PRESCHOOL EDUCATION FOR ALL

A FINANCIALLY FEASIBLE PLAN TO PROVIDE AT LEAST ONE YEAR OF PRESCHOOL EDUCATION TO ALL CHILDREN IN BOSNIA AND HERZEGOVINA

Summary and Main Conclusions

Preschool education for all children in Bosnia and Herzegovina (BiH) is possible. Recent analysis shows it is not a dream but a realistic objective, to be achieved in the coming years.

Seven years after the adoption of the Framework Law on Preschool Care and Education, which holds the promise of at least one year of compulsory preschool education for all children in the country, the implementation remains uneven across the country. Some jurisdictions have been successful in expanding the capacity of their preschool systems, while others are yet to harmonize their legislation with the Framework Law.

Yet, it appears to be feasible to provide at least one year of preprimary education to all five year olds in the country, in the perspective of even lower entry age in the future. An excellent study by Innova Management Consulting has explored the option of expanding short preschool programs of 3 hours per day, 5 days per week and about 40 weeks per year. Aiming at enhancing the development and school-readiness of five year old children, these 600 hour programs form an essential addition to the kindergartens, which will continue to fulfill the double function of enhancing child development and providing daycare for working parents.

At 74 BAM, the monthly costs per child of the short programs are about 4.5 lower than those of full daycare, but their impact on child development and school-readiness is the same. The number of five year olds who are currently not yet in preschool is estimated at 21,200. This would mean that an additional 19 million BAM per year is needed at national level to enroll all the five year olds. This is only a fraction of GDP growth even under pessimistic economic forecasts. The money can also be mobilized by reducing inefficiencies in primary education; in fact, this strategy would free up sufficient resources to enroll even the four year olds.

The 19 million BAM is a symbolic figure rather than a national fiscal requirement, since preschool education in BiH is a matter for the municipalities rather than the national government. Assisted by authorities at cantonal level, every municipality must seek to expand preschool education in ways that best suit its own context.

In towns and cities it is usually possible to find sufficient numbers of five year olds to form groups of 20, and in some places the cost-effective two-shift system might be applicable: one teacher, using one classroom and inventory, attends one group of 20 in the morning and another in the afternoon. Given the decline in the annual number of births in recent decades, it

is possible in many places to utilize classrooms in primary schools. Moreover, the demographic trend has caused "hidden redundancy" of primary school teachers in the country, which means that retiring primary school teachers can be replaced by preschool teachers, thereby making more efficient use of the budget for primary education.

In rural and mountainous areas, however, there are many villages and hamlets where the number of five year olds is very limited. In such context, we must accept that the costs per child are higher, partly because groups are smaller, partly because either the teacher or some of the children require transportation. Reducing the number of groups sessions per week may also be acceptable: it reduces the frequency of travel while quality remains high since the groups are so small that children receive a lot of individual attention. No concessions should be made to the "permanence" of the program: it should span the entire school year, not just a few months. In hamlets where groups are very small, it is an option to include also the four year olds; children in these places would receive a program of somewhat lower intensity but longer duration.

The economic "returns" (benefits or profits) on such investments are likely to be several times the amount spent per year, thanks to a range of positive effects such as: better performance in education; higher labor productivity and more tax revenue; less spending on health care and social benefits; lower crime-related expenditure; et cetera. Economic analyses suggest returns of up to 17 times the initial investment for the most disadvantaged children.

But to reap these benefits, it is imperative to enhance the transparency of preschool funding. Some diversity in financial arrangements may be unavoidable in the governance structure of BiH, but it should not lead to a lack of oversight and to inertia. Line budgeting should make way for more advanced financial techniques. Furthermore, jurisdictions at all levels should keep track of the expansion of preschool: not just in the kindergartens, but also in the various shorter programs. To develop powerful and costed strategies to close the gap, we must know how many children are excluded and where they are. The Ministries of Civil Affairs and Education have essential roles to play in monitoring and the exchange of good practice.

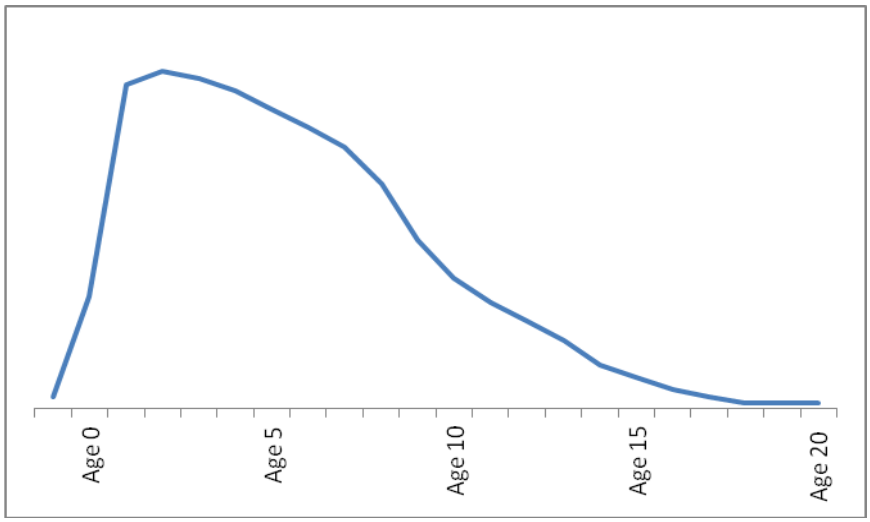
This Policy Brief is based on the report by Innova Management Consulting, supplemented with additional data and analysis. The very rich Innova report (which will be available at the website of the UNICEF Country Office in Sarajevo) contains much more information than what is used in this Policy Brief and it is highly recommended to policy makers and experts. It is hoped that this more concise Policy Brief, on its turn, disseminate the vision of universal preschool more widely and inform the discussion on how best to achieve this goal.

Two arguments to invest in children: child development…..

Recent years have seen an accumulation of evidence that investing in quality services for young children yields high returns. Whether it concerns early learning (the focus of this Policy Brief) or health, nutrition or social protection: interventions during early childhood

have a much bigger beneficial impact, and against much lower costs, than interventions aimed at addressing problems at a later age. Brain development – the formation of synapses – is a crucial factor in this regard. As figure 1 shows, it peaks in the early years[1] and if this unique opportunity is not fully seized, children start their educational careers – and eventually their working lives - with a disadvantage which is very difficult to overcome later.

Figure 1: Brain development – synapse formation – by age.



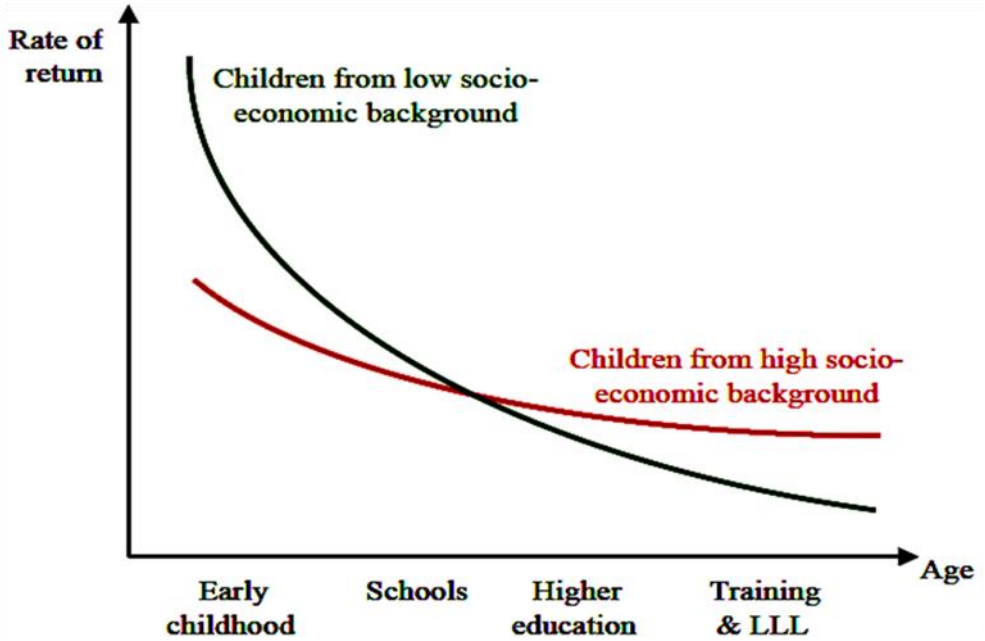
Source: adapted from C. Nelson (2000) "From Neurons to Neighborhoods"

…. and economic benefits, both for families and the state.

The pattern in figure 1 is mirrored in figure 2 which shows the rates of return of education at different ages. The rate of return is the total "profit" (the benefits for the individual as well as the society at large, expressed in financial terms) divided by the initial investment. A multitude of studies suggest that every million BAM invested in early childhood services such as preschool education will "return" up to 17 times in the form of better performance in education; better health, hence lower spending on health care; higher labor productivity; more economic growth; higher tax revenues for the state; lower crime-related spending; et cetera. So just like brain development in figure 1, rates of return peak in the early years.

[1] For a good understanding: the formation of synapses concerns the building of the *capacity to learn*, not learning as such. Obviously, learning continues beyond the age of 15; in fact it should continue throughout life. But beyond the age of 15, the further formation of synapses is limited, and there is no period in the lifecycle in which it is as intense as during early childhood. Figure 1 also shows that the first three years are very important. This is not to say that children must be enrolled in programs at that age. The best environment for the 0-3 to thrive is a caring and stimulating home environment with lots of opportunities to learn through play. It is at the age of 3 that this should be supplemented by playgroups, to lay the foundation for socialization beyond the home (The Lancet, Volume 369, 20 January 2007, page 238).

Figure 2: Rates of return for education at various periods in life



Source: adaptation of the Heckman curve from Woessmann, L., "Efficiency and Equity of European Education and Training Policies", CESifo Working Paper No. 1779, 2006

Figure 2 makes a distinction between children from high socio-economic background and those born to less wealthy families. Indeed, for the latter the impact is even higher than for the former, who already benefit from a good home learning environment with a variety of stimuli, better nutrition, and usually well-educated parents with a richer vocabulary.

In BiH, only about 12% of the 3 to 6 year old children are enrolled in kindergarten[2], and by far most of them have two working parents[3]. In a country where most couples have just one job or no job at all, this is an already privileged group that "consumes" most of the government's preschool budget[4], while children who are most in need of the service are excluded. Hence, the rate of return on preschool investment in BiH is currently low: partly because of the limited impact on the predominantly advantaged children, partly because of the

[2] It is difficult to establish exactly which percentage of the children of BiH are enrolled in kindergarten. The official Statistical Bulletins provide detailed information about absolute numbers of enrolled children, but the Enrolment Ratios (the number of enrollees expressed as a percentage of the total number of children in the relevant age) are missing. This may be due to missing or contested population data. The figure quoted here (about 12%) stems from an international database (Transmonee, operated by the Regional Office of UNICEF) which reports that 12.4% of the 3-6 year olds were enrolled in the year 2010. The Innova Report estimates that 9% of the children are enrolled (section 2.3.2.1) but this concerns the wider age range of 0-6, not 3-6. So there is no contradiction. Do note that the statistics cover just kindergarten, not alternative preschool programs.

[3] In school year 2011-2012, 10969 children were enrolled in some form of preschool education in the Federation of BiH, and out of this number, 8528 children had a father and a mother who were employed. For the Republika Srpska, these figures were 7369 and 5461, for school-year 2012-2013. Sources: Statistical Bulletin 185 (2013) for the Federation and Statistical Bulletin 6 (2013) for the Republika Srpska.

[4] A part of the costs are covered by the parents themselves. Innova Management Consulting found that these parental fees vary across the country, but within the range of 120 to 160 BAM per month. The average of 140 BAM per child per month would be about 40% of total costs. Compared to some other countries in the region this is relatively high. Elsewhere, parents may only pay the food, or a percentage of up to 25% of overall costs.

high costs of the full daycare program. The "profit" for the government and society of BiH would be much higher if programs were less costly and reached more disadvantaged children. This brings us to the idea of boosting preschool education by means of shorter programs. But are these just as effective as longer programs?

Short programs are just as good as full daycare ……..

The answer is yes. Consistently, program evaluations[5] have shown that the impact on child development from programs of 3 hours per day equals that of full daycare programs, provided that the short program is delivered continuously and without too much interruption from vacations. A well-established "formula" is that of the 600 hour program:

*3 hours per day * 5 days per week * 40 weeks per year = 600 hours per year*

Most of the often quoted program evaluations in the USA – known for their high returns on investment – also concern short and targeted interventions rather than expensive full daycare kindergarten. By contrast, a school-preparation program of only 100 or 150 hours, covering just a few months, cannot be expected to yield the same impact.

The equivalence – in terms of impact – between short programs and full daycare is not surprising. If we consider the daily activities of children in the latter program, we see that a lot of time is spent on meals, the afternoon nap, and free play in the afternoon. Focused learning activities are limited to about three hours in the morning, the same as in the short programs. Children who only attend the short program – either in the morning or in the afternoon – have another half day in which they can learn-through-play in the home environment, usually with their peers. This interchange of learning environments – program and home – might be more stimulating and beneficial than a long day at the kindergarten.

…. but their costs are much lower

It is self-evident that short programs have lower unit costs (costs per child per year) than programs that are about three times longer. But the cost difference is actually bigger than the time difference, since the kindergarten provides expensive services such as meals and dormitory, necessitating a lot of extra staff, space, and recurrent expenses such as food ingredients, heating, electricity and water. These are not necessary in short programs.

Innova Management Consulting analyzed a fair number of kindergartens and short programs in the country, and found that the economic costs[6] per child per month in full daycare is 330

[5] Annex 2 of the aforementioned report from Innova Management Consulting provides an elaborate overview of the relevant evidence.

[6] Economic costs are the full costs - including salaries as well as material expenditure – regardless of who pays which part (government, canton, municipality, parents, employer).

BAM on average in BiH, against a mere 74 BAM for the short program. *Thus, the short programs are a factor 4.5 less costly than the kindergartens*. This is broadly consistent with findings in other countries in the region[7] with similar preschool systems. In Poland, short programs were found to be 3.75 times less costly than full daycare, while in Georgia the difference was a factor 4 and in Kyrgyzstan a factor 3.6. In Macedonia, a detailed costing exercise based on norms and standards revealed more or less the same difference.

Current state of implementation of the compulsory preschool year

So how has BiH progressed with short programs? Given their cost-effectiveness, and given the fact that the Framework Law on Preschool Care and Education made them compulsory in 2007, it is important to monitor their implementation. But since short programs do not seem to be included in official statistics (see footnote 2), Innova covered this in an in-depth survey on preschool education in six municipalities: Gacko, Siriko Brijeg, Laktasi, Novi Grad, Brcko, and Olovo. These municipalities were carefully selected, doing justice to the socio-economic, geographic and demographic diversity of BiH. While Innova's survey covered a rich set of issues, we focus on the five year olds since this is the target group for the compulsory preschool year. Table 1 presents for each of the municipalities (from left to right): the total population of 5 year olds; the absolute number of 5 year olds in kindergarten; those enrolled in an Early Childhood Development Center (ECDC); and those in a 600 hour preschool program. For each municipality, these numbers are added up and divided by the total population of 5 year olds, resulting in the enrolment ratio. On the far right-hand side is a column with the numbers of children in programs that do not fully qualify as effective child development programs, such as the 150 hour program (in Gacko and Brcko) and a playgroup from an NGO (in Olovo). The table is followed by further comments.

Table 1: Population and enrolment of five year olds in six selected municipalities.

	Population aged 5-6	Enrolled in KG	Enrolled in ECDC	Enrolled 600 hrs	Total Nr. Enrolled	Enrolment Ratio	In other programs
Gacko	122	31	0	0	31	25,4	25-30
Siriko Brijeg	300	70	0	0	70	23,3	0
Laktasi	385	109	65	97	271	70,4	0
Novi Grad	1435	345	0	822	1167	81,3	0
Brcko	980	206	0	615	821	83,8	100
Olovo	63	0	0	0	0	0,0	10

Note: Novi Grad has an ECDC, but the number of attending 5 year old children could not be found. Possibly it is included in the total number of enrolled children age 5.

Clearly, the table illustrates the important diversity in terms of preschool enrolment, even if the sample may not be statistically representative for the country. The lowest chances of being enrolled are the children in Olovo, where there is neither kindergarten nor an alternative

[7] By region we mean, in this case, Central and Eastern Europe and the Commonwealth of Independent States.

program. An NGO provides a playgroup facility for a small number of children, ten of whom are five years of age. About a quarter of the five year olds are enrolled in Gacko and Siriko Brijeg, and all of them in the kindergarten. Gecko also offers a school-preparation program of 150 hours. Laktasi is a good example of a municipality that has diversified preschool education by providing the 600 hour preschool program to about a 100 children, as well as an ECDC enrolling 65 children. Six of these centers (their exact names differ) have been created about a decade ago in BiH, following the latest scientific insights. They attend children aged 3 to 6 and also offer services to the parents. Generally, however, it is difficult to sustain the funding for these centers, where unit costs are higher than in the 600 hour program. Novi Grad and Brcko, finally, have the goal of universal attendance in sight, not least because of the many children in the 600 hour program.

Financing preschool education: a patchwork of funding arrangements

Not only is the state of implementation very different in the six municipalities, there are also significant differences in terms of financial arrangements for preschool. Responsibilities rest at very different levels of government, and line budgeting[8] still prevails over funding based on unit costs[9]. The result is a high degree of financial in-transparency and indeed inertia: if nobody can tell what it costs to enroll one child for one year, there is no way to even estimate the costs of universal access, which on its turn prohibits the development of strong plans to achieve that goal.

The six municipalities are illustrative for the situation in the country. As table 2 shows, even the education budgets vary significantly (from 0.5% to 16.5% of the overall municipality budget). But the variation in preschool budgets is extreme: from nil to 77% of the education budget. And this seems to bear no relation with the enrolment levels from table 1. The last column of table 2 shows how unambitious the municipalities were around the year 2012: budget decreases seem to exceed budget increases.

Table 2: Funding arrangements and funding levels in six selected municipalities

	Education budget as % of municipality budget	Preschool budget as % of Education budget	Development of preschool budget
Gacko	9	42,9	1.1% increase 2011 to 2012
Siriko Brijeg	13,6	7,9	No change since 2002
Laktasi	8,3	77,2	6.8 % decrease 2011 to 2012
Novi Grad	5,7	Just small grants	CECD's budget insecure
Brcko	16,5	4,2	2.56% decrease 2011 to 2012
Olovo	0,5	0	9,800 BAM starting 2012

[8] Line budgeting is the provision of funds for distinct items needed to provide a service (e.g. salaries, utilities, materials).

[9] The unit cost is the integral cost of enrolling one child for one year in a program.

It seems clear that any powerful strategy to universalize preschool education will have to address the complexity in terms of governance and funding arrangements. But first we assess the total cost of universal preschool. Even though direct funding from the national level is not possible (it would be in conflict with the Constitution) it is good to have a strong indication of the financial challenge at national level in order to assess the feasibility of universalizing preschool for the 5 year olds.

Estimating the additional costs of including all five year olds

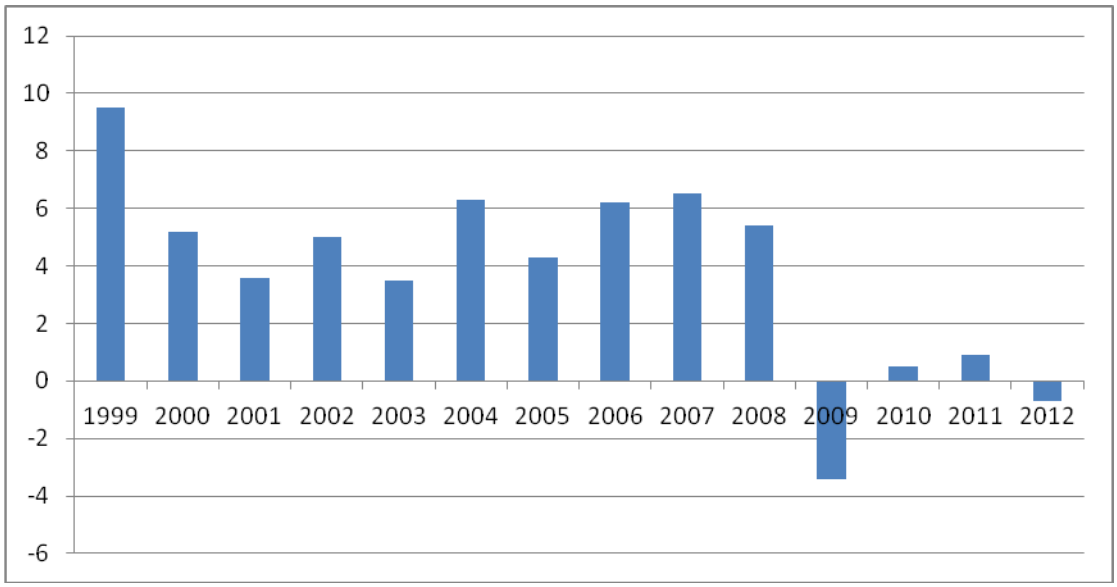
A critically important finding from the Innova report is the unit cost of the 600 hour program: 74 BAM per child per month, i.e. 886[10] BAM per year. This is the price per child, and it needs to be multiplied by the number of five year olds who are currently not in preschool, as this constitutes the lacking capacity that we need to create. Determining this lacking capacity requires a simulation since the official enrolment data include only the children in kindergarten, not those in the 600 hour program and the ECDCs. This simulation is carried out in Annex 1 of this Policy Brief, which found that approximately 21,200 five years olds are currently not in preschool. Multiplied with the unit cost of 886 BAM, this yields an annual recurrent cost requirement of 18,783,023 BAM, which we will round off to 19 mln BAM[11].

To put this annual cost requirement in a broader perspective, we first examine GDP growth over the last 15 years. Figure 3 shows that GDP growth in BiH has fluctuated over a longer period of time between about 4% and about 6%, before the country was hit hard by the global financial crisis.

[10] The precise unit cost per month is 73.87 BAM. Considering that teachers and utilities are paid all year around, we multiply this by 12 which makes 886.45 BAM per year.

[11] We round off because of the assumptions that were needed. The Innova report arrived at a higher estimation (31,32 mln BAM) because of a difference in approach: it does not take into account the children who are already enrolled. So while 31 mln BAM would be needed to enroll all the five year old children in BiH in the 600 hour program, only 19 mln BAM is needed to enroll those who are currently excluded.

Figure 3: GDP growth in BiH (1999-2013)



Source: IMF World Economic Outlook, October 2013

Based on figure 3 it is very difficult to say whether BiH will return to pre-2008 growth levels, whilst the disaster in May 2014 might add to the economic uncertainty. But even 1% growth of a GDP which is in the order of magnitude of 50 billion BAM[12] means an increase of 500 million BAM in every year that it occurs. The 19 million BAM that is needed to universalize preschool education for the five year olds represents less than 4% of an annual growth of 1%. Thereby we need to take into account that the expansion process is bound to take a few years before it is completed. If it takes four years, for instance, then it means that less than 1% of annual growth needs to be tapped[13] in order to finance universal preschool. To underscore that this is realistic this is, we compare BiH with other countries.

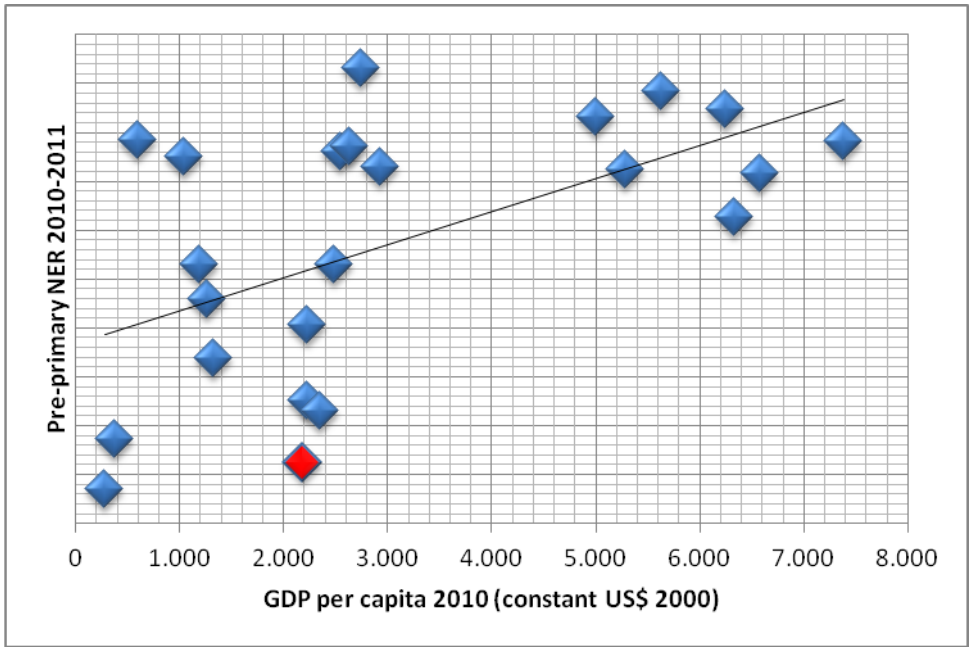
A lot of room for improvement

The points in figure 4 (below) represent 23 countries in Central and Eastern Europe and the Commonwealth of Independent States with very comparable preschool systems. The countries range from lower to higher income per capita (left to right) and from lower to higher preschool enrolment (bottom to top). This concerns enrolment from age 3 to 6; for most of these countries this refers to formal kindergarten. BiH is the red point: it has the second lowest level of preschool enrolment of the 23 countries. Further comments follow after the figure.

[12] In constant prices. Source: http://www.tradingeconomics.com/bosnia-and-herzegovina/gdp-constant-prices

[13] This "tapping" does not imply higher taxes. Nor does it imply any reduction of other government spending. Even if all tax *levels* remain the same, the annual tax *revenues* will automatically grow along with economic growth. So the government will see it's income increase, and from that increase (from this "new money") we need to tap a very small proportion to finance the aspired expansion of preschool.

Figure 4: Preschool enrolment (ages 3-6) by per capita GNP (2010/11)



Source: Transmonee database, UNICEF Regional Office

At first sight, the figure's regression line seems to confirm what many people think: the richer a country, the better the chances for high preschool enrolment. However, if we look more closely, we see two distinct subgroups of countries: the ones with a per capita income up to US$ 3000 and the ones higher than US$ 5000. Among the latter – mostly Central European countries - we see no preschool enrolment levels below 60%, so a high income seems to "guarantee" high enrolment. But among the cluster of countries below US$ 3000, we find strong variation: from below 10% to above 90%. In simple words: there is nothing that prevents countries with lower income levels to achieve high preschool enrolment. It is all a matter of political will and prioritization.

The reason behind this is that preschool education is a home-grown people-service. It is a service delivered by teachers, nurses, pedagogues, carers, cleaners, cooks, all from within the country. Even the buildings and most of the inventory is produced by citizens of BiH. So if a country A is twice as rich as country B (meaning that average income is twice as high in A than it is in B), the salaries in country A will also be twice as high. And so are the costs of preschool education. At the end of the day, the affordability of preschool education is the same[14]. So again: there is nothing that would prevent BiH to achieve the same high level of preschool enrolment as the best performing countries in figure 3, especially if it focuses on cost-effective programs such as the 600 hour course.

But the question is: how? Given the fact that a centralized national strategy does not fit the governance structure of BiH, what are some concrete approaches that can be applied at the grass roots level to include the five year olds?

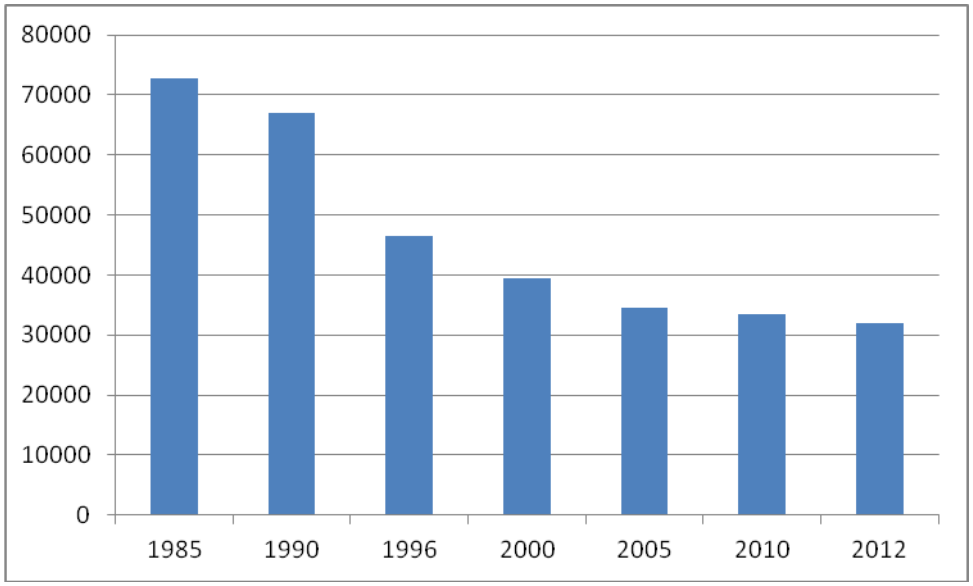
[14] It is only when items must be purchased at the international market (e.g. computers, vehicles or specialized equipment in hospitals) that richer countries are at an advantage over poorer countries.

Excellent grass roots initiatives

Throughout the country, various innovative and cost-effective approaches are being applied to provide 600 hours of preschool education to five year olds. In towns and cities where it is not too difficult to find 20 children of age five to form a group, empty classrooms of primary schools are often used. In the larger cities, it might even be possible to apply a two-shift system, whereby one fulltime teacher, using one classroom and its inventory, attends one group of about 20 children in the morning and another group in the afternoon. This results in a very cost-effective pupil-teacher ratio of about 40:1. It is a way to make good use of scarce resources, without concessions to education quality.

Given the sharp decline in the annual number of newborns, it may even be possible to find primary schools teachers who agree to be retrained to teach preschoolers of age five. As figure 5 shows, the number of children born each year has more than halved so that many primary school teachers are either redundant, or are still practicing but for very small groups (hidden redundancy). Annex 2 elaborates this point. However, the developmental differences between preschoolers and pupils in primary school are significant, even if the former are five years old and the latter six or seven year of age. Hence, intensive retraining must be applied before primary school teachers can teach five year olds, and ideally this policy is restricted to teachers with experience in the lower grades of primary school.

Figure 5: Live births in BiH, 1985-2012



Source: Agency for Statistics of BiH, quoted from:
http://en.wikipedia.org/wiki/Demographics_of_Bosnia_and_Herzegovina

In remote rural and mountainous areas the situation is of course very different. Forming groups of 20 children of age five is impossible in an increasing number of villages and hamlets. So either we must accept that classes are small or that children travel, acknowledging that five year old children should not travel long distances on a daily basis. In either case – small groups or travel – the unit costs are inevitably higher. We have to accept this: children

in sparsely populated areas have same right as those in more densely populated areas. Moreover, the total number of children in sparsely populated areas is significantly smaller than the total number living in other circumstances. Costs per child may be high, but it concerns a relatively small group.

This is not to say that there are no defensible ways to mitigate these costs. To explore this we revisit the 600 hour formula mentioned earlier: 3 hours per day * 5 days per week * 40 weeks per year. The international consensus is that it may be possible to reduce the number of hours per day or the number of days per week, but preferably not the number of weeks per year. It is critically important that there is "permanence": to achieve a lasting impact it is imperative that the program spans the whole year rather than just a few months[15].

One option could be to provide a program on three or even two days per week (thereby limiting the travel time for the teacher), as long as the sessions last a good four hours and are delivered throughout the year. The formula would then become: 4 hours per day * 2 days per week * 37 weeks per year = 296 hours. Thus, one fulltime teacher could provide such a 300 hour program to small groups of five year olds in four or even five villages or hamlets (depending on distance and road conditions). The developmental impact would still be significant, precisely because the groups are small so teachers can give ample attention to each individual child.

A variation on this model could be that in villages and hamlets where very few children of age five can be found, the teacher includes the four year olds in the group. Children in these places would thus receive a program of, on the one hand, relatively low intensity (twice weekly) but on the other hand a long duration (two years). The impact may well be as good as that of one year of more intensive teaching. Finally, in some circumstances it might be considered to include five year olds in small groups with children in primary grade 1, again on the condition that the teacher is well prepared for this task.

As Annex 2 demonstrates, such local solutions may even make it possible to reach out to all five year olds without significant extra costs. More in particular, seeking synergy between preschool and primary schools on the basis of facility sharing can broaden the economic basis of both.

[15] The official school year in BiH has 37 weeks instead of 40, but this is a minor problem

Annex 1. Estimation of the number of five year olds who are not in preschool

In order to estimate the annual recurrent costs of enrolling all five year olds in preschool education in BiH, we need to avail of an estimation of the number of five year olds who will live in BiH in the coming years who would *not* be enrolled in kindergarten, in a ECDC, or in a short program unless a new impulse is given to the expansion of preschool. This is one of two factors of the multiplication, the other being the unit cost.

To begin with, the total number of five year olds in BiH in the coming years is estimated at 35,333 according to the Innova report. The total number of five year olds in kindergarten, nationwide, is also known: 4,763 in 2012/2013[16]. The problem is that the number of five year olds in the ECDCs and in the 600 hour program could not be found.

However, with the data from the six municipalities from the Innova survey, it is possible to make a simulation. The second column from the left of the table below contains the empirical population and enrolment data from the sample of six municipalities. In the third column, these absolute numbers are converted into percentages. It appears that in these municipalities, 23% of all the five year olds are in kindergarten. Nationwide this is only 13% (see 4th column) showing that the sample is not statistically representative[17]. We now must make some assumptions in order to pursue our analysis. First we assume that if the enrolment of five year olds in kindergarten is almost twice as high in the sample than it is nationwide, the same is possibly the case for the enrolment in the 600 hour program. For the ECDCs, however, we assume equal enrolment since their mission is to reach the poorest children. So all the percentages between brackets in the third column are estimations, not empirical findings. They are deducted from the assumptions that were made. These assumptions would lead to the estimation that nationwide about 40% of all the five year olds are either in kindergarten, or in a ECDC, or 600 hour program. This leaves 60% of all five year olds not enrolled (or enrolled in a program that does not qualify as a preschool program in terms of the Framework Law of 2007). Applied to the 35,333 five year olds in the country, this 60% would correspond with lacking capacity of **21,200**.

Simulation to estimate the number of excluded five year olds

	Six sampled municipalities		Nationwide	
	Absolute	Percentage	Percentage	Absolute
Total population age 5	3285	100%	100%	35333
In Kindergarten	761	23%	13%	4763
In ECDC	65	2%	(2%)	
In 600 hour	1534	47%	(25%)	
Total Enrolled	2360	72%	(40%)	
Not enrolled in preschool	925	28%	(60%)	(21200)

[16] 2,704 in FBiH plus 2,059 in RS.

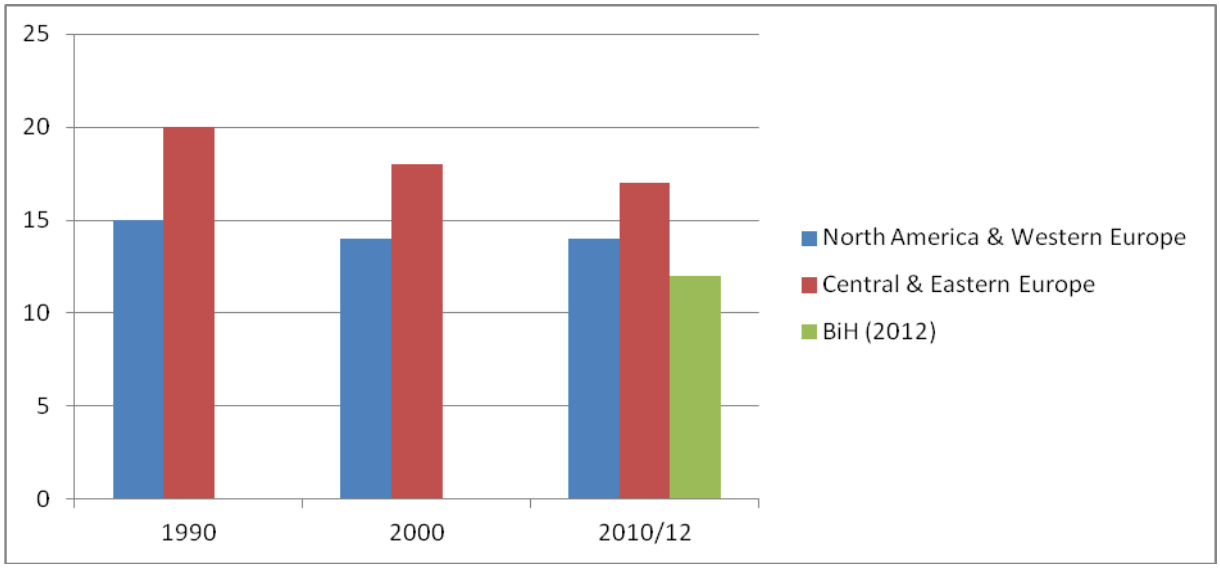
[17] E.g., the Olovo municipality, which is very poor, is home to only 63 children of five years old, against over a thousand in Novi Grad. So although the sample is *illustrative* for the diversity of the country, the sample is not *statistically* representative, in that the poorer municipalities have less statistical "weight".

Annex 2. The demographic dividend

Figure 5 in the main text of this Policy Brief shows the sharp decline in the annual number of newborns, especially after 1990. While this is highly problematic in many respects – and while the causes of this negative trend are dramatic – it does have at least one potential advantage: lower numbers of children in primary and secondary education means that a larger part of the education budget is available for investment in quality and, indeed, in preschool.

However, data suggest that this has not happened. The figure below compares the development of the average pupil/teacher ratio from 1990 to 2010 in North America and Western Europe with that of Central and Eastern Europe. For BiH, the value for 2012 has been calculated (earlier data could not be found). Comments follow below the figure.

Pupil/teacher ratios in primary education, 1990-2010/2012



Source: various EFA Global Monitoring Reports. For BiH (2012): own calculations based on Statistical Bulletin.

The figure shows that while pupil/teacher ratios in North America and Western Europe have not changed much in recent decades, those in Central and Eastern Europe have clearly decreased. The ratio in BiH is even lower than that of North America and Eastern Europe. The ideal interpretation of this trend would be that countries in Central and Eastern Europe have invested heavily in the quality of education by appointing more teachers. But this interpretation is highly questionable because this would have taken place in a period of deep, post-transition crisis. So the more likely interpretation is that pupil/teacher ratios have risen merely because the numbers of pupils have fallen dramatically, while the numbers of teacher did *not* fall (or did not fall proportionally).

Thus, the Innova team have explored the possibility of recruiting redundant primary school teachers and retrain them for preschool. However, the team found at local level that no redundant teachers were readily available. So what probably happened - both in BiH and in the wider region - is that throughout the post-transition years the same teachers kept going to the same classrooms every morning, only to find less and less children inside, year by year. In

this perspective, the extremely low pupil/teacher ratio of BiH is a matter of allowing inefficiency rather than investing in quality.

But at the same time this constitutes an opportunity to expand preschool education: by building links between preschool and primary education it is possible to mobilize a sufficient number of preschool teachers against no additional costs. The simulation in the table below shows how. The pupil/teacher ratio in BiH is calculated in three different situations. First, the current situation with 24,484 primary school teachers for 304,972 pupils. Second, the same number of teachers for an additional 21,200 five year old children[18]. And third, the same number of teachers for an additional 30,000 four year old children[19].

Pupil/teacher ratios in BiH with/without inclusion of children of preschool age

Primary school teachers	Primary school pupils	5 year olds not in preschool	4 year olds not in preschool	Pupil/teacher ratio
24,484	304,972	-	-	12.4
24,484	304,972	21,200	-	13.3
24,484	304,972	21,200	30,000	14.5

As expected, the pupil/teacher ratio goes up with the inclusion of the five year olds, and it goes further up if we also bring the four year olds into the equation. But the increase is very modest. Even with all the four year olds on board, the average pupil/teacher ratio (across primary school and preschool) would reach the level of North America and Western Europe, and would still remain well below that of Central and Eastern Europe. *In other words, by enhancing efficiency, BiH can include all the four and five year olds without substantial additional costs and without concessions to quality.* In this calculation, we did not even take into account the fact that the preschool program is only three hours per day. So it is possible that just one teacher, using just one classroom, serve the four year olds in the morning and the five year olds in the afternoon.

At grass roots level, we can reap the benefits of this "demographic dividend" in various ways. Using empty classrooms of primary schools for preschool groups is the most obvious strategy, and it is already widely applied. Furthermore, the introduction – or expansion – of high quality multi-grade teaching in primary schools can free up human resources for preschool. This does not necessarily mean that primary school teachers be retrained for preschool. It can also mean that retiring primary school teachers be replaced by teachers who graduated from Pedagogical University with qualifications for preschool. More in general, the increasing problem of sub-scale primary schools can be countered by building links with equally sub-scale preschool institutions. Alone, both are weak, together they are stronger. The bottom-line is that the current budget for primary education, and the "volume" of human resources that it represents, is sufficient to include all five year olds in preschool, and even the four year olds.

[18] This is the number of five year olds who are not in kindergarten, CECD, or 600 hour program (See Annex 1).
[19] This is a rough estimation of the number of four years olds (35,333) minus those in kindergarten or CECD.