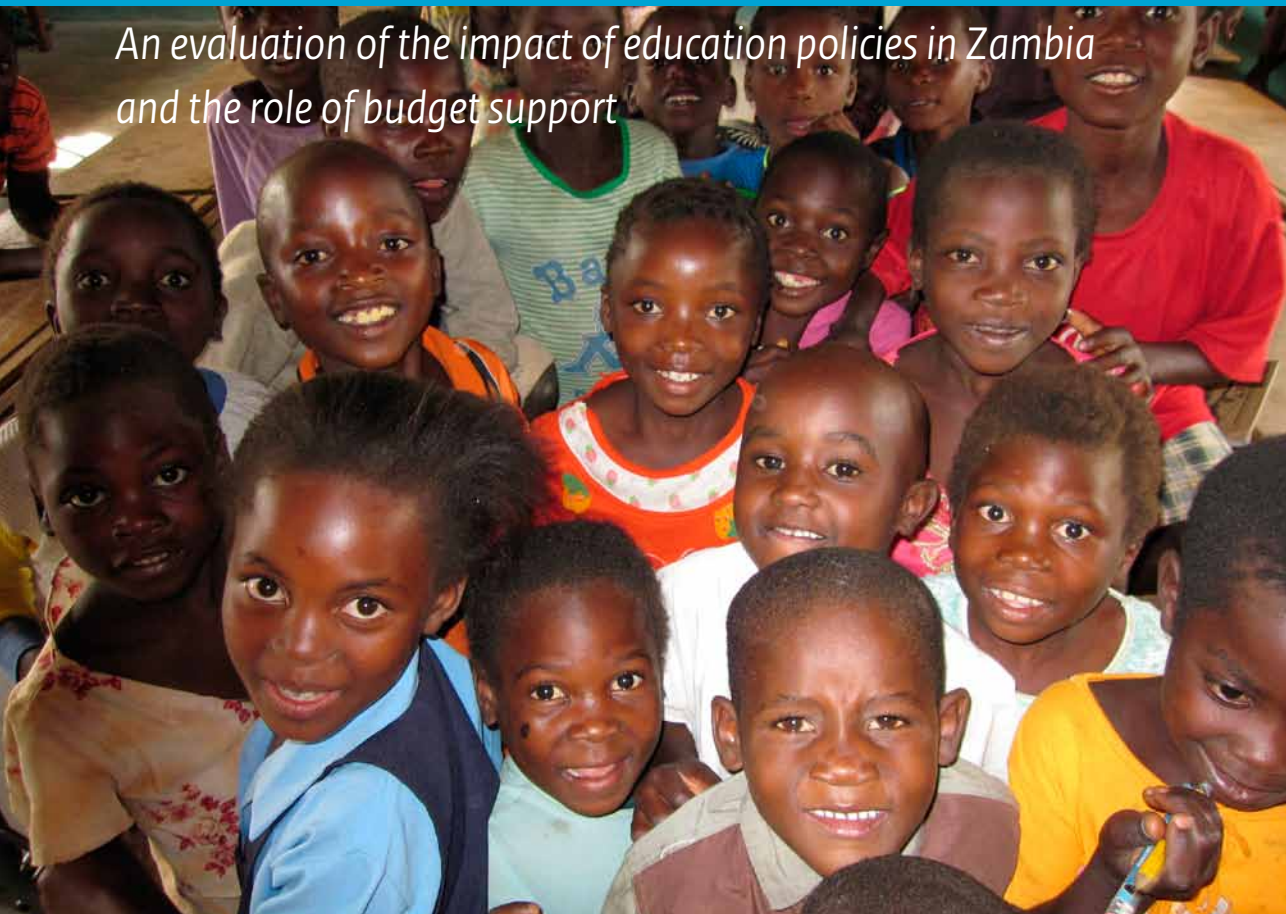Ministry of Foreign Affairs of the Netherlands

IOB Evaluation

Unfinished business: Making a difference in basic education

An evaluation of the impact of education policies in Zambia and the role of budget support

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Preface

The past 15 years have witnessed a shift in development cooperation from a project approach to a sector-wide approach and sector and general budget support. These new aid modalities were introduced in response to the perceived lack of efficiency, effectiveness and sustainability of project aid, which was caused by fragmentation, and the lack of coordination and ownership.

Zambia is no exception in this paradigm shift. There, education was one of the first sectors where the sector-wide approach (SWAp) was introduced at the end of the 1990s. By then, the sector had deteriorated and enrolment was low as a result of many years of budget cuts, emanating from the economic problems facing the country. Sector cooperation has proved to be rather successful and despite the enormous challenges, the sector could point to impressive results. Increased resources contributed to a large increase in the number of pupils enrolled in basic education. The collaboration contributed to further harmonization and alignment with the introduction in 2007 of the *Joint Assistance Strategy for Zambia* and general budget support, called Poverty Reduction Budget Support (PRBS), which was aligned with Zambia's *Fifth National Development Plan* for the period 2006–2010. The Netherlands and Ireland became lead donors for the education sector. The Netherlands also provided general budget support (GBS).

The shift to GBS was effectively accompanied by increases in the national education budget and thus no crowding-out effects were registered. Public expenditures on education increased substantially, from 2.7% of the budget in 2005 to more than 4% in 2009. That year (i.e. 2009), budget support and pooled sector funding accounted for about 12% of the total resources of the Ministry of Education and about 30% of the discretionary budget. There is evidence that the poorest groups benefited relatively more from these investments in education and the introduction of free primary education: disparities in school attendance have become much smaller and thus expenditures on basic education are strongly *pro-poor*. Examination pass rates have improved and the gender gap has narrowed significantly.

The introduction of budget support created new challenges as well. While there was a strong feeling among partner countries, Cooperating Partners and academics that budget support would be a more efficient, effective and sustainable mode of aid delivery, it also proved complicated to analyze its impact. The lack of information on tangible results has contributed to debates in a number of partner countries about the effectiveness of this aid modality. In response, the evaluation departments of the (cooperating) partners took the initiative to assess the effectiveness of budget support in recipient countries in order to provide empirical evidence regarding the contribution of budget support to the realization of government objectives, i.e. (economic) development, poverty reduction and improved service delivery.

This report contributes to an evaluation of budget support in Zambia. It analyzes the impact of budget support on the education budget and education policies, as well on the impact of these policies. The long-term and consistent involvement of a number of donors, including the Netherlands government, in supporting basic education in Zambia offered a suitable framework for an in-depth analysis of the key variables that influence the effectiveness and impact of the cooperation. The main purpose of the report is to contribute to and enhance the effectiveness of sector policies and sector collaboration, resulting in further improvements in the quality of basic education in Zambia.

The evaluation shows that substantial progress has indeed been made, and that the results can be partly attributed to the selected budget support modalities. Much work remains to be done, however, both to enhance teacher quality and ensure the equitable regional distribution of education. While some of the results have been impressive, the quality of education generally remains low. This is partly the result of the large increase in enrolment of pupils in poor, remote areas. The socioeconomic backgrounds of pupils and language barriers have had an impact on their test and examination results. These challenges have not been effectively addressed. Through budget support and the sector pool, the government and Cooperating Partners have invested mainly in the 'hardware' (more teachers, more classrooms, more books), thereby paying insufficient attention to the 'software': teacher education and training, and especially school management and strengthening the standards section. Aided by sector and PRBS targets, they have focused too much on symptoms such as high pupil–teacher and pupil–classroom ratios. A detailed analysis of the determinants of examination results points to the importance of improving teacher education and school management as key variables that could guarantee cost-effective pathways to further improvements in the quality of basic education. Improving education in the rural areas requires a more holistic approach, taking into account cultural values and language barriers. In sum, the support of development partners to basic education is still unfinished business.

The research for the (overall) study of budget support in Zambia has been conducted within the framework of a joint evaluation of budget support by the Policy and Operations Evaluation Department (IOB) of the Netherlands Ministry of Foreign Affairs, the Evaluation and Audit Department of the German Federal Ministry for Economic Cooperation and Development (BMZ-E) and the Secretariat for Evaluation of the Swedish International Development Cooperation Agency (Sida), in collaboration with the Ministry of Finance and National Planning (MoFNP) in Zambia.

Antonie de Kemp (IOB) and Charles Ndakala, systems development manager, Directorate of Planning and Information of the Ministry of Education (MoE/DPI) coordinated the study of the basic education subsector and wrote the report. Many other individuals also contributed to this report: Mwila Chikwekwe (Impreuna Consulting), Joe Kanyika, Teza N. Musakanya and Shadreck Nkoya (Examinations Council of Zambia, ECZ), Bupe Musonda, Valentine Chitambala and Noel Chiluba Mulopa (MoE/DPI), Dominic Nyambe (MoE/ Standards), and Justine Lupele (EQUIP II). Support from the ECZ and the Central Statistical Office is gratefully acknowledged. The report also owes a lot to Chola Chabala of the

Monitoring and Evaluation Department of the MoFNP and Alexander Chileshe, executive director of the Economics Association of Zambia, Miyanda Kwambwa and Yvonne Chomba (Irish Embassy in Lusaka, Leo van de Zwan (Netherlands Embassy in Lusaka), and Vincent Snijders (Netherlands Ministry of Foreign Affairs), who commented on a draft of the report.

This evaluation is also an input to the Dutch education sector policy evaluation.

The final responsibility for this report rests with IOB.

Professor Dr Ruerd Ruben
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Acronyms and Abbreviations

BESSIP	Basic Education Sub-sector Investment Programme
BMZ	Federal Ministry for Economic Cooperation and Development (Germany)
CPCC	Cooperating Partner Coordination Committee
CSO	civil society organization
DDCC	District Development Coordinating Committee
DEO	District Education Office
DFID	Department for International Development (UK)
DPI	Directorate of Planning and Information, Ministry of Education (Zambia)
ECZ	Examinations Council of Zambia
EMIS	Education Management Information System
ESIP	Education Sector Investment Plan
FAWEZA	Forum for African Women Educationalists of Zambia
FBE	free basic education
FE	fixed effects
FNDP	Fifth National Development Plan
FTI	Fast Track Initiative
GLS	generalized least squares
GNI	gross national income
GRZ	Government of Zambia
IOB	Policy and Operations Evaluation Department, Netherlands Ministry of Foreign Affairs
JAR	Joint Annual Review
JASZ	Joint Assistance Strategy for Zambia
JSSLE	Junior Secondary School Leaving Examination
LCMS	Living Conditions Monitoring Surveys
MDGs	Millennium Development Goals
MoE	Ministry of Education (Zambia)
MoESP	Ministry of Education Strategic Plan
MoFNP	Ministry of Finance and National Planning (Zambia)
MoU	Memorandum of Understanding
MTEF	Medium-Term Expenditure Framework
M&E	monitoring and evaluation
NBTL	New Break Through to Literacy
NGO	non-governmental organization
NIF	National Implementation Framework
OECD/DAC	Organisation for Economic Co-operation and Development, Development Assistance Committee
OVCs	Orphans and Vulnerable Children
PAF	Performance Assessment Framework
PITC	Policy and Implementation Technical Committee
PRBS	Poverty Reduction Budget Support
PRP	Primary Reading Programme
PSRP	Public Sector Reform Programme

PSLCE	Primary School Leaving Certificate Examination
PTR	pupil–teacher ratio
SAG	Education and Skills Development Sector Advisory Group
SACMEQ	Southern and Eastern Africa Consortium for Monitoring Educational Quality
Sida	Swedish International Development Cooperation Agency
SNDP	Sixth National Development Plan
SWAp	sector-wide approach
UNICEF	United Nations Children's Fund
WEPEP	Western Province Education Programme
WLS	weighted least squares
ZDHS	Zambian Demographic and Health Survey

Summary and conclusions

Education is one of the most important instruments for reducing poverty and stimulating economic growth. Governments all over the world have recognized this. Partly as a result of the *Education for All* initiative in 1990 and the *Millennium Development Goals* (MDGs), the sector became one of the most popular and most crowded sectors of development cooperation. Zambia has been no exception in this respect. At the end of the 1990s, the education sector had deteriorated as a result of budget cuts in the preceding decades, with enormous consequences for enrolment and learning achievements. At the start of the new millennium, the country was far from realizing the MDG targets for education.

Recognizing this, the Government of the Republic of Zambia (GRZ) and its Cooperating Partners began to cooperate to revitalize the sector. The introduction of the sector-wide approach (SWAp) created the financial preconditions for large investments in basic education and for the abolition of school fees in 2002. As a result, enrolments have grown enormously since then. The successful sector cooperation catalyzed further harmonization and alignment of external support, culminating in a Joint Assistance Strategy for Zambia (JASZ, 2007). As part of this process, in 2005 the government of Zambia and a number of Cooperating Partners signed a Memorandum of Understanding for the provision of Poverty Reduction Budget Support (PRBS). With the introduction of general budget support (GBS) in 2005/2006 and the acceptance of the JASZ, several Cooperating Partners ended their active participation in the SWAp and direct funding of the education sector.

This report analyzes the impact of the move to general budget support on the education sector, and the basic education subsector in particular. The report contributes to a wider analysis of the impact of budget support in Zambia. In order to be able to analyze this impact, the report discerns two specific levels:
a) the level of policy formulation, including the policy dialogue and development of the budget;
b) the impact of the implementation of (government) policies on basic education.

The main purpose of this report is to contribute to insights that could enhance the effectiveness of sector policies and sector collaboration, resulting in improvements in the quality of basic education in Zambia.

Conclusions

1. *Between 2005 and 2009 the move to general budget support had a positive impact on the development of the education budget and the funding of the education sector.*

The financial resources of the Cooperating Partners created the preconditions for the implementation of policies aimed at achieving the MDG education targets and the introduction of free (basic) education. The shift to budget support has not reduced total allocations to the Ministry of Education. Several Cooperating Partners have continued to provide funding directly to the Ministry and domestic spending increased enormously until 2009. Until recently, there has been no evidence of funds being moved from education to other sectors. Between 2005 and 2009, real (domestic) expenditures on education rose by more than 50%. The increase was much higher than the reduction of disbursements from the sector pool and the importance of the education sector in the total budget grew. Budget support and the sector pool account for about 12% of the total resources of the Ministry of Education and about 30% of the discretionary budget. Moreover, the move to general budget support enhanced the allocative efficiency. The insistence of Cooperating Partners on increasing domestic resources for education, through the sector dialogue and through the PRBS meetings, was successful.

2. *The PRBS and sector dialogue were effective in contributing to the development of sector policies. Strong ownership by the government and the convergence of sector objectives and strategies were important conditions for this result.*

Sector cooperation in the *education sector* worked smoothly. First, there was strong ownership by the government. Education, especially basic education, is politically important and the government has shown its commitment through its coordinating role in the sector, through the introduction of free primary education and through large increases in the (domestic) budget. The Cooperating Partners have helped to strengthen sector planning and budgeting, to improve transparency, accountability and monitoring and evaluation in the sector, and have contributed to the decentralization of the sector. The JASZ and the move to PRBS have enhanced harmonization and coordination in the sector and have reduced transaction costs on the side of the Ministry. The lead donors on the other hand had to take on a huge work load because of the distribution of labour and the consequent exit of some donors from the sector. The exit of donors also meant stripping the sector of much needed technical expertise in some areas.

Recently, Cooperating Partners have become more critical of the effectiveness of cooperation in the education sector. There is a sense that the current sector dialogue mechanisms are not working effectively. These concerns are partly a reaction to irregularities in other sectors and the slowness of the government in responding to them, as well as the lack of progress towards targeted budget support. Follow up on the recommendations of the Fiduciary Risk Assessments of 2008 has been slow, which impedes the timely move towards targeted budget support. Other issues have also contributed to an increasing focus on fiduciary issues. While it is important to ensure that funds are spent correctly and in

accordance with their original objectives, there is also a risk that this focus detracts from the effectiveness of education policies.

3. *Investments in the education sector have effectively contributed to the achievement of sector targets.*

The extra resources were used to recruit more teachers, build more schools and construct more classrooms. Between 2005 and 2009, the number of basic schools increased by 475, of which 275 were GRZ and grant-aided schools, and remainder (mainly) community schools. The government recruited 9000 extra teachers for the basic education sector and constructed 5000 extra classrooms. These resources both encouraged and were necessary to cope with a huge growth in enrolments at the lower and middle basic levels (the primary level), from 2.6 million in 2005 to 2.9 million in 2009. Among these, enrolments at the upper basic level rose from less than 300,000 pupils in 2005 to more than 400,000 in 2009. There is evidence that especially the school attendance of children from the poorest households improved. In line with the enrolment growth, the number of examination candidates at grades 7 and 9 grew very rapidly, and pass rates improved. In 2005, 50% of grade 7 candidates passed their examination; in 2010 this figure had increased to 84%. The pass rates of grade 9 candidates did not improve, however.

The investments in education explain almost 40% of the enrolment growth between 2005 and 2009. For a large part, these investments were also necessary to accommodate the enrolment growth due to population growth or other factors. Although total enrolments continued to increase, the investments also contributed to slight reductions in pupil–teacher, pupil–classroom and pupil–book ratios. Overall, GRZ and grant-aided schools accounted for 63% of the total enrolment growth between 2005 and 2009, and community schools for most of the remainder.

4. *While the situation is improving, education spending is still regressive and regional imbalances remain. Nevertheless, these imbalances are also the result of large differences in enrolment growth.*

Mainly as a result of the high enrolment growth, pupil–teacher ratios remain high, especially in rural areas. In line with the urban–rural disparities there are also large differences between districts. The distribution of teachers among districts is regressive, with relatively fewer teachers employed in the poorest districts. Teacher allocation has improved only slightly. However, this is partly the result of the relatively high enrolment growth in the poorest districts (and in rural areas). The deployment of teachers in rural areas and the construction of classrooms attracted new children. As a result, pupil teacher ratios and pupil classroom ratios improved less than anticipated. Therefore, precisely because of the impact on enrolment, the investments have been more effective than the changes in pupil teacher ratios and pupil classroom ratios suggest. Nevertheless, for poor rural areas, investments in classrooms and in new teachers have hardly been enough to compensate for the increased enrolments. As a result, some children have to sit on the floor, without books and, in the case of double shifts, school hours are short. So far, the ministry has not succeeded in finding a system that leads to a more equal allocation of teachers. The 20% bonus paid to teachers in rural areas is not enough, and many teachers in urban areas can

compensate for this bonus by teaching two shifts, which is an incentive for maintaining this system.

Disbursements to basic schools are progressive, with the poorest districts receiving relatively more money. At the same time, it must be noted that the budget per pupil is far too low to have an impact. The payment of school grants is erratic and the average grant per pupil has decreased by more than 60% (in real terms) over the years.

A specific district analysis showed large differences between districts in terms of resources, examination results, equity issues and the development of basic education. Overall, the worst-performing districts are in the Northern, Southern and North Western provinces. In order to improve the performance of these districts it is necessary to:

1. improve the allocation of resources, and the collaboration of NGOs and bilateral Cooperating Partners with the Ministry of Education;
2. develop more effective programmes to resolve the problems with English in rural areas;
3. develop more effective policies to reduce repetition and dropout rates in a number of districts;
4. step up support to community schools; and
5. pay more attention to equity issues and develop specific programmes for girls focusing on districts with low gender parity indices.

5. *There are serious inefficiencies in the allocation of resources, the deployment of teachers and the distribution of classrooms, all of which have had a negative impact on the effectiveness of basic education.*

While total resources for basic education are too low to deal with all the challenges in basic education, the inefficient allocation of resources also has a negative impact on sector results. There are large differences in pupil–teacher ratios, even among GRZ schools. For almost 30% of pupils, this ratio is lower than 40:1, whereas for 10% of pupils it is above 100:1.

The allocation of resources is mainly based on the number of pupils, but given the lack of classrooms, deploying more teachers in a school will not always be the best option. In some schools the number of teachers (almost) equals the number of classes, rather than the number of classrooms. This means that teachers teach only one class (instead of two if the school has a system of double shifts). Moreover, the actual teaching by head teachers has decreased as well, while the absenteeism of teachers has increased. These findings imply a serious waste of scarce resources and of the most important, but also most expensive, resource in basic education. Improving the deployment of teachers could free up resources that could be used to improve the quality of basic education.

6. *Access to education has improved enormously, but the quality of education generally remains low. However, the development of basic education over the past decade has been more successful than a superficial analysis suggests.*

The numbers of pupils completing primary and upper basic education have increased enormously, but *average* test and examination results have not much improved.

However, it must be stressed that several successes tend to disguise more positive sector results:

1. The high enrolment growth in rural areas had a negative impact on efforts to reduce pupil–teacher and pupil–classroom ratios. The numbers of teachers and classrooms increased more rapidly in rural than in urban areas, but so did enrolments. Moreover, the deployment of more teachers and the construction of more classrooms attracted new pupils.

2. Related to this phenomenon is the effect of enrolment growth on learning achievements. With the increased access of underprivileged groups, the composition of the children enrolled in basic education has changed. In 2010, many children in poor, remote rural areas now go to school, while their parents had no education. This had an important impact on average test and examination results. In general, children in poor rural areas have relatively poor results as their backgrounds and home environments are not conducive to learning. One of the problems is that few people in these areas speak English, yet school examinations are in English. As a result, many pupils do not master English and therefore perform poorly in the examinations. In this respect, the relatively stable results may be seen as an important achievement.

The problem with English appears to be one of the main challenges. Tests and examinations are in English, but in large parts of the country, people do not master English. At the beginning of the Millennium, Zambia was a forerunner in the introduction of New Break Through to Literacy (NBTL), an approach introducing learning in the local language up to grade 3 as a way of countering the potential effecting of learning in a foreign language. While in 2003 an evaluation concluded that the pilot was highly successful, it appears that the subsequent implementation was less effective.[1] The teacher deployment system also facilitates the continued use of local languages. Teachers continue to teach in one of the local languages, with the result that grade 7 pupils – and even many grade 9 pupils – do not master English. The evaluation also shows that this is a regional phenomenon (with the largest challenges in Northern Province and Southern Province).

This evaluation also pays attention to the persistent misunderstanding that underresourced community schools perform as well as GRZ schools. Community schools have had a very important role in improving access to education and one can only have great respect for the communities who created these schools and the teachers who volunteered to work in these schools. Many children in these schools are learning under very difficult and unconducive environments, with teachers who are in most cases untrained, and with minimal learning materials. However, there is enormous variation between community schools. Whereas many schools are solely supported by the community, other schools receive assistance from churches, NGOs or private enterprises. Only a few (about 100) of the almost 3,000 community schools are entitled to subject pupils to examinations. These schools are much better resourced than other community schools, and often even better than GRZ schools. The examination results of these schools are indeed comparable with the results of GRZ schools, but they are not representative for all community schools. The grade 7 pupils of other

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[1] In fact, already the IOB (2008) evaluation questioned the sustainability of the results in the pilot schools (see chapter 6 of this report).

community schools take their examinations in other examination centres, usually GRZ schools.

7. *While there are important reasons why learning achievements have not improved, the quality of education can and should be improved.*

There are a number of other reasons why learning achievements have not improved. A first explanation is the lack of resources. Resources have increased, but not enough to cope with the dilapidated state of the (basic) education sector in the 1990s and the high enrolment growth. As a result, in some schools children sit on the floor in overcrowded classrooms. The system of double shifts has led to a short contact time between teachers and pupils, and this has been further reduced by increasing teacher and pupil absenteeism. The failure by teachers to spend adequate time preparing lessons and marking has had devastating impacts on the teaching and learning process. Teacher motivation is low.

There are at least four reasons why interventions are not more (cost-)effective:
1. The problem with local languages has not been effectively resolved, and has undermined the effectiveness of teaching and the use of instructional materials.
2. The system of double and even triple shifts has led to shorter contact time between teachers and pupils, and this has been aggravated by increasing teacher and pupil absenteeism.
3. The extremely low school grants mean that schools cannot pay their bills and cannot afford the most fundamental teaching and learning materials, with serious impacts on the effectiveness of teaching.
4. Many schools do not offer an environment that is conducive to learning. Increased teacher and pupil absenteeism has a negative impact on education results and may lead to higher dropout rates.

Investing in the *quality of school management* (through education and training as well as strengthening of the standards unit) is the most effective way to improve results. Well-managed schools perform better, and investing in the quality of management is a relatively cheap way to improve results. A well-managed school ensures pupil and teacher attendance, motivates teachers, encourages the efficient allocation of resources and offers a child-friendly environment. If the quality of school management is raised, teachers become considerably more (cost-)effective. And naturally, well-trained teachers raise the cost-effectiveness of books. As a result, pupils perform better. Line items that contribute to improved quality e.g. standards and curriculum must receive adequate allocation of resources. Given the scarce resources, it is important to strategically allocate resources to those components that will have significant/maximum impact.

Improving education in rural areas also requires a more holistic approach. It appears that in the past decade, the government and Cooperating Partners have tended to focus on the 'hardware' (more teachers, more classrooms, more books), thereby paying insufficient attention to the 'software', i.e. teacher education and training, and especially school management and strengthening the standards unit, localized target setting, and commu-

nity participation and empowerment. Cooperating Partners and the ministry have focused too much on symptoms such as high pupil–teacher and pupil–classroom ratios. However, more teachers will not be a solution if each teacher teaches only for three hours per day. More classrooms are also needed, but that is also only part of the solution. It is necessary to invest more in the causes of underperformance in rural areas, which are related to cultural values and language barriers, rather than just focusing on pupil–teacher or pupil–classroom ratios. If these problems are not resolved, deploying more teachers or constructing more classrooms will not have a large effect. In the end, money remains key: more resources are needed to deal with the challenges facing the sector.

The analysis also shows that it is illusory to think that in general a project approach would be more effective. Many projects, such as the Dutch Western Province Education Programme (WEPEP), implemented in the late 1990s, have proved to be unsustainable. In other cases, like a context where funding centrally has risks because of a weak system, projects may be more effective. Overall, it appears that a combination of modalities leads to the best results: sector budget support or pooled funding are the most adequate instruments to discuss sector issues, general budget support helps to raise issues at a higher level and projects may help to address specific (regional) issues or function as a pilot for the development of new instruments.

8. *Recent developments endanger the sector results achieved, and create the risk of a new erosion of the sector.*

In spite of all investments, total resources for the education sector remain too low. Zambia spends less than 4% of its GDP on education, against an average of 5% in comparable countries. Even though the education budget has increased, it is still far too low to deal adequately with the challenges facing the sector. In 2010, the total releases of the Ministry of Finance and National Planning (MoFNP) and Cooperating Partners were much lower than the budget and commitments, and also much lower than disbursements in 2009.[2] This contributed to a delay of investments and a further reduction in the already very low school grants. Moreover, disbursements often come very late (in the fourth quarter) and this prevents effective utilization of resources. This has especially a negative impact on (classroom) construction.

Apparently, the interest of GRZ and Cooperating Partners in basic education is waning. Several partners are withdrawing from the education sector, have reduced their budget support or are ending their bilateral support to Zambia. This will likely have negative consequences for the development of the basic education subsector. Large investments are still needed to deal with the low level of education and the high population growth.

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[2]   In late 2010 some partners decided to delay disbursement because they felt that not enough progress had been made on a number of issues, including the introduction of targeted budget support, fiduciary issues, and substantial weaknesses in financial and accounting systems, and because of the lack of follow-up on a number of reports.

1

Introduction

Education is one of the most important instruments for poverty reduction and economic growth. Partly as a result of the *Education for All* initiative in 1990 and the Millennium Development Goals (MDGs), the sector became one of the most popular and most crowded sectors of development cooperation. Until recently, this was the case in Zambia, where in the late 1990s education was one the first sectors where the sector-wide approach (SWAp) was introduced. The successful collaboration between the government and Cooperating Partners in the education sector contributed to the further harmonization and alignment of aid, resulting in the move to general budget support in 2005.

The shift from project aid to sector support and general budget support was not unique to Zambia, but rather a reflection of the perceived lack of efficiency and effectiveness of project aid, which was caused by fragmentation and the lack of coordination, ownership and sustainability. However, this shift created new challenges as well. While there was a strong feeling among partner countries, Cooperating Partners and academics that budget support would be a more efficient, effective and sustainable mode of aid delivery, it also became more complicated to analyze its impact. A lack of information on tangible results contributed to the debate in development partner countries about the effectiveness of this aid modality. The evaluation departments of (cooperating) partner agencies have therefore taken the initiative to assess the effectiveness of budget support in recipient countries. The objective of these evaluations has been to provide empirical evidence regarding the contribution of budget support to the realization of its objectives, i.e. (economic) development, poverty reduction and improved service delivery.

The *evaluation of budget support to Zambia* includes, apart from an overall analysis of the development and impact of budget support, several sector case studies: infrastructure, agriculture, health and (basic) education. The choice of sectors was based on:
- their role within the MDGs;
- their role within the Poverty Reduction Budget Support (PRBS) and the Performance Assessment Framework (PAF);
- their budgetary importance; and
- discussions with the government of Zambia and the Cooperating Partners.

The *synthesis report* discusses the development of budget support in Zambia and analyzes its impact on government reforms, service delivery and households.

This report represents the contribution of the education sector to the budget support evaluation. The evaluation focuses on the development of the policy dialogue and funding of the basic education subsector, as well as on the impact of government policies, to which the Cooperating Partners have contributed. If these policies have been successful, then external support, including budget support, was well spent. Nevertheless, the main purpose of the report is to contribute to enhancing the effectiveness of sector policies and sector collaboration, resulting in improvements in the quality of basic education in Zambia. In order to ensure the practical use of the report, the Directorate of Planning and Information of the Ministry of Education (MoE/DPI) contributed to the formulation of the Terms of Reference and participated actively in the evaluation.

This case study builds on the results of an earlier collaboration.[3] While the previous study focused on the *impacts* of selected education interventions in terms of incidence and educational results, the new evaluation seeks to provide empirical evidence of the contribution of budget support to the realization of its objectives, i.e. (economic) development, poverty reduction and improved service delivery. Moreover, the new evaluation covers the full nine years of basic education, focusing on:

- the impact of budget support on the MoE budget;
- the impact of budget support on service delivery;
- the distributional effects of improved service delivery;
- the impact of improved service delivery on enrolment and learning achievements; and
- equity issues and causes of gender and regional disparities.

While for comparison the period 2000–2005 has been taken into account where relevant, the primary interest is in the years 2005–2010.

Chapter 2 explains the methodology used for this evaluation. This is a combination of field research and data analysis. The main source of information is the Education Management information System (EMIS), in combination with the Educational Statistical Bulletins. The report is an example of how these sources may be used for a policy evaluation. The Examinations Council of Zambia (ECZ) provided additional information, making it possible to link investments in education to learning achievements.

Chapter 3 describes and analyzes education policy in Zambia and the role of the Cooperating Partners in the sector. It assesses the impact of budget support on the sector dialogue as well as on the sector budget. The chapter concludes that the start of the new millennium *may* have marked the end of a decade of intensive and successful sector cooperation.

Chapter 4 presents the direct results in terms of outputs (such as the recruitment of teachers and classroom construction) and outcomes (such as enrolment, girls' access to education and completion rates). It also analyzes the determinants of enrolment growth, including policy interventions. Through this analysis, the evaluation was able to estimate the impact of investments in the education sector on enrolment growth. Once again, the focus is on 2005–2010, rather than on the first years of the decade.

Chapter 5 makes an excursion to the allocation of resources and does so in two ways. First, it analyzes disparities in the allocation of resources across districts in order to assess whether poor areas are relatively under-resourced. In many cases, such an analysis is static, considering just one moment in time. The evaluators feel, however, that such an analysis should be dynamic. It is not very interesting to conclude that the allocation of resources is progressive or regressive; it is more important to determine the direction of and trends in resource allocations. Second, the chapter assesses the allocative efficiency of investments in the sector. It concludes that the sector may gain a lot from an improvement in allocative efficiency. The main challenge is to find the right incentives for the actors involved.

[3]   IOB (2008a), Primary Education in Zambia, IOB Impact Evaluation no 312.

Chapter 6 provides a detailed analysis of the impact of interventions in the education sector on learning achievements. The analysis has relied on a combination of qualitative research, using information from the literature, field visits, expert information from MoE officials and interviews with standards officers, (head) teachers, pupils and parents, as well as detailed quantitative information. While it may be tempting to focus solely on the impact of interventions, the evaluation team feels that it is more important to understand the actual process of teaching and learning. The chapter sketches some challenges for the (further) improvement of basic education in Zambia.

Chapter 7 shifts attention once again to the district level. Over the last two years, the ministry has been working on district profiles. These are valuable instruments for assessing developments in the education sector in each district. At the same time, the development of these district profiles raised interest in the causes of underperformance in several districts. While the district profile may give a comprehensive picture of developments in one district, chapter 7 tries to sketch a broader picture through a comparative analysis using a number of indicators developed for such an analysis.

Chapter 8 returns to one of the main objectives of the evaluation, which is to assess the impact of budget support. While the whole evaluation tries to assess the impact of budget support in itself, many policy makers want to know whether it is more or less effective than project aid. Curiously enough, the reverse question has never been raised in evaluations of project aid. Nevertheless, without attempting to answer this question, chapter 8 highlights some of the disadvantages of project aid. The Achilles heel of projects appears to be sustainability.

2

Research questions and methodology

2.1 Introduction

This report is the result of a collaboration of the Policy and Operations Evaluation Department (IOB) of the Netherlands Ministry of Foreign Affairs and the Directorate of Planning and Information of Zambia's Ministry of Education. The report serves two overlapping objectives. The first is to assess the contribution of budget support to the funding of the education sector in Zambia and the realization of sector objectives. Part of this evaluation involved an analysis of developments in service delivery – who benefitted and what was the impact? – following an agreed set of research questions and methodology.[4] The second, related, objective is to assess the causes of underperformance in a number of districts, in close collaboration with the Directorate of Planning and Information of the Ministry of Education.

2.2 Research questions and definitions

The evaluation seeks to provide empirical evidence on the contribution of budget support to the realization of objectives in the basic education subsector. The *central questions* are:

1. To what extent has budget support contributed to external funding for the education sector and what was the impact on the sector dialogue?
2. What was the impact of sector policies on service delivery?
3. Who benefitted from changes in service delivery?
4. What was the impact of investments in the sector on access and learning achievements in the basic education subsector?
5. What are the causes of regional imbalances?

Central to the evaluation is the analysis of the impact of investments in the basic education subsector, to which Cooperating Partners have contributed through budget support and the sector pool (of funds for the National Implementation Framework of the Fifth National Development Plan).

In line with the OECD/DAC (2006), the evaluation defines sector budget support as un-earmarked funding to the national treasury. Nevertheless, the evaluation also includes the direct funding of the education sector through the sector pool and especially tries to analyze the relation between the two instruments.

The evaluation focuses on the basic education subsector, as this is the largest subsector of interest to the Cooperating Partners and especially PRBS partners. In line with the provisions of Poverty Reduction Budget Support from 2005 onwards, attention is focused on the period 2005–2010, although other years have been taken into account where relevant.

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[4] The development of the methodology is an initiative of the Evaluation Unit of the Europe Aid Co-operation Office of the European Commission. The Steering Group on budget support further includes the evaluation departments of Belgium, Canada (CIDA), Denmark (DANIDA), Finland, France (AFD), Germany (BMZ), Ireland (Irish Aid), the Netherlands (IOB), Norway (NORAD), Sweden (Sida), the United Kingdom (DFID) and the OECD/DAC secretariat.

2.3   Budget support and the measurement of impact

Budget support normally comprises four *instruments* or elements: a) the funds, b) the policy dialogue, c) the conditions attached to the support, and d) technical assistance and or capacity building activities (Hammond, 2006). It is the *expectation* that this mix of instruments – under the right conditions – will contribute to the realization of specific government outputs, such as increased funding for discretionary spending, resulting in increased quantity and quality of goods and services provided by the public sector.

The intervention logic underlying budget support renders an evaluation of the instrument's effectiveness complex. In contrast with the evaluation of projects, there is no way to measure the effects directly. The impact of budget support on education is determined by the quality of national strategies and policies, the government's commitment to pursue these policies, and the government's political and administrative capacities to use the resources to implement these policies. Therefore, an analysis of the impact of budget support must include an analysis of the impact of sector policies efficiently and effectively. This does not mean that Cooperating Partners may fully claim the successes of these policies. Rather, it means that the evaluation analyzes the effectiveness of interventions to which PRBS partners have contributed. The evaluation also tries to assess how PRBS partners contributed to the development of these sector policies through funding and other non-financial contributions.

The road to the measurement of impact of education policies is also paved with methodological problems. Programmes may seem effective or ineffective, but many factors apart from direct interventions may have determined the results. Three related problems need to be addressed. First, there is the *attribution problem*. Which effects can be attributed to educational interventions? Many other factors interfere and may have an impact as well. An unbiased assessment of the effects of educational interventions on enrolment, for instance, must take into account the effects of the size, remoteness and poverty status of households, as these factors may also determine enrolment rates. For example, enrolment rates may improve as a result of increased incomes, the lowering or abolition of school and examination fees, increased awareness of the importance of education among parents, etc. Moreover, there are also certain factors that have a negative impact on learning and learning achievement. Poor education outcomes may be due to the poor quality of the schooling system (teachers, teaching methods, materials), to underfunding or to factors beyond the education policy.

The attribution problem is related to *selection effects*, which may occur when the characteristics of the intervention and control group(s) are different. The neglect of selection effects may lead to biased estimates (White et al., 2006, pp.3–4). As long as selection is based on observable characteristics, these may be included in the analysis. However, not all characteristics are observable. This is the third problem: *selection of unobservables*. If the effects of one particular intervention are evaluated, it is not necessary to include all relevant factors in the model *as long as these other factors are not correlated with the intervention*. This is what causes the problem of unobservables and *endogeneity*. For instance, one may be interested in the effect

of class size on learning achievement.[5] Class size may be endogenous or correlated with school management (see, for instance, Glewwe and Kremer, 2005). However, school management is seldom included in the analysis. Moreover, it is often assumed that the school choice of motivated (and probably well-educated) parents is correlated with class size, as these parents tend to send their children to schools with low pupil–teacher ratios. The evaluation uses a number of techniques to deal with these challenges.

2.4 Methodology

Different methods were used to solve the methodological problems encountered. The evaluation relies on a mix of methods, including qualitative research as well as quantitative impact analysis. The impact of budget support and the policy dialogue on the MoE budget and MoE policies are evaluated through an analysis of evaluations and (sector) reviews (including Public Expenditure Reviews and the Fiduciary Risk Assessment), documentation of Cooperating Partners and GRZ (including the documentation on pooled funding, targeted sector budget support and general budget support), analysis of budget allocations and through interviews. The impact of budget support (including pooled funding) on service delivery is analyzed through the sector plans (especially the MoE's Strategic Plan, MoESP, and the National Implementation Framework, NIF) and specific other plans (such as the Infrastructure Plan), budget allocations, monitoring information and available evaluations. The impact on service delivery is analyzed using information from the yearly Educational Statistical Bulletins and the Education Management Information System (EMIS) that contains information from the annual school censuses. As part of the analysis, the team visited the provincial education office of Eastern Province and the district education offices and basic schools in Chadiza and Chipata. In addition, the team visited the district councils in Kalomo and Sinazongwe in Southern Province and held focus group discussions in several wards in these districts.

Next, the evaluation analyzed the effects of the education policies and investments in the sector in terms of the impacts on enrolment and learning achievements. Basically, regression techniques were applied to resolve problems of (observed) confounding factors and selection effects (see Annex 5). The approach is known as the 'estimation of education production functions' (see Glewwe and Kremer, 2005). Differences in access and learning achievements are explained by:
- *characteristics of the pupils* (gender, age, where they live, work at home);
- specific *characteristics of households* (such as welfare and education of parents, language);
- *school-related factors* (such as distance to school, availability of desks and books, teacher qualifications, pupil–teacher contact time, teacher absenteeism).

[5] In traditional usage, a variable is endogenous if it is determined within the context of a model. In econometrics, it is used to describe any situation where an explanatory variable is correlated with the disturbance term. Endogeneity arises as a result of omitted variables, measurement error or in situations where one of the explanatory variables is determined along with the dependent variable.

The main unit of analysis is the school. It therefore seems appropriate to distinguish a number of specific school-related factors: school characteristics, infrastructure, learning materials, teachers and management. In a formal mathematical notation:

$$Outcome_i = a + b_iS_i + c_iM_i + d_iI_i + e_iL_i + f_iT_i + g_iP_i + h_iH_i + k_iR_i + \varepsilon_i$$

where S, M, I, L, T, P, H and R denote vectors of observable characteristics, a denotes the estimated constant, b_i through k_i denote the estimated coefficients, and residual ε indicates all unobserved characteristics, which include:

S = vector of specific school characteristics
M = vector of management characteristics
I = vector of infrastructural characteristics
L = vector of learning materials
T = vector of the number and quality of teachers
P = vector of pupil characteristics
H = vector of household characteristics
R = vector of regional characteristics.

The econometric analysis was complemented by qualitative research, including a review of the recent literature, interviews, field visits and focus group discussions.

The evaluation also analyzed the distributional effects of (basic) education, focusing on gender differences, and differences by income and by region. This analysis was carried out in two ways: 1) by linking administrative data (from the EMIS) to census data and poverty maps; 2) by using household survey data on the actual use of education services and other differences between groups (such as differences in income and urban/rural differences). The analysis examined differences in:

• the provision of education services (schools, teachers, classrooms);
• enrolment;
• learning achievements.

An important aspect of this part of the evaluation is an analysis over time: it is more interesting to know if differences are decreasing than to describe existing differences. Of specific interest is the development of education services among the poorest groups. This analysis was based on household surveys as well as by linking of administrative data to poverty maps.

The assessment of distributional effects is linked to an analysis of the causes of underperformance in some districts.

2.5 Data

The main data sources for the beneficiary incidence analysis and the impact analysis are:
- Ministry of Education, Educational Statistical Bulletins 2000–2009;
- the *Annual School Census* for the years 2000–2010. This database contains information on school inputs (teachers, classrooms, books and other school facilities, school characteristics, enrolments and pupil characteristics);
- *examination data* (grade 7) of the Examinations Council of Zambia for 2001–2009, which provide information on learning achievements;
- the National Assessment Tests (1999, 2001, 2003 and 2006);
- the *Zambian Demographic and Health Survey* (ZDHS) (especially the *DHS EdData Survey 2002*). Relevant variables from the ZDHS include household characteristics and education (educational attainment, school attendance, repetition and dropout rates, and literacy);
- the *Population and Housing Census* of 2000 (household characteristics, education and economic activities);
- the *Living Conditions Monitoring Surveys* (LCMS), which include, apart from pupil and household characteristics, information on school attendance, (highest) education level and reasons for non-attendance and dropout;
- the results of the SACMEQ tests (2000 and 2007).

3

Education policy

3.1   Introduction

Zambia was a relatively rich country at independence in 1964. However, between 1975 and 2000 the economy developed unfavourably and could not keep pace with the population growth. GNI per capita declined from USD 590 in 1975 to USD 300 in 2000. At the end of the 1990s, Zambia was one of the poorest countries of sub-Saharan Africa. Even today, around 64% of the 13 million Zambians are classified as poor. As a result of the economic problems and a huge foreign debt, the government was forced to cut expenditures in the social sectors. At the end of the 1990s, average real government expenditure on education (per capita) was no more than about 60% of the level at the beginning of the decade (Das et al., 2004). The underfunding of the education sector led to substantial decline in non-salary expenditures and investments. School infrastructure deteriorated which led to insufficient furniture, teaching and learning materials. The enrolment of children decreased. By 1999, 37% of school-age children were not enrolled.

This context is important for understanding the development of the education sector and an adequate assessment of the impact of recent investments. By the end of the 1990s, the GRZ and Cooperating Partners started to work together to revitalize the education sector. They felt that with the enormous shortages, close sector collaboration would be more efficient and effective than the initiation of more or less isolated projects.

The sector cooperation proved to be rather successful. The goals of the Ministry of Education and Cooperating Partners coincided, and despite the enormous challenges, the sector could point to significant and impressive results. This contributed to the further harmonization and alignment of external support, as agreed in the 2007 Joint Assistance Strategy for Zambia (JASZ). During the JASZ negotiations, the GRZ indicated its preference for general budget support as the main aid modality. Several Cooperating Partners supported this initiative. In April 2005, the GRZ and four Cooperating Partners (the European Commission, the World Bank, DFID and the Netherlands) signed a Memorandum of Understanding on the provision of Poverty Reduction Budget Support, PRBS. Later, Sweden, Norway, Germany, Finland and the African Development Bank followed.

The JASZ and the PRBS had important consequences for the funding of the education sector. The number of Cooperating Partners that continued to fund the sector through the sector pool decreased, while other donors reduced their direct contribution to the sector in exchange for indirect funding through general budget support. The JASZ aimed at a more efficient division of labour among Cooperating Partners. As an outcome of the JASZ, it was agreed that fewer donors would participate actively in the education sector dialogue.

This chapter describes and analyzes the development of the sector cooperation, culminating (partly) in the move to general budget support. Section 3.2 describes policy developments since the end of the 1990s and section 3.3 analyzes the role of the Cooperating Partners in this process. Section 3.4 proceeds with a description of the policy dialogue. Section 3.5 sketches the development of budget and expenditure and section 3.6 analyzes the impact of general budget support on the development of education sector budgets.

Section 3.7 describes the proposals to introduce targeted budget support and the hindrances towards its implementation.

Section 3.8 assesses the impact of budget support, and section 3.9 presents a summary and conclusions.

3.2   Sector policies

In 1996, in response to the challenges in the education sector, the government of Zambia produced a policy document called *Educating Our Future*. This document marked the beginning of the revitalization of the education sector. The following year (1997) the government adopted the *Education Sector Investment Plan* (ESIP). Based on ESIP, the Ministry of Education developed the *Basic Education Sub-Sector Investment Programme* (BESSIP) for the period 1999–2002. BESSIP brought together several national policies and interventions such as the Poverty Reduction Strategy Paper, the Public Sector Reform Programme (PSRP), National Gender Policy, HIV/Aids, etc., into one programme. With BESSIP, the MoE sought to redress the deterioration of the basic education subsector and to improve both access to and the quality of basic education.

BESSIP had a slow start. The slow restructuring process at the Ministry of Education and the slow pace of decentralization hindered effective implementation of BESSIP at the local level. The initial stages of the process were characterized by protracted consultations and long preparatory processes centred on procedures, funding modalities, accountability and the MoE's capacity to sustain a programme of such magnitude (Chilangwa, 2002). In 1999, only 19% of the pooled funds were actually spent (Chisala and Cornelissen, 2003, p.86). The programme was more successful in its second phase, however.

In 2003, the programme was followed by the *Ministry of Education Strategic Plan* (MoESP) for 2003–2007, which covered the entire sector. The plan recognized the need for further investment in the education sector and expanded the focus from basic education to the whole sector, including basic school, high school and tertiary education.[6] Whereas the emphasis of BESSIP had been on enrolment at grades 1–7, the MoESP stressed the need to also expand enrolment in grades 8 and 9 (the higher basic education level). In addition, remote and disadvantaged areas were given special attention, and targeted for the deployment of more teachers, and the allocation of additional resources for the construction or rehabilitation of infrastructure. The MoESP intended to improve the quality of education as well. According to the strategic plan, the quality of education had been compromised by overloaded and compartmentalized curricula, dismal pupil–teacher contact time and shortages of educational materials (MoESP, 2003, p.23). The plan sought to increase the number of teachers (especially female teachers) in rural areas by increasing incentives in terms of promotion, upgrading opportunities and hardship allowances. It was anticipated that by 2005, about 39,000 teachers would be needed at the middle basic level (including 6400 private school teachers) and (an additional) 9400 teachers at the upper basic level (including 2100 private school teachers). The (continued) use of 'double shifting', with more

6   Not including skills training and TEVET.

New classrooms, Mpezeni Park, Chipata (Eastern Province)

than 43% of the teachers taking double shifts, was regarded as a necessary evil in the efficient utilization of classrooms.

In 2007, a group of consultants reviewed the results of the Ministry of Education Sector Plan (Chileshe et al., 2007). Their report was rather critical and concluded that:
- Zambian students were not learning enough;
- schools were not places of vibrant learning; and
- there was little sense of accountability throughout the system and no willingness to change.

While the main observations were technically correct, several Cooperating Partners felt that the report was unfair, as it did not take into account the situation and the end of the 1990s, did not bring in the limited resources and did not have an eye for the time need to accomplish changes. While the report advised moving to evidence-based policy development, the recommendations in the report were not evidence based, such as establishing a national Education Council to ensure that education is kept on the national agenda.

During the implementation of the MoESP, the government of Zambia adopted the *Fifth National Development Plan* (FNDP) that aimed at providing a coherent national development strategy. Initially, the MoESP *de facto* served as the implementation framework (or NIF-I) of the FNDP. At the same time, in conjunction with Cooperating Partners, the ministry developed the

National Implementation Framework 2008–2010 (NIF-II, MoE, 2007), which functioned as the main vehicle for the implementation of the objectives of the FNDP for the education sector. In 2009, the ministry developed a new *Education Sector Strategic Plan* for the years 2009–2015 (MoE, 2009). The sector plans and the NIF are implemented through the *Annual Work Plan and Budget*. The plans define the key priorities for the next year and allocate the funds.

In line with the FNDP, the NIF (II) underlined the reorientation of expenditures towards pro-poor programmes as the most important approach towards the realization of the plan's theme (p.21). For the basic education subsector, the document identified several major challenges, including improving the poor quality of education, the high pupil–teacher ratios in the lower grades, the need for curriculum reform, the provision of more teaching and learning materials, increasing access for vulnerable children, and the retention of girls (p.43). At the same time, drawing a lesson from the MoESP, the NIF warned of the importance of 'injecting a sense of realism' regarding what the ministry would be able to accomplish within a couple of years, given the institutional capacity and (human) resource limitations (p.23).

The NIF identified the following strategic priorities:
1. *Access*: achieving the goals of the Education for All initiative through the provision of additional facilities, including infrastructure development.
2. *Quality*: enhancing learning achievements through curriculum development, the provision of educational materials and teacher training and deployment.
3. *Improving the efficiency and effectiveness of education service delivery* through improved school and teacher management, stimulating teacher motivation, and pupil retention and progression.
4. *Equity*: promoting equitable access to education through specific programmes targeted at girls and children with special needs, reaching children not attending school, children in community schools and reducing the rural–urban divide.

To achieve these sector priorities, the document recommended the following interventions (p.24):
• Establishing an effective mechanism for joint and unified sector planning, development and funding involving all stakeholders.
• Reorienting the sector budget to the financing of core functions.
• Integrating government budget resources and donor support through the development of better financing modalities, including the review of the current pool funding mechanisms.
• Financing and managing programmes/activities through general budget support (GBS), as the preferred modality, and a sector-wide approach (SWAp), focusing on the adoption of common accounting, monitoring and reporting systems.
• Strengthening the links between the subsector expenditure programme and the sector-wide Medium-term Expenditure Framework (MTEF).
• Strengthening formal and informal consultation mechanisms among all the major stakeholders, including the Cooperating Partners.
• Enhancing management support systems for financial management and accounting,

procurement, information and reporting systems, as well as infrastructure management.
- Improving systems of monitoring and measuring sector performance through an effective M&E system.
- Taking the policy of decentralization to a higher level.
- Addressing the challenges of gender and HIV/Aids in a more proactive manner, including mainstreaming them into all education programmes.
- Developing a mechanism for engaging with the private sector and civil society in education service delivery.

The Ministry of Education has developed the third National Implementation Framework (NIF-III) for the years 2011–2015, to spearhead the implementation of the *Sixth National Development Plan* (SNDP; MoE, 2010).[7] The framework also serves as the primary tool to operationalize the strategic plan at all levels. In improving the quality of education, the NIF-III (2010) identifies the following critical challenges:
- insufficient structure, inadequate teaching and learning materials and desks;
- low teacher motivation;
- delayed disbursement of funds;
- ineffective teacher supervision and management;
- delays in updating and reviewing the curriculum;
- inadequate transport at lower levels.

3.3   Sector cooperation

The government's prioritization of the education sector coincided with donors' intention to shift from projects to sector support. Until then, aid had been almost entirely 'projectized', with informal coordination among donors (OPM, 2010). It was felt that development assistance had too often been based on un-coordinated projects and led by agents who were not sufficiently supported at the national level. As a result, the sustainability of projects was questioned on many occasions. Moreover, project support frequently contributed to institutional fragmentation and incoherent policies.

By and large, the Basic Education Sub-Sector Investment Programme brought about improved coordination and harmonization of donor activities. Cooperating Partners contributed to BESSIP through pool funding, depositing funds in a separate bank account, earmarked budgets and project funding. In the initial stages of BESSIP, development partners had their own rules and guidelines and a number of agencies still wanted to earmark their contributions (in order to enforce their own priorities or to guarantee their visibility at home). Several donors wanted BESSIP to be compatible with their own projects (BESSIP Completion Report, 2004, p.52). The Netherlands (in Western Province), Irish Aid (in Northern Province) and NORAD (in the Copperbelt) were still carrying out their own province-wide programmes. A number of agencies expressed their concern that the ministry would not have the capacity to ensure public financial accountability, ownership of the programme and transparency. Over the years, BESSIP nevertheless contributed to a strong

[7]   However, at the time of writing this report, the NIF had not yet been finalized and approved.

donor coordination, which significantly improved development partners' influence on the implementation of the plan (BESSIP Completion Report, 2004). By the end of BESSIP, 14 development agencies were involved. Several of these, including USAID, the Netherlands, Irish Aid, Danida and Finida, provided technical assistance. Partnerships have been formed that have helped in building partner confidence and sharing mutual responsibilities in the planning, management and implementation of programmes in the sector.

The sector plan of 2003, the Ministry of Education Strategic Plan (MoESP or NIF-I) contributed to a new stage in the development of sector cooperation. Based on that plan, the Ministry of Education and nine development agencies signed a Memorandum of Understanding (MoU). The sector pool became the main funding modality, although the MoU also recognized other funding categories such as financial assistance through the Treasury and project support.

The signing of the MoU for the education sector coincided with other activities to harmonize aid. In 2003, the government, through the Ministry of Finance and National Planning (MoFNP), began a process of assessing the cooperation between the government and its external funding agencies. Out of this came the Harmonization in Practice, which culminated in the Wider Harmonization in Practice (WHIP) and MoU signed in April 2004, which fed into the Joint Assistance Strategy for Zambia (JASZ). The JASZ was the result of an international dialogue on aid effectiveness referred to as the Paris Declaration on Aid Effectiveness. The JASZ (2007–2010) was agreed by the government and its Cooperation Partners and officially signed in 2007. Ireland and the Netherlands became the lead donors in the education sector.

In May 2008, the MoE and Cooperating Partners agreed on a new MoU for the education sector. This MoU defined the relations between the GRZ and Cooperating Partners, and especially their contribution to the funding and implementation of the National Implementation Framework 2008–2010 of MoE programmes defined in the Education and Skills Development Chapter of the FNDP 2006–2010. In accordance with the JASZ, the MoU recognized four different funding modalities: general budget support, sector budget support, sector pool support and project support. However, the MoU also mentioned the preference of the GRZ for GBS over other aid modalities, and the signatories promised to respect GRZ's preference for direct budget support.

The MoU defined four MoE responsibilities:
1. ensuring relevant and appropriate inter-ministerial coordination in the education sector policy dialogue and participation in the Sector Advisory Group (SAG) and other key fora;
2. ensuring that the funds allocated to the education sector will be used to finance jointly decided expenditures as defined in the FNDP, the NIF and subsequent AWPBs;
3. informing the Cooperating Partners of any circumstances (including any type of misuse of funds or irregular procurements) that would interfere or threaten to interfere with the successful implementation of the NIF; and
4. strengthening preventive measures to eliminate the misuse of all resources.

The MoU also defined a number of Cooperating Partners responsibilities, including:
- providing financial support to the NIF through a variety of modalities, as defined in the MoU;
- including their monitoring and assessment requirements in the MoE system;
- using the Cooperating Partners Coordinating Committee (CPCC) for all sector dialogue and relevant sector issues.

Membership to the CPCC was only open to signatory partners to the MoU.

As part of the JASZ dialogue, the ministry, in consultation with MoFNP, considered how aid could be delivered to the sector more effectively by simplifying and harmonizing donor procedures and financing modalities. This resulted in the Education Sector Management and Coordination Guidelines, which sought to enhance MoE ownership and management of the programmes in order to improve the overall effectiveness of aid, and to reduce the transaction costs of managing development assistance through the development of disbursement procedures and greater budget flexibility. Since then, GRZ and Cooperating Partners have been moving towards targeted budget support (sector budget support), as proposed by the Fast Track Initiative (FTI) Fiduciary Risk Assessment. Based on this assessment, it was agreed in 2008 that Zambia would receive USD 60 million from the Fast Track Initiative Catalytic Fund.

In 2002, Zambia was expected to be one of the first countries to receive money from the FTI Catalytic Fund. However, it took until 2008 before the country applied for endorsement. Initially, Zambia did not expect to benefit, as the Catalytic Fund was only open to so-called 'donor orphans'. The GRZ and Cooperating Partners were confident that the latter would raise the necessary resources for additional funding (Bartholomew, 2010, p.7). This situation had changed in 2007, when Zambia decided to apply for the FTI endorsement. First of all, the eligibility criteria for the Catalytic Fund had been broadened and the existence of a realistic country plan as well as a resulting gap had become the main criteria. Moreover, it had also had become clear that local donors would not fill the funding gap of the NIF 2008–2010 (Bartholomew, 2010, p.7).

The 2008 assessment of the Education for All Fast Track Initiative (EFA-FTI) examined the necessity of additional funding, based on the needs defined in the NIF 2008–2010 and the need for additional funding from the FTI. The (government) assessment concluded that despite progress in terms of access, the quality of education remained a key concern. It also noted that the local donors to the education sector had concluded that the government's NIF 2008–2010 constituted a sound and credible path to the achievement of Millennium Development Goals for education, as well as building the human resource base required for economic growth and poverty reduction (EFA-FTI Assessment, 2008, p.19).

The contribution of budget support was important for the sector. Budget support and the sector pool accounted for about 12% of the total resources of the Ministry of Education and about 30% of the discretionary budget. The financial resources of the Cooperating Partners created the preconditions for the implementation of policies aimed at achieving the MDG education targets and the introduction of free (basic) education. Moreover, Cooperating

Partners, through the sector dialogue and the PRBS meetings, insisted on spending more on education, on recruiting more teachers and on constructing more classrooms. They focused on urban–rural disparities and the necessity to invest more in rural areas and supported (the position of) community schools. Now, community schools are better represented in the dialogue (Irish Aid, Country Evaluation, 2011, draft report). In a number of cases, the Cooperating Partners provided incidental project support that aimed at solving specific sector challenges. For instance, in 2005 a gift from the Netherlands enabled the removal of retired teachers from the payroll, which opened the way for the recruitment of new teachers. Another example is the payment of urgently needed desks. Several Cooperating Partners (including the Netherlands and Irish Aid) demanded attention to issues of gender and vulnerability and supported the Forum for African Women Educationalists of Zambia (FAWEZA), an NGO that focuses on girls' education, with four strategic programmes:

- advocating for policies and programmes that support the education of girls and women;
- implementing pilot demonstrations/interventions that enhance girls and women's participation in education;
- creating and strengthening collaborative partnerships and networks for effective implementation and monitoring; and
- building the capacity of FAWEZA at all levels to carry out its mandate effectively.

The Cooperating Partners also raised awareness around issues such as the re-entry of young mothers and the inclusion of gender-responsive indicators in the monitoring framework (Irish Aid, Country Evaluation, 2011, draft report).

Another area where Cooperating Partners have been active is skills development. A vibrant skills training sector is required to meet the needs of the many young people who leave school and try to find employment or create their own opportunities, but the sector is unable to meet the demand. The Netherlands has supported the Ministry of Science, Technology and Vocational Training (MSTVT) in the development of a national skills training strategy and the establishment of a specific sub-granting facility (TEVET fund) to subsidize training institutions on the basis of competitive proposals.

The Cooperating Partners also continued to provide technical assistance and project support. For instance, USAID, Irish Aid and the Netherlands provided external technical assistance to the Directorate of Planning and Information. They have helped to strengthen sector planning and budgeting, to improve transparency, accounting, and monitoring and evaluation, and have contributed to decentralization in the sector. They provided technical inputs to the appraisal of NIF II and NIF III and contributed to the Fiduciary Risk Assessment. The Cooperating Partners also provided technical assistance for the Infrastructure Operation Plan that aimed to resolve the most serious challenges in the backlog of infrastructure (especially schools and classrooms). USAID provided extensive support to the development of a reliable Education Management Information System (EMIS), based on the yearly school census. Ireland and the Netherlands (through SNV) have supported projects in Northern Province.

In addition, other international NGOs and local civil society organizations support the education sector through projects and/or provision of technical assistance. The private sector has also contributed to the development of education through the provision of infrastructure, teaching and learning materials, ICTs, etc. While these organizations are not signatories to the JASZ, the underlying principles are applicable. Separate guidelines are still to be developed to strengthen the role of civil society and the private sector in education.

3.4   Sector dialogue

In line with the JASZ principles, several joint coordination structures between the MoE, the Cooperating Partners and other stakeholders have been established. The *Cooperating Partner Coordination Committee* (CPCC) is the formal coordination forum for the Cooperating Partners for all sector dialogue, and is used to prepare all relevant sector issues and to agree on a position to be presented to the Ministry of Education in the joint coordination committees. Meetings are held regularly (monthly) and membership is only open to signatories to the MoU.

The *Education and Skills Development Sector Advisory Group* (SAG) is the main consultative forum in the sector. SAG meetings are chaired, in rotation, by the permanent secretaries from the MoE and the Ministry of Science and Technology. In addition, several committees advise on education policies. The *Policy and Implementation Technical Committee* (PITC), constituted between MoE and the Cooperating Partners in the education sector, provides a coordination mechanism for the Financial Technical Committee (FTC), the Procurement Technical Committee (PTC), and the Monitoring and Evaluation Technical Committee (METC). The PITC is an advisory body, which makes recommendations to the top management regarding the implementation and monitoring of the NIF. The PITC is chaired by the MoE's director of planning, and regular meetings are, like most committees, planned on a monthly basis.

SAG meetings are, in theory, held twice a year, although the last one was in October 2009. Moreover, there have been complaints about the constantly changing participants, which, together with the absence of key personnel, erodes the substance of the discussions. Reports are often circulated months after the meetings, and key background papers for the meetings arrive late or not at all (OPM, 2010). On the positive side, the smaller working groups function better. Overall, harmonization and MoE leadership in the sector are better than they were ten years ago (OPM, 2010). However, a recent report by consultants Moore Stephens, prepared at the request of the Danish embassy, concluded that the various committees and internal meetings take up a considerable amount of MoE staff time. According to the consultants, there is scope for streamlining both the number of committees and meetings, as well as the number of participants, as most committees are too big to be effective (Moore Stephens, 2010, p.24).

The main mechanism for dialogue and sector cooperation is the *Joint Annual Review* (JAR), which provides a consultative forum for reviewing the performance of the education sector, providing inputs into the planning and budgeting for the following year, and enables

sharing of information and experiences in the sector. Participants in the JAR are key stakeholders in the sector, including relevant government ministries, civil society organizations (CSOs) and the private sector. The JAR, therefore, plays an advisory and monitoring role regarding implementation of education sector programmes in the FNDP, SNDP and other national plans.

Until recently, the JAR functioned effectively as an instrument for sector dialogue. The reviews involved 150–200 people from the community of Cooperating Partners, the MoE and other ministries involved in education, provincial education officers, CSOs and a small number of private sector actors (OPM, 2010). Now it appears that the JAR can no longer perform this function. During the most recent review (2010), there appeared to be little interest among top management and Cooperating Partners (with the exception of Japan and the lead donors). The Annual Review seems to provide a rather impressionistic picture and seems to serve as an outlet for dissatisfaction within the sector. In a joint working group, the Cooperating Partners, the MoE and CSOs agreed on the basic principles for a JAR in early 2011. These principles were sent to the MoE's top management, but no decision was made and no regular JAR was foreseen for 2011.

For the PRBS partners, the annual PRBS Review is an important instrument for monitoring progress in the education sector. In 2009, four indicators of the Performance Assessment Framework (PAF) were related to the education sector:
- the number of district education profiles developed and presented to the District Development Coordinating Committee (DDCC);
- the number of districts falling below the threshold of 80% net enrolment for grades 1–7;
- the number of girls receiving bursaries in grades 8–9;
- the number of districts with a pupil–teacher ratio of over 100:1 in the lower basic grades (1–4).

PAF indicators are continuously changed, however. In 2010, the PAF included only three indicators for the education sector as a result of the wish to streamline the monitoring instrument (the number of indicators was reduced from 36 to 25). These indicators are:
- the number of districts whose net enrolment rate difference by gender is more than the threshold of 5% for grades 1–7;
- the number of districts whose transition rate from grade 7 to grade 8 for girls fall below the threshold of 50%;
- the number of districts with pupil–teacher ratios of over 80:1 in the lower basic grades (1–4).
It goes without saying that such a change of indicators complicates a comparison over the years

3.5   Budget and expenditures

Since 2000, the government has increased funding to education. The introduction of the sector-wide approach (SWAp) created the financial preconditions for large investments in basic education and for the abolition of school fees in 2002. The MoESP anticipated an increase in expenditures for (middle) basic education (grades 1–7) from ZMK 215 billion

(USD 77 million) in 2001 to ZMK 496 billion (USD 179 million) in 2006 – an increase of 131% (constant 2001 prices). The budget share allocated to (middle) basic education was to increase from 44% in 2001 to 53% in 2006. The Fifth National Development Plan, for the period 2006–2010, gave a new boost to the education sector. In this plan, the government had prioritized education as a key social sector by targeting a minimum allocation of 20.5% of the total annual discretionary budget. The education sector's share of GDP increased substantially, from only 2% in 2000 to more than 4% in 2009.

Table 3.1 shows the development of budgets and expenditures in constant prices. Cooperating Partner contributions (not including general budget support) were lower than the government had anticipated in the FNDP, but MoFNP budgets and disbursements were higher. As a result, the MoE was able to realize FNDP input targets. It must also be noted, however, that part of the increase in GRZ resources was funded by general budget support. If budget support is taken into account, donor contributions were in line with the FNDP projections (with the exception of 2010; see section 3.6).

Table 3.1 shows that budgets and expenditures increased strongly between 2005 and 2009. In 2010, however, GRZs own allocations as well as – or especially – actual disbursements from Cooperating Partners reduced enormously. Domestic releases were much lower than budgeted, mainly because of huge overspending (136%) by the Ministry of Agriculture and Cooperatives (MoFNP 2011, PRBS Review 2010, pp.10–11). With the exception of 2009, the country spends less than 4% of its GDP on education, compared with an average of 5.3% in comparable countries. In terms of per capita GDP, Zambia spends about 8.6% on basic education, while the average in other less developed countries is about 12.4% (MoE, 2009a, p.14). Comparable countries devote 25% of their domestic discretionary budgets to education, compared with Zambia's 20%.

While the situation improved enormously between 2005 and 2009, recent developments suggest a break. This has and will have important implications for the education sector, including basic education (MoE 2011, SACMEQ III, draft report). In a note for the High Level Policy dialogue in 2009, Cooperating Partners criticized the expected decline in the education budget from 2009 to 2010. Moreover, the projections of the education sector MTEF 2010–2012 indicated a reduced amount for education from 18.5% in 2009 to 15.8% by 2012. This reduction was not in line with the government's commitment to ensure that MoE funding would be 20% of the total budget. The MTEF defended the reduction as a 'result of the fall in donor contribution'. However, this argument is not consistent with the government's own preference for general budget support, with the stated priorities in the FNDP, and with GRZ's own responsibility for the sector.

Table 3.1 Development of budgets and expenditures on education, 2004–2010 (constant prices, million USD)	2004	2005	2006	2007	2008	2009	2010
FNDP Targets							
GRZ			422	488	485	519	536
Cooperating Partners			92	103	104	106	106
Total			514	591	589	625	642
Actual budget:							
GRZ	332	327	422	478	501	585	631
Cooperating Partners	124	137	92	79	73	85	84
Total	456	464	514	557	574	670	715
Budget by subhead:							
Basic schools	288	263	286	338	358	391	431
High schools	38	68	84	75	97	129	150
Tertiary education	57	74	65	95	99	95	89
Administration and support	73	59	77	48	19	55	40
Early Childhood Care (ECCDE)			2	1	1	0	0
Total budget	456	464	514	557	574	670	710
Basic education as % of total budget	63%	57%	56%	61%	62%	58%	61%
Expenditure:							
GRZ	336	326	421	432	549	634	590
Sector pool/NIF	92	92	67	89	62	111	17
Total expenditure	428	418	488	521	611	745	607
Total expenditure as % of GDP	3.7%	3.5%	3.8%	3.8%	4.2%	4.8%	3.6%
Total GRZ expenditure as % of GDP	2.9%	2.7%	3.3%	3.2%	3.8%	4.1%	3.5%

Sources: MoFNP/MoE; authors' calculations.

Table 3.1 also includes a division by subhead.[8] The share of basic education remained more or less stable (at about 60% of the budget), with an increase for high school education and reductions in tertiary education and administration and support.

[8] Data derived from the Yellow Books and Financial Reports of the MoFNP and the MoE's annual work plans and budgets. In 2004 and 2005 the sector pool was not included in the Yellow Book.

About 80% of the budget (and 90% of government's own resources) expenditures on basic education were devoted to personal emoluments, such as salaries, allowances and pensions. Between 2005 and 2010, the budget for personal emoluments doubled (in constant prices), leaving little for educational necessities (see figure 3.1). The lack of resources contributed to the backlog in the provision of infrastructure (World Bank, 2006, 2008). About 22% of the total growth between 2005 and 2009 can be explained by the increase in the number of teachers; the rest must be explained by increased teacher salaries. In 2009, the budget for infrastructure had increased, at the expense of educational materials and grants to basic schools.

Figure 3.1 *Development of the budget for basic education, 2005–2010 (constant prices 2008; million USD)*
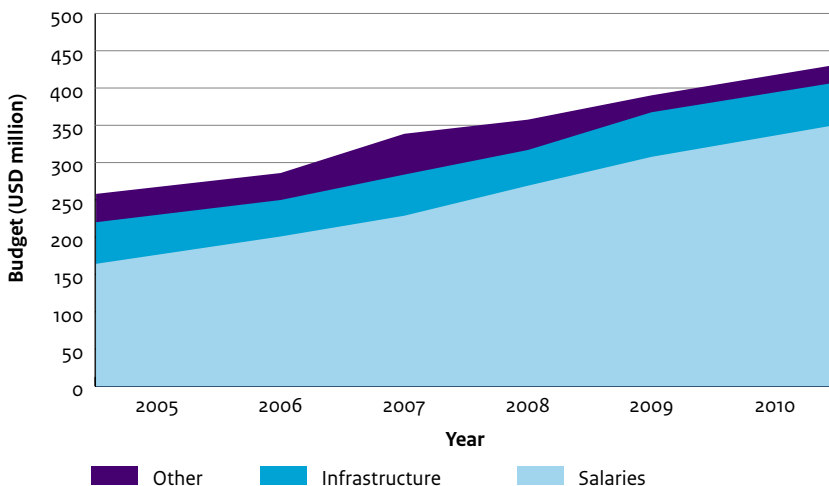
Sources: MoE (ABWP); authors' calculations.

3.6 Impact of budget support

From 2004 onwards, the sector pool was the main financial instrument for sector coopera-tion. As a result of the implementation of the *Joint Assistance Strategy for Zambia* (JASZ) and the move to general budget support, Finland and Canada have withdrawn from direct involve-ment in the education sector through the sector pool. Norway, DFID and the European Commission contributed to the funding through GBS. In 2006, 10% of the total budget was funded through the sector pool and 4% through designated project accounts (World Bank, 2008). The remaining part (86%) was funded by the GRZ (including GBS). Partly as a result of these developments, the sector contribution of the Cooperating Partners decreased from 38% in 2005 to 12% in 2008 (MoFNP, 2009, p.63). Four bilateral Cooperating Partners (Ireland, the Netherlands, Denmark and Germany) provided support in 2009 through the sector pool. For the 2010 budget, that number had fallen to three: the Netherlands, Ireland

and Denmark (apart from a small contribution from USAID). In addition, the MoE received USD 30 million from the FTI Catalytic Fund, which was the remainder of the USD 60 million promised. That same year, releases by the Cooperating Partners were much lower than anticipated. In late 2010 some partners decided to delay disbursement of the final tranche (including USD 30 million FTI) because they felt that not enough progress had been made on a number of issues, including the introduction of targeted budget support, fiduciary issues, and substantial weaknesses in financial and accounting systems, and because of the lack of follow-up on a number of reports. Moreover, the Cooperating Partners had received information about alleged irregularities and were therefore no longer in a position to disburse funds at that stage.

Figure 3.2 *Development of releases from the sector pool, 2005–2009, and the budget (b) and releases (r) in 2010 (million USD, constant prices 2008)*
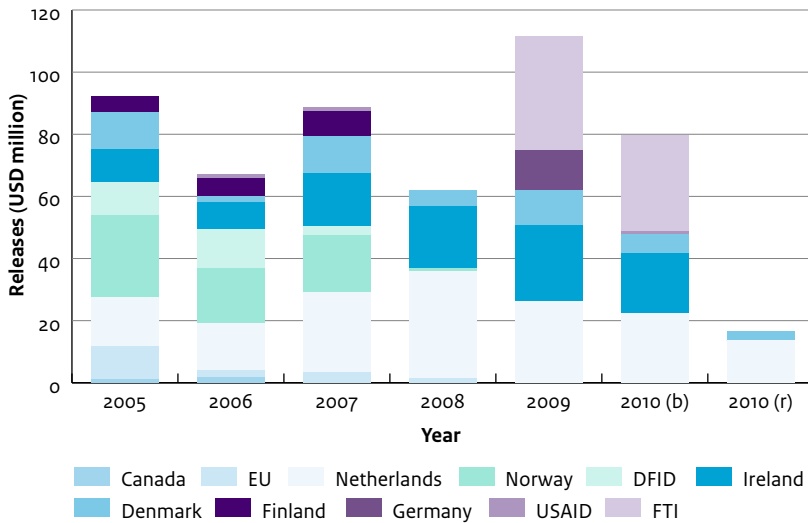
Sources: MoFNP/MoE; authors' calculations.

The donor pool funds are not mixed with the GRZ funds but are kept in separate bank accounts. With the intended move to sector budget support, funds would be channelled through the MoFNP, which has to transfer them immediately to the MoE account at the Bank of Zambia. In 2008 a Fiduciary Risk Assessment was conducted to analyze the feasibility of the move to sector budget support. It concluded that public financial management systems in Zambia have many weaknesses, although reform efforts had begun to yield results. There were problems of leakages (World Bank, 2006, 2008) and allegations of misappropriation of public funds (High Level Policy Dialogue, 2009).

At the same time, the sector pool also has its deficiencies, including inefficiencies and fiduciary risks, such as a) the administrative burden of dual budgeting and accounting, b) weak and delayed accountability, and c) capacity constraints in procurement systems as well

as late disbursements from the Cooperating Partners. The creation of parallel budgeting and accounting structures prevents transparency of overall resource use. In addition, administrative resources are allocated to managing this parallel system and considerable efforts have been made to improve the operation of the sector pool, which could be used for improving management of all resources flowing through the sector. The assessment report concluded that sector budget support would improve efficiency and reduce fiduciary risks. It proposed that disbursements continue to be linked to financing needs of the sector rather than to the achievement of specific targets (p.6). The establishment of the Zambia Public Procurement Authority (ZPPA) to oversee and guide the procurement system, and the Integrated Financial Management Information System (IFMIS) at national and provincial levels to monitor and track financial utilization are expected to enhance capacity.

The JASZ and the shift to general budget support had a negative impact on the size of the sector pool, although the (financial) effect of the shift of Norway, the UK, Finland and the European Community from the sector pool to GBS was cushioned by increases by the Netherlands and Ireland and the contribution of Germany in 2009. Nevertheless, until 2010, there was no evidence that the move to GBS had a negative impact on the total education budget. Figure 3.3 shows the increases in (real) domestic education expenditures from 2004 to 2010 (with a negative figure for 2005), the development of the sector pool and 20% of general budget support.[9] It appears that there was a break in 2010, when the levels of domestic releases from the GRZ and Cooperating Partners were lower than in 2010.

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Figure 3.3 *Development of GBS, domestic expenditures on education and the sector pool, 2005–2010 (million USD, constant prices 2008)*
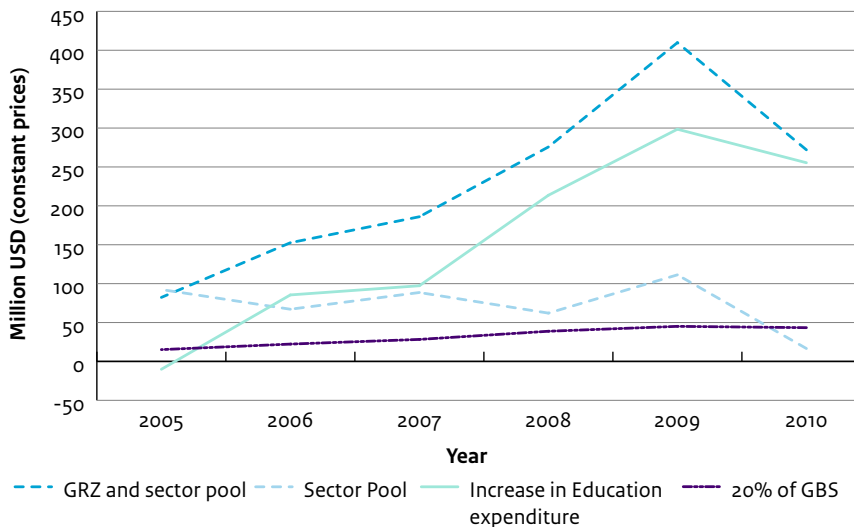
Sources: MoFNP/MoE; authors' calculations.

[9] The figure of 20% of GBS disbursements was taken because of the government objective to spend 20% of the budget on education.

Figure 3.4 shows the development of expenditures on education from 2000 to 2010 (with budget figures for 2009). The data come from various sources, while for some years the Cooperating Partner contributions (apart from the sector pool) had to be estimated. Moreover, before 2006 the sector pool and other Cooperating Partner contributions were not included in the GRZ budget. The figure shows that domestic resources increased by an average of USD 45 million per year (in constant prices), or more than 13% per year. This increase was especially pronounced between 2005 and 2009, and was also (much) greater than the reduction in the sector pool disbursements when several Cooperating Partners moved to general budget support. Once again, recent developments present a more worrisome picture, with serious consequences for the development of the sector.

Figure 3.4 *Expenditures on education, 2000–2010 (million USD, constant prices 2008)*
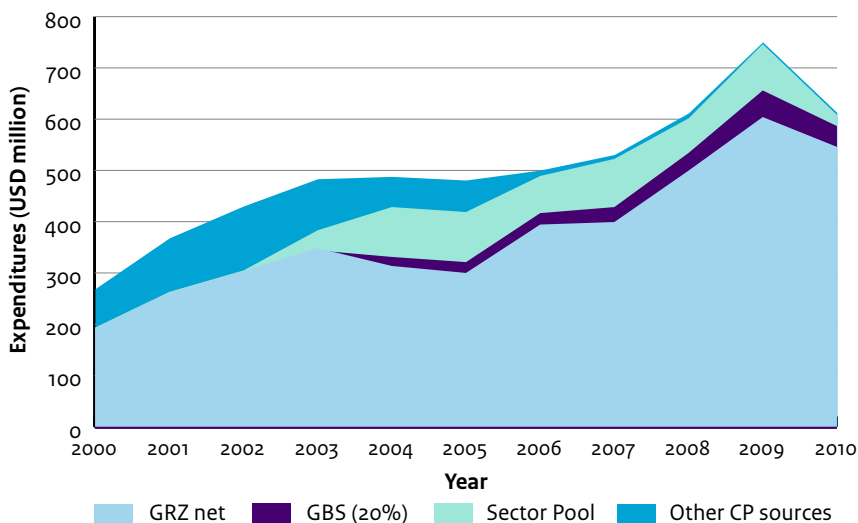
Sources: MoFNP/MoE; authors' calculations.

3.7 Targeted budget support

For a number of years, the Ministry of Education and Cooperating Partners have been working towards the introduction of targeted budget support (TBS). This was a response to the conclusions of two reports in 2008: the Education Public Expenditure Tracking Survey (PETS) and the Fiduciary Risk Assessment for the Fast Track Initiative (FTI). Both reports documented major inefficiencies in the current sector pool, by having a dual planning, accounting and reporting systems for GRZ and donor funding.

The 2008 Public Expenditure Tracking Survey (PETS) concluded that there had been some notable improvements in public funding in education in Zambia, such as a dramatic rise in funding allocations, streamlined donor funding, and increased rule-based and discretionary

funding, but it also pointed to a number of systemic weaknesses. In order to resolve these weaknesses, the MoE and the Cooperating Partners needed to clarify the funding formula, deepen decentralization, move more funds to the frontline, and move to sector budget support. Based on the findings of the tracking survey, the Cooperating Partners undertook a Fiduciary Risk Assessment (FRA) to explore ways to improve the sector pool and propose a more efficient and aligned channel for donor funding, including those from the anticipated resources from the FTI Catalytic fund. The FRA was also used to support the process of Zambia's application for additional funding from the FTI.

The FRA assessed the risks of moving towards sector budget support and identified suitable ways to manage and/or mitigate them. The team discerned six critical dimensions of performance of the financial management system: the credibility of the budget; the comprehensiveness and transparency of the budget; policy-based budgeting; predictability and control in budget execution (including procurement); accounting, recording and reporting; and external scrutiny and audit. The FRA concluded that public financial management systems in Zambia were characterised by a number of weaknesses across these dimensions, but that ongoing reform efforts were starting to yield results in terms of improved performance. Moreover, the team also noted that the sector pool had its deficiencies, such as the requirements for dual budgeting and accounting, which imposed an additional administrative burden, weak and delayed accountability from spending units, and serious capacity constraints in procurement systems and processes at all levels. The overall conclusion of the report was that sector budget support combined with stronger focus on financial management and procurement systems within the MoE would improve efficiency and reduce the fiduciary risks associated with all funding flowing through the education sector (FRA, 2008, p.3–4). However, the team felt that the time was not yet ripe for sector budget support, with its disbursements linked to the achievement of quantitative outcome targets. As a transition arrangement, TBS would continue to be linked to financing needs of the sector budgets (p.6). TBS was intended to replace both the operation of parallel accounting systems at local level and the parallel flows of funds with the associated separate accounts (Moore Stephens, 2010, p.52). Through this modality, the Cooperating Partners would continue to provide earmarked support in support of the NIF instead of full-fledged general budget support. However, rather than disbursing to an MoE managed account with specific accounting and reporting requirements, as in the sector pool, Cooperating Partner funds would be mingled with GRZ funding to finance any activity in the mutually agreed Annual Work Plan and Budget (AWPB) (FTI Assessment, 2008, p.18).

Based on the Fiduciary Risk Assessment, the MoE and Cooperating Partners agreed on a road map for the introduction of targeted budget support. For the GRZ, TBS would be a logical step in the direction of GBS. It was expected to reduce the burden of day-to-day management for the MoE, and especially of the dual government and donor reporting structures (Irish Aid, Country Evaluation, 2011, draft report). However, according to a report by Moore Stephens (2010), the effect would be minimal. The Moore Stephens report (see below) also saw the funding to the whole budget – including personnel emoluments and administration – as a drawback, as Cooperating Partners had not previously funded them. This is a peculiar argument, for two reasons. First, budgets are fungible, so there is no major

difference. Second, the improvement of allocative efficiency was one of the main arguments for introducing budget support. An advantage of TBS would be the enhanced predictability of funding. Nevertheless, the budget support evaluation shows that there is not a strong relation between such support and the predictability of funding.

Progress in introducing TBS has been slow. For instance, the procurement audit, which was agreed following the Fiduciary Risk Assessment of December 2008, has still not been undertaken. In March 2010, PricewaterhouseCoopers completed for USAID a draft report on the pre-award assessment of the Ministry of Education. The objective of the assessment was to provide reasonable assurance to USAID that the ministry has an acceptable organizational management structure, with accounting, financial management systems, procurement systems and other systems of internal control. The assessment concluded that there were moderate risks in all major areas, such as:
- internal control structure: irregular review of financial reports;
- financial management system: consolidation of financial information;
- personnel policies: inaccuracies in payroll records;
- procurement policies and procedures: lack of qualified personnel;
- internal and external audits: no comprehensive and updated internal audit manual; audit committee is not functional; lack of capacity.

A few months later, Moore Stephens conducted a pre-award assessment for the Danish embassy in Lusaka. The objective of the pre-assessment was to:
- provide an independent pre-award assessment of public financial management systems within the MoE;
- assess the appropriateness of and progress towards implementing 'targeted budget support' from January 2011; and
- develop a road map to identify responsibilities and timelines for necessary remedial actions.

The main conclusions of the pre-award assessment of targeted budget support were (Moore Stephens, 2010) that:
- the MoE was not yet in a position to implement full targeted budget support;
- all the steps in the TBS matrix were unlikely to be fully completed by 1 January 2011; and
- the timeline for operation of the Decentralized Electronic Financial Management Information System (DEFMIS) was likely to be March 2011.

In general, the report also concluded that:
- the planning and budgeting functions were largely ineffective as the process of producing budgets was not based on work plans, and the flow of funds was not regular or predictable enough to deliver effective budget implementation;
- the financial controls operating at the MoE were generally satisfactory, although slow and bureaucratic; and
- the new audit committee had not reached its full potential and the lack of follow-up on audit issues remained a concern; internal audit was ineffective.

The consultants advised MoE and the Cooperating Partners to use the advantages offered by the road map to TBS in terms of increased reporting capabilities, but to continue to fund the MoE through a separate flow of funds with a set disbursement timescale. The consultants drafted 29 recommendations. Following up on these recommendations was important for the move to TBS and the disbursement by sector pool donors. Partly as a result of these findings, and partly because of the slow follow-up on the recommendations, the Cooperating Partners decided to suspend the final tranche for 2010, including the second FTI tranche, while expressing their concerns about the lack of progress on TBS and other issues.

At the moment, the Cooperating Partners involved still consider fiduciary risks for targeted budget support to be too high, for three reasons:
- audit reports of the MoE still show shortcomings in financial management;
- the progress and financial reports show weaknesses in activity and budget management; and
- delays in implementing improvements or actions.

They have therefore proposed to start to support NIF III through pooled funding. In addition, they have proposed to earmark the NIF funds for school construction and renovation; funding school boards; standards and inspection; curriculum development and educational materials; distance education and equity issues (gender/orphans and vulnerable children); and for strengthening public financial management systems. They have also proposed that a minimum percentage of the Cooperating Partner funds should be dedicated to basic education.

3.8 Assessment

At the turn of the millennium, the Ministry of Education and Cooperating Partners started to coordinate external aid more closely through a sector-wide approach. Moreover, the MDG for education also helped to raise the interest of Cooperating Partners in (basic) education. As a result, education became one of the most crowded sectors. With the introduction of general budget support in 2005/2006 and the acceptance of the Joint Assistance Strategy for Zambia, the Cooperating Partners tried to (further) harmonize and align their support. Two lead donors became the main discussion partners for the ministry, although other partners remained active in the sector. Moreover, as a result of the JASZ and the introduction of general budget support, several partners ended their contribution to the sector pool (or NIF funds).

These developments did not have a negative impact on the education sector budget. Until 2010, there is no evidence of funds being moved from education to other sectors; rather, the opposite appears to have been the case. The government continued to allocate more money to the sector and basic education benefited proportionately. Between 2005 and 2009, real (domestic) expenditures on education almost doubled. The increase was much higher than the reduction in disbursements from the sector pool and the importance of the education sector in the total budget grew. Domestic (public) expenditures on education increased from 3.5% in 2005 to 4.8% in 2009.

Through the PRBS, the Cooperating Partners were able to discuss the development of the education sector and the required budgets at a higher level. They had often raised the issue of domestic resources for education at the annual sector review, but this was not the right level for this discussion. Through the annual PRBS reviews they were in a better position to raise important issues such as the budget or the allocation of resources across the country. The PAF indicators were instrumental in this discussion, although they were not the best indicators for monitoring progress in the education sector.

The education sector scores relatively well on the PAF indicators. In 2010, all three targets were achieved and in 2009 the sector had a 'score' of 87.5 (out of 100). The target for net enrolment rates (no more than two districts with a net enrolment rate below 80%) was not achieved, although the assessment gave the verdict 'partly met', because the number of districts was reduced from four to three. The other targets were (easily) met. However, while the government considers this as satisfactory performance, some stakeholders believe that this was the result not only of more satisfying sector performance, but also of relatively easily achievable targets, such as the target for the number of girls receiving bursaries. The target for pupil–teacher ratios said nothing about the distribution *within* a district. For other targets, such as enrolment ratios, it is difficult to obtain reliable estimates, because population estimates may be inadequate. According to official figures, several districts had net enrolment rates above 100%, which is impossible by definition. Therefore, changes in population estimates may have a larger impact on the calculation of enrolment rates than changes in enrolment.[10] For 2010, there is a weird discrepancy and inconsistency between the full realization of sector targets and the withholding of NIF budget. At the sector level, the Cooperating Partners were not satisfied with pace of reforms, while at the level of the PRBS dialogue, education was one of the most successful sectors contributing to the release of PRBS funds.

For the government and for the Ministry of Finance and National Planning, general budget support is the 'preferred modality', as it gives them the greatest leverage. The sector ministries, on the other hand, have more leverage if they receive funds from different sources, and do not have to rely on from the MoFNP alone. Officials within the Ministry of Education feel that the budget allocation is not adequate for it to carry out the activities for which it is responsible. This is clearly true; even though the budget has increased, the education budget is far too low to deal adequately with the challenges facing the sector. Moreover, the 2010 releases and the arguments used in the MTEF confirm the hesitation of MoE officials. Disbursements often come very late (usually in the fourth quarter), preventing the effective utilization of resources. This has a negative impact, especially on (classroom) construction. The MoFNP requires that unspent GRZ funds left in MoE accounts in the Bank of Zambia and in commercial banks, be returned to MoFNP at end of each financial year. These funds are classified as expenditures when transferred to the Bank of Zambia.

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[10]   The three indicators of the 2010 PAF are an improvement, although measurement problems still exist.

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MoE officials and the Cooperating Partners feel that the JASZ and the move to PRBS have reduced transaction costs and have enhanced harmonization and coordination in the sector. During the BESSIP and MoESP periods, many Cooperating Partners were active in the sector. Transaction costs were considerable, as each donor felt that it needed to discuss issues directly with the relevant (or most senior) MoE official available (OPM, 2010). Moreover, many Cooperating Partners had different financial reporting requirements. Another negative result was that some donors apparently implied, in their own discussions with MoE officials, that 'all donors' had been consulted on a particular issue, when in fact this was not the case (OPM, 2010). For the Cooperating Partners, the results appear to be mixed. On the one hand, they suggest that coordination costs have increased. There appears to be agreement among Cooperating Partners that the division of labour system brings with it high costs for the lead donors – a great deal more time and effort than most Cooperating Partners anticipated when the role was created in 2006/07. There is also a lack of clarity on the mandate of the lead donors (OPM, 2010). On the other hand, the JASZ implies almost by definition that fewer donor officials are involved in the daily business of the ministry, as indicated by the large reduction in the number of donors attending the Annual Education Sector Review.

There have been other, more tangible positive results, however. The Cooperating Partners have contributed to capacity building within the ministry. They have helped to strengthen sector planning and budgeting, to improve transparency, accounting and monitoring and evaluation, and have contributed to decentralization in the sector. Finally – and most

important – the financial resources of the Cooperating Partners created the preconditions for the implementation of policies aimed at achieving the MDG education targets and the introduction of free (basic) education.

Recently, stakeholders have become more critical of the effectiveness of cooperation in the education sector. While acknowledging that the education sector had made significant progress, Cooperating Partners concluded by the end of 2010 that they were not in a position to release the third tranche, as the MoE had not made satisfactory progress towards the operationalization of targeted budget support by January 2011. They felt that MoE had not done enough to strengthen financial management and accountability systems, and that weaknesses in both the GRZ and sector pool fund and financial management systems continued to exist. Moreover, they criticized the inadequate follow-up on audit issues, weaknesses in internal audit and the lack of follow-up on the procurement plan. There is a strong sense that the current sector dialogue mechanisms are not working effectively, because meetings are regularly delayed or cancelled and because of inadequate representation at appropriate levels. The tracking survey of 2008 concluded that the accountability system is institutionally weak. Alleged irregularities revealed by the Auditor General, as well as the results of a pre-award assessment, confirm this conclusion. Several times, Cooperating Partners have also criticized the 'workshop culture' (see Chileshe et al., 2008). In 2010, there was a large overspending of the institutional management budget, mainly caused by (allowances for) workshops. This phenomenon is not limited to the education sector, or to Zambia, and appears to have been initiated by donors who introduced these allowances. However, the many workshops organized by donors and other external agencies, have a large impact on the daily business and contribute to delays in planned activities.

The concerns are not only a reaction to the lack of progress towards targeted budget support, but also to irregularities in other sectors. It has been suggested, moreover, that the effectiveness of donor interventions has also been hampered by the absence of a joint partner agenda (Irish Aid, Country Evaluation, 2011, draft). Harmonization and alignment and the move to GBS have resulted in a shift in attention from specific (donor) projects towards a focus on financial issues, GRZ management and accounting systems. The constant discussions on financial and fiduciary issues have also diverted attention from specific implementation issues and challenges, in spite of the field visits. The Cooperating Partners have focused more on the aid architecture and financial management systems than on outcomes. The large number of donor reports on financial and fiduciary issues in relation to reports on the development of education quality is a case in point.

Developments in the home countries of the Cooperating Partners have also played a role. In a number of countries, governments and the media have become more critical of the effectiveness of budget support and development cooperation in general. Governments feel that as a result of the global financial crisis, cuts in development cooperation are inevitable. As a result of these sentiments, Denmark and the Netherlands have announced that their bilateral support to Zambia will end. The 2010 disbursements showed the consequences of these withdrawals if no other partners come forward to fill the gap, or if the Zambian government does not succeed in raising the education budget to compensate for their

withdrawal. The announced withdrawal of Denmark and the Netherlands also show the downside of a more efficient division of labour. While the JASZ had important positive effects on the efficiency of sector support, the examples also show the huge consequences if one or two partners decide to end their support.

There are other negative consequences. Apart from the direct impact of the financial contributions to infrastructure construction, the budget for textbooks and other programmes (such as girls' education), the sector dialogue was instrumental in forcing reforms in the education sector. With the withdrawal of one lead donor and a second active donor, the technical assistance of their embassies will come to an end and the incentive of the NIF funds will lose its appeal, with a negative impact on the pace of much-needed sector reforms. One of the main challenges for the Cooperating Partners is to respond consistently to developments in the sector. If they fail to do so, it will make incentive systems – through either the PRBS or the NIF pool – ineffective (IOB/BMZ/Sida, 2011).

3.9   Summary and conclusions

In the 1980s and 1990s, economic developments and a heavy debt burden forced the government of Zambia to cut education budgets. As a result, the education sector deteriorated. By the end of the millennium, the government and the Cooperating Partners started to work together to revitalize the sector, starting with the basic education subsector. In 2003, the sector cooperation was widened to the whole sector, although basic education remained the main area of interest. In 2008, the *National Implementation Framework 2008–2010* (NIF) followed. This framework functioned as the main vehicle for implementing the objectives of the Fifth National Development Plan for the education sector. The government and Cooperating Partners are now moving towards targeted budget support (sector budget support), as proposed by the Fast Track Initiative (FTI) Assessment (2008).

As a result of the sector cooperation and the resulting investments, and the introduction of free basic education, enrolment in basic education increased by more than 60% between 2000 and 2005. The introduction of general budget support and the acceptance of the JASZ did not have a negative impact on the budgeting of the sector, even though several donors ended their contribution to the sector pool (NIF funds). Until 2010, the government continued to allocate more funds to the sector and basic education benefited proportionately. Between 2005 and 2009, real expenditures on basic education rose by more than 50%. Nevertheless, Zambia's spending on education is still low. Moreover, an increasing part of the education budget is going to personal emoluments, thereby reducing the funds available for infrastructure, textbooks, school grants and specific programmes.

Recent developments suggest that 2010 marked a clear break with the period 2005–2009, and that the honeymoon of sector and budget support is over. The Cooperating Partners have become more critical of developments and especially the slow pace of reforms. As a result of developments in their home countries, and in other sectors, they have become more critical of irregularities and fiduciary issues. These developments point to the

diminishing effectiveness of budget support. The Cooperating Partners consider the slow pace of sector reforms, the lack of response to alleged irregularities and the reduced budget allocation as expressions of decreasing ownership. As these issues are central to the Cooperating Partners, these developments have also led to a divergence of preferences and interests, impairing the effectiveness of support to the sector. A lack of consistency in signals from PRBS donors also undermines this. In 2010, the Cooperating Partners withheld NIF disbursements, while at the level of the PRBS dialogue, the education sector met the three PAF targets, thereby contributing to the disbursement of PRBS resources.

One of the main risks appears to be 'education fatigue' among both the government and the Cooperating Partners. Important donors such as the Netherlands and Denmark have announced that they will end their bilateral support to Zambia. But domestic resources are low in comparison with neighbouring countries, and are insufficient to deal with the many challenges facing the basic education sector, all of which are aggravated by the high population growth.

4

Induced outputs and outcomes

4.1   Introduction

Chapter 3 presented an overview of the evolution of (basic) education policy in Zambia. Mainly as a result of economic problems, the development of education stagnated in the 1990s. Enrolment figures remained stable throughout the decade (1.6 million pupils at the middle basic level), even though the population grew. Low enrolment and the low quality of education required substantial investments in teacher training, infrastructure and provision of instructional materials. The Basic Education Sub-sector Investment Programme (BESSIP), and later the MoESP and NIF (II), made valuable contributions to these investments. At the same time, the two plans gave a strong boost to primary education, resulting in a significant increase in enrolments – by 67% (to 2.7 million pupils) – between 1999 and 2006. This dramatic development required substantial new investments to ensure that the number of teachers, classrooms and books kept pace with the growing number of pupils.

This chapter outlines the results of these investments in teachers, teaching materials and school infrastructure over the period 2000–2009, with a focus on the years 2005–2009. Apart from the changes over time, the chapter also provides insights into a number of regional differences. Section 4.2 starts by outlining the development of key indicators. Section 4.3 analyzes the main determinants of the enrolment growth, and section 4.4 presents a summary and conclusions.

4.2   Development of key indicators

In 2000, there were approximately 5,300 basic schools in Zambia; by 2010 this number had risen to 8,400 (with the largest increase in the number of community schools). Over the same period, the number of classrooms increased from 25,000 to 44,000. New teachers were recruited and trained, and their number increased by 65%, from 37,000 in 2000 to 63,000 in 2010.

The results show that the Ministry of Education succeeded in significantly enhancing access to basic education after years of underinvestment in teachers, classrooms and learning materials and abolishing school fees in 2002. Enrolments in primary education increased by more than 80%, from 1.6 million in 2000 to 2.9 million in 2009. Enrolment in basic education increased from 1.8 million to 3.4 million. Investments in teachers and teacher training, in schools and classrooms and in school facilities and books have been and are important instruments for reducing dropout and repetition rates, and for improving progression and completion rates (IOB, 2008). The completion rate at grade 9 rose from 34% in 2000 to 52% in 2010. The gender gap has narrowed and parity has almost been achieved at the basic education level.

Table 4.1 Development of key indicators of basic education, 2000-2010							
	2000	2005	2006	2007	2008	2009	2010
Basic schools (x 1000)	5.3	7.6	7.6	8.0	8.2	8.1	8.4
Classrooms (x 1000)	25	33	33	35	38	41	44
Teachers (x 1000)	37	50	53	57	62	61	63
Pupil–teacher ratio (grades 1–9)	49	55	53	51	50	51	51
Enrolment in primary education (grades 1–7, million)	1.6	2.6	2.7	2.8	2.9	2.9	3.0
Enrolment in basic education (grades 1–9, million)	1.8	2.9	3.0	3.2	3.3	3.4	3.4
Gender parity grades 1–7	0.93	0.96	0.97	0.96	0.97	0.98	0.98
Gender parity grades 8–9	0.77	0.86	0.86	0.90	0.88	0.88	0.88
Dropout rate grades 1–9	4.6%	2.5%	2.6%	2.4%	2.2%	2.4%	2.4%
Pass rate grade 7	50%	50%	53%	60%	65%	71%	84%
Completion rate grade 9	34%	43%	43%	47%	51%	53%	52%*

* Estimate for 2010.

Sources: IOB (2008a) and MoE (Statistical Bulletins).

The largest increases in the numbers of schools, classrooms and enrolments were seen among schools run by the private sector, NGOs, churches and communities. Community schools are founded by communities to meet the basic education needs of those children who are not in formal schools. Pupils in community schools generally belong to the poorest and most vulnerable social strata. Less than one third of community school families live in permanent structures, compared to 46% of public school families (DeStefano, 2006). The schools are attended by a relatively large number of orphans.

A large number of these schools have wattle-and-daub constructions and temporary provisions. Classrooms and water and sanitation facilities are of poor quality. Teaching and learning materials are generally inadequate. Pupils often sit on the floor. The vast majority of teachers are volunteers and unqualified (Chondoka, 2006, p. 7). In general, community schools are relatively small. However, there is enormous variation between community schools. Whereas many schools are solely supported by the community, other schools receive assistance from churches, NGOs or private enterprises. Only a few (about 100) of the almost 3,000 community schools are entitled to subject pupils to examinations (see chapter 6). These schools are much better resourced than other community schools, and often even better than GRZ schools.

Between 2000 and 2005, the number of community schools increased enormously. However, these schools are relatively small, so that most of enrolment growth was seen in GRZ and grant-aided schools (see figure 4.2 and table 4.2). Moreover, the MoE has recog-nised community schools as an important addition to the formal school system and has

increased its support to these schools. The MoE has established regulations and quality control procedures to ensure that the growing numbers of community schools are formally registered and eligible for government support. Most officially registered community schools receive some MoE support (school grant, textbooks, professional guidance and sometimes a GRZ funded teacher seconded to the community schools). Actual support depends on the specific policy of the particular districts.

Figure 4.1 *Growth in the number of basic schools by type of school, 2000–2010*
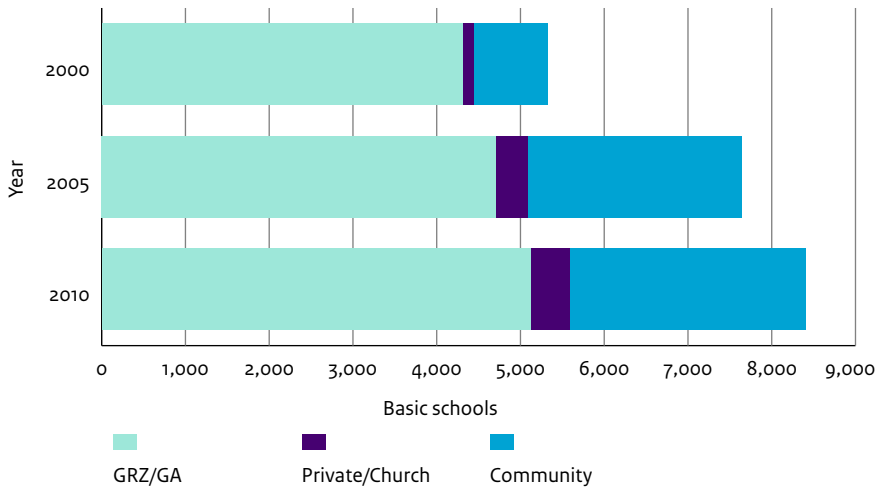
Sources: MoE; authors' calculations.

Figure 4.2 *Growth in the number of school pupils (grades 1–9) by type of school, 2000–2010*
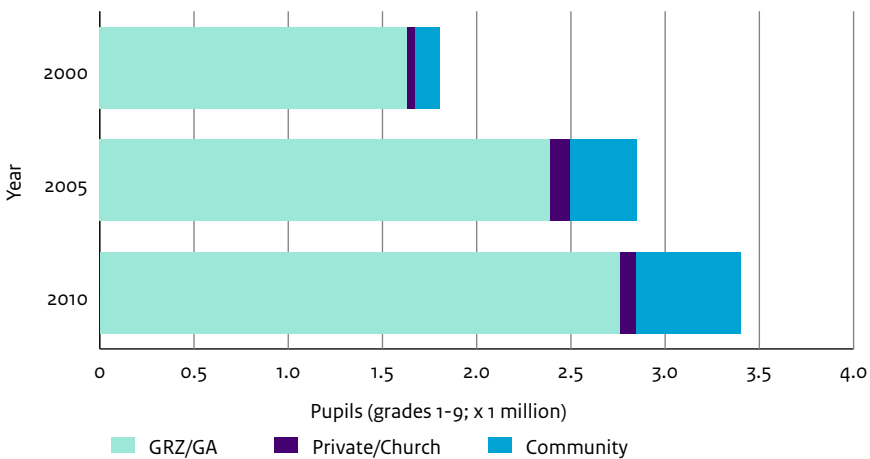
Source: MoE; authors' calculations.

The rapid increase in enrolments, especially between 2000 and 2005, created shortages at all levels: teachers, classrooms and books, and resulted in a worsening of pupil–teacher, pupil–classroom and pupil–book ratios. Between 2006 and 2009, the MoE constructed 178 new basic schools and rehabilitated another 85 (Republic of Zambia, 2011, p.206).[11] Pupil–teacher ratios improved slightly from 2006 onwards (see figure 4.3). The increase in 2009 was the result of the increased enrolment in secondary schools, and the accompanying recruitment of teachers.

Table 4.2: Development of key indicators of basic education, 2005–2009.				
	2005	2009	Total increase	Increase GRZ/ Grant-aided schools
Basic schools	7,640	8,110	470	275
Classrooms (x 1,000)	33	42	9	5
Teachers (x 1,000)	50	61	11	9
Female teachers (x 1,000)	24	31	7	6
Enrolment (grades 1–7), (x 1,000)	2,567	2,944	377	198
Enrolment (grades 8–9), (x 1,000)	285	408	123	115
Girls enrolled (grades 1–7), (x 1,000)	1,259	1,455	196	110
Girls enrolled (grades 8–9), (x 1,000)	133	192	59	55

Source: MoE; authors' calculations.

From 2005 onwards enrolment growth flattened slightly, an effect of achieving higher enrolment rates. Nevertheless, the increased enrolment in community schools suggests that the demand for basic education was greater than the government could supply. The construction of new schools and classrooms and the recruitment of new teachers did not keep pace with the demand for basic education.

[11]   The Ministry also took over the responsibility of a number of community schools.

Figure 4.3 *Development of pupil–teacher ratios, 2000–2010*
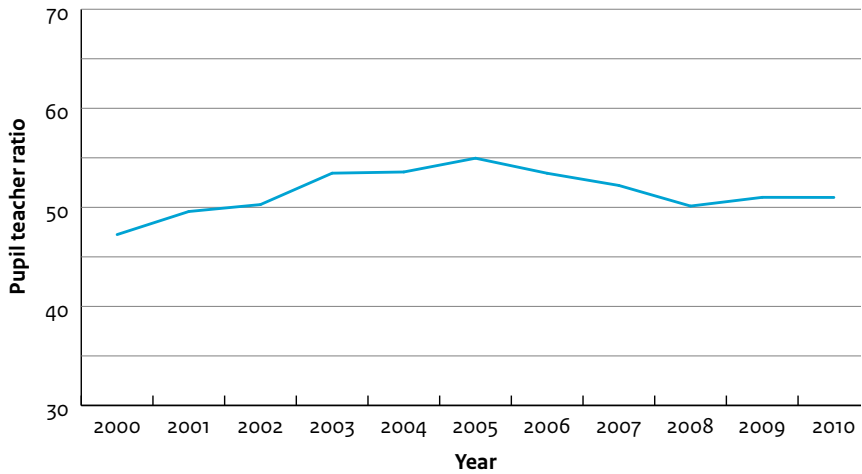
Sources: MoE Statistical Bulletins and EMIS; author's calculations.

Figure 4.4 *Development of pupil-book ratios in GRZ basic schools, 2001–2009*

Sources: MoE Statistical Bulletins and EMIS; author's calculations.

4.3 Determinants of enrolment growth

This section estimates of the effects of policy changes on the development of enrolment in basic education. The main factors appear to be:
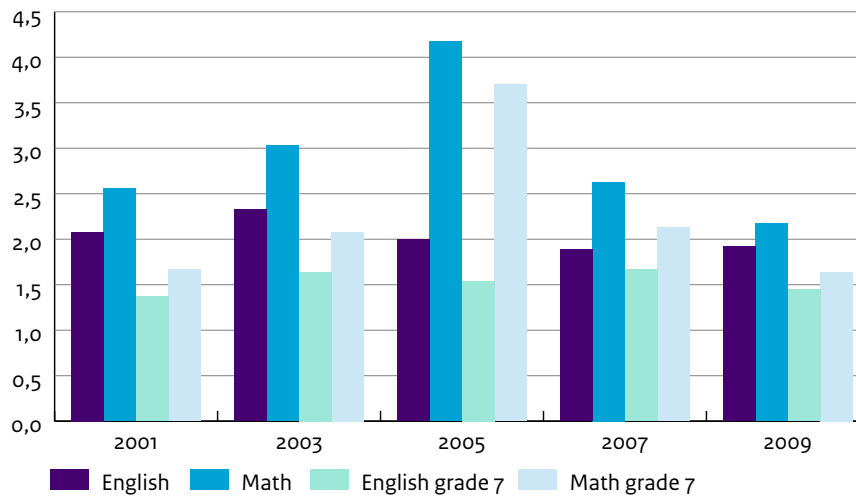
- the growth of the school-age population (7–15 year-olds);
- government investments in the sector;
- the introduction of free basic education in 2002; and
- the growing number of community and private schools.

In February 2002, the President announced free basic education for children in grades 1–7. Statutory fees for these grades were abolished in order to improve enrolment and retention, especially of vulnerable children.[12] Moreover, school uniforms were no longer compulsory. Parent–teacher associations (PTAs) were an important mechanism for disseminating information on the new policy, which was implemented immediately.

Only part of the growth in enrolments can be explained by the increase in the school-age population. Figure 4.5 shows the development of enrolment between 2000 and 2010, as well as indices for several indicators that may explain this development: the numbers of classrooms, teachers, basic schools and children aged 7–15. The graph uses indices to show the relative growth of the indicators compared with the base year (2000). For instance, between 2000 and 2010 total enrolment growth was 88%, and this is represented in an index of 188 for 2010.

The increased enrolment cannot be explained by population growth alone. In 2010, the number of children aged 7–15 was about 25% higher than in 2000, while the number of basic school pupils rose by more than 80%. The numbers of classrooms, teachers and schools also increased, although at lower levels, resulting in deteriorating pupil–teacher and pupil–classroom ratios, particularly until 2005. Since 2006, both of these ratios tended to improve as the combined result of the lower enrolment growth and the additional teachers and classrooms. Nevertheless, huge investments are still necessary to realize acceptable class sizes and contact time.

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[12] In 2001, the MoE had already abolished fees for the Primary School Leaving Certificate Examination (PSLCE).

Figure 4.5 *Development of enrolment (grades 1–9), classrooms, teachers, schools and children aged 7–15,*
2000–2010 (2000 = 100)
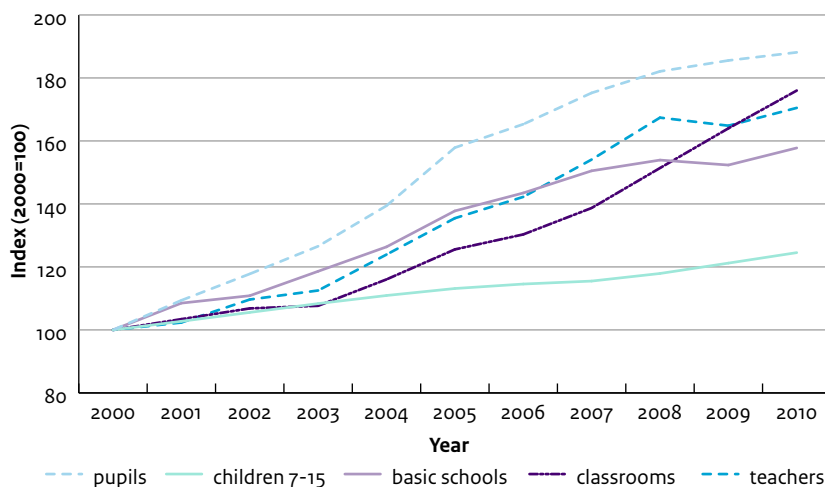
Sources: MoE (several sources); authors' calculations

The IOB report *Primary Education in Zambia* (2008a) analyzed the impact of investments in the
education sector over the period 2000–2005, when the number of pupils enrolled in basic
education increased from 1.8 million to 2.85 million (see Annex 3). That analysis showed
that population growth, the growth of community schools and the introduction of free
basic education in 2002 had important impacts on enrolment growth. Between 2000 and
2005, investments by the government and Cooperating Partners can explain about 25% of
the enrolment growth. These investments were necessary to cope with the effects of
population growth and the introduction of free basic education for children at grades 1 to 7.
The large increase in enrolments in 2002 and 2003 was to be expected. In other countries,
including Malawi and Uganda, the introduction of free basic education had an enormous
effect on total enrolment, but a comparable development did not occur in Zambia. Many
schools turned away applicants (Mwansa et al., 2004) because they did not have enough
classrooms, teachers or desks to accommodate the enormous increase in pupils. As a result,
many of the effects of free basic education became visible only gradually; that is, only after
investments in new school buildings, classrooms and teachers enabled schools to admit
more pupils.

Mothers cooking school meals; Chilenga Basic School, Chadiza (Eastern Province)

A new analysis gives estimates for the years 2005–2009 (see Annex 3). New enrolments create the demand for new teachers and classrooms. However, as the example of the introduction of free basic education shows, new classrooms and new teachers also lead to increased enrolment. According to the results of the regression analysis in Annex 3, one new classroom leads *on average* to 15 more pupils and one new teacher to 12 more pupils. The construction of a new school leads, on average, to the enrolment of about 100 more pupils. In other words, the effect of lowering the pupil–teacher and pupil–classroom ratios by constructing classrooms and recruiting teachers is partially negated by the attraction of new pupils. This is an example of *vanishing benefits*: the impact of investments is greater than the data suggest.[13]

Table 4.3 presents estimates of the contributions of the different factors to the total enrolment growth. Population growth is one of the most important. The increase in the number of 7–15 year-olds explains approximately 40% of the total enrolment growth. It must be stressed, however, that population growth alone cannot account for this enrolment growth. Between 1990 and 2000, total enrolments remained relatively stable in spite of the population growth. The conclusion must therefore be that the investments in

[13]   Suppose that a school has 200 pupils and three teachers. According to the estimates, the recruitment of another teacher leads to the enrolment of 12 new pupils. Therefore the pupil–teacher ratio does not reduce to 200:3 but to 212:3. A new school with three classrooms and three teachers would lead to an increase of 100 + 3x15 + 3x12 = 181 pupils.

education have also made a significant contribution to this growth. In comparison with the previous estimate, the contribution of community schools to enrolment growth has diminished, while those of teachers and population growth have increased. This last variable shows that the impact of a shortage of classrooms as an impediment to enrolment has decreased. There remains an unexplained increase of 32,000 pupils (6%). This may be the result of other policy measures, the influence of NGOs, and/or changes in the behaviour of parents.

Table 4.3 Estimates of factors that have contributed to enrolment growth		
	Number of pupils	**Percentage**
Total number of pupils in 2005	2,850,000	
Total number of pupils in 2009	3,350,000	
Total growth	500,000	
Population growth	200,000	40%
Community schools	80,000	16%
New schools (300)	31,000	6%
New classrooms (3000)	45,000	9%
More teachers (9300)	112,000	22%
Other influences	32,000	6%
Total	500,000	100%

Sources: MoE/EMIS; authors' calculations.

There is evidence that especially the poorest groups benefited from the investments in education and the introduction of free basic education in 2002. In 2000, about 50% of children in the poorest wealth quintile attended primary school; by 2007 this figure had increased to 73%. Disparities in school attendance remained, but they became much smaller. Disparities between regions (wards) also became much smaller, with the largest increases in enrolment in the poorest wards (IOB, 2008). It is known from the literature that expenditures on basic education are pro-poor (see Demery and Gaddis, 2009), while investments in higher education disproportionately benefit higher-income groups.

Figure 4.6 *Primary school attendance by wealth quintile, 2000 and 2007*
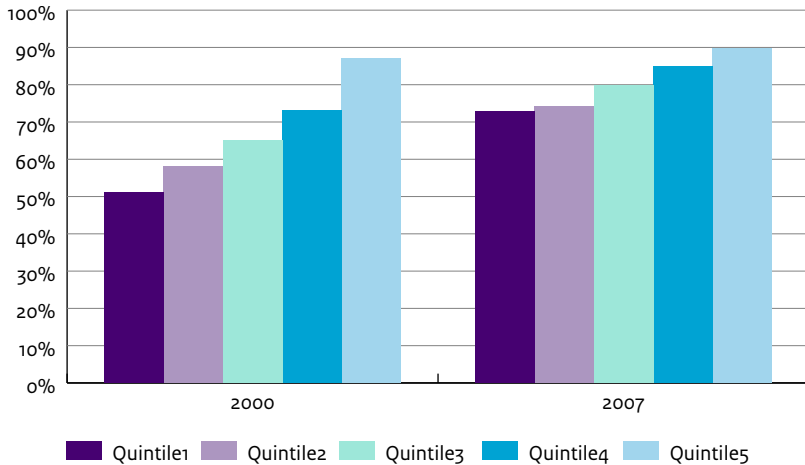
Sources: IOB (2008a) and DHS (2007).

Another much debated issue is the demand for education. It has been suggested that the introduction of free basic education may ignore the demand for education and that the abolition of school fees may even have a negative impact on the commitment of parents with regard to the education of their children (see Banerjee and Duflo, 2009), with increased non-attendance and dropout rates as the logical results. However, the large increase in enrolment by children of the poorest households in Zambia, coupled with the reduction in dropout rates, falsifies this hypothesis. Moreover, field visits confirmed that parents, especially mothers, value education highly. During several focus group discussions parents told the evaluators that providing (basic) education for their children was their top priority, even though it appeared that improvements in other public services (such as healthcare facilities and water and sanitation) were more urgent. Many parents see education as a way for their children to escape the poverty trap (Banerjee and Duflo, 2011, p.87).

4.4 Summary and conclusions

This chapter has focused on the development of the education sector between 2005 and 2010. Enrolments continued to rise, even after five years of already very high growth (2000–2005). The number of children enrolled in basic education grew from 2.8 million in 2005 to 3.4 million in 2009. Of the additional 600,000 pupils, almost 80% enrolled in GRZ and grant-aided schools. The enrolment growth was particularly high among children in the lowest income quintiles. Moreover, the enrolment of girls improved and gender parity was almost achieved at the lower and middle basic levels. At the upper basic level, girls continued to drop out of the school system in significantly greater numbers than boys.

The increased education budget enabled the Ministry of Education to invest more in teachers and classrooms. This resulted in improved pupil–teacher, pupil–classroom and pupil–book ratios, although the improvements were modest. An important reason is that the higher teacher salaries absorbed most of the budget increases (see chapter 3). However, another important explanation is that these investments provoked new enrolments. Therefore, the investments in teachers and classrooms were much more successful than the reduction in pupil-teacher ratios and pupil-classroom ratios suggest. Nevertheless, the large increase in pupils at community schools showed that the ministry was still unable to meet the rising demand. The education system still does not serve all children in an equitable manner. Rural children tend to be disadvantaged in terms of both access to and the quality of education. Gender disparities remain at the middle and upper basic levels, and completion rates at the upper basic level are low.

The role of budget support

Budget support and the sector pool account for about 12% of the total resources of the Ministry of Education and about 30% of the discretionary budget, thereby contributing to investments in the sector. The Cooperating Partners have insisted that the ministry spends more on education, recruiting more teachers and constructing more classrooms. They focus on urban–rural disparities and the need to invest more in rural areas. Budget support and the insistence of the Cooperating Partners on increasing domestic resources for education, through the sector dialogue and through the PRBS meetings, have contributed to investments in the sector, and to increased enrolments, especially of girls and of children from the poorest wealth quintile. In spite of this, the ministry has been able to reduce pupil–teacher, pupil–classroom and pupil–book ratios.

5

Allocation of resources

5.1   Introduction

The previous chapter sketched the development of the main indicators for the basic education subsector. Enrolment growth remains impressive. Thanks to increased teacher recruitment and classroom construction, pupil–teacher and pupil–classroom ratios have improved slightly. The Achilles heel of these developments appears to be the equitable allocation of resources. Many schools do not have sufficient desks and books, even in urban areas.

This chapter focuses on resource allocation, and especially on teacher deployment. Section 5.2 starts with a description of disparities in pupil–teacher ratios. Section 5.3 describes urban–rural disparities in teacher deployment and analyzes differences between districts. Section 5.4 examines inefficiencies in teacher deployment. Section 5.5 discusses the allocation of school grants. Section 5.6 presents a summary and conclusions.

5.2   Disparities in pupil–teacher ratios

Zambia has an objective of having no more than 40 children in one classroom. The high pupil–teacher ratios show that many more teachers will be needed to achieve this goal. The imbalances between the numbers of teachers and pupils require an efficient system that ensures a more or less equitable deployment of teachers in basic schools. Zambia uses a planned deployment system that takes into account existing differences in pupil–teacher ratios, but also allows teachers to choose where they work (Mulkeen et al., 2010, p.49). Each year, vacant posts are advertised nationally and candidates are required to apply directly to the districts of their choice. In order to reduce urban–rural disparities, the Ministry of Education pays teachers in rural schools an incentive bonus of 20% of their salary to encourage them to work in rural areas. Once employed, a teacher must stay at his or her post for at least two years.

At the moment, the system is unable to ensure the equitable allocation of teachers. Figure 5.1 shows the distribution of teachers and pupils in GRZ schools. The vertical axis represents the pupil–teacher ratio (per school). The schools are on the horizontal axis. The width of a school to the next school (on the axis) depends on the number of pupils. Therefore, the horizontal axis represents the (cumulative) percentage of pupils.[14] The figure shows that almost 30% of pupils are enrolled in schools with a pupil–teacher ratio of less than 40. Almost all of these schools are in urban areas. At the other extreme, more than 10% of pupils are enrolled in schools with a pupil–teacher ratio higher than 80, almost all of which are in rural areas.

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[14]   The figure includes public (GRZ) basic schools (grades 1–9) without pre-primary education. Small schools with less than 100 pupils are not included. The figure is limited to schools with relatively stable pupil–teacher ratios (the difference in PTR in 2008 and 2009 is not larger than 25%). Finally the figure gives the average for the years 2008 and 2009 ((pupils08 + pupils09)/(teachers08 + teachers09)).

The graph shows that Zambia is a long way from achieving the objective of an average pupil–teacher ratio of 40:1. In figure 5.1, the white area on the left between the horizontal line at 40 and the actual pupil–teacher ratio is much smaller than the grey area above the line. If Zambia wants to achieve a more equal distribution in the short run without recruiting thousands of new teachers, it will have to move the horizontal line upwards. Cooperating partners have criticized the significant reduction in the 2010 budget for teacher recruitment by 67%, since this will have immediate consequences for the access to and the quality of education.

Figure 5.1 *Pupil–teacher ratios in GRZ schools (averages, 2008–2009)*
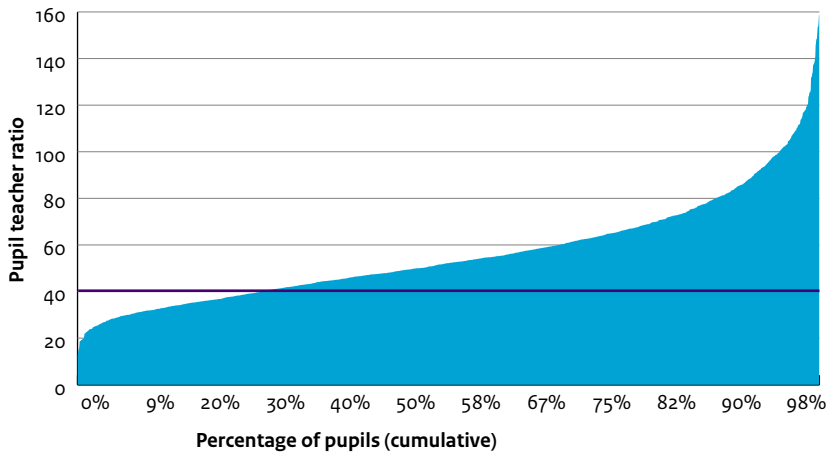
Sources: EMIS: authors' calculations

Large variations in teacher deployment exist not only in Zambia, but in other countries as well. Figure 5.2 presents data from seven countries, showing districts with the highest and the lowest pupil–teacher ratios. It appears that the variations are largest in Malawi, Uganda and Zambia, three countries where enrolment growth has been high. An interesting difference between Uganda and Zambia is that schools in Uganda have overcrowded classrooms, with 120–150 pupils, whereas in Zambia the system of double shifts has been introduced to limit the number of pupils per classroom.

It must be noted that the pupil–teacher ratios shown in figure 5.2 are district averages, and do not reveal intra-district variations. Intra-district variations in teacher deployment are also often invisible in statistical bulletins (Mulkeen, 2010). In Zambia, differences in pupil–teacher ratios are included in the PAF, and differences between districts are reported in the Annual Reviews, but these neglect the large intra-district variations.

Figure 5.2 *Pupil–teacher ratios at the district level in seven countries*
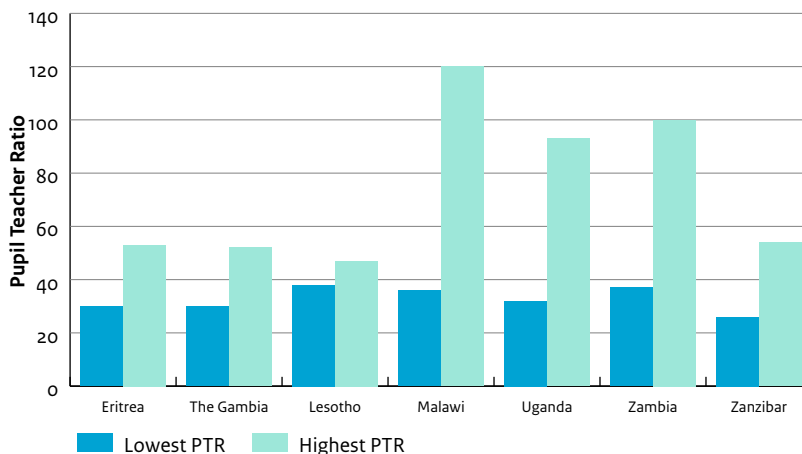
Source: Mulkeen et al. (2010).

5.3 Urban–rural disparities

The enrolment of children from the poorest households has improved enormously, but this is not the case with the distribution of resources for the education sector (schools, classrooms and teachers). Over the years, the Cooperating Partners have stressed the need to reduce existing disparities between urban and rural areas. In particular, the large disparities in pupil–teacher ratios – they are much higher in poor and remote rural areas than in wealthy urban areas – are a continuing concern.

In 2006, a World Bank study concluded that teacher deployment in Zambia was regressive. Schools with pupils from high-income households employed the most experienced teachers and had significantly lower pupil–teacher ratios. The study concluded that school funding was generally regressive, with 30% higher allocations to richer schools. The IOB study of 2008 confirmed the large differences between urban and rural areas, with the highest pupil–teacher ratios in the poorest districts. Most teachers prefer to work in urban areas, resulting in an enormous shortage of trained teachers in more remote areas. The lack of suitable housing in rural areas is an obstacle to teacher recruitment and retention (World Bank, 2006, p.29). Recent field visits support the conclusion that the absence or low quality of housing and the difficult living conditions in rural areas have a negative impact on the retention of teachers. Specific allowances, such as bonuses for teachers working in remote rural areas, are not sufficient to compensate for the hardships they have to face.

Table 5.1 presents pupil–teacher ratios in rural and urban areas in 2001, 2005 and 2009. The data show, in particular, the impact of the increased enrolments on these ratios. It appears that between 2005 and 2009, pupil–teacher ratios improved (slightly) more in rural than in urban areas.

| Table 5.1 Pupil–teacher ratios by type of school and location, 2001, 2005 and 2009						
	2001		2005		2009	
	Rural	Urban	Rural	Urban	Rural	Urban
GRZ schools	58	37	66	44	56	39
Grant-aided schools	43	28	60	31	62	41
Community schools	–	–	58	54	73	59
Private/church schools	28	21	39	21	39	18
Total	57	35	64	41	58	38

Sources: MoE/EMIS; authors' calculations.

The fact that most teachers prefer to work in urban areas contributes to high turnover rates. In 2008, about 9700 basic school teachers left their position (out of 62,000). Many teachers initially posted to remote schools later transfer to more desirable locations, resulting in a large volume of inter-school movements. Moreover, large numbers of teachers move to upper basic and high schools after upgrading their qualifications. Attrition rates are high in community schools, where many teachers are not employed on a formal basis, or are not paid a regular salary. HIV/Aids related cases may be an explanation for teacher attrition as well.

The Ministry of Education pays an incentive bonus of 20% to encourage teachers to work in rural areas, but this is not enough to attract sufficient applicants (Mulkeen et al., 2010). Given the relatively high pupil–teacher ratios, it is often not very difficult for teachers to find a job in a more urban area. Under the system of double shifts, teachers in urban schools receive an allowance of 20% of their salary, thereby eliminating the salary differences between urban and rural areas (Mulkeen et al., 2010, p.53). Moreover, it will be very difficult to attract more teachers to rural areas unless proper housing is provided.

Poverty is especially a rural phenomenon. Since poverty levels are much higher in rural than in urban districts, differences in teacher deployment are also correlated with differences in district poverty levels (see Annex 2). Figure 5.3 shows pupil–teacher ratios by district poverty level for 2000, 2005 and 2009. The grey dots in the figure represent 72 districts plotted according to the percentage of poor households (on the *x*-axis) and the average pupil–teacher ratio for basic schools in the district (*y*-axis) in 2009. The three lines indicate the relationship between pupil–teacher ratios and poverty levels at the district level for the years 2000, 2005 and 2009.

Figure 5.3 *Relationship between pupil–teacher ratios and district poverty levels in 72 districts, 2000, 2005 and 2009*
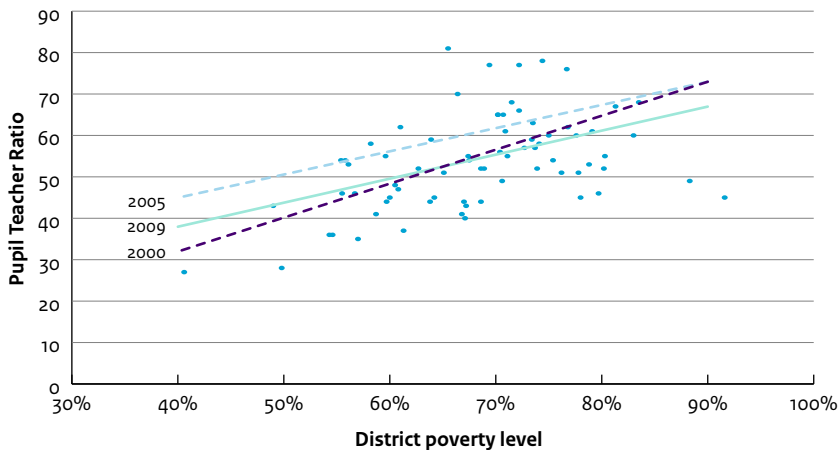
Sources: Ministry of Education; authors' calculations.

The figure confirms that the distribution of teachers is regressive, with higher pupil–teacher ratios in the poorest districts. Between 2000 and 2005, this relation became less skewed when the huge increase in enrolments had a particularly negative impact on pupil–teacher ratios in districts with lower poverty levels. Between 2005 and 2009, pupil–teacher ratios improved in most districts, but there was no reduction in regional disparities.

One of the reasons why the ministry has not been more successful in combating inequalities in pupil–teacher ratios is that enrolments grew faster in rural areas and poorer districts than in urban areas and wealthier districts. Between 2005 and 2009, the number of children enrolled in basic schools in rural areas rose by 18%. This growth was concentrated in community schools. The enrolment growth in urban areas was much lower (7%). Figure 5.4 shows a similar trend, with higher enrolment growth in the poorest districts. The highest enrolment growth was in Shangombo in Western Province and Nakonde in Northern Province. Therefore, relatively more teachers were deployed in rural areas, but as a result of the increased enrolment (which was also induced by the recruitment of more teachers), the disparities between urban and rural areas did not diminish.

Figure 5.4 *Enrolment growth in basic schools by district poverty level, 2005–2009*
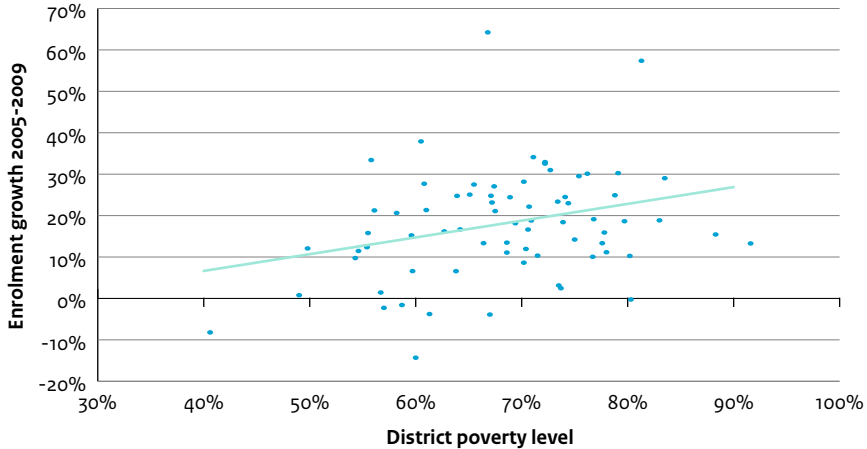
Sources: MoE; authors' calculations.

5.4   Inefficiencies in teacher deployment

The focus on the large differences in pupil–teacher ratios, especially between urban and rural areas, may distract from other inefficiencies in the deployment of teachers. In general, there are also large differences in pupil–teacher ratios at different levels. In 2009, the average pupil–teacher ratio at the lower levels (grades 1–4) was about 57:1. At the middle basic level (grades 5–7) this was 52:1 and at the upper basic level (grades 8–9) this was 28:1. At secondary level (grades 10–12) the ratio was 25:1. The difference in pupil–teacher ratios between grades 1–7, especially grades 1–4, and the other grades was caused by the introduction of double shifts at the lower grades.[15]

Many schools have resorted to the system of *double or even triple shifts*, especially for the lower grades, in order to cope with the large number of pupils in relation to the number of classrooms. This system reduces significantly the contact time between teachers and pupils. In the lower grades in these schools, official school hours range from 2.5–3.5 hours, but in practice they are often shorter because shifts start late and staff briefings are held during school hours. The first shift may start at 7.00 am and the second at, say, 10.30 am or 1.00 pm. The idea is that in these cases, teachers give their lessons in two shifts. This would mean that the number of teachers is correlated with the number of classrooms, rather than with the number of classes. In many schools, this is not the case, as many teachers work one shift rather than two. This impression from the data was confirmed by field visits. In most of the schools visited, the number of teachers equalled more or less the number of classes, rather than the number of classrooms, even though they had introduced double shifts for

[15]   A teacher with two classes in the lower grades is only counted once. Therefore, with two classes of 40 pupils, this situation leads to a pupil teacher ratio of 80:1.

Teacher in Kapongolo Upper Basic School, Kasama (Northern Province)

grades 1–5. Ideally, some teachers from such schools should be transferred to reduce wastage.

Moreover, in practice, many schools have considerably more than 50 or 60 pupils per classroom in the lower grades (a phenomenon that is not unique to Zambia), indicating that pupils who are closer to taking their examinations at grades 7 or 9 are given priority (MoE, 2005). However, this prioritization does not reflect the fact that small classes provide a much more favourable environment for younger children. Pedagogically, it is a more effective strategy to reduce pupil–teacher ratios in the lower grades. The MoE might choose to gradually increase the ratios in higher grades, as older children are better able to work independently.

Table 5.2 presents estimates of teacher–class ratios in GRZ schools by province and location (rural or urban). A teacher–class ratio of 1.00 means that in the district the number of teachers equals the number of classes; a teacher–class ratio of 0.50 would mean that a teacher teaches two classes (on the same day). This ratio differs from the teacher–classroom ratio. A class is a more or less permanent group of pupils in a grade. For instance, a school may have three grade 1 and two grade 2 classes. In practice, most schools have more classes than classrooms, which means that they have double shifts (usually in the lower grades): on the same day, different groups or classes receive lessons in the same classroom (at different times).

The table shows that the teacher–class ratios in GRZ schools are much higher in urban than in rural areas. Apart from the equity argument, there is also an efficiency argument for improving the allocation of teachers. It must be noted, however, that there are far more schools in rural areas than in urban areas.

Table 5.2 Teacher–class ratios in GRZ schools by province and location, 2009		
Province	**Rural**	**Urban**
Central	0.71	1.66
Copperbelt	0.84	1.22
Eastern	0.65	1.30
Luapula	0.60	0.94
Lusaka	0.90	1.12
North Western	0.77	1.31
Northern	0.58	1.14
Southern	0.71	1.44
Western	0.65	1.33
Total	0.68	1.23

Sources: MoE/EMIS; authors' calculations.

A different way to analyze differences in the allocation of teachers and classrooms involves the use of a *production function*. The large differences in pupil–teacher and pupil–classroom ratios mean that there are differences in inputs (labour and capital, as measured by teachers and classrooms) for the production of outputs (the education of pupils, as measured by the number of pupils). As an estimation of this effect, 40% of the differences in the number of pupils (as outputs) – given a specific school size – may be explained by inefficiencies in the allocation of teachers and classrooms (see Annex 4).

Figure 5.5 gives a graphic representation of the results. The vertical axis shows the efficiency level of each (GRZ) school. The schools are on the horizontal axis. The width of a school (on the axis) to the next school depends on the number of pupils. Therefore, the horizontal axis represents the (cumulative) number of pupils. On average, schools with more resources perform better than those with fewer resources, although the differences are small (see chapter 6).

Figure 5.5 *Productive efficiency in GRZ schools (averages, 2008–2009)*
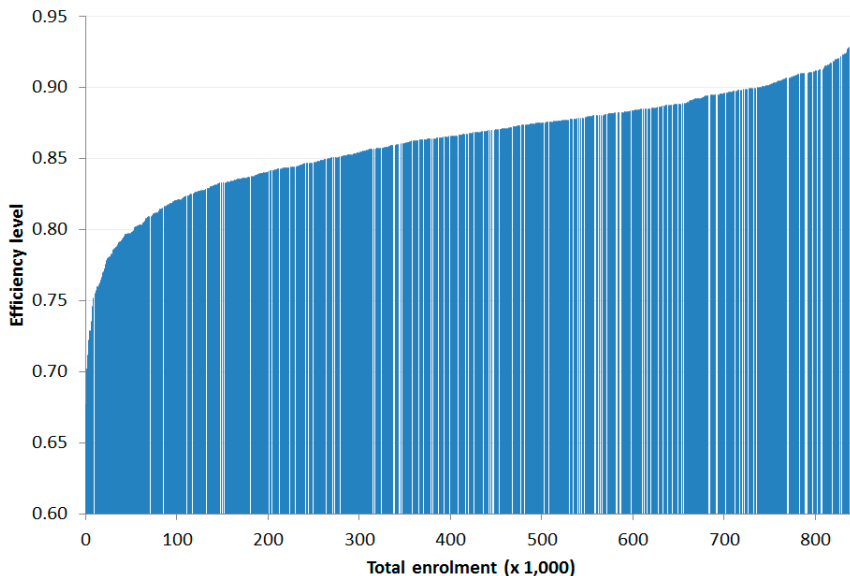
Sources: MoE/EMIS; authors' calculations.

5.5   School grants

The school grant allocation scheme that accompanied the introduction of free basic education initially favoured smaller (rural) schools, as every school received the same amount in 2002. On average, rural schools are smaller than urban schools. In 2004, a World Bank study based on a 2002 survey of 184 basic schools concluded that the fixed school grants were pro-poor (Das et al., 2004). This conclusion was confirmed in a study by Mwansa et al. (2004). School grants were sufficient according to 32% of rural schools, but less than 5% of urban schools. Since then, the scheme has been changed to take into account the number of pupils.

Figure 5.6 shows the disbursements to basic schools – grants and resources for infrastructure and textbooks – over the period 2005–2009. Private schools do not receive grants and so are not included in the analysis. The grants total about USD 150 million per year, an average of USD 30 million and about USD 10 per pupil per year. Of course, this is only a small part of the total resources for basic schools, as the main part goes to salaries and infrastructure. Nevertheless, the figure shows that over the period the expenditures were pro-poor: on average, poorer districts received more money than wealthier districts. Three of the poorest districts received much more: Luangwa in Lusaka, Milenge in Luapula and Chavuma in North Western Province. Schools in these relatively sparsely populated districts benefited from the disbursements for classroom construction.

Figure 5.6 *Disbursements to basic schools by district poverty level (averages, 2005–2009)*
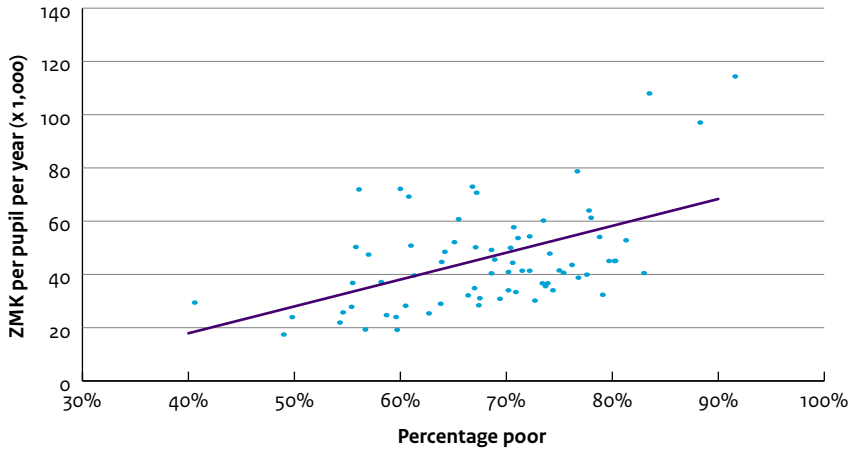
Sources: MoE; authors' calculations.

At the same time, it must be noted that these disbursements and especially *school grants* are erratic. The grants were introduced for grades 1–7 when the government announced free primary education in 2002. The grants are extremely low and irregular; in June 2010, many schools had not yet received their grant for that year. The *Public Expenditure Tracking and Service Delivery Survey* of 2007 concluded that 40% of schools did not receive their grant.

Figure 5.7 *Development of education expenditures, pupils, teachers and school grants (indices for 2005–2009; 2005 = 100)*
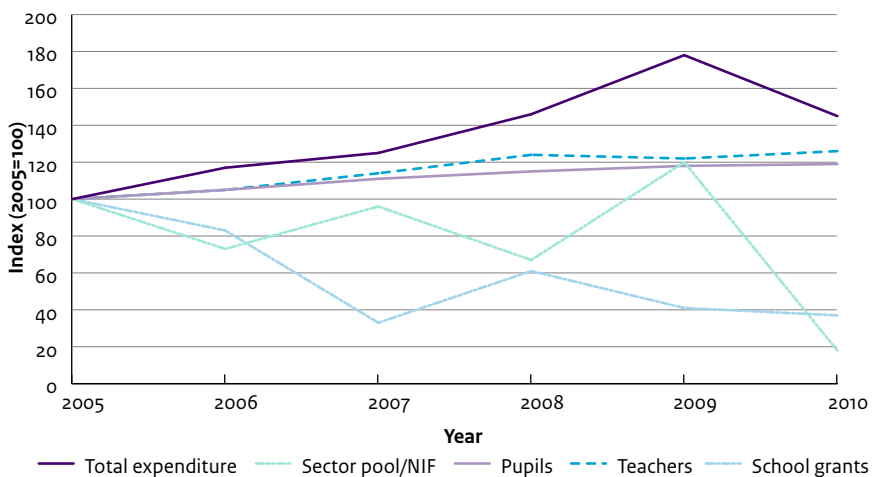
Sources: MoE; authors' calculations.

In real terms, the total amount decreased each year between 2005 and 2010. In 2010 the total amount was less than 40% of the total sum in 2005 (in constant prices), despite the huge rise in enrolments. In 2010, schools in many districts received less than ZMK 10,000 (about USD 2) per pupil for the whole year. The school fees for grades 8–9 are usually much higher, usually about ZMK 90,000 to ZMK 250,000 per pupil per year.[16] As a result of the low disbursements, schools without access to additional resources are severely underfunded. This has serious consequences. Schools that cannot pay their water bills, for example, are disconnected, so even those that have flush toilets can no longer use them, and there is hardly any money for teaching materials or repairs.

5.6   Summary and conclusions

This chapter has analyzed differences in the allocation of resources for basic schools, focusing on the deployment of teachers and the allocation of school grants. The data show first of all the existence of huge differences in pupil–teacher ratios. For almost 30% of pupils, this ratio is lower than 40:1, whereas for 10% of the pupils it is above 100:1. In general, schools with low pupil–teacher ratios are in urban areas, and those with very high ratios are in rural areas. As a result, urban–rural disparities are very large. So far, the Ministry of Education has not succeeded in finding a system that leads to more equal allocation. The 20% bonus paid to teachers deployed in rural areas is not enough, and many teachers in urban areas can compensate by teaching two shifts, which is an incentive for maintaining this system.

Alongside the urban–rural disparities there are also large differences between districts. Poor districts have higher pupil–teacher ratios than other districts and therefore teacher allocation is regressive. In part, this is the result of the inability to retain teachers posted to rural areas, but there is another explanation as well. Enrolment growth was higher in the poorest districts than in other districts, and this contributed to the apparent ineffectiveness of deploying teachers in poor rural areas. In fact, the number of teachers in rural areas rose, but as a result of the high enrolment growth, the disparities in pupil–teacher ratios did not diminish.

The allocation and deployment of teachers has to do with equity, but also with efficiency. The analysis shows that the efficiency of allocation could be improved. The allocation is manly based on the number of pupils, but given the shortage of classrooms, deploying more teachers in a school will not always be the best option. Because of the shortage of classrooms, many schools have introduced two or even three shifts, especially for the lower grades. In these circumstances, teachers are expected to teach two shifts. However, in many schools the number of teachers (almost) equals the number of classes, rather than the number of classrooms. This indicates a serious waste of scarce resources and of the most important, but also most expensive, resource in basic education. Improving the allocation of teachers could generate money for improving the quality of basic education.

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[16]   Basic education is free only for children in grades 1–7.

The chapter also reported on the allocation of school grants. These grants were introduced in 2002 when school fees were abolished, and appear to be progressive: schools in poor districts receive higher grants (per pupil) than those in other districts. However, these grants are very small and their disbursement is completely erratic. Over the years, the grants have not risen in line with either the increases in the education budget or the number of pupils, and their real value has fallen dramatically. This has serious implications for the effectiveness of basic schools in Zambia.

6

Outcomes: learning achievements

6.1   Introduction

The substantial and rapid increase in enrolments made it difficult to improve or even maintain the quality of education. Chapter 5 showed the effects on pupil–teacher and pupil–classroom ratios, despite investments in teachers and classrooms.

This chapter outlines the effects on pupils' learning achievements as measured by the grade 7 and 9 examination results. Sections 6.2 and 6.3 outline the development of the grade 7 and grade 9 examinations, respectively, between the end of the 1990s and 2009. Section 6.4 analyzes the cost-effectiveness of interventions. Section 6.5 looks at the development of learning achievements in Zambia using the results of a recent international survey (SACMEQ III). Section 6.6 presents a summary and conclusions.

6.2   Grade 7 examinations

In Zambia, education includes nine years of basic education, which may be subdivided into four years of lower basic, three years of middle basic and two years of upper basic education. Primary education consists of the seven years of lower and middle basic education. Pupils complete their primary (middle basic) education by taking a Primary School Leaving Certificate Examination (PSLCE). This is a remnant of the old system of seven years of primary education and the results are used to select pupils for the upper basic education (grades 8 and 9). The PSLCE will probably be abolished in the future, as it is the objective of the government that every pupil completes the full nine grades of basic education if there is classroom space. The main examination will then be the Junior Secondary School Leaving Examination (JSSLE) at the end of grade 9.[17]

Between 1997 and 2000, the number of pupils taking the grade 7 examinations fell by 7%. After 2000, the increase in enrolments also resulted in a growing number of pupils taking the grade 7 exam. Between 2000 and 2010, this number increased by 88%, a growth rate of 6.5% per year (and more than 7% between 2000 and 2009). The increase was especially high among girls (98%), and this improved the ratio of female to male candidates from 0.78 to 0.86. The largest increases in examination candidates were in North Western and Eastern provinces (both with more than 100%).

[17]   The main instrument for monitoring progress in basic education is the National Assessment Survey (NAS), conducted by the Examinations Council of Zambia (ECZ) in 1999, 2001, 2003, 2006 and 2008. In order to assess developments in learning achievements, this evaluation focuses on the grade 7 and 9 exams. These examination data have some major advantages: they are not based on samples, but cover (technically) all pupils at the end of grade 7, and they have been available since 2001 (for grade 7). One of the disadvantages is the absence of school-related variables that may explain differences between schools. This problem was solved by linking the exam data to the EMIS database.

Figure 6.1 *Development of examination candidates (grade 7), 1997–2010*
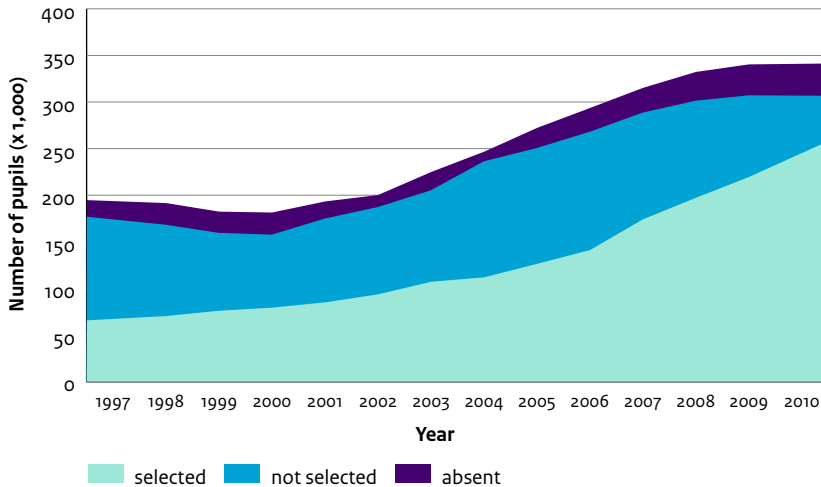
Source: MoE/ECZ.

6.2.1   Absenteeism of candidates

Over the years, only 90% of potential candidates actually sat for the grade 7 examination; almost 10% did not show up. This absenteeism is a serious and increasing problem, with rates slightly higher for girls (11%) than for boys (10%) in 2010. Absence rates were highest in Luapula, North Western, Northern and Western Provinces (about 13%), and were much higher in rural areas (10–11%) than in urban areas (6%). These differences are highly significant.[18]

One reason why many pupils fail to show up is the distance they have to travel to an examination centre. Not every school is entitled to subject its pupils to examinations. If a school does not comply with minimum standards, the Examinations Council of Zambia (ECZ) does not recognize it as an examination centre. In these cases, pupils must sit their grade 7 or grade 9 examinations in another school. Pupils at many community schools, but also at GRZ schools, sit their examinations in other schools, in practice nearly always a GRZ school.

A complication for the evaluation is that the ECZ does not keep records of which schools the examination candidates attend, so it is not possible to check whether candidates who did not show up came from other schools. However, if the expectation of the MoE is correct, then schools with more candidates than grade 7 pupils will have relatively high absence rates.

[18]   Difference of means test; t=34.8.

Annex 6 shows the results of the regression analyses. The results confirm the impact of distance: schools with high examination/grade 7 ratios do have higher absence ratios for the grade 7 examinations. This confirms that absenteeism is related to the fact that pupils cannot sit the examinations in their own school (and probably have to travel further). The fact that absence rates are higher in poor and rural areas also confirms the impact of distance. The Ministry of Education has recognized this problem, and is trying to reduce absenteeism by constructing new classrooms and allowing more schools to register as examination centres, thereby reducing the distance pupils have to travel. Private and grant-aided schools have lower absence rates.

The results also point to a significant and strong impact of pupil–teacher ratios on the probability of absenteeism: schools with higher pupil–teacher ratios also have higher absence rates. Nevertheless, the analysis did not find strong evidence that increasing or decreasing pupil–teacher ratios have a direct (immediate) effect on absence rates: a change in pupil–teacher ratios does not (directly) have an effect on absenteeism from grade 7 examinations.[19]

6.2.2 *Examination results*

Grade 7 examination pass rates improved between 1997 and 2000, but remained more or less stable between 2000 and 2005. This is due to the fact that pass rates were determined by the capacity at the upper basic level. Because of the limited capacity at this level, Zambia was forced to restrict the number of pupils admitted to grade 8. From 2006 onwards, pass rates increased from 53% in 2006 to 71% in 2009, mainly the result of the expansion of school infrastructure.

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[19]   There are two possible explanations for these contradictory findings. The first is a possible selection bias: theoretically, the results of the cross section analysis (or the comparison between schools) may be biased as schools with high pupil–teacher ratios could exhibit other characteristics than those with low ratios. However, the analysis controlled for differences in school type (i.e. GRZ, private, grant-aided and community schools), socioeconomic background characteristics, and location (urban–rural). Therefore, this selection bias does not seem to be very likely. It is more probable that low pupil–teacher ratios mean that teachers can pay more attention to individual pupils and that this reduces absenteeism. The fact that a fixed effects regression does not capture these effects may mean that time lags may make it difficult to capture them over time (see Annex 5).

Figure 6.2 *Pass rates for examinations at grade 7, 1997–2010*
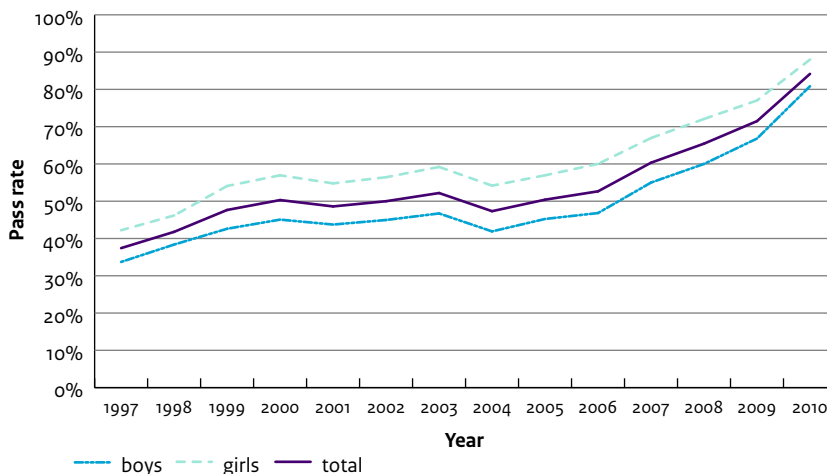
Source: MoE/ECZ.

Pass rates are higher for girls than for boys. In 2009, the pass rate for girls was 77% and for boys 67%. This is the result of the government policy to encourage girls to enrol in grade 8. Girls do not have better examination results per se, but the cut-off points are lower for girls than for boys. The difference is decreasing, nevertheless. In 2010, the pass rate for boys was 81% and for girls 88%. In terms of numbers, however, more boys than girls passed their grade 7 examination in 2010 – 133,000 boys and 125,000 girls – and the difference seems to be increasing.

The steep increase in grade 7 examination pass rates in recent years is mainly a reflection of improved access to grade 8, rather than an expression of better results. The lack of facilities at the upper basic level (grades 8 and 9) has forced the ministry to maintain these examinations as an instrument to limit the number of pupils admitted to grades 8 and 9. Which pupils are admitted to the upper basic level is based on their results at grade 7; only the pupils with the best scores are admitted to grade 8. Therefore, these pass rates are more reliable indicators of the development of the capacity at the upper basic level, rather than of progress in learning achievements.[20] For an assessment of learning achievements, the development of average examination scores is a better progress indicator.

Figure 6.3 shows the development of average examination scores for a number of subjects. The maximum score for English, mathematics and social studies is 60; for other subjects, like science and Zambian languages, the maximum is 50.[21] It is understandable, therefore,

[20]   Schools with adequate number of grade 8 places are not even required to subject pupils to an examination as they should all proceed to grade 8.

[21]   Each pupil's average exam score is based on a complex computation of five subjects and two special papers. The highest score for the special papers is 50. A total score is computed on the basis of the four best exam scores and the two special papers. In theory, the maximum score is therefore 60+60+60+50+50+50=330.

that the average scores for science are lower than those for English, maths or social studies. However, in several years the average scores for Zambian languages were higher than those for maths. Taking into account the differences in maximum scores, the results for Zambian languages are better than those for the other subjects.

Figure 6.3 *Average examination scores at grade 7, 2001–2009*
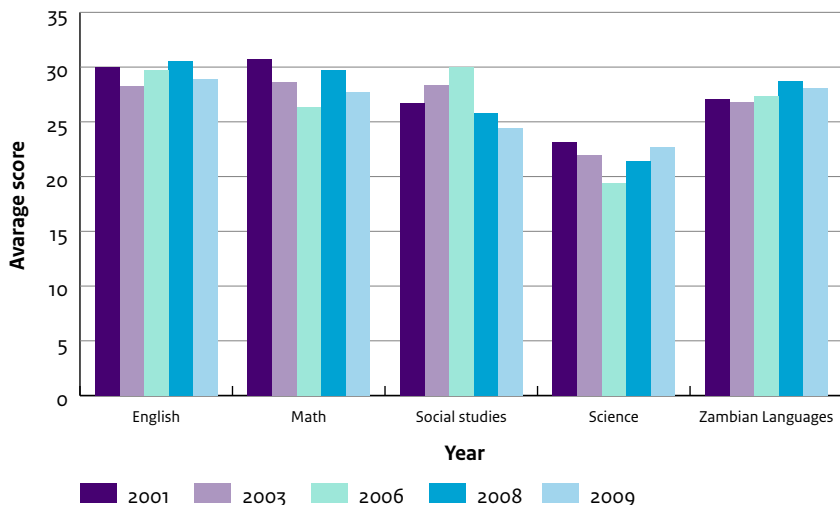
Sources: ECZ; authors' calculations.

The inclusion of local languages in the examinations reflects their importance. In addition to English, the national language, there are approximately 20 distinct Zambian languages, seven of which are used in education: Bemba, Kaonde, Lozi, Lunda, Luvale, Nyanja and Tonga (see Annex 2). Many people in rural areas do not speak English, and if they do, it is their second or even third language. This has important implications for the education system. The Primary Reading Programme was developed to overcome language barriers at school by first teaching children to read their own language (see IOB, 2008a).

The data in figure 6.3 show that average examination results for English have been more or less stable over the years. For maths and science, they went down until 2006, but improved in 2008 and 2009. The results for social studies improved until 2008, but deteriorated in 2008 and 2009. In these two years, the highest scores were not 60 but 55. The scores for Zambian languages improved slightly. Overall, examination results have been more or less stable over time, although there are large regional variations. Figure 6.4 shows the average scores for English by province.

Figure 6.4 *Average examination scores for English by province (grade 7), 2001–2009*
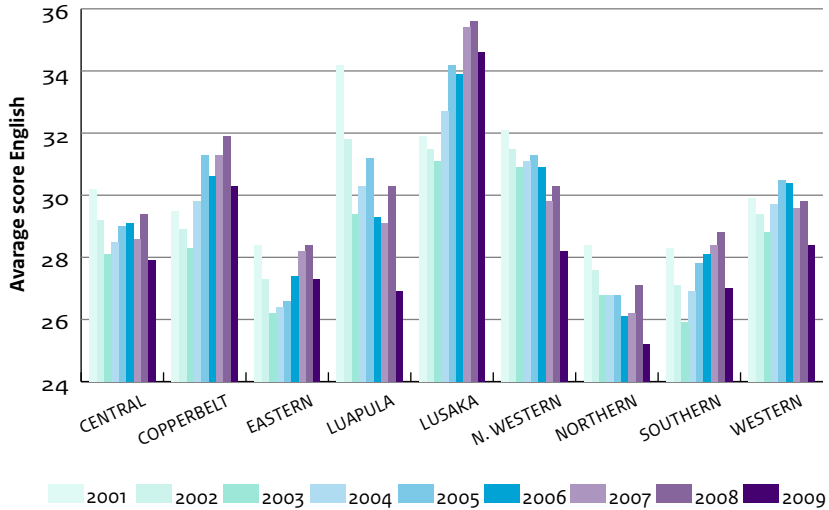
Sources: ECZ; authors' calculations.

In figure 6.4, there is a marked contrast between Lusaka (province) and several other provinces, especially Northern, North Western and Luapula. While the average scores for English improved rapidly in Lusaka, they fell in Northern, North Western and Luapula provinces. The relatively large increase in the number of candidates in Northern (88%), North Western (114%), and Luapula (89%) provinces contributes to an explanation, although this growth was also high in Eastern Province (104%). In Copperbelt, Southern and Eastern provinces, the scores for English improved between 2003 and 2008.

For maths, the picture is more homogeneous (see figure 6.5). Between 2001 and 2006, the results for maths worsened, and after 2006 they improved in every province. Once again, there is a large difference between Lusaka and Luapula: while the overall trend was positive for Lusaka Province, this was not the case for Luapula.

Figure 6.5 *Average exam scores for maths by province (grade 7), 2001–2009*
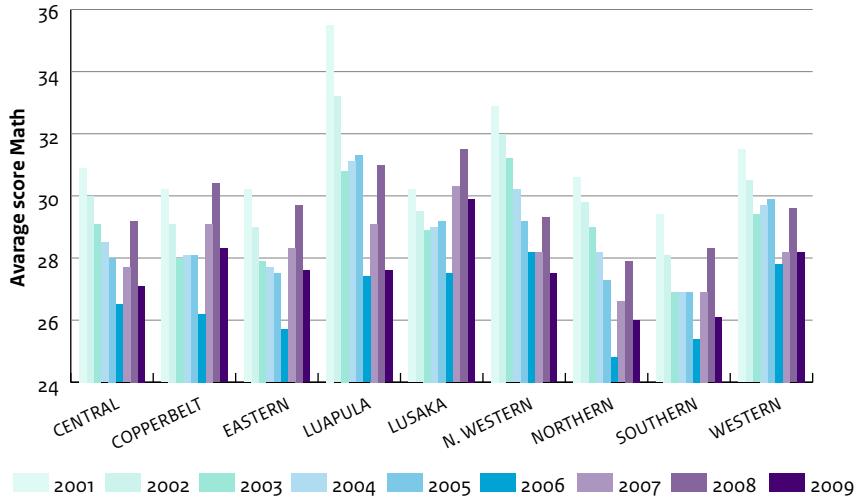
Sources: ECZ; authors' calculations.

The differences for English may be related to the growth in the number of pupils in rural areas. Table 6.1 shows the average examination scores for English and maths by location. In 2001, there were hardly any differences; pupils in urban areas performed no better than those in rural areas. Since 2003, however, this has changed: pupils in urban areas are now performing better than those in rural areas and the gap is widening. This trend is more distinct for English than for maths.

Table 6.1	Examination results for English and maths (grade 7), 2001–2009			
		All pupils	**Rural**	**Urban**
English	2001	29.9	29.2	31.0
	2003	28.1	27.0	30.0
	2005	29.9	28.1	33.1
	2006	29.6	27.8	32.7
	2008	30.6	28.2	34.5
	2009	29.0	26.3	33.1
Maths	2001	30.6	31.0	30.1
	2003	28.6	28.8	28.2
	2005	28.3	28.0	28.6
	2006	26.3	26.0	26.8
	2008	29.7	28.8	31.0
	2009	27.7	26.6	29.2

Source: ECZ, EMIS.

The increase in the number of examination candidates was higher in rural areas than in urban areas. In 2001, about 37% of candidates sat their grade 7 examinations in an urban school; in 2009 this figure fell to 33%. More important are the changes *within* urban and rural areas: within both urban and rural areas, the composition of enrolment changed as children from the poorest households were able to access basic education (see chapter 4). Figure 6.6 compares the distributions of average examination results in urban and rural areas in 2009. The two distributions are completely different: in urban areas, the curve follows a kind of Gaussian distribution, with large groups of pupils with average scores between 100 and 250. The mode is around 230. In rural areas, on the other hand, most pupils scored around 150. The curve follows a log-normal distribution, highly skewed to the left. Therefore, the scores in rural areas are more homogeneous: most pupils have low scores. In urban areas, the differences are much larger, showing the coexistence of some schools with good results and others with results as low as those in rural areas.

Figure 6.6 *Distributions of examination scores in rural and urban areas, 2009*
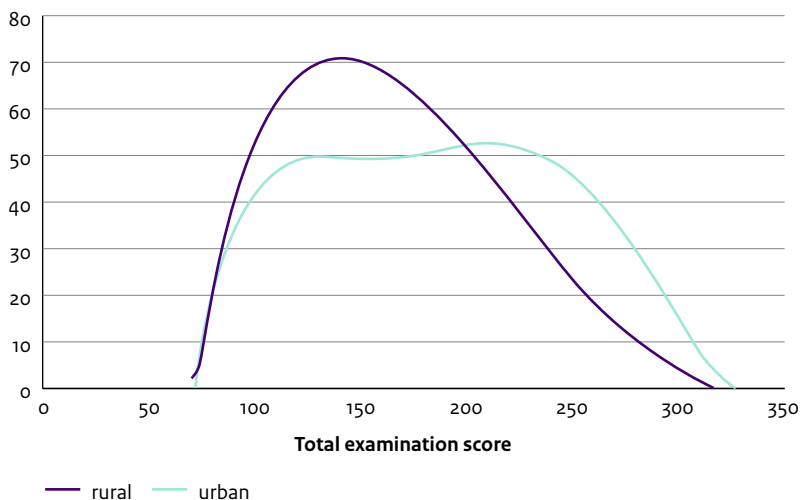
Sources: ECZ, authors' calculations.

The better results in urban areas also relate to the existence of private schools. For instance, urban schools in Lusaka perform relatively well, but this could be explained by the fact that most private schools are in Lusaka. Figure 6.7 shows that the distributions of examination results at GRZ and community schools were more or less the same, although grant-aided schools performed slightly better. Most pupils scored between 100 and 200, although a fairly large group (roughly 30%) achieved higher scores. The differences between private and other schools are striking. Private schools performed considerably better than other schools. For private schools, the curve follows a hypergeometric distribution, which mirrors the distribution for rural areas (i.e. highly skewed to the right). Many pupils scored between 230 and 310.

Urban–rural differences may be partly explained by the fact that most private schools are located in urban areas (especially in Lusaka). In addition, schools in urban areas may have a 'comparative advantage' as well: for most urban pupils, the distance to school is much shorter and, on average, their parents are better educated. For community schools it must be noted that only a few of them, probably the best schools, are entitled to subject pupils to examinations (see chapter 4). These schools are much better resourced than other community schools, and often even better than GRZ schools. Children from other community schools take their examinations in another school (generally a GRZ school). This may have a negative effect on the average results of GRZ schools while at the same time only the best schools run by other agencies qualify as examination centres. As a result, the comparison of community and GRZ schools is biased: the results do not allow concluding that community schools perform better than or as well as GRZ schools. This is a widespread misunderstanding.

Figure 6.7 *Distribution of examination scores by type of school, 2009*
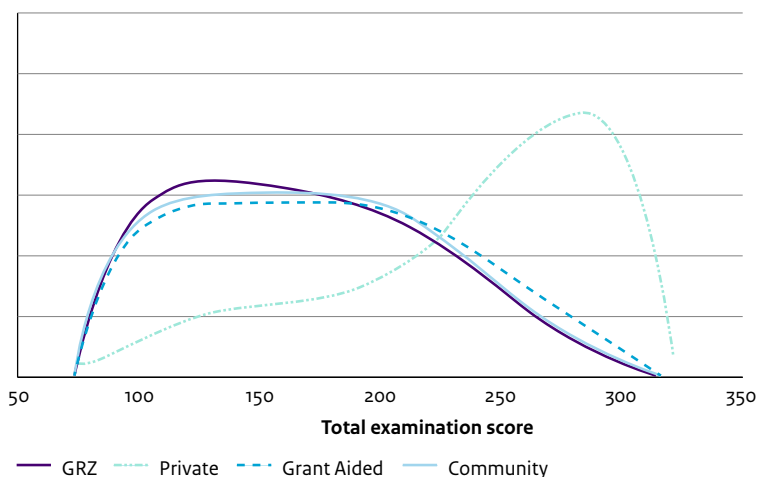
Sources: ECZ, authors' calculations.

6.2.3   Determinants of grade 7 examination results

The preceding section showed that there are significant variations in learning achievements. This section seeks to explain these differences and especially to analyze the impact of policy-related variables (such as teachers, classrooms and books). For the measurement of learning achievements, the analysis focuses on the examination scores for English and maths as well as the overall scores. The analysis assesses the impact of policy variables (such as increases in the number of teachers, classrooms and books) on learning achievements (see chapter 2).

The model

A brief note on the *specification* of the various relationships is in order. The relationship between pupil–teacher ratios and educational achievement has long been debated (see Michaelowa, 2003). An analysis of the relationship between pupil–teacher ratios and

examination results suggests that the inverse relation (or the teacher–pupil ratio) offers the best specification.[22] Moreover, this is consistent with the *scaling* of school variables by dividing them by the number of pupils. This scaling is important, because learning achievements are not determined by the number of teachers *per se*, but only by the number of teachers in relation to the number of pupils.

The regression analyses calculate an average effect of changes in teacher–pupil ratios. However, these effects are not necessarily the same for every school. Preliminary analyses showed large differences in the (regional) mastering of English, which appear to have an important impact on examination results (as most subjects are examined in English). The analysis therefore uses three difference estimates for the impact of the teacher–pupil ratio, for schools in regions with low, average and relatively high scores for English. The hypothesis is that teaching is more effective in regions where pupils have mastered English. In other regions, any improvement will require more resources.

Usually, there is one teacher per classroom, independent of the number of pupils. Therefore, the correlation between the teacher–pupil and classroom–pupil ratios is very high. Both variables cannot be included in the model at the same time.[23] Therefore, the classroom–teacher ratio was included in the model in order to estimate the effect of (additional) classrooms. This is also quite logical: it is to be expected that teachers function better if they are able to teach in their own classroom. The availability of teaching materials is measured by the number of books per pupil required for the subject considered. A separate variable was used to determine scale effects. This (latent) variable is calculated using principal components analysis and the number of teachers, classrooms, pupils and the number of pupils in the previous year as indicators.[24]

The analysis includes several other teacher characteristics: professional qualifications (with a distinction between teachers with a diploma or degree and those without), the percentage of teachers with additional training, the age of teachers and teacher attrition.[25] The qualification of the head teacher is included as a management variable (with the same distinction as for teachers), as is school type (GRZ, private, grant-aided or community).[26]

The analysis also includes several pupil characteristics: the average age of examination candidates, the percentage of female candidates and the percentage of orphans in grade 7. Regional variables are related to these pupil characteristics: the level of urbanization,

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[22] This was also the conclusion of a previous evaluation and of a similar study for Uganda (IOB 2008b).

[23] The inclusion of both variables in one regression would create a collinearity problem. This is a linear relationship between explanatory variables. As a result, the estimated coefficients may be shaky and may show large differences between two samples.

[24] Principal components analysis combines several indicators for the calculation of one or more new (latent) variables.

[25] Unfortunately there is no information on teacher attendance, which is likely to be an important determinant of educational quality.

[26] Technically, the analysis does not include a dummy for GRZ schools. Therefore, the dummies for the other school types indicate the effect in relation to GRZ schools, taking all other variables into account.

poverty (at ward level) and provinces.[27] The regional score for English (at constituency level) is an indicator of regional problems with English. This score only includes the results for English of *other* schools in the region, i.e. for school *i*, the regional scores includes the scores of all other schools in the region, but not the score of school *i*.

The analyses include four different regression techniques. The first approach uses weighted least squares (WLS) in order to take into account differences in the size of schools. The weight of each school is proportional to its size. The second technique of (random effects) generalized least squares (GLS) combines information across schools as well as changes within schools over time. Two other techniques control for (possible) selection bias. The first approach looks only at differences between schools *within* a specific ward. The idea is that schools within a given ward are more or less homogeneous with respect to certain characteristics such as regional characteristics and the background of the pupils. The second approach looks only at differences within schools (over time). This is generally the best way to eliminate possible selection bias and is therefore the most rigorous method (see Annex 5).

Regression results

Annex 7 presents the results of regression analyses for English, maths and the overall examination scores. Most analyses show a significant (positive) effect of teacher–pupil ratios. This effect is lowest for the WLS and fixed effects regression (at the school level). For the WLS, this may be an effect of the greater weight given to larger schools (apart from possible selection bias). This would mean that teachers in larger schools are less effective. The negative effect of school size points to the same phenomenon: large schools have lower average results, especially for maths. Moreover, the estimates are much larger for the fixed (school) effects regressions than for the others, which points to a negative effect of the large (rapid) increase in the number of schools over the past ten years. Note, however, that one cannot conclude from this that the quality of education has deteriorated, for two reasons. First, this negative scale effect is at least partly the result of changes in the composition of the enrolled population (see chapter 4). Second, other variables, such as the training and recruitment of teachers or the building of classrooms, have compensated for this effect.

The results also point to differences in the effects of changes in pupil–teacher ratios: improving pupil–teacher ratios in regions with huge problems with English does not appear very effective. Accompanying measures are needed to improve the effectiveness of reducing pupil–teacher ratios. Nevertheless, in all estimates, the impact of a reduction in the pupil–teacher ratio is small. Reducing the ratio from 80:1 to 40:1 for instance, would lead to an improvement in the examination scores of about 4–5 percentage points. For other measures variables, such as improving book–pupil or pupil–desk ratios, the effects on examination results also appear to be limited.

[27]   Province dummies and year dummies are not reported.

Development of examination results; Lunkhwakwa, Chipata (Eastern Province)

The ineffective utilization of teachers contributes to the low impact of reducing pupil–teacher ratios. In Zambia, teaching hours are relatively low, especially at the lower and middle basic levels. Official weekly teaching hours range from 17.5 hours for the lower basic level, up to 27.5 hours at the middle basic level and 16.5 hours at the upper basic level (Mulkeen et al., 2010, p.59). The findings of studies of the impact of the system of double shifts are mixed (IOB, 2008a; Mulkeen et al., 2010). Moreover, the introduction of double shift teaching often results in an unofficial reduction in the time teachers allocate to each shift (Mulkeen et al., 2010, p.60).

The effect of increasing the number of teachers with a diploma also appears to be significant, but relatively small. This does not point to effective teaching and therefore to ineffective teacher training. The requirement for more teachers created a demand for shorter courses and lower entry requirements (Mulkeen et al., 2010, p.80). This created the necessity of additional (in-service) training, but this has had a negative impact on teacher attendance, as most training takes place during school hours. Mulkeen et al. (2010, pp.87–88) report that the past years Zambia produced 4,300 newly trained primary teachers, while at the same time 1,100 teacher years were lost through the in-service upgrading courses. The effect of teacher education appears to be larger for English than for maths. The results are not significant for the fixed effects regression (at school level). This may point to selection biases for the level regressions as well as to lag effects: an improvement in the percentage of teachers with a diploma does not directly lead to improved examination

results. This makes sense as in many cases, the best and most experienced teachers will teach at grade 7. However, that fact that the estimates are smaller for the ward fixed effects regressions than for the other regressions suggests the impact of unobserved variables on the estimates (and therefore a selection bias).

The effects point to an enormous challenge for the basic education system in Zambia. Teachers need more training to teach mathematics effectively. At the moment, many schools with teachers with the required qualifications do not achieve the desired results. Reviews of teacher education conducted in 2005 and 2007 concluded that qualifications of teachers and teacher educators are inadequate, and that access to teacher education and training is insufficient (Chileshe et al, 2007).

The results of the (school) fixed effects regressions point to the negative impact of teacher attrition: schools with high teacher attrition rates have – *ceteris paribus* – lower results. This is especially a problem in rural areas (HLPD/PRBS, 2009). Several other variables also suggest that rapid changes in a school, such as an increase in school size, and even of improvements in (head) teacher qualifications, may have a negative impact on learning achievements. However, the inclusion of a variable measuring the impact of a relative change in the number of pupils does not have a significant impact. Reverse causality may play a role (good results attract new pupils), although these pupils (or their parents) should react to the results in previous years and the correlation of examination results over the years is not high. Examination results appear to be volatile (see IOB, 2008a).

There is little information about the impact of school management on average examination results. The qualification level of the head teacher does not have an impact. Once again, this does not point to effective teacher education. The SACMEQ III test revealed that the teaching by head teachers has decreased in Zambia, thereby reducing their role as instructional leaders (MoE 2011, SACMEQ III, draft report).

The analysis shows that private schools outperform GRZ, grant-aided and community schools by more than 20% (for English and maths, results are 6–8 points higher than those at GRZ schools, even after all other variables in the model have been taken into account). However, the costs of these schools are about ten times higher than those of GRZ schools. Grant-aided schools perform slightly better than GRZ schools, an effect that is probably the result of aid from NGOs or other organizations.[28] Community schools do not perform better or worse than GRZ schools. One must take into account the fact that the pupils of only one in 20 community schools can take their examination at their own school. These are probably the best community schools and they may be aided by NGOs or other organizations as well. The other pupils must take their examination at another school (usually a GRZ school). The analysis shows a negative effect for those schools functioning as examination centres for other schools, although the effect is small.

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[28] Moreover, they are allowed to charge school fees at the lower and middle basic level.

Other reports have also underscored the importance of school management. A main conclusion of the evaluation of the Western Province Education Programme was that the lack of supervision and inadequate monitoring undermined the effectiveness of the programme (WEPEP evaluation report, 2003). The IOB evaluation (2008a) pointed to the improvement in school management as an important instrument for improving learning achievements and reducing pupil and teacher absenteeism. This conclusion was echoed in the FTI Assessment (2008) that mentioned teacher management as a specific area of concern. Teacher management should be improved to tackle retention and absenteeism of teachers and the provision of qualified teachers. Another study concluded that systems for managing teachers are weak (Mulkeen et al., 2010). Head teachers should play important roles in managing, supervising and mentoring teachers, but in practice they devote much of their time to dealing with administrative authorities outside the school. This finding is consistent with those of field visits that indicated that management problems are greater in rural settings.

The National Implementation Framework III (2010) mentioned the following critical challenges for improving the quality of education:
• infrastructure construction and the provision of teaching and learning materials and desks;
• improving teacher motivation;
• ensuring the timely disbursement of funds;
• effective teacher supervision and management;
• updating and reviewing the curricula;
• providing adequate transport for pupils at lower levels.

With regard to pupil characteristics, the analyses confirm that pupils who take their examinations at the appropriate age perform better than older pupils, who obtain lower average results. This strengthens the argument for enrolling pupils at the right age. Nevertheless, one has to be aware that the fact that particular pupils are older can be a result of repetition, which would mean that the results are not an effect of age *per se*, but that older age is an effect of repetition. There are significant differences between male and female examination candidates, but these effects are very small. Schools where a high percentage of pupils are orphans show, on average, slightly lower results for English.

Urban–rural differences and socioeconomic conditions are more important for English than for mathematics. An explanation is that English is more commonly spoken in urban areas and among wealthier families. Finally, the analyses show a large impact of regional differences. In a number of mainly rural areas results for English are much lower than elsewhere. In these areas, children do not hear English at home, their parents do not speak English and even (local) teachers find it difficult to express themselves in English, but the examinations are in English. Schools lack sufficient (English) books, and even if there are enough, there is no point in pupils taking them home as most homes do not have electricity. Moreover, the SACMEQ III test revealed that the percentage of pupils who had access to the school library and were allowed to take books home had fallen (MoE 2011, SACMEQ III, draft report). The problem is even more complicated. If children have not mastered English, providing extra books, written in English, is unlikely to be effective (Banerjee and Duflo, 2011, p.94).

The above mechanisms have a large impact on the examination results in a school and improving proficiency in English is a regional challenge. The SACMEQ III results show that the use of English outside school is lowest in Northern, Southern and Western Provinces (MoE 2011, SACMEQ III, draft report), although there are large differences between urban and rural areas.

Table 6.2 Examination results for English (grade 7) in urban and rural areas, by province, 2009		
	Urban	Rural
Central	32	27
Copperbelt	31	26
Eastern	34	27
Luapula	29	26
Lusaka	35	27
North Western	29	28
Northern	28	25
Southern	33	25
Western	34	29

Sources: ECZ; authors' calculations.

Figure 6.8 illustrates the problems with proficiency in English in *rural* areas. In order to reduce the effects of exceptional results in a district in one particular year, the figure gives the mean results for the years 2008 and 2009.

Figure 6.8 *Proficiency in English in rural areas (grade 7), 2008–2009**
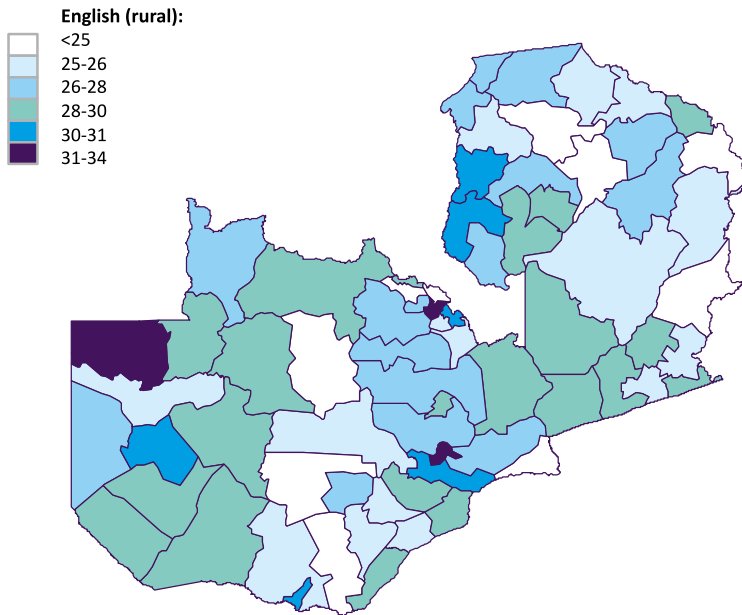
English (rural):

* *Mean score for English in the rural areas in the district*

Sources: ECZ; authors' calculations.

Controlling for differences in poverty levels, rural character and differences in school resources, English examination results in districts where Icibemba is the main language are 5% lower [than those elsewhere?] (see table 6.3).

Table 6.3	Factors explaining the results for English (grade 7) at district level, 2009.			
	B	**Std. error**	**t**	
Poverty (headcount)	−3.52	4.19	−0.84	
Percentage rural	−7.62	1.17	−6.52	**
Resources	−0.07	0.26	−0.29	
Icibemba	−1.27	0.52	−2.43	*
Constant	36.69	2.10	17.46	**

* Significant at 5%;level; ** significant at 1% level.

R^2 adj = 0.64; N = 72.

The language of examinations in Zambia is an important issue, with implications for the overall results. All assessment tests, and grade 7 and 9 examinations are in English, with the exception of Zambian languages. Therefore, a pupil's proficiency in English has important implications for the results for other subjects. The results for English are highly correlated with the results for other subjects, except for Zambian languages, and with the total test

results; likewise, the results for Zambian languages are not correlated with the results for other subjects or with the total test results.

Table 6.4 Correlation matrix of examination subjects (grade 7; 2009).						
	English	**Math**	**Social studies**	**Science**	**Zambian languages**	**Total score**
English	1.00					
Math	0.81*	1.00				
Social studies	0.91*	0.91*	1.00			
Science	0.90*	0.90*	0.96*	1.00		
Zambian Languages	−0.11	0.13	0.04	−0.02	1.00	
Total	0.92*	0.77*	0.84*	0.84*	0.05	1.00

Significant at the 1% level.

The results point to the need for a holistic approach within a region, taking into account language barriers and regional cultural values. Paradoxically, the Primary Reading Programme (PRP) may have contributed to regional differences. In the late 1990s, the government and Cooperating Partners started to experiment with this programme, also called the New Break Through to Literacy (NBTL), which recognizes that it would be more effective to teach children to read and write in their mother tongue. The *Primary Reading Programme* (PRP) aimed at enhancing the reading and writing skills at the lower (grades 1-4) and middle (grades 5-7) basic education levels (IOB 2008). The programme's main purpose was to improve literacy rates by teaching in local languages. The programme had a target of 80% of the children achieving nationally agreed reading standards in specific grades. To facilitate this target, children in the first classes were to learn to read and write in one of the seven main Zambian languages before continuing to learn English. The programme was evaluated several times and each one was extremely positive (Linehan, 2004, p.12). The main findings included better all-round teaching, successful learning, motivated teachers, supportive parents and communities and a pupil–centred approach that promoted children's confidence and higher attendance rates. Teachers reported higher attendance rates as a result of the free atmosphere, well-resourced environment and improved participation that motivated children to come to school (BESSIP Completion Report, p.20). Based on an evaluation, it was decided to scale up the programme and to implement it in more than 4,000 government primary schools and 74 community schools.

A more recent evaluation was more critical (IOB, 2008a), however. The report concluded that the evaluations of the programme were biased and had not measured the real programme effects. This evaluation confirms the more critical findings. The evaluation shows that in many rural areas, examination candidates hardly speak English. The evaluation also shows that this is a regional phenomenon (with the largest challenges in Northern Province and Southern Province). The teacher deployment system in Zambia facilitates the continued use of local languages, as most teachers apply only to districts where the local language is familiar (Mulkeen et al., 2010, p.45). Children in the first classes were to learn to

read and write in one of the seven main Zambian languages before continuing to learn English. They would switch gradually to English. However, it appears that local languages remain the main language of instruction, while the examinations are in English. Field visits suggest that teachers continue to teach in one of the local languages, with the result that grade 7 pupils do not master English.

6.3   Grade 9 examinations

6.3.1   Introduction

With the objective of GRZ that every child completes nine years of basic education, grade 9 examinations have become more important over time. This is reflected in the growth in the number of candidates, from 190,000 in 2005 to more than 280,000 in 2010 (see figure 6.9). In particular, the number of female candidates increased from 89,000 to 133,000, and this resulted in an improvement in the female–male ratio, from 0.87 to 0.90. However, the percentage of candidates who failed to show up for the grade 9 examinations was slightly higher among girls (10%) than boys (9%). Initially, absence rates increased from 9% in 2005 to 13% in 2007, but now seem to have stabilized at around 9%.

Figure 6.9   *Grade 9 examination results, 2003–2010*
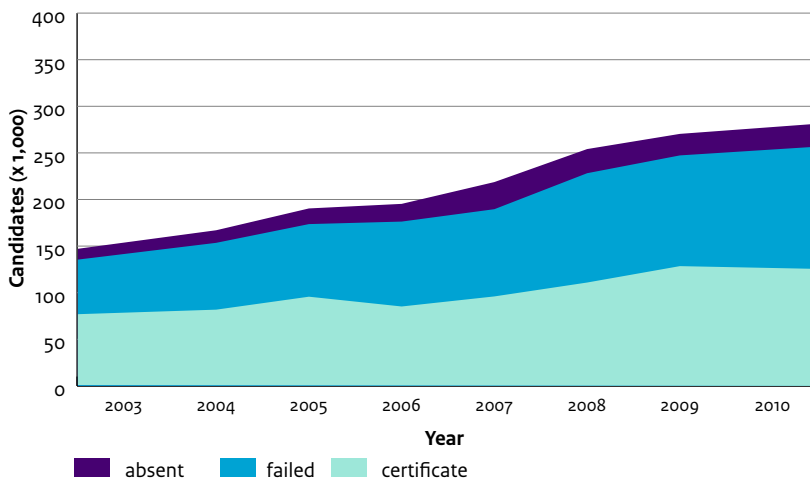
Sources: MoE; ECZ.

As a result of the rapid growth in the number of examination candidates, pass rates declined from 56% in 2003 to 48% in 2006 (see figure 6.10). Since then, pass rates have remained stable at around 50%, although they improved slightly for girls. In 2010, the average pass rate was 49% (for boys 52% and for girls 45%).

Figure 6.10 *Grade 9 pass rates, 2003–2010*
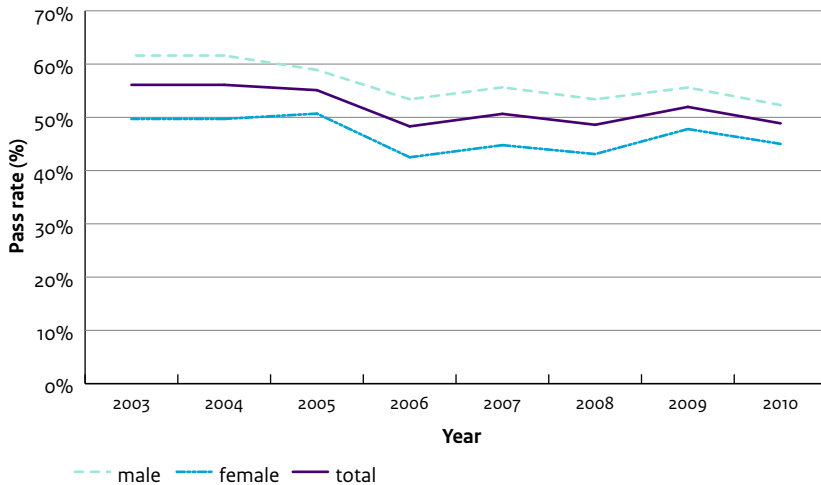
Sources: MoE; ECZ.

The average examination results for English and maths also show that in 2008 the results were slightly below the levels of 2007 and 2009. While this may be an effect of the yearly variation, it is interesting to note that in 2009 results for maths were much better than in 2007 and 2008. Data for 2010 and 2011 should show if this is a trend and not a one year effect. Overall, boys achieve significantly better maths results than girls, although in 2009, girls showed larger improvements in the results for both maths and English than boys. While more data are needed to confirm if this is a trend, the results for girls are encouraging.

Table 6.5 Grade 9 results for English and maths, 2007–2009.			
	2007	**2008**	**2009**
English			
Male	45.0	43.6	45.3
Female	45.1	44.0	46.1
Total	45.0	43.8	45.7
Math			
Male	38.5	36.7	42.8
Female	33.7	32.5	40.5
Total	36.3	34.7	41.7

Source: ECZ.

At the same time, one has to recognize that average grade 9 examination results figures are far too low. Unlike the grade 7 examinations, the maximum score is not 60, but 100. Once again, and even at this level, (regional) problems with English are an important cause.

6.3.2   Urban–rural differences

The differences between urban and rural areas at grade 7 are also evident at grade 9 (see figure 6.11). Here, again, differences for English are much larger than those for maths. For maths the mode is about 30; for English the mode is about 40 for rural areas and around 50 for urban areas.

Figure 6.11 *Distribution of grade 9 results for English and for maths in rural and urban schools, 2009*
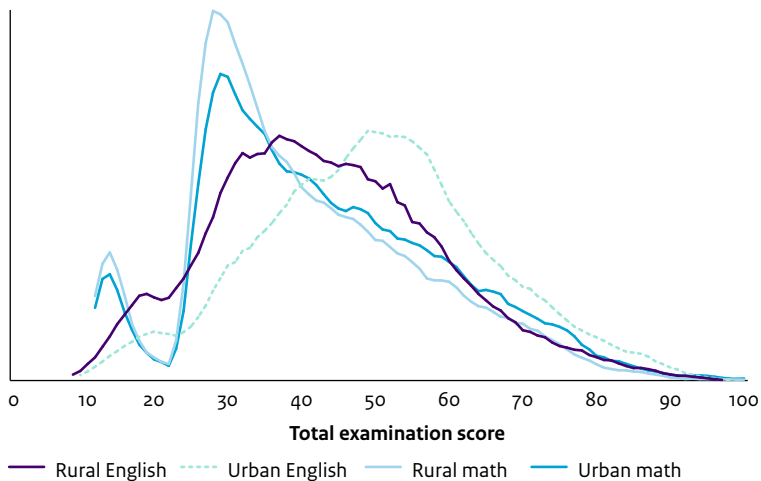
Sources: ECZ; authors' calculations.

Once again, the results show that poor results for English are a regional phenomenon: if *other* schools in the region have poor results for English in grade 7, then the grade 9 results of a school will – on average – also be relatively poor. After controlling for regional differences in proficiency in English (as measured by grade 7 results), the differences between urban and rural areas are much smaller and, in the case of maths, no longer significant. This stresses the need to improve English teaching in rural areas.

Table 6.6 Grade 9 results for English and maths by location, 2009			
	Unadjusted	**Adjusted for regional differences in proficiency in English**	*t*
English:			
Rural	41.7	44.2	
Urban	48.0	45.6	
			2.4*
Math:			
Rural	39.6	40.6	
Urban	42.2	41.3	
			0.9

* Significant at 5% level.
Sources: ECZ; authors' calculations.

6.3.3   Determinants of grade 9 examination results

It must be noted that the results of the above mentioned analysis *may* be biased in the sense that other exogenous variables – such as socioeconomic differences or regional differences in school resources – may have an impact on the grade 7 and grade 9 results. The evaluation therefore includes for the grade 9 examinations the same kind of analyses as for the grade 7 examinations. Data are, however, limited to the years 2007–2009.[29]

The results of the regression analyses are in line with those for grade 7 (see Annex 8). Reducing pupil–teacher ratios has a significant, although not very large effect. This effect is larger for English than for maths. For maths, female teachers achieve lower results than male teachers. For English, teachers with diplomas achieve better results than those who do not; for maths, this effect is not significant. There is a significant negative effect of teacher attrition: the grade 9 achievements of schools with a high teacher turnover are lower than those of school with a low turnover.

Private and grant-aided schools perform better than GRZ schools, even after controlling for other variables. The results of private schools are about 30% higher than those of GRZ schools, and about 15% higher than those of grant-aided schools. For English there is a positive effect of increasing school size: larger schools perform better than smaller ones. For maths, there is no significant effect.

The analyses confirm once again the large impact of regional problems with English: schools in regions where other schools have relatively poor grade 7 results, have relatively low achievements in English and maths. For English, there is also a strong correlation with (ward) poverty levels; for maths, this effect is not significant. For English, urban–rural differences are no longer significant in a multivariate model. These differences are captured by the poverty variable. For maths, there is a significant effect, showing that in rural areas

29   The time frame was too short for a fixed effects regression.

the grade 9 results are better than in urban areas after controlling for other variables.

There is another important difference between English and maths: for English, the included variables explain 40% of the differences in achievement between schools; for maths this is no more than 22%. Apparently, for maths, other variables are more important. Overall, in poor rural areas problems with English are an important cause of poor examination results, and the Ministry of Education should therefore focus on improving proficiency in English in these areas.

Once again, it must be concluded that so far, the Primary Reading Programme has not been effective in realizing this objective. In urban areas, achievements in maths are far too low. The higher proficiency in English gives pupils in urban areas a small comparative advantage, but after controlling for regional differences in English, the (maths) performance of pupils in urban areas is even below that of pupils in rural areas. Given their comparative advantages at many levels, these pupils should be able to perform much better. The quality of maths lessons needs to be improved.

6.4   Cost effectiveness of interventions

6.4.1   Introduction

So far, the analyses have assessed the effectiveness of specific interventions, such as the recruitment of teachers, the construction of classrooms or the provision of textbooks. However, these analyses do not take into account relative prices: recruiting more teachers appears to be more effective than providing more books, but of course the differences in price are enormous. For a better comparison, one should take into account the costs of interventions. This is precisely what a cost-effectiveness analysis does. Such an analysis weights the coefficients of the regression analyses with (relative) prices. This approach assesses the costs of improving learning achievements, as measured by examination results, through different interventions.

This section aims to provide a *rough* estimate of the cost-effectiveness of interventions. It is not possible to give very accurate estimates, as these estimates depend heavily on the underlying assumptions. Three kinds of uncertainty are important:
• uncertainties in the true value of the estimated effects;
• uncertainties about the prices that have been used; and
• uncertainties about the amortization period.

Moreover, actual effects will *always* depend on the exact combination of instruments at the school level. If a school has no teachers, the construction of classrooms or the provision of books will have no effect. Nevertheless, marked variations between different interventions allow us to make a rough estimate of their cost-effectiveness. The effects are estimated for an average Zambian GRZ school.

Bauleni Basic School, Lusaka

For the computation of the cost-effectiveness of interventions, several assumptions had to be made about costs and amortization period. Annex 9 presents these assumptions. The analysis is based on the results for the grade 7 examinations.

6.4.2 Results

Because it is difficult to establish definitively the cost-effectiveness of different interventions, we have chosen to provide a graphic representation. Figure 6.12 illustrates the estimated *average* effects based on the results of the regression analyses in this chapter (results for grade 7). Annex 9 also sketches the uncertainties in the results.

Figure 6.12 shows the *average* effect of equal investments in teachers, buildings, desks or instructional materials. If, in a particular school, the quality of the head teacher (management) is good and there are enough good teachers, there is no point in investing in teachers. Moreover, if a school has an adequate number of books, investing in books will not lead to better results.

Leaving aside the impact of improved school management for a moment, the cost-effectiveness of interventions is rather low. In the current situation, investing in *school facilities* is likely to be very cost-effective. A good learning environment has a large impact on school attendance and on learning outcomes. One of the best interventions is investing in school *desks*: children are more attentive and perform much better if they are able to sit at a desk

rather than on the floor. The estimated impact of investing in *textbooks* is rather low. Nevertheless, because the cost of books is low in comparison with the other instruments, investing in books is relatively cost-effective. Moreover, increasing the provision of books may also enhance their effectiveness. In many schools, investments in books are not effective because many of them are locked in cupboards in the classroom or in the head teacher's office, and remain unused. Books may be locked away because they are scarce, and there are not enough copies to go round. The effectiveness of books will also increase if teachers are trained to use them and the school management supervises their effective use.

Figure 6.12 *Estimated average cost-effectiveness of interventions.*
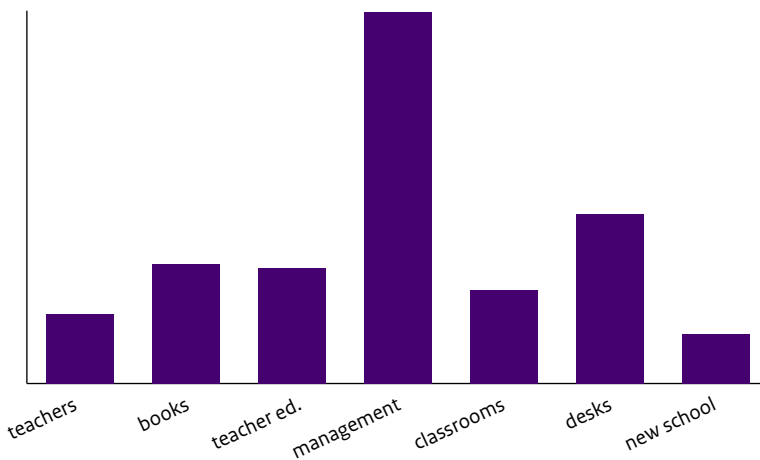
Investments in the building of new *classrooms* are more expensive. This does not mean, however, that they are not cost-effective. The reduction of the pupil–teacher ratio is highly correlated with the building of new classrooms. The system of double shifts tries to deal with the shortage of classrooms, but the application of this system is not always efficient. Field visits and the data show that in many schools there are more teachers than class-rooms. In these cases, the construction of new classrooms should be a top priority, provided that this will lead to a reduction in the use of double or triple shifts.

Recruiting new teachers does not seem to be as cost-effective as investing in books. However, one must be careful with this conclusion. In particular, there are no schools that have both high pupil–teacher ratios as well as good results.

It pays to have a pupil–teacher ratio that does not exceed 50:1 or even lower. However, the analysis showed that within the present structure, simply increasing the number of teachers would not have a significant effect on the learning outcomes of many schools. Teacher and pupil absenteeism, starting late (with the already short lessons) and low quality of teaching are explanations. The data suggest that in the current situation, improving the quality of teacher education would be more cost-effective than recruiting new teachers.

There appear to be at least four reasons why interventions are not more (cost-) effective:

1. The evaluation showed that the problem with local languages has not been effectively resolved. In many regions, pupils, parents and even teachers speak little English and this undermines the effectiveness of teaching and the use of instructional materials.
2. Related to the first problem is inadequate teacher education and training, which also contributes to the ineffective use of textbooks.
3. The system of double and even triple shifts leads to a very short teacher–pupil contact time and this is aggravated by increasing teacher and pupil absenteeism (MoE 2011, SACMEQ III, draft report);
4. Many schools do not offer an environment that is conducive to learning. Increased teacher and pupil absenteeism has a negative impact on education results and may lead to high dropout rates.

This brings us to the impact of improved school management. This evaluation has provided some evidence. The best indication was the far better results of private schools, even when other factors, such as urban–rural disparities and differences in pupils' backgrounds are taken into account. Nevertheless, the fact that private schools are more effective does not make them more cost-effective. The costs of many private schools are much higher than those of GRZ schools, sometimes about ten times as high. The costs of GRZ schools may be estimated at USD 220 per pupil, while several private schools calculate an annual fee of about USD 2,400. While many authors stress the better functioning of private schools (see, for instance, Banerjee and Duflo, 2011), they normally ignore the large differences in pupils' backgrounds and the much higher costs.

The evaluation was unable to estimate the impact of improved school management, although other studies have confirmed its important role. Well-managed schools perform better, and investing in the quality of management is a relatively cheap way to improve results. Better school management leads to improvements in pupil and teacher attendance, teacher motivation, management of resources and the school climate. Better school management starts with the head teacher in his or her role as instructional leader and supervisor, creating an environment that is conducive to learning, ensuring the timely attendance of teachers and pupils and promoting high-quality teaching. If the quality of school management is raised, teachers would become considerably more (cost-)effective. With good management, the (cost)effectiveness of an additional teacher would be much higher. Failure by teachers to spend adequate time preparing lessons and marking can have a devastating impact on the teaching and learning process (MoE 2011, SACMEQ III, draft report). And naturally, well-trained teachers would also raise the cost-effectiveness of books. As a result, pupils perform better.

In Masindi, Uganda, one school management project improved test and examination results by 50% (IOB, 2008b).[30] The IOB evaluation showed that investing in the *quality of school management* (through education and training, as well as strengthening of the standards unit) as the most effective way to improve results. An important part of the project was the yearly extensive (standardized) monitoring through inspections, using 16 quality indicators for school performance. The 16 quality indicators form the basis of nationally agreed school inspection procedures.

These indicators are:

Teaching and Learning
1) Quality of Teacher's Planning
2) Quality of use of Resources and of the Classroom environment
3) Quality of the Teaching and Learning Process
4) Assessment and Record Keeping
5) Teacher Knowledge
6) Pupils' Understanding and Attainment

School Management
1) Leadership
2) Financial Management
3) Management of Resources
4) Supervision of Teaching and Learning
5) Staff Deployment and Development
6) Management of Co-Curricular Activities
7) Access and Equity
8) Climate and Relationships within the School

Governance
1) School Governance
2) Community Relations

Finally, the results of the Uganda evaluation have been used to estimate the impact of new schools.

Figure 6.12 shows that building new schools would be the most expensive investment. However, one way or another, the problem of distance needs to be addressed: if children have to walk long distances, attendance rates will be low, resulting in high dropout and repetition rates and poor learning achievements. Moreover, a disproportionate emphasis on the addition of classrooms to existing schools rather than establishing new schools means that in some cases, schools grow very large, but many children still need to walk long distances to reach them. This is not conducive to access. Therefore, recent investments in new schools must be welcomed.

[30] For this evaluation, the estimated coefficients of the Uganda evaluation have been used (see Annex 9).

6.5   International comparison

So far, the analyses have focused on differences within Zambia. For an understanding of the quality of basic education it is also instructive to compare Zambia with other countries in the region. The main sources of data for this comparison are the most recent SACMEQ surveys.

In 1991, the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) began with a national survey of the quality of primary education in Zimbabwe, and then extended the initiative to include other African countries. By 1995 this had resulted in the establishment of a network of seven countries, leading to a cross-national survey conducted between 1995 and 1998 (SACMEQ I), and a second survey in 2000 (SACMEQ II). By then, the SACMEQ network had expanded to 15 members. The results of SACMEQ III (2007) have recently become available.

The findings of the international SACMEQ III survey were important for Zambia (see table 6.7). While in a number of countries the reading and math results improved between 2000 and 2007, in Zambia they remained low. The results for reading deteriorated slightly, and those for maths remained stable. Together with Malawi, Zambia had the lowest results for reading and for maths.

Table 6.7 Achievements in reading and maths in nine countries (SACMEQ), 2000 and 2007*				
	Reading		Mathematics	
	2000	2007	2000	2007
Botswana	521	535	513	521
Malawi	429	434	433	447
Mozambique	517	476	530	484
Namibia	449	497	431	471
South Africa	492	495	486	495
Tanzania	546	578	522	553
Uganda	482	479	506	482
Zambia	440	434	435	435
Zimbabwe	505	508	–	520
SACMEQ	500	512	500	510

* Mean figure 2000=500
Source: SACMEQ III.

While the survey results were disappointing, it is important to acknowledge the limitations of such international comparisons. First, one cannot arrive at conclusions without taking into account changes in enrolment in the countries involved. One has to bear in mind that in Zambia, the major difference between 2000 and 2007 was the large increase in the number of children enrolled in schools in poor and remote areas. Of the nine countries listed in the table, only Mozambique and Tanzania witnessed comparable increases in enrolments between 2000 and 2007. As a result of the large increase in the school-going population in Zambia, one might have expected lower results (see IOB, 2008a). Taking into account this effect, the decline in the average results for reading in Zambia is modest. The Tanzanian results appear to be much better than those in Zambia. However, an important explanation is that in Tanzania the reading tests were conducted in Kiswahili, the national language, while in Zambia they were conducted in English, a language that few Zambians have mastered.

An analysis at the provincial level reveals some remarkable differences within Zambia. In North Western and Central provinces, average results improved slightly, while they deteriorated in Copperbelt and Southern provinces. It also appears that the results were improving in rural areas, while they went down in urban areas. The picture appears to be more complicated, however. A comparison of SACMEQ results (at grade 6 level) with grade 7 examinations shows that there is no correlation between the two at the provincial level. While North Western Province showed a marked improvement in the SACMEQ test results, the grade 7 examination results deteriorated. Copperbelt, on the other hand, was doing relatively well in the national examinations. As the Ministry of Education stated in the draft report, these developments need further analysis (MoE, 2011; SACMEQ III, draft report).

Table 6.8 Pupil reading and mathematics achievements by province (SACMEQ), 2000 and 2007.						
	Reading			Mathematics		
Province	**SACMEQ 2000**	**SACMEQ 2007**	**Exam grade 7 2001–2007**	**SACMEQ 2000**	**SACMEQ 2007**	**Exam grade 7 2001–2007**
North Western	400	416	−7%	411	424	−14%
Central	427	448	−5%	433	440	−10%
Luapula	417	423	−15%	420	437	−18%
Eastern	420	435	−1%	433	437	−6%
Northern	423	434	−8%	427	428	−13%
Lusaka	465	458	+11%	443	454	0%
Western	430	434	−1%	437	433	−10%
Copperbelt	469	437	+6%	447	441	−4%
Southern	438	414	0%	436	417	−8%
ZAMBIA	440	434	0%	435	435	−8%

Sources: SACMEQ II and SACMEQ III; ECZ.

6.6 Summary and conclusions

This chapter has focused on the development of *learning achievements* in Zambia between 2000 and 2010. The analyses are based on annual school census data and grade 7 and grade 9 examination scores.

Between 2000 and 2010, the number of pupils who entered the grade 7 examination increased by almost 90%. Total growth was especially high for girls (98%), improving the ratio of female to male candidates from 0.78 to 0.86. In spite of this increase, and of the overall enrolment growth, grade 7 examination scores remained fairly stable *at the national level*. The results are remarkable given the deteriorating pupil–teacher, pupil–classroom and pupil–book ratios (between 2000 and 2005) and the increase in the number of pupils from poor and rural areas. The differences between boys and girls were minor. Pass rates remained stable between 2000 and 2005, mainly as a result of capacity problems at the upper basic level. These capacity problems determined pass rates, rather than examination results. From 2005 onwards, pass rates improved markedly, which is evidence of improved access to grade 8. Once again, girls benefitted in particular.

The grade 9 examination results present a comparable picture. Between 2003 and 2010 the number of examination candidates almost doubled. The number of female candidates increased from 89,000 in 2005 to 133,000 in 2010, resulting in an improvement of the female–male ratio (from 0.87 to 0.90). Pass rates went down initially, but improved in 2009. Investments in teachers, classrooms and books contributed significantly to the examination results.

Yet in spite of these positive developments, Zambia faces enormous challenges. The quality of education remains poor, especially in rural areas. In 2009, average grade 9 scores for English in rural areas were 42 out of a maximum score of 100; for maths this was 40. Absence from examinations appears to be an increasing challenge. In comparison with neighbouring countries, Zambia has the lowest results. While (international) test results improved in a number of countries, they did not in Zambia. An important explanation is the large enrolment growth.

One significant challenge appears to be the problem with English in a number of rural areas. There, children do not hear English at home, their parents do not speak English and even (local) teachers find it difficult to express themselves in English. However, the examinations are in English. The Primary Reading Programme was introduced to facilitate learning in areas where children do not speak English. However, teachers continue to teach in one of the local languages, with the result that grade 7 pupils – and even many grade 9 pupils – do not master English. The teacher deployment system also facilitates the continued use of local languages.

There are, however, considerable differences between provinces. Moreover, whereas national-level results are stable, they conceal large fluctuations at the school level.

Several quantitative analyses of the factors that have an impact on learning achievements lead to the following conclusions:

- The analyses confirm the strong correlation between pupils' *socio-economic background* and their examination results. This is an important finding, because precisely the number of pupils in poor regions increased. Without the improved access of these groups to basic education, average achievements would have been better. In other words: the results of pupils within a specific socioeconomic stratum improved, but the overall results did not because the portion of pupils from the most vulnerable socioeconomic groups increased. This is a classic example of 'vanishing benefits': at first sight, there are no positive effects, but a more thorough analysis shows improvements.
- *Urban–rural differences* point to the effect of socioeconomic differences as well. Schools in urban areas produce better results than those in rural areas, even after correcting for differences in school type (including private schools in urban areas and community schools in rural areas) and differences in the numbers of teachers, classrooms, books, etc.
- The analyses confirm the enormous impact of local languages and the limited use of *English* in rural areas. This has an impact not only on the results for English, but on other subjects as well because the examinations are in English. In regions where English is hardly spoken, examination results are also low.
- There is evidence of a negative effect of high *teacher attrition*: schools with high teacher attrition rates have lower results. Again, this is a problem in rural areas.
- A significant *negative scale effect* emerges from the analyses. Large schools perform – *ceteris paribus* – less well than smaller schools. Moreover, fast growing schools also perform less well. This is not (solely) an effect of an increase in the number of pupils: a large change in the number of pupils does not have a direct effect on examination results.

The results of the quantitative analyses show that investments in teachers, classrooms and books were significant, though their effectiveness can be improved.
Changes in pupil–teacher ratios have a significant effect, but this is small. Moreover, the impact of more teachers with diplomas also appears to be limited. This does not point to effective teacher education. Investments in the quality of teacher education, school management and the inspectorate are necessary to improve the effectiveness of the recruitment of teachers and the procurement and dissemination of textbooks. The recruitment of new teachers must be accompanied by building more classrooms in order to be cost-effective. Too often, there are more teachers than classrooms in many basic schools.

An analysis of the *cost-effectiveness* of interventions confirms that their effectiveness can be improved. Taking into account relative prices, the impact of investing in more teachers is not very high. On average, classroom construction, the provision of books, the education and training of teachers and especially the provision of desks are more effective. For schools where children have to sit on the floor, one of the best ways to improve their results is to provide desks.

However, it appears that in the past decade, the government and Cooperating Partners have focused on the 'hardware' (more teachers, more classrooms, more books), thereby paying insufficient attention to the 'software': teacher education and training, and especially

school management and strengthening the inspectorate. The cost-effectiveness analysis shows that if anything will help to raise educational results, it is the development of more effective school management and inspectorates. A well-managed school ensures improvements in pupil and teacher attendance, teacher motivation, the efficient allocation of resources and a child-friendly environment. If the quality of school management is raised, teachers become considerably more (cost-)effective. And naturally, well-trained teachers raise the cost-effectiveness of books. As a result, pupils perform better.

It is also necessary to invest more in addressing the causes of underperformance in rural areas, rather than just focusing on improving pupil–teacher or pupil–classroom ratios. The underperformance in rural areas is related to cultural values and language barriers. If these problems are not resolved, deploying more teachers or constructing more classrooms will not have a large effect.

7

District performance

7.1   Introduction

The previous chapters have shown that there are large differences between provinces in terms of access, learning achievement and equity. This chapter seeks to analyze these differences at the district level. The objective is to trace weaknesses and thereby to contribute to improvements in basic education at the district level.

There are many ways to assess developments and results in the various districts. The main instruments used by the Ministry of Education are the district profile, developed by the ministry and district education boards for each of the 72 districts. These profiles provide detailed insights into the development of education at district level by comparing the results with provincial and national averages. For example, figure 7.1 shows the first indicator (the net intake rate) for a specific district. Net intake rates improved between 2005 and 2006 and stabilized from 2006 onwards. The 2008 figure was relatively low in comparison with the national average, but high in comparison with the province average.

Figure 7.1   *First indicator of the district profiles*
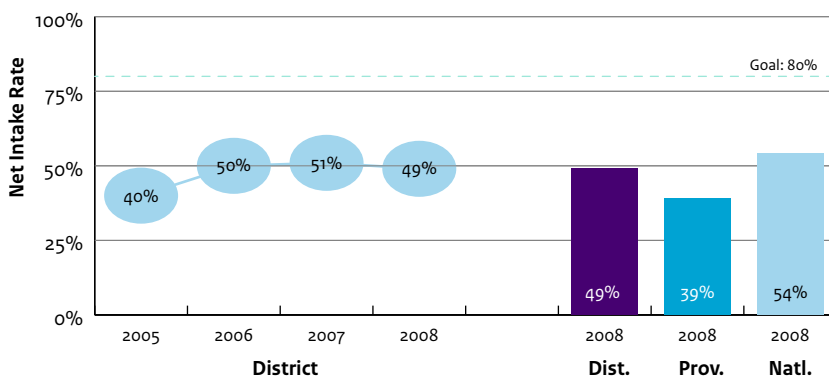
Sources: MoE: Example of a district profile.

This evaluation has chosen a different approach. Here the assessment does not start with the individual district, but rather with a comparison of the 72 districts. For the assessment, the chapter analyzes (educational) performance in districts along four dimensions:

1.   *availability of resources*, as measured by pupil–teacher and pupil–classroom ratios;
2.   *education results*, as measured by repetition and dropout rates, and grade 7 and 9 examination results;
3.   *equity*, as measured by gender differences;
4.   *progress*, as measured by changes in access, achievement and gender differences.

Because of the focus of the evaluation on budget support, the analysis looks at developments between 2005 and 2009.

7.2   Resources

The measurement of the adequacy of resources at the district level includes two variables: the pupil–teacher and pupil–classroom ratios at the district level for basic schools.

The analysis combines the two indicators using the technique of principal components analysis. This ensures that both indicators have the same weight, independent of scale. The newly created variable has a mean of 0 and a standard deviation of 1. Therefore, districts with a score below 0 are under-resourced, while those with scores above 0 are relatively over-resourced (taking into account total enrolment in the district).

Chapter 5 revealed large differences in the allocation of resources among schools, which exist at more aggregate levels as well. In general, the western districts, with the exceptions of Namwala, Kalomo and Sinazongwa in Southern Province, have relatively favourable pupil–teacher and pupil–classroom ratios (see Annex 2 for province and district maps). These ratios are low in the zone ranging from Mwinilunga in North Western Province, through the southern districts of Copperbelt, Central and Lusaka Provinces – with the exception of the capital Lusaka – to Petauke in Eastern Province. They are also low in several districts in Northern Province and (especially) in Luapula. The eight most under-resourced districts are Nchelenge, Chienge and Mansa in Luapula, Solwezi in North Western Province, Lufwanyama and Mpongwe in Copperbelt, Mumbwa in Central Province and Nakonde in Northern Province. In 2009, two districts in Luapula, Nchelenge and Mansa, had much higher pupil–teacher ratios than other districts (above 80:1 for grades 1–9).

Figure 7.2 *Distribution of resources for basic education by district, 2009*

Resources:
very poor (< -1.00)
poor (-1.00 − -0.60)
below average (-0.45 − 0)
(above) average (0 − 0.35)
relatively good (0.50 − 0.90)
best (>1.00)
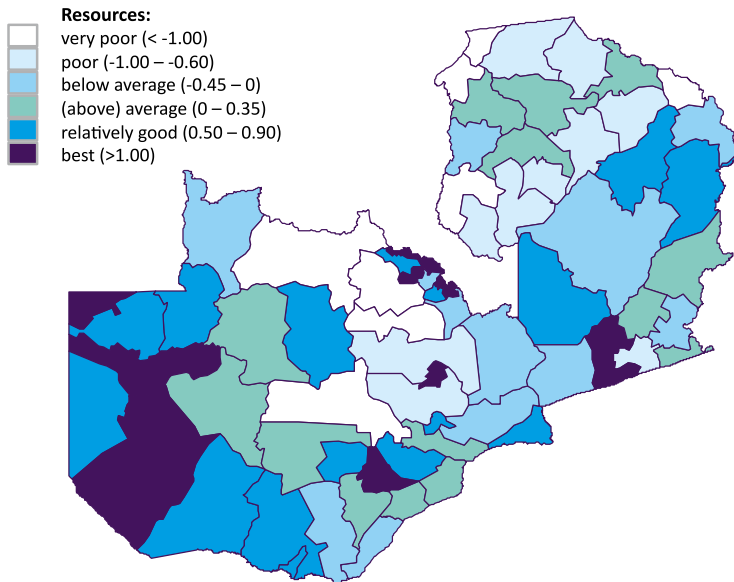
Sources: MoE /ECZ; authors' calculations.

7.3   Educational results

Educational quality is a complex concept that has to do with the availability, quality and use of educational resources. This evaluation has chosen to assess educational quality by its results. Differences in resources may contribute to an explanation of differences in learning achievements, although many other factors have an impact as well (see chapter 6). The assessment of the results at the district level includes the following variables:

• the mean total score of the grade 7 examinations at the district level;
• the average of the mean scores for English and maths of the grade 9 examinations;
• the mean dropout rate (basic schools); and
• the mean repetition rate (basic schools)

The first two indicators are related to the quality of education; the third and fourth indicators are (also) related to efficiency. Three of the four variables are correlated. The dropout rate is correlated with the repetition rate (r=0.47), but not with the examination results.

The four variables have been combined to give a single quality indicator through the method of principal components analysis. The correlation of this new variable with the original variables is:

• grade 7 examination results (r=0.79);
• grade 9 examination results (r=0.76);

- repetition rate (r=−0.89);
- dropout rate (r=−0.60).

The new variable has a mean of 0 and a standard deviation of 1. Figure 7.3 shows the results for the newly created variable at the district level.

Figure 7.3   *The quality of basic education by district, 2009*

Achievements:
- very poor (< -1.20)
- poor (-1.05 − -0.65)
- below average (-0.60 − 0)
- (above) average (0 − 0.55)
- relatively good (0.75 − 1.35)
- best (>1.65)
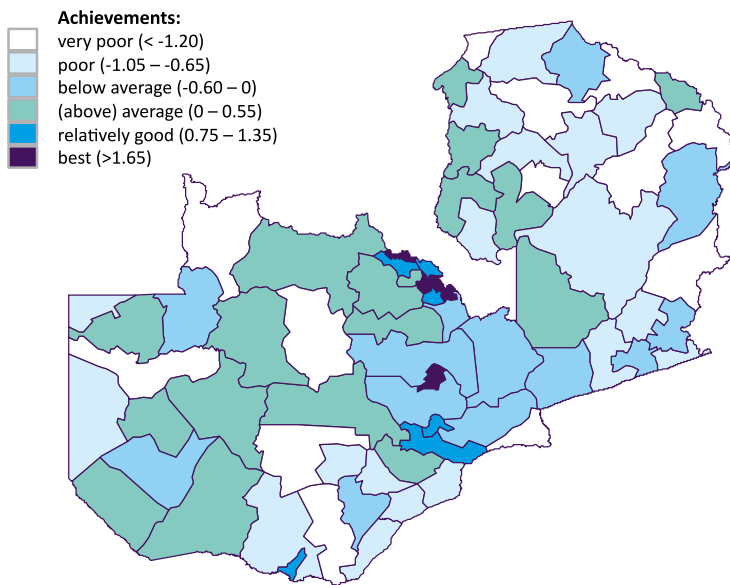
Sources: MoE/ECZ; authors' calculations.

Two examples may illustrate the meaning of the constructed (latent) variable. In figure 7.3, Chilibombwe in Copperbelt Province has the best results. There, examination results are relatively good: 187 for grade 7 (mean 172) and 55 for grade 9 (mean 43). The repetition and dropout rates are relatively low, at 3% (7%) and 1.1% (2.4%), respectively. The worst-performing districts are Isoka in Northern Province and Kasempa in North Western Province, with 150 and 153, respectively, for the grade 7 examination results, 33 and 39 for the grade 9 examinations, and 13% and 12% repetition rates. The dropout rate is relatively low in Isoka (1.8%), but high in Kasempa (4.3%).

In general, districts in Copperbelt and Western provinces perform better than those in Northern and Eastern districts. Four other districts perform relatively well: Kabwe, Lusaka, Kafue and Livingstone. Nevertheless, taking into account district poverty levels, the results in Livingstone are much lower than might be expected on the basis of the percentage of poor in the district. Figure 7.4 sketches this relation between quality, as measured by the newly created variable, and district poverty levels. The results show a fairly strong correlation: the results are better in the wealthier districts than in the poorest districts. Taking into account the district poverty level, the performance of Livingstone is relatively poor because

of a relatively high repetition rate and, especially, relatively poor results at grade 9. Possibly, Livingstone attracts higher basic level pupils from the neighbouring Kazungula district.

Figure 7.4 *Performance by district poverty level, 2009*
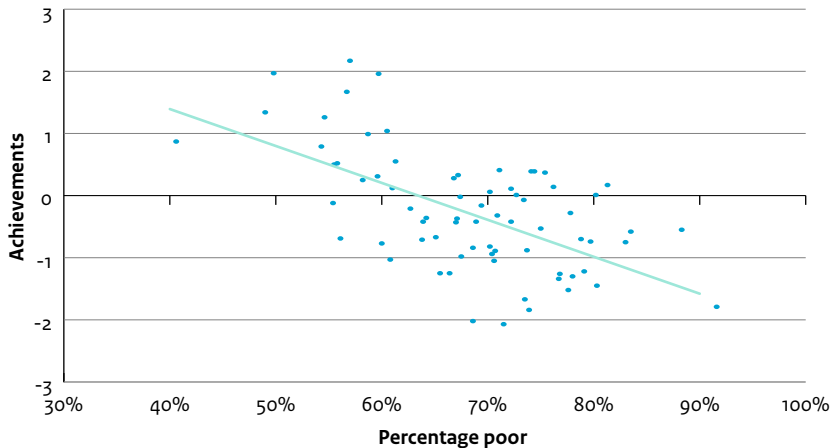
Sources: MoE and ECZ; authors' calculations.

Another, even more important, factor in explaining the results at district level is the character of the district – whether rural or urban. This variable was defined as the number of pupils (grades 1–7) living in rural areas as a percentage of the total number of pupils (see Annex 2). The regression analysis of table 7.1 shows the importance of this factor: a 10% increase in the number of rural pupils lowers the results by 0.2 standard deviation.

Controlling for poverty level and the rural/urban character of the district, differences in (Zambian) language are not significant: taking into account differences in the urban/rural character, poverty levels and resources, there are no significant differences between languages (see table 7.1). At the district level, differences in resources, as measured by pupil–teacher and pupil–classroom ratios, do not have a significant effect. The reason is that there is too much variation within districts to have an effect at that level.

Table 7.1 Factors explaining the results at the district level, 2009.				
	B	Std. error	t	
Poverty (headcount)	−2.42	1.40	−1.73	*
Percentage rural	−2.04	0.41	−5.00	***
Resources	0.12	0.09	1.40	
Chitonga	−0.16	0.23	−0.68	
Cynyanja / Chicewa	−0.19	0.20	−0.96	
Kikaonde	−0.15	0.42	−0.36	
Lunda	−0.34	0.51	−0.67	
Luvale	0.33	0.68	0.48	
Silozi	0.24	0.33	0.71	
Constant	3.15	0.76	4.14	***

*Significant at 10% level; ** significant at 5% level; *** significant at 1% level.*
$R^2adj=0.64$; N=72.

7.4 Equity

The assessment of equity focuses on gender differences. This variable includes three indicators:
- *gender parity index*, as defined by the number of female pupils divided by the number of male pupils;
- *grade 7 parity index*, as defined by the number of female grade 7 examination candidates divided by the number of male grade 7 candidates; and
- *grade 9 parity index*, as defined by the number of female grade 9 examination candidates divided by the number of male grade 9 candidates.

The three indicators have been combined to create a single equity variable through the method of principal components analysis. The correlation of this new variable with the original variables is:
- total gender parity (enrolments) ($r=0.91$);
- parity at grade 7 examinations ($r=0.95$);
- parity at grade 9 examinations ($r=0.92$).

The new variable has a mean of 0 and a standard deviation of 1.

Figure 7.5 shows the achievement of equity objectives at the district level. Levels of inequity are highest in Northern, Luapula and North Western provinces.

Figure 7.5 *Equity at the district level, 2009*

Equity
- very poor (< -1.80)
- poor (-1.50 – -0.75)
- below average (-0.65 – 0.30)
- (above) average (-0.20 – 0.50)
- relatively good (0.70 – 1.00)
- best (>1.15)
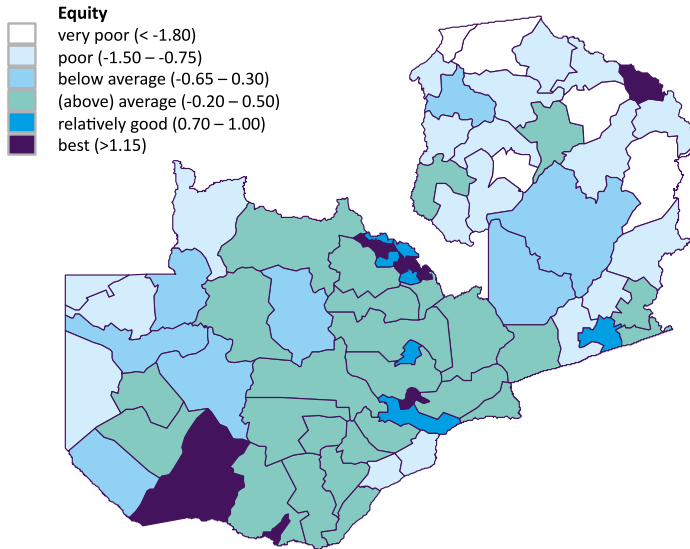
Sources: MoE and ECZ; authors' calculations.

Figure 7.6 shows the correlation between equity and poverty levels: the poorest districts are much further from achieving gender parity than the wealthier districts. Nakonde district in Northern Province is a positive exception.

Figure 7.6 *Correlation between equity and poverty at the district level, 2009*
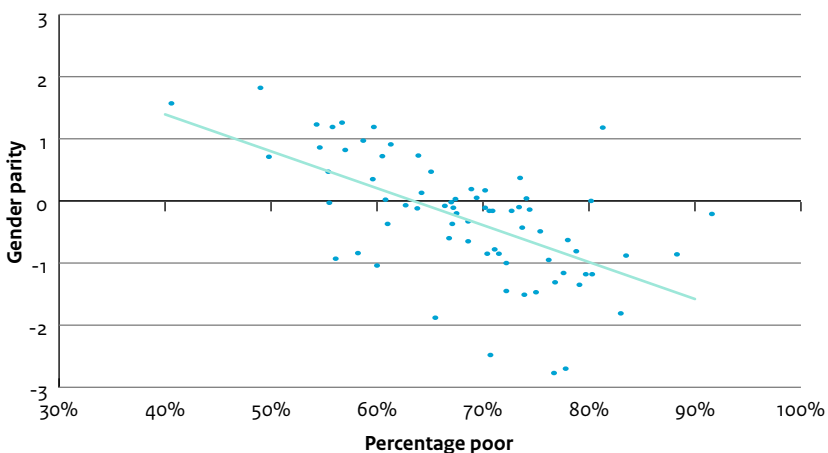
Sources: MoE and ECZ; authors' calculations.

Five districts (Lusaka, Livingstone, Kitwe, Chingola and Ndola) have achieved parity on at least one of the three indicators. Chilubi (Northern Province) and Chama (Eastern Province) have the lowest indices: for total enrolment respectively 0.78:1 and 0.82:1 (mean 0.97:1); for the grade 7 examination results 0.53:1 and 0.49:1 (mean 0.82:1); and for the grade 9 examination results both 0.42:1 (mean 0.85:1).

Table 7.2 Factors explaining differences in gender equity at the district level (grade 7), 2009.				
	B	Std. error	t	
Poverty (headcount)	−3.35	1.13	−2.57	**
Percentage rural	−1.71	0.36	−4.69	***
Resources	0.08	0.08	1.00	
Icibemba	−0.32	0.16	−1.96	*
Constant	3.60	0.66	5.50	***

*Significant at 10% level; ** significant at 5% level; *** significant at 1% level.*
$R^2adj=0.65; N=72.$

7.5 Progress

The analysis of the previous section is essentially static and does not include developments within a district. Several districts may appear to be poor performers, although they have come a long way and are catching up. This section therefore focuses on progress: which districts have achieved the greatest improvements? For this assessment, the analysis includes the following indicators, measured as changes between 2005 and 2009:
• enrolment;
• dropout and repetition rates;
• examination results (grade 7);
• equity (gender parity).

These four indicators have been standardized (with a mean of 0 and a standard deviation of 1), in order to give them equal weight. The progress indicator gives the mean value of the four indicators.

In terms of *progress*, Eastern Province has the best performing districts. Lusaka, Southern Province and Copperbelt had the smallest improvements. In Northern Province, the picture is mixed. While most districts did not improve, three (Mpulungu, Nakonde and Luwingu) showed remarkable progress. In Mambwe, in Eastern Province, both the examination results and the gender balance improved.
In the above analysis, each district is given the same weight. As a result, the average provincial figures may be misleading. A weighted comparison, taking into account total enrolment in a district, gives a different picture. Taking into account the number of pupils in a district, progress was lowest in Lusaka and Southern provinces, while the greatest progress was made in Eastern and Central provinces.

Figure 7.7 *Overall progress in basic education by district, 2005–2009*

Progress
Poor (<-1.20)
Below average (-1 – - 0.25)
Average (-0.10 – 0.6)
Above average (0.7 – 1.15)
Good (>1.40)
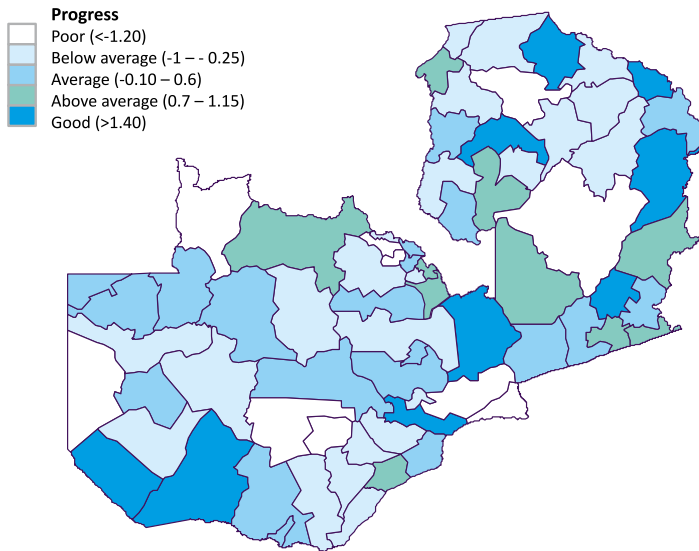
Sources: MoE/ECZ; authors' calculations.

7.6 Underperforming districts

This chapter has looked at basic education at the district level, focusing on four indicators:
- *resources*: pupil–teacher ratio sand pupil–classroom ratios;
- *educational results*: repetition and dropout rates, and grade 7 and grade 9 examination results;
- *equity*: overall gender parity and gender parity at grade 7 and grade 9 examinations; and
- *progress*: changes in enrolment, repetition and dropout rates, equity and examination results.

Table 7.3 summarizes the results at the provincial level. Not surprisingly, Lusaka and Copperbelt are the best-performing provinces, with relatively good results on resources, quality and equity. Progress has been relatively weak. Western Province is also well resourced, but scores negatively on the other indicators. Central Province on the other hand is under-resourced, but performs relatively well on quality and progress indicators.

Luapula and Northern Province are the weakest performers. Luapula is severely under-resourced and scores badly on equity issues. In Northern Province, quality (educational results) and equity are the main concerns.

Table 7.3 Assessment of performance at the provincial level					
Province	Resources	Quality	Equity	Progress	Overall
Copperbelt	0.36	1.18	0.94	−0.16	0.92
Lusaka	0.48	1.00	1.35	−0.58	0.88
Western	0.88	−0.08	−0.16	−0.15	0.19
Central	−0.28	0.26	0.03	0.45	0.18
Eastern	−0.02	−0.51	−0.43	0.66	−0.12
Southern	0.48	−0.55	0.12	−0.44	−0.16
North Western	−0.29	−0.55	−0.58	0.11	−0.52
Luapula	−1.53	−0.07	−0.78	0.19	−0.86
Northern	0.34	−1.02	−1.01	0.00	−0.94
Zambia	0.00	0.00	0.00	0.00	0.00

There is also large variation within provinces. In Copperbelt, for instance, districts in the northeast of the province are among the best performers, while those in the southwest have much lower results. Nakonde is a positive exception in Northern Province.

Figure 7.8 *Overall performance by district, 2009*
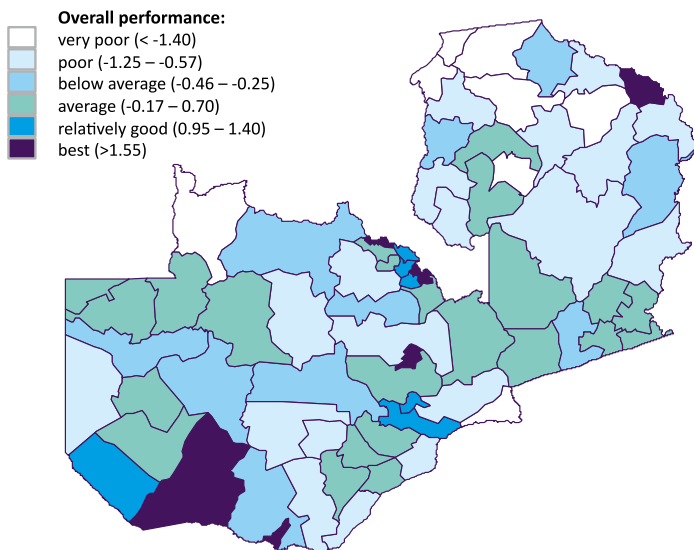
Sources: MoE/ECZ; authors' calculations.

The main underperforming districts are in Luapula and Northern Province. In both provinces, the districts are under-resourced, in both absolute and relative terms. These districts are not making progress, with two exceptions: Nchelenge in Luapula and Chilubi in Northern Province.

Several other districts have relatively high pupil–teacher and pupil–classroom ratios, but underperform nevertheless. These include Ithezi Tezhi in Southern Province, Lukulu and Kalabo in Western Province, Nyinma in Eastern Province and Luangwa in Lusaka Province. In the rural districts Lukulu, Kalabo and Luangwa, problems with English play a role.

It also appears that equity is a good predictor of underperformance. There is a high correlation between equity and overall performance (r=0.73). In other words, gender parity indices are good indicators of problems in basic education at the district level.

Table 7.4 Districts with the weakest performance				
Province	Resources	Quality	Equity	Progress
Luapula:				
Chienge	-	-	-	0
Nchelenge	-	0	-	+
Mansa	-	+	0	-
Northern Province:				
Chilubi	-	-	-	-
Kaputa	-	-	-	-
Mungwi	-	-	-	-
Mpokoroso	-	0	-	-
North Western Province:				
Mwinilunga	-	-	-	-
Kasempa	+	-	-	-
Southern Province:				
Kalomo	-	-	0	-
Namwala	-	-	0	-
Sinazongwe	-	-	-	-
Western Province:				
Kalabo	+	-	-	-
Lukulu	+	-	-	-
Eastern Province:				
Lundazi	0	-	-	+
Nyimba	+	-	-	0
Central Province				
Kapiri Mposhi	-	-	0	-
Lusaka:				
Luangwa	+	-	-	-

The worst performing districts

Chienge, Luapula

Chienge, the most northerly district of Luapula Province, is completely rural, but not the poorest in the province (66% poor in 2006). The main language is Aushi a dialect of Icibemba. Why, then, is this district the poorest performer in Luapula? First, Chienge is severely under-resourced, with very low pupil teacher and pupil–classroom ratios. In 2008, the pupil–teacher ratio was almost 80:1 and the figure appears to have risen enormously in 2009 as a result of a steep drop in the number of teachers. The pupil–classroom ratio is about 100:1.

Performance at grade 7 and grade 9 examinations is low, partly because of the lack of resources and partly as a result of problems with English. The average results for English are lower in Chienge than in other districts in the province. Repetition rates (8%) and dropout rates (5%) are also relatively high. On equity, the performance of the district is worse than other districts in the region, comparable with only the neighbouring Kaputa district in Northern Province. Gender inequalities are high. The overall gender parity index for grades 1–9 is 86:100, dropping to 51:100 for grade 7 examinations and 65:1 for grade 9 examinations. On the positive side, the growth in the numbers of pupils (28%) and grade 7 examination candidates (43%) were relatively high.

Kaputa, Northern Province

Kaputa, which neighbours Chienge, is the most northerly district of the country. The main local language is Icibemba. The district is completely rural, and slightly poorer than Chienge. It is under-resourced, but not as much as Chienge. Kaputa is one of the weakest districts because of its poor results and, especially, its large male–female disparities. In 2009, only one in three grade 7 examination candidates was female and for grade 9 the figure was even lower. Overall, the female–male ratio in basic education was 84:100. The mean examination scores for grade 7 (169) and grade 9 (39) were below the national averages (172 and 43, respectively). The dropout rate (4.5%) was relatively high (average 2.4%). The results for English were slightly below the average for rural areas.

Mwunilunga, North Western Province

Mwunilunga is the weakest performer in North Western province. The district lies in the far northwest of the province, bordering Angola and the Democratic Republic of Congo, and is one of the larger rural districts. The main language is Lunda. The district scores relatively badly on all four indicators: the district is under-resourced, educational results and the participation of girls are low, and education has not improved. Of these four groups of indicators, educational results and equity issues are the main challenges. Pupil–teacher and pupil–classroom ratios are below average. In spite of this, educational results are a serious concern. In 2009, the mean score for grade 7 examinations (161) was the lowest in the province; for grade 9 the average scores for English and maths (both 40) were also below average. Rates of repetition (10%) and dropout (5.7%) are important challenges. The enrolment of girls is relatively low: in 2009 the gender parity index was 0.88 (0.60 for grade 7 and 0.54 for grade 9 examinations), pointing to a high female dropout rate.

Girl power; Mpezeni Park; Chipata (Eastern Province)

Kalomo, Southern Province

Kalomo is one of the larger districts in Southern Province. The main language is Chitonga. Kalomo is not one of the poorest districts, but it is almost completely rural (except for Kalomo town). In comparison with other districts in the province, Kalomo does not score very well on equity issues. In grade 9, there are only 77 female examination candidates for every 100 male candidates. Moreover, the district is under-resourced and results are poor (about 153 for grade 7 and about 36 for grade 9). English appears to be a serious problem (with average scores of 24 for grade 7 and 36 for grade 9). Compared with other districts in the province, Kalomo has not developed well.

Lukulu, Western Province

Together with its neighbour Kalabo, Lukulu is one of the weakest districts in Western Province. Situated in the northwest of the province, Lukulu is completely rural and the poorest district of Western Province. The main languages are Lunda and Luvale. English is a serious problem; results for English are very low at grade 7 (24) and grade 9 (39), and even the results for the local language (Silozi) are relatively low. In spite of a relatively favourable resource situation (teachers and classrooms), performance is low. The repetition rate (9%) is relatively high (national average 7%). The participation of girls in basic education is better than in Kalabo, although not as good as in other districts. The percentage of pupils taking examinations is relatively low (43% for grade 7 and 42% for grade 9). The main concern is the lack of progress.

Lundazi, Eastern Province

Lundazi is a rural district in the north of Eastern Province, with a relatively large population. Together with neighbouring Chama, it has the highest levels of poverty in the province. Based on the indicators used, Lundazi is the weakest performer in the province. One of the reasons is the low participation of girls in the highest grades of basic education. In 2009, only 37% of grade 7 examination candidates were female; for grade 9 this was 40%. Performance, as measured by school results (repetition and dropout rates and examination scores), was also below average. Repetition and dropout rates are in line with the national average, but in 2009 the grade 7 examination results were far below average, with a score of 154 (mean 172). As in other districts, the lack of English appears to be one of the main causes of underperformance. The main language in the district is Cynianja Chichewa. Grade 9 examination results (35) were also much lower than the national average (43). The scores for English were low at both grade 7 and grade 9. On the positive side, the district has seen a relatively rapid growth in the number of pupils, especially of girls.

7.7   Summary and conclusions

This chapter has analyzed the performance of basic education at the district level. For this analysis, the evaluation used four groups of indicators:
1. *availability of resources*, as measured by pupil–teacher and pupil–classroom ratios;
2. *educational results*, as measured by repetition and dropout rates and grade 7 and grade 9 examination results;
3. *equity*, as measured by gender differences; and
4. *progress*, as measured by changes in access, achievement and gender differences.

On the first indicator, the availability of resources, the analysis showed that there are large differences, as measured by pupil–teacher and pupil–classroom ratios, between districts. In general, the western districts, with the exceptions of Namwala, Kalomo and Sinazongwe in Southern Province, have relatively favourable pupil–teacher and pupil–classroom ratios. These ratios are low in the centre and north of the country. Inefficiencies in the allocation of resources are one cause. These inefficiencies may also be created by projects of NGOs and bilateral Cooperating Partners. However, the rapid increase in enrolments may be another cause (see chapter 5). One of the challenges for the Ministry of Education is to act directly on the large differences in pupil–teacher ratios between districts.

Second, there are large differences in educational results as measured by repetition and dropout rates, and examination results at grade 7 and grade 9. In general, districts in Copperbelt and Western provinces perform better than the Northern and Eastern districts. At the district level, differences in resources are not strong predictors of educational results. More important factors are the character (urban or rural) of a district, poverty levels and the use of English in the district. Once again it appears that more attention is needed to overcome problems with English.

Equity was measured by the gender parity index (grades 1–9) as well as the percentage of girls taking grade 7 and grade 9 examinations. In general, the gender parity index is low at grade 7 and grade 9. Basic school enrolment is relatively low in the northeastern and western districts. The participation of girls in basic education is especially low in poor and rural districts. The analyses also showed that equity indices are good predictors of district performance, as measured by the four groups of indicators. In general, districts with low female enrolment and school attendance, or with a low percentage of girls sitting grade 7 or grade 9 examinations, score relatively on the overall index. Therefore, with these reliable indicators that can be measured easily, the Ministry can quickly identify underperforming districts. The gender parity index for either enrolment or for examinations is a good indicator for a performance assessment framework.

The fourth indicator focused on changes in performance, measured by changes in enrolment, repetition and dropout rates, the gender parity index and examination results. In terms of *progress*, Eastern Province has the best performing districts. Southern Province, Lusaka Province and Copperbelt showed the smallest improvements. Taking into account the number of pupils in a district, progress has been slowest in Lusaka and Southern Provinces, and greatest in Eastern and Central Provinces.

Overall, the worst-performing districts are in the northern provinces (including the most northerly districts of Eastern Province), Southern Province, the two most easterly districts of Lusaka Province, the most northerly districts of Northern Province and in the centre of the country. Taking into account the number of pupils in a district, Luapula and Northern Province are the worst performers.

In order to improve the performance of districts it is necessary to:
- improve the allocation of resources, and the collaboration of NGOs and bilateral Cooperating Partners with the Ministry of Education;
- develop more effective programmes to resolve the problems with English in rural areas;
- develop more effective policies to reduce repetition and dropout rates in a number of districts; and
- pay more attention to equity issues and develop specific programmes for girls focusing on districts with low gender parity indices.

The district profiles are very helpful in analyzing the weaknesses of districts.

8

Effectiveness and sustainability of projects

8.1   Introduction

One of the objectives of this evaluation has been to assess the effectiveness of budget support for the education sector in Zambia. While many challenges still exist, this does not necessarily mean that a project approach would be more effective. This chapter gives an example with an analysis of a Dutch programme in Western Province. Section 8.2 briefly describes the programme, and section 8.3 analyzes its sustainability. Section 8.4 presents a summary and conclusions.

8.2   Western Province Education Programme

Between 1998 and 2002, the Netherlands, in cooperation with the Government of Zambia and UNICEF, supported and implemented the Western Province Education Programme (WEPEP). The programme was developed in response to the need to improve the state of education in Zambia and in Western Province in particular. Western Province was targeted for additional support because it had the highest incidence of poverty. The programme aimed at:
- improving the quality of education;
- promoting decentralization as an instrument for improving the efficiency and effective-ness of education services; and
- improving the participation of girls and women in education.

WEPEP was implemented in ten schools (randomly) selected in each of the seven districts in the province.[31] The total cost of the programme was €3.5 million. The programme provided technical assistance for capacity building in the areas of planning, implementation and monitoring. WEPEP was discontinued in 2003, when the Netherlands signed the Memorandum of Understanding for providing sector support.

The programme was evaluated in 2003. The overall conclusion of the evaluation report was that 'although the WEPEP target schools have relatively improved their performance over the four years compared to non-target schools, the problem of under-achievement in rural Western Province is still evident' (p.vi). One of the main challenges was inadequate monitoring of the quality of teaching in both target and non-target schools (see also chapter 6). School managers did not supervise teachers or check their work plans. Teachers continued to use traditional teacher-oriented methods such as rote learning rather than more learner-centred approaches.

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[31]   In two districts (Mongu and Lukulu) 11 schools were selected, bringing the total to 72 schools (including seven secondary schools).

8.3 Sustainability

In order to assess the effectiveness and especially the sustainability of the programme, the examination results of WEPEP schools were compared with those of other schools in the province and of similar schools in other provinces. This analysis builds on a previous evaluation (IOB, 2008a).

The IOB evaluation compared the results of schools that participated in the programme with a control group, a number of other schools with similar characteristics, such as socioeconomic background, location (urban/rural), school size, etc. For the creation of this control group, the evaluation used the method of *propensity score matching*. This method forms pairs by matching on the *probability* that schools have participated in the project. The method uses all available information in order to construct a control group.[32]

Schools in the control group were selected in Northern, Luapula, Eastern and North Western Provinces, based on the incidence of poverty (at provincial level). Schools were matched based on specific characteristics in 2001:
- total number of pupils (grades 1–7);
- school type (community or GRZ school);
- location (urban/rural);
- distance to the DEO;
- pupil–teacher ratio;
- special education;
- percentage of girls;
- percentage of orphans;
- socioeconomic characteristics (at ward level); and
- poverty level (squared poverty gap, at district level).

For this evaluation, the analysis of the 2008 report was extended to 2009. Figure 8.1 presents the results.[33]

Initially, WEPEP and non-WEPEP schools in Western Province produced better results than the control group, although the differences were minor. One of the most striking results was the high correlation between the results of WEPEP schools and other schools in the district. It appears that specific district characteristics were more important than the WEPEP programme. The results for 2003 were unexpected. In 2005 and 2006, the results of schools in the Western Province were better than those of schools in the control group. Still, the effect was no more than 3–4%.

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[32]   See Wooldridge, 2002, chapter 18.
[33]   The results for 2002 and 2004 were calculated by interpolation in order to be able to sketch the results over the whole period.

Kalweo Community School, Nchelenge (Luapula Province); Photo Vincent Snijders

Figure 8.1   *Examination results for WEPEP schools, other schools in Western Province and a control group, 2001–2009*
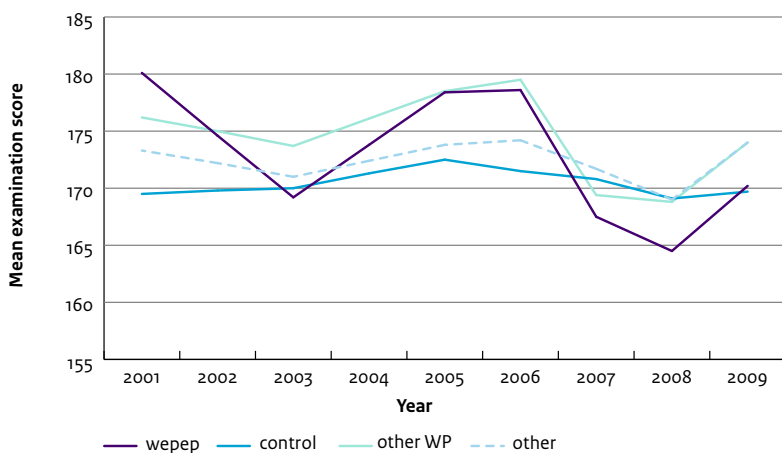
Sources: ECZ, EMIS; authors' calculations.

After 2006, the examination results of the WEPEP schools worsened, and in 2008 were lower than the average results of other schools in Western Province and the control group. Between 2005 and 2008, the results of the WEPEP schools declined on average by 8%, while they were more stable for other schools. In 2009, the average examination results of WEPEP schools and the control group were almost identical. The distributions were also almost identical (see figure 8.2).

Figure 8.2 *Distribution of examination results for WEPEP schools and the control group, 2009*
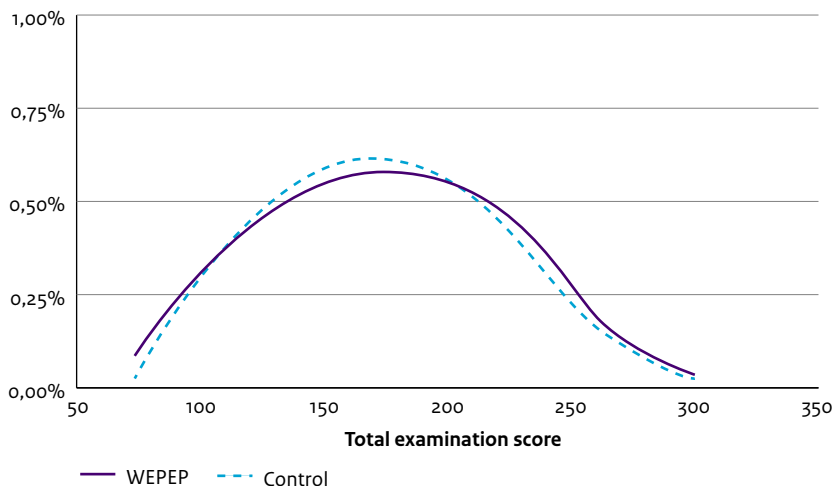
Sources: ECZ, EMIS; authors' calculations.

Table 8.1 sketches several changes in the groups over the years. In 2001, the WEPEP schools had on average a lower pupil–teacher ratio than the control schools. The differences increased between 2001 and 2005, because enrolment growth at the control schools was higher than at the WEPEP schools. Initially, the WEPEP schools had a more equitable male–female distribution in grade 7 and, consequently for the grade 7 examinations. Between 2005 and 2009, the WEPEP schools had a higher enrolment growth, but gender equity declined. In 2009, WEPEP schools and control schools were comparable in terms of school size, pupil–teacher ratios and the percentages of girls and orphans in grade 7. Examination results were also comparable. The WEPEP schools were doing no better than the control schools. Therefore, the results of the programme were not sustainable.

Table 8.1 Changes in WEPEP schools and control schools, 2001–2009.						
	2001		2005		2009	
	WEPEP schools	Control schools	WEPEP schools	Control schools	WEPEP schools	Control schools
Number of schools in the analysis	60	118	61	118	60	117
Average school size (no. of pupils)	408	408	527	545	617	597
Pupil–teacher ratio	40	46	50	58	48	49
% girls in grade 7	48%	45%	46%	44%	47%	46%
% female exam candidates	48%	45%	46%	42%	47%	45%
% orphans in grade 7	6%	7%	6%	8%	6%	5%

Sources: ECZ, EMIS; authors' calculations.

8.4   Summary and conclusions

This chapter has analyzed the sustainability of a Dutch education programme in Western Province. The programme was implemented in 1998 and lasted until 2003. The analysis shows that the programme was not sustainable. While the schools in the programme achieved good examination results in 2005 and 2006, the results worsened from 2007 onwards. Since then, programme schools performed no better than similar schools or other schools in the province. The example shows that the sustainability of the project approach may be questioned.

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Annexes

Annex 1   About IOB

Objectives

The objective of the Policy and Operations Evaluation Department (IOB) is to increase insight into the implementation and effects of Dutch foreign policy. IOB meets the need for independent evaluation of policy and operations in all policy fields falling under the Homogenous Budget for International Cooperation (HGIS). IOB also advises on the planning and implementation of the evaluations for which policy departments and embassies are responsible. Its evaluations enable the Minister of Foreign Affairs and the Minister for Development Cooperation to account to parliament for policy and the allocation of resources. In addition, the evaluations aim to derive lessons for the future. Efforts are accordingly made to incorporate the findings of evaluations into the Ministry of Foreign Affairs' policy cycle. Evaluation reports are used to provide targeted feedback, with a view to improving both policy intentions and implementation. Insight into the outcome of implemented policy allows policymakers to devise measures that are more effective and focused.

Approach and methodology

IOB has a staff of experienced evaluators and its own budget. When carrying out evaluations, it calls on the assistance of external experts with specialised knowledge of the topic under investigation. To monitor its own quality, it sets up a reference group for each evaluation, which includes not only external experts but also interested parties from within the Ministry of Foreign Affairs.

Programme

The evaluation programme of IOB is part of the programmed evaluations annexe of the explanatory memorandum to the budget of the Ministry of Foreign Affairs.

An organisation in development

Since IOB's establishment in 1977, major shifts have taken place in its approach, areas of focus and responsibilities. In its early years, its activities took the form of separate project evaluations for the Minister for Development Cooperation. Around 1985, evaluations became more comprehensive, taking in sectors, themes and countries. Moreover, IOB's reports were submitted to parliament, thus entering the public domain.
In 1996 a review of foreign policy and a reorganisation of the Ministry of Foreign Affairs took place. As a result, IOB's mandate was extended to the Dutch government's entire foreign policy. In recent years, it has extended its partnerships with similar departments in other countries, for instance through joint evaluations.
Finally, IOB also aims to expand its methodological repertoire. This includes greater emphasis on statistical methods of impact evaluation. As of 2007 IOB undertakes policy reviews as a type of evaluatio

Annex 2   Maps of Zambia

Figure 2.1   *The provinces of Zambia*
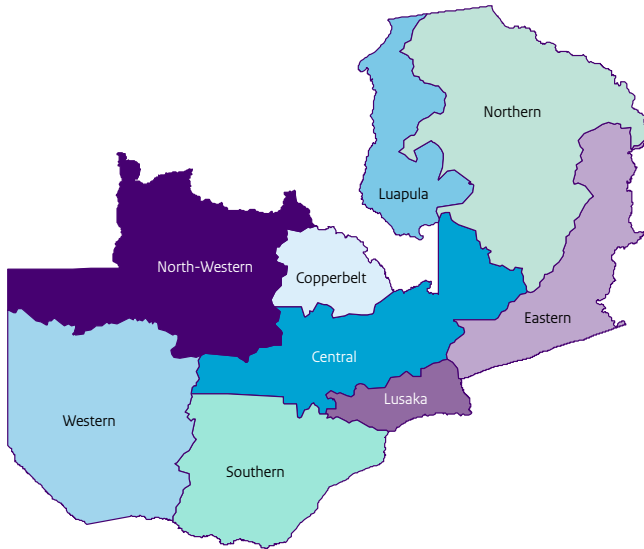
Figure 2.2   *The districts of Central Province*
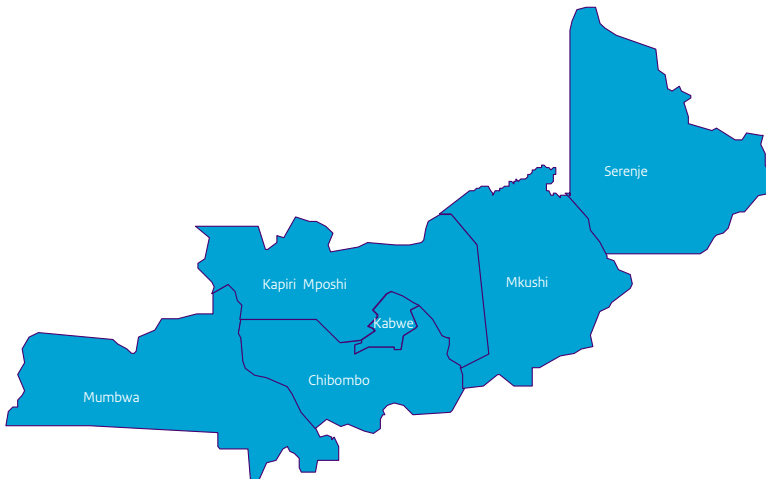
Figure 2.3 *The districts of Copperbelt Province*
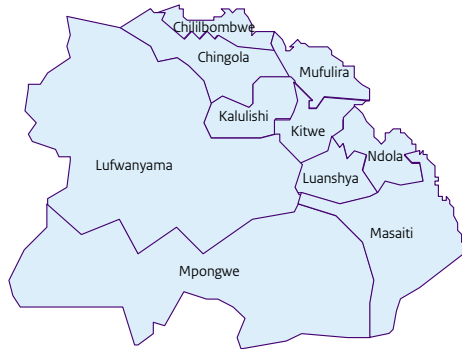
Figure 2.4 *The districts of Eastern Province*

Figure 2.5 *The districts of Luapula Province*
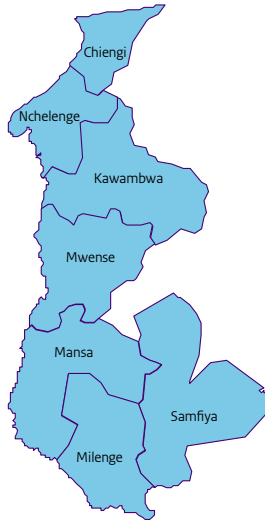
Figure 2.6 *The districts of Lusaka Province*
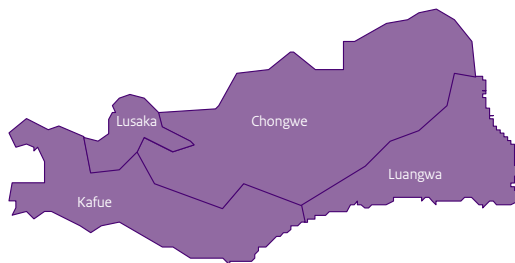
Figure 2.7 *The districts of Northern Province*

Figure 2.8 *The districts of North-Western Province*
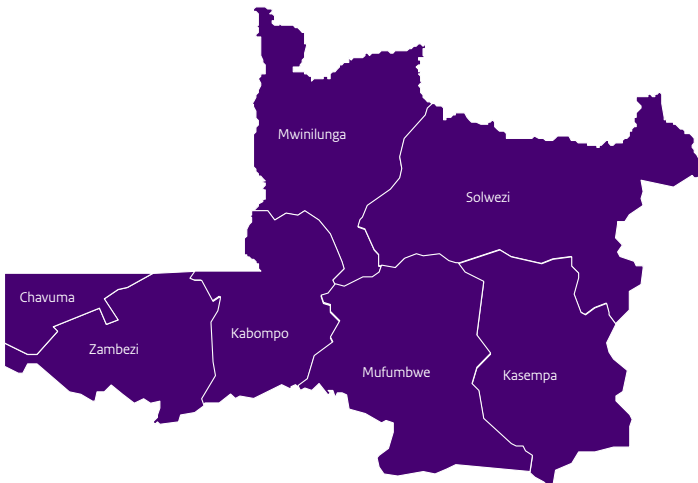
Figure 2.9 *The districts of Southern Province*
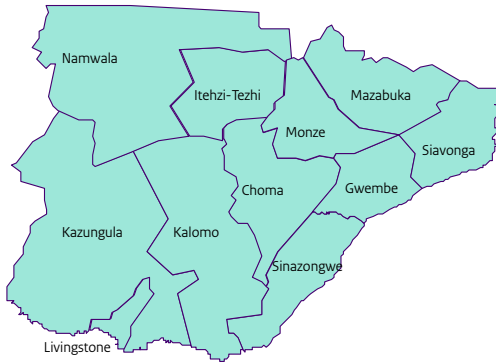
Figure 2.10 *The districts of Western Province*

Figure 2.11 *Official languages examined in basic schools*

Languages:
- Luvale
- Lunda
- Silozi
- Chitonga
- Kikonde
- Icibemba
- Cynianja Chichewa
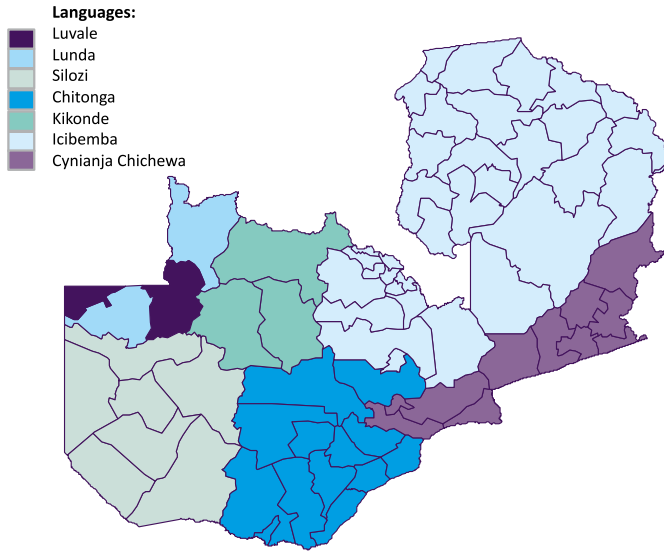
Sources: ECZ/author's calculations.

Figure 2.12 *District poverty levels, 2002–2003.*

Poverty headcount
- extreme poverty (>80%)
- very poor (78% - 80%)
- poor (69%-77%)
- (above) average (64% –68%)
- relatively low poverty levels (54%-61%)
- Lowest poverty levels (<50%)
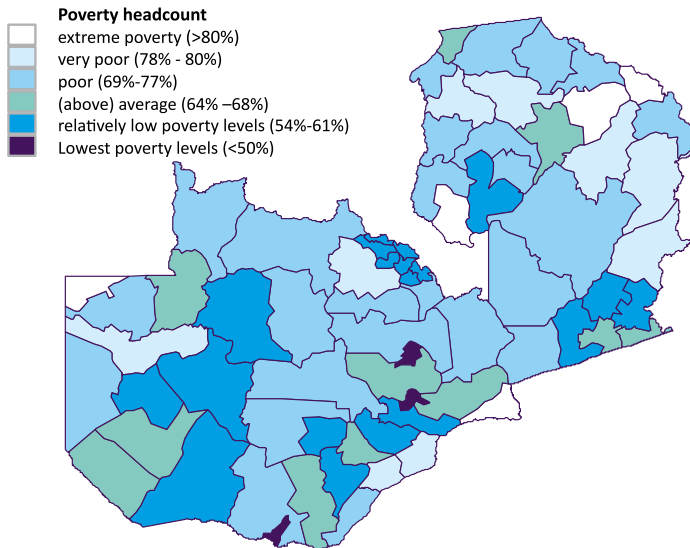
Source: CSO (2007).

Figure 2.13 *Percentage of rural pupils by district, 2009*

Percentage rural pupils (grade 1-7):
- 100%
- 85% - 99%
- 60% - 82%
- 10% - 35%
- <5%

Source: MoE (EMIS)/authors' calculations.
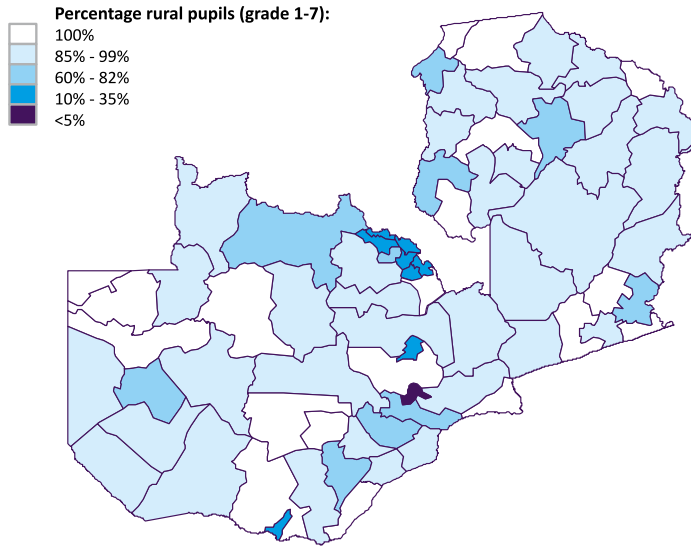
Annex 3   Determinants of enrolment growth

Figure 3.1   *Determinants of enrolment growth 2000–2005 (number of pupils x 1000 and percentages).*

Free basic education
220; 21%

Population growth
320; 30%

Teachers
60; 6%

Classrooms
80; 8%

New schools
90; 8%

Private schools
60; 6%

Community schools
220; 21%
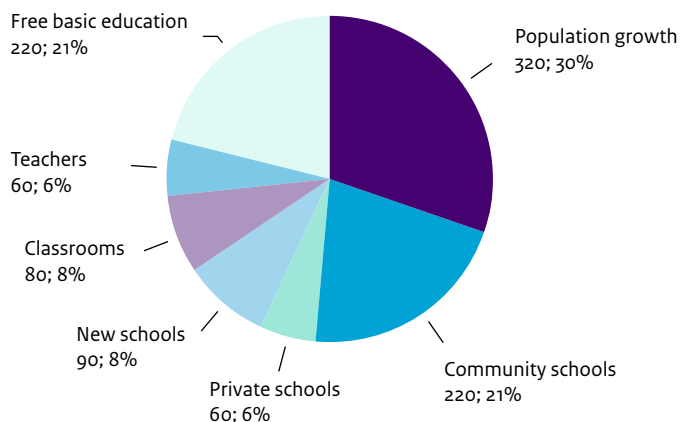
Sources: IOB (2008a); authors' calculations.

Table 3.1   Variables explaining the increase in enrolment, 2005–2009 (WLS).

Variable	Coefficient	t–value	Significance
Population (ages 7–15) (t- (t−1))	0.16	0.49	
GRZ Schools (t- (t−1))	103	2.08	*
Community schools (t- (t−1))	26	0.50	
Classrooms (t- (t−1))	14	2.03	*
Teachers (t- (t−1))	12	2.52	*
Central	399	1.34	
Copperbelt	−29	−0.16	
Eastern	368	1.90	
Luapula	557	3.21	**
Lusaka	336	0.78	
Northern	97	0.61	
North Western	141	0.97	
Southern	69	0.57	
Western	129	1.04	
N=288			
R^2 = 0.66			

* *Significant at p<0.05; ** significant at p<0.01.*

Source: EMIS, 2000–2005.

Annex 4   Efficiency

The relation between inputs (teachers and classrooms) may be measured with a production function. For the estimation, the analysis uses a *translog production function*. An advantage of the translog production function is its flexibility in analyzing scale effects. The (two-factor) translog production function is defined by:

$$\ln P = a + \beta_l \ln(L) + \beta_k \ln(K) + \beta_{ll}(\ln(L))^2 + \beta_{kk}(\ln(K))^2 + \beta_{lk} \ln(L)\ln(K) + \varepsilon_i \qquad (1)$$

In order to be able measure inefficiencies, it is assumed that the disturbance (or error) has two parts: a normally distributed error (with mean 0) and a one-sided disturbance, being the inefficiency.

The analysis uses a (stochastic) frontier function to estimate (technical) inefficiencies:

$$\ln P = a + \beta_i X_i + v_i + u_i \qquad (2)$$

where v_i is a *normally* distributed error term and u_i is the (technical) inefficiency component. It is assumed that u_i is positive and follows a *half-normal distribution*.

The combination of (1) and (2) leads to the following function:

$$\ln P = a + \beta_l \ln(L) + \beta_k \ln(K) + \beta_{ll}(\ln(L))^2 + \beta_{kk}(\ln(K))^2 + \beta_{lk} \ln(L)\ln(K) + v_i + u_i.$$

Table 4.1 Production functions for basic schools, 2009.			
	Coefficient	z-score	Significance
Ln(teachers)	−0.04	−0.45	
Ln(classrooms)	0.11	1.01	
Ln(teachers)²	0.08	2.52	*
Ln(classrooms)²	−0.01	−0.23	
Ln(teachers) * Ln(classrooms)	0.12	1.79	
Ln(teachers) * pupils grades 8−9	−0.02	−0.06	
Ln(classrooms) * pupils grades 8−9	1.07	3.99	**
Ln(teachers) * Ln(classrooms) * pupils grades 8−9	−0.39	−5.35	**
Constant	5.36	43.09	**
sigma v	0.28		
sigma u	0.19		
lambda	0.67		
N= 1,403			
Wald chi²= 4,488			

*Significant at p<0.05; ** significant at p<0.01.*

Sources: MoE/EMIS; authors' calculations.

Annex 5   Regression techniques

The analyses include four regression techniques. The first technique uses weighted least squares (WLS) in order to take into account differences in the size of schools. The weight of each school is proportional to its size. The second technique of (random effects) generalized least squares (GLS) combines information across schools as well as changes within schools over time.

The two estimation techniques *may* lead to biased estimates. A simple example may explain this. In general, well-educated and rich parents, living in urban areas, will send their children to private schools, while parents in poor, rural areas have no choice and can only send their children to the nearest GRZ school. A comparison of two such schools will show that private schools perform better than GRZ schools. However, this is a biased result, as the populations of the two school types differ. Only when private and GRZ schools have the same populations, or when it is possible to control for the differences between them, will it be possible to draw conclusions about the functioning of the two types of school. In principle, multiple regression allows us to control for other variables, provided that these variables are observed (included in the regression model). However, one of the main problems is that one cannot avoid the possibility that excluding one or more unobserved variables leads to biased estimates. This problem, also called the 'endogeneity curse', has become dominant in impact evaluations.

The analyses include two techniques to control for (possible) selection bias, both of which rely on fixed effects (i.e. they look solely at changes within groups and ignore information across groups). The first approach looks only at differences between schools *within* a particular ward. The idea is that schools within a given ward are more or less homogeneous with respect to certain attributes such as regional characteristics and the background of the pupils. If this assumption is not correct, or if other variables have an impact on the estimates, the estimated coefficients may still be biased.

The second approach looks only at differences within schools (over time). In general, this is the best way to get rid of possible selection bias and is therefore the most rigorous method.[34] An advantage of the first three techniques is that they allow the inclusion of explanatory variables that do not change over time. Moreover, they are less sensitive to measurement error and make better use of the available information.

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[34]   Under specific conditions, the approach identical with the double difference approach.

Annex 6   Determinants of absenteeism from examinations

The analyses include four different regression techniques. The first technique uses weighted least squares (WLS) in order to take into account differences in the size of schools. The weight given to each school is proportional to its size. The total number of grade 7 pupils is used as the (analytic) weight. The second technique of (random effects) generalized least squares (GLS) combines information across schools as well as changes within schools over time. The third first approach looks only at differences between schools *within* a specific ward. The fourth model only looks at differences within schools (over time).[35]

The results show that schools with higher pupil–teacher ratios have higher absence rates. However, the effect is much smaller and is not significant for the fixed effects regression (FE, school). There are two possible explanations for this difference:
- The calculated coefficients in the first two regressions are biased as a result of *unobserved* selection effects. For instance, parents who value education highly may try to find schools for their children with low pupil–teacher ratios, and will also want to ensure that their children actually sit the examinations.

- The second fixed effects regression controls for unobserved (time invariant) selection effect differences, as it looks only at changes within schools and not at differences between schools. However, this approach has its disadvantages as well: the approach increases the impact of noise in the data and therefore requires high-quality data. While estimates are in principle unbiased, the calculated coefficients may also reflect a large measurement error.

The fixed effects estimation relies on the time-series information within schools to the detriment of cross-sectional information, and this results in a loss of precision (Barro 1998, pp.37, 41; Temple 1999, p.132). Moreover, the estimation becomes more sensitive to an incorrect treatment of time lags. This appears to be one of the main problems here: changes in pupil–teacher ratios do not necessarily have an *immediate* strong effect on outcomes.

The *conclusion* is that:
- schools with high pupil–teacher ratios have higher absence rates;
- however, there is no proof of a direct (immediate) effect of increasing or decreasing pupil–teacher ratios on absence rates from examinations.

Finally, absence rates were lower in 2003, 2005 and 2007 than in 2001 and 2009.

[35]   See the previous annex for an explanation of these techniques.

Table 6.1 Determinants of absenteeism from grade 7 examinations, 2001–2009.*				
	WLS	**GLS, RE**	**FE (ward)**	**FE (school)**
Exam/grade 7 ratio	2.2 (7.83)	3.8 (11.58)	3.2 (11.2)	3.4 (10.86)
Teacher–pupil ratio	−75.2 (−8.57)	−58.3 (−6.00)	−64.8 (−6.19)	−13.0 (−0.96)
Private schools	−1.0 (−2.39)	−1.4 (−2.69)	−1.6 (−3.15)	
Grant-aided schools	−2.2 (−5.91)	−2.2 (−5.11)	−1.3 (−2.97)	
Community schools	−0.4 (−0.38)	−0.2 (−0.22)	1.2 (1.23)	
Girls/total candidates	−5.2 (−5.93)	−4.1 (−5.31)	−3.8 (−4.55)	−0.8 (−0.92)
Urbanization	−1.1 (−17.06)	−1.3 (−13.48)	−1.1 (−6.75)	
Poverty (ward)	1.3 (6.22)	1.6 (4.75)		
2003	−1.0 (−4.37)	−1.4 (−6.20)	−1.4 (−5.88)	
2005	−1.0 5.22)	−1.1 (−5.43)	−1.2 (−5.49)	
2007	−0.9 (−4.93)	−0.9 (−4.21)	−1.0 (−4.72)	
2009	0.2 0.15	0.1 (0.28)	−0.04 (−0.17)	
Constant	2.8 (1.86)	−0.3 (−0.15)	9.9 (19.37)	6.9
N (=schools)	12,353	12,353	12,353	14,272
R²	0.12	0.08	0.03	0.02

t-values and z scores (for GLS, RE) are given in parentheses; calculations based on robust standard errors.

Annex 7   Determinants of grade 7 achievements

For the assessment of the impact of interventions on learning achievements, the analysis includes 12 regression equations. First, the analyses have been applied to the results for English and maths and to the overall examination results. Second, for each of these dependent variables, the analysis includes four regression equations: weighted least squares (with school size as weights); a GLS random effects model and two fixed effects regressions. The first of these two regressions analyses differences within a ward and allows for specific effects at the ward level. The second FE analysis examines only differences over time, allowing for specific school effects. Given that the school is the unit of analysis, this is the more conventional approach. For an analysis based on two observations in time, the analysis is identical to a double difference approach.

Table 7.1 Determinants of grade 7 English achievements, 2001–2009.*				
	WLS	GLS, RE	FE (ward)	FE (school)
Teacher–pupil ratio (1)	26.86 (1.60)	35.88 (2.29)	55.16 (3.49)	19.30 (1.52)
Teacher–pupil ratio (2)	62.39 (5.06)	50.15 (4.21)	64.40 (5.60)	
Teacher–pupil ratio (3)	93.67 (6.94)	97.69 (8.30)	112.44 (9.35)	
Classroom–teacher ratio	0.45 (2.51)	0.35 (1.91)	0.27 (1.53)	0.10 (0.48)
Book–pupil ratio	0.26 (3.48)	0.23 (3.07)	0.21 (3.03)	0.17 (2.02)
Desk–pupil ratio	0.84 (2.95)	0.19 (0.60)	0.60 (2.02)	0.46 (1.21)
Pre-primary	1.27 (2.90)	1.30 (3.12)	1.09 (2.47)	
Upper basic	−1.20 (−6.77)	−0.58 (−3.36)	−0.76 (−4.42)	
Percentage pupils grade 9	3.50 (3.88)	1.35 (1.49)	1.58 (1.81)	
Exam/g7 ratio	−0.76 (−3.43)	−0.54 (−2.75)	−0.57 (−2.81)	−0.56 (−2.45)
School size (log)	−0.62 (−5.81)	−0.82 (−6.21)	−0.50 (−4.30)	−1.41 (−5.52)
Change in number of pupils (t/(t−1)	0.13 (1.54)	0.22 (1.33)	0.24 (1.48)	0.10 (0.84)
Diploma teachers (ratio)	1.72 (3.58)	1.32 (2.70)	1.21 (2.52)	0.32 (0.62)
Female teachers (ratio)	0.50 (1.51)	0.46 (1.32)	0.72 (2.13)	0.98 (2.17)

Table 7.1 Determinants of grade 7 English achievements, 2001–2009.*			
Teacher departure	−0.31 (−0.58)	−0.17 (−0.31)	0.45 (0.83)	−0.57 (−0.95)
Diploma head teacher	−0.04 (−0.23)	−0.25 (−1.51)	−0.10 (−0.65)	0.02 (−0.09)
Female head teacher	0.18 (1.12)	−0.01 (−0.03)	0.12 (0.75)	−0.03 (−0.19)
Private schools	7.93 (11.28)	6.64 (9.08)	7.75 (11.88)	
Grant-aided schools	0.82 (1.79)	1.20 (2.74)	1.72 (3.96)	
Community schools	0.29 (0.33)	0.85 (1.06)	1.56 (1.83)	
Girls/total candidates	- 0.002 (−0.34)	−0.02 (−3.33)	−0.01 (−2.03)	−0.02 (−2.70)
Age of candidates	−0.67 (−7.52)	−0.36 (−4.48)	−0.60 (−7.40)	
Orphans	1.88 (2.18)	2.09 (2.39)	1.92 (2.18)	2.57 (2.72)
Urbanization	0.45 (4.36)	0.81 (5.96)		
Poverty (ward; log)	−2.06 (−7.47)	−1.92 (−5.69)		
Electricity (in school)				0.16 (0.73)
Piped water (in school0				0.59 (1.81)
Regional score in English	0.44 (10.54)	0.53 (15.48)	0.47 (13.35)	0.61 (20.79)
Constant	38.31 (14.32)	33.05 (11.53)	23.24 (13.41)	10.58 (5.77)
N	10,700	10,700	12,304	12,312
R²	0.35	0.29	0.15	0.08

t-values and z scores (for GLS, RE) are given in parentheses; calculations based on robust standard errors.

Table 7.2 Determinants of grade 7 maths achievements, 2001–2009.*			
	WLS	GLS, RE	FE (ward)	FE (school)
Teacher–pupil ratio (1)	5.38 (0.37)	22.09 (1.46)	24.62 (1.66)	52.37 (4.30)
Teacher–pupil ratio (2)	40.15 (3.63)	43.47 (3.91)	47.03 (4.33)	

Table 7.2 Determinants of grade 7 maths achievements, 2001–2009.*				
Teacher–pupil ratio (3)	64.23 (5.37)	78.75 (6.96)	78.60 (6.75)	
Classroom–teacher ratio	0.33 (1.94)	0.39 (2.30)	0.28 (1.68)	0.54 (2.56)
Book–pupil ratio	0.37 (3.68)	0.31 (3.07)	0.31 (3.10)	0.42 (3.61)
Desk–pupil ratio	0.70 (2.67)	−0.11 (−0.40)	0.33 (1.18)	−0.33 (−0.93)
Pre-primary	1.16 (3.16)	1.20 (2.98)	1.26 (3.11)	
Upper-basic	−0.95 (−5.79)	−0.48 (−2.91)	−0.65 (−3.91)	
Percentage pupils grade 9	0.95 (1.25)	−0.58 (−0.68)	0.09 (0.10)	
Exam/g7 ratio	−0.71 (−3.70)	−0.57 (−3.05)	−0.71 (−3.73)	−0.98 (−4.41)
School size (log)	−0.68 (−6.68)	−0.78 (−6.26)	−0.69 (−6.25)	−2.40 (−9.66)
Change in number of pupils (t/(t−1)	0.10 (1.55)	0.18 (1.31)	0.20 (1.52)	0.03 (0.36)
Diploma teachers (ratio)	0.55 (1.27)	0.77 (1.67)	0.37 (0.81)	−0.22 (−0.43)
Female teachers (ratio)	−0.71 (−2.31)	−0.50 (−1.54)	−0.72 (−2.24)	−0.05 (−0.11)
Teacher departure	−0.63 (−1.28)	−0.48 (−0.95)	−0.05 (−0.10)	−1.30 (−2.26)
Diploma head teacher	−0.11 (−0.76)	−0.33 (−2.14)	−0.16 (−1.09)	−0.28 (−1.61)
Female head teacher	0.10 (0.71)	−0.04 (−0.24)	0.07 (0.46)	−0.06 (−0.35)
Private schools	7.37 (11.21)	6.06 (9.06)	6.64 (11.11)	
Grant-aided schools	0.52 (1.34)	0.94 (2.30)	1.28 (3.13)	
Community schools	−0.70 (−1.02)	−0.51 (−0.74)	−0.001 (−0.00)	
Girls /total candidates	−0.02 (−3.13)	−0.02 (−3.98)	−0.02 (−3.00)	−0.02 (−3.04)
Age candidates	−0.34 (−4.58)	−0.25 (−3.43)	−0.35 (−4.85)	0.16 (0.17)
Orphan quote	1.44 (1.75)	1.91 (2.23)	2.12 (2.53)	2.19 (2.36)

Table 7.2 Determinants of grade 7 maths achievements, 2001–2009.*				
Urbanization	−0.14 (−1.54)	−0.04 (−0.34)		
Poverty (ward; log)	−0.84 (−3.85)	−0.90 (−2.89)		
Electricity (in school)				−0.28 (−1.24)
Piped water (in school0				0.49 (1.49)
Regional score English	0.32 (9.11)	0.41 (13.05)	0.33 (9.87)	0.51 (17.70)
Constant	32.34 (14.80)	30.18 (11.48)	26.85 (16.74)	15.12 (8.52)
N (= schools)	10,700	10,700	12,304	12,312
R²	0.22	0.23	0.15	0.10

t-values and z scores (for GLS, RE) are given in parentheses; calculations based on robust standard errors.

Table 7.3 Determinants of grade 7 overall achievements, 2001–2009.*				
	WLS	GLS, RE	FE (ward)	FE (school)
Teacher–pupil ratio (1)	26.81 (0.38)	86.60 (1.26)	170.44 (2.54)	139.88 (2.56)
Teacher–pupil ratio (2)	231.48 (4.47)	222.62 (4.41)	263.00 (5.36)	
Teacher–pupil ratio (3)	356.58 (6.26)	405.33 (7.91)	455.34 (8.79)	
Classroom–teacher ratio	0.90 (1.16)	0.77 (0.99)	0.35 (0.47)	0.66 (0.72)
Book–pupil ratio	1.21 (3.76)	1.14 (3.54)	1.03 (3.42)	1.03 (2.96)
Desk–pupil ratio	5.08 (4.08)	1.78 (1.40)	3.85 (3.04)	1.12 (0.71)
Pre-primary	5.42 (2.79)	6.23 (3.33)	6.07 (3.17)	
Upper-basic	−5.42 (−7.17)	−2.88 (−3.85)	−3.72 (−4.97)	
Percentage pupils grade 9	9.92 (2.60)	0.49 (0.12)	4.17 (1.11)	
Exam/g7 ratio	−3.27 (−3.51)	−2.71 (−3.17)	−2.78 (−3.21)	−2.29 (−2.33)
School size (log)	−2.56 (−5.47)	−2.94 (−5.14)	−2.02 (−4.04)	−6.92 (−6.19)

Table 7.3 Determinants of grade 7 overall achievements, 2001–2009.*				
Change in number of pupils (t/(t−1))	0.63 (1.77)	0.95 (1.40)	1.12 (1.55)	0.41 (0.66)
Diploma teachers (ratio)	5.77 (2.76)	4.84 (2.33)	3.22 (1.59)	−3.17 (−1.39)
Female teachers (ratio)	0.04 (0.03)	−0.10 (−0.07)	−0.41 (−0.28)	1.09 (−0.57)
Teacher departure quote	−1.45 (−0.61)	−0.49 (−0.21)	1.23 (0.54)	−5.07 (−2.04)
Diploma head teacher	−0.31 (−0.43)	−1.35 (−1.91)	−0.60 (−0.89)	−0.35 (−0.45)
Female head teacher	0.41 (0.59)	−0.42 (−0.61)	0.27 (0.40)	−1.07 (−1.35)
Private schools	37.14 (12.42)	30.30 (9.81)	34.55 (12.89)	
Grant aided schools	4.51 (2.25)	5.62 (2.80)	7.50 (3.84)	
Community schools	0.26 (0.07)	3.20 (0.95)	5.07 (1.49)	
Girls/total candidates	−0.09 (−3.14)	−0.14 (−5.60)	−0.11 (−4.21)	−0.16 (−5.45)
Age candidates	−2.12 (−5.89)	−1.17 (−3.46)	−2.04 (−6.08)	−0.12 (−0.29)
Orphan quote	10.62 (2.80)	11.12 (2.90)	10.48 (2.82)	13.05 (3.21)
Urbanization	0.56 (1.25)	1.85 (3.17)		
Electricity (in school)				0.23 (0.24)
Piped water (in school)				2.94 (2.07)
Poverty (ward; log)	−6.09 (−5.38)	−6.03 (−4.12)		
Regional score English	1.73 (9.94)	2.07 (14.32)	1.74 (11.78)	1.86 (15.00)
Constant	190.27 (17.32)	177.15 (14.41)	152.19 (20.95)	124.69 (15.97)
N	10,700	10,700	12,304	12,312
R^2	0.26	0.25	0.14	0.07

*t-values and z scores (for GLS, RE) are given in parentheses; calculations based on robust standard errors..

Annex 8 Determinants of grade 9 achievements

Table 8.1 Determinants of grade 9 English achievements, 2007–2009.*			
	WLS	**GLS, RE**	**FE, ward**
Teacher–pupil ratio	52.75 (3.01)	52.57 (2.85)	87.15 (6.10)
Classroom–teacher ratio	1.44 (1.07)	0.32 (0.24)	0.04 (0.03)
Percentage female teachers	2.36 (1.60)	1.03 (0.69)	1.06 (0.48)
Female head teacher	0.95 (1.82)	0.90 (1.84)	0.92 (1.72)
Diploma head teacher	−0.66 (−1.12)	−0.73 (−1.32)	−0.90 (−1.28)
Diploma teachers (ratio)	5.11 (3.35)	4.34 (2.85)	6.95 (4.20)
Average teacher age	−0.16 (−1.99)	−0.07 (−0.90)	0.04 (0.38)
Private school	13.13 (7.09)	13.91 (8.03)	15.60 (6.37)
Grant-aided school	2.79 (2.06)	2.29 (1.74)	7.84 (5.30)
Female examination candidates (ratio)	7.67 (2.30)	4.75 (1.60)	3.41 (1.36)
Orphans (ratio)	1.13 (0.35)	2.97 (1.00)	1.06 (0.27)
School size (ln)	0.17 (0.28)	0.21 (0.33)	1.92 (2.92)
Regional results English (grade 7)	0.24 (3.29)	0.30 (3.99)	
Poverty (ward; log)	−3.54 (−4.45)	−3.52 (−4.24)	
Urbanization	0.38 (1.20)	0.12 (0.36)	
Teacher departure	−1.46 (−0.46)	−2.55 (−0.76)	−4.11 (−1.02)
Dummy for 2009	1.99 (4.33)	1.36 (3.19)	0.81 (1.70)
Constant	56.97 (7.49)	55.21 (6.99)	23.07 (3.70)
N	1,006	1,006	1,360
R²	0.42	0.39	0.40

t-values and z scores (for GLS, RE) are given in parentheses; calculations based on robust standard errors.

| Table 8.2 Determinants of grade 9 maths achievements, 2007–2009.*			
	WLS	**GLS, RE**	**FE, ward**
Teacher–pupil ratio	−2.48 (−0.09)	5.23 (0.20)	46.39 (2.28)
Classroom–teacher ratio	0.93 (0.51)	1.45 (0.76)	1.09 (0.94)
Percentage female teachers	−5.49 (−2.46)	−3.96 (−1.65)	−7.49 (−2.76)
Female head teacher	1.42 (1.85)	0.83 (1.02)	0.45 (0.67)
Diploma head teacher	−1.15 (−1.30)	−1.09 (−1.25)	0.31 (0.32)
Diploma teachers (ratio)	6.71 (2.86)	3.43 (1.38)	1.26 (0.45)
Average teacher age	−0.25 (−1.81)	−0.07 (−0.55)	−0.15 (−0.91)
Private school	13.86 (4.76)	14.16 (4.66)	13.74 (5.00)
Grant-aided school	1.72 (1.19)	1.08 (0.59)	6.76 (3.70)
Female examination candidates (ratio)	−4.77 (−1.07)	−5.12 (−1.28)	−2.42 (−0.79)
Orphans (ratio)	0.68 (0.14)	2.97 (1.00)	−2.44 (−0.48)
School size (ln)	0.42 (0.45)	0.10 (0.10)	1.29 (1.08)
Regional results English (grade 7)	0.34 (3.18)	0.49 (4.09)	
Poverty (ward; log)	−0.74 (−0.70)	−1.19 (−0.99)	
Urbanization	−1.17 (−2.34)	−2.02 (−3.82)	
Teacher departure	−9.88 (−2.31)	−12.32 (−4.29)	−12.38 (−2.45)
Dummy for 2009	7.09 (10.01)	6.11 (9.14)	5.07 (7.42)
Constant	41.71 (3.69)	37.45 (3.12)	35.34 (3.38)
N	1,006	1,006	1,360
R^2	0.22	0.18	0.22

*t-values and z scores (for GLS, RE) are given in parentheses; calculations based on robust standard errors.

Annex 9   Assumptions in the analysis of cost effectiveness

1. *Salaries*: Annual teacher salary of ZMK 25.2 million (USD 5180).
2. *Teacher education*: Estimated by dividing the total budget for teacher education colleges in 2009 by the number of students. The result was multiplied by two (for a two-year course), giving a total of USD 6500. In addition, it is assumed that a diploma will lead to a salary increase of 15%, and that the average career of a (diploma) teacher lasts 20 years.
3. *Classrooms*: The cost of constructing a (single) classroom is estimated at USD 4200. This estimate is based on the construction of a block with three classrooms. Moreover, it is assumed that a classroom can be used for 15 years.
4. *Desks*: The estimated cost of a desk is USD 90. It is assumed that desks can be used for five years.
5. *Books*: Based on Bontoux and Musonda (2009) and Ward et al. (2006), and on the European Commission's review of textbook procurement, the cost of a book is estimated at USD 5.
6. *Management*: The impact of improved management was derived not from Zambian data, but from a comparable study in Uganda. The estimate of the effect used for the Uganda calculated coefficient, as well the estimated difference in impact between improving pupil–teacher ratios and improving school management. In calculating the costs, Zambian prices were used. Based on the Uganda case, initial training costs are estimated at USD 4300 and annual costs at 30% of a teacher's salary (for the head teacher). In addition, a fixed amount of USD 500 per year was included to cover the costs of strengthening the school inspectorate, increasing school inspections and other measures to improve the quality of schools.
7. It was assumed that the effect of additional (management) training will last for 10 years.
8. *Reducing distance*: Reducing the average distance pupils have to travel to school would require new schools to be built. The cost of building a new school is estimated at USD 75,000 (a block with three classrooms and three houses for teachers). It would also require an additional head teacher (USD 6700). However, it would also reduce the pupil–classroom ratio, but this effect is ignored.

Figure 9.1 indicates the uncertainties in the estimates, which are calculated using the standard errors of the estimated coefficients. The upper and lower limits are one standard error above and below the estimated effects. The figure shows large uncertainties in the estimates of the cost effectiveness of interventions aimed at improving teacher training and school facilities.

Figure 9.1 Estimated upper and lower limits of the cost effectiveness of interventions.
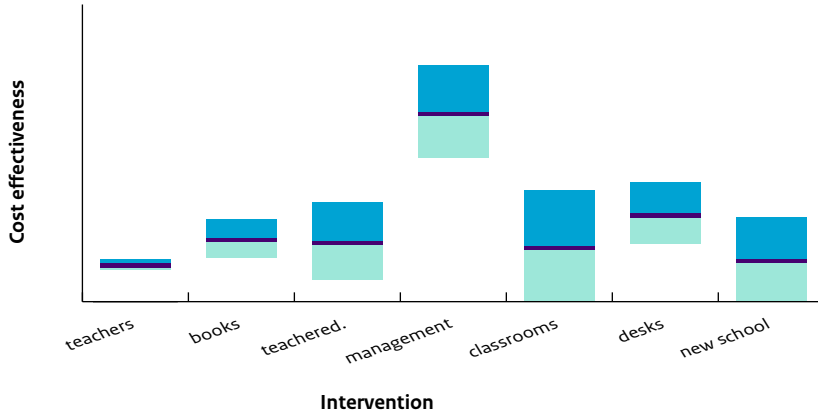
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Annexes

Since the late 1990s, donors and recipient countries have increasingly shifted their development policies from project aid towards a sector-wide approach and later to sector and general budget support. It was felt that these new modalities would enhance the efficiency and effectiveness of aid and would contribute to sustainable development. However, the lack of information on tangible results has contributed to debates in a number of countries about the effectiveness of budget support.

This report analyzes the consequences of the shift to sector and general budget support for the education sector in Zambia. The report contributes to a broader evaluation of budget support in Zambia and a policy evaluation of Dutch support to the education sector.