Masthead Logo

Journal of Catholic Education

Volume 22 | Issue 1 Article 27

5-30-2019

More Schools, Larger Schools, or Both? Patterns of Enrollment Growth in K12 Catholic Schools Globally

Quentin Wodon
World Bank and University of Notre Dame, qwodon@worldbank.org

Recommended Citation

Wodon, Q. (2019). More Schools, Larger Schools, or Both? Patterns of Enrollment Growth in K12 Catholic Schools Globally. *Journal of Catholic Education, 22* (1). http://dx.doi.org/10.15365/joce.2201072019

More Schools, Larger Schools, or Both? Patterns of Enrollment Growth in K12 Catholic Schools Globally

Cover Page Footnote

The author is a Lead Economist with the World Bank and a Distinguished Research Affiliate with the Kellogg Institute at the University of Notre Dame. The analysis and views expressed in this paper are those of the author only and may not reflect the views of the World Bank, its Executive Director, or the countries they represent.

More Schools, Larger Schools, or Both? Patterns of Enrollment Growth in K12 Catholic Schools Globally

Quentin Wodon
World Bank and University of Notre Dame

After the governments of China and India, the Catholic Church is probably the third largest provider of K12 education in the world. How has growth in enrollment in K12 Catholic schools varied across countries over the last two decades? Which countries have accounted for most of the growth at the regional and global level? What has been the role of the number of schools and the size of schools in enrollment growth, or in the decline observed in some countries? Given trends towards higher enrollment in the developing world due to population growth and higher educational attainment, has enrollment growth in Catholic schools enabled them to maintain their market share over time? Finally, what do the data suggest for some of the constraints and strategic choices faced by Catholic schools in various countries? The objective of this paper is to answer these questions with a focus on trends in Catholic school enrollment and market shares across countries from 1995 to 2016.

Keywords
Enrollment Growth, Preschools, Primary education, Secondary education, Catholic schools, School construction, School size

Enrollment in K12 Catholic schools is increasing globally. Estimates for 2016 suggest that 35 million children were enrolled in Catholic primary schools, 20 million in secondary schools, and more than seven million in preschools and nurseries (Secretaria Status, 2018; Wodon, 2019a). Given the difficulty of aggregating data from multiple types of Catholic providers of education, including not only dioceses but also religious congregations, the estimates could be on the low side, especially in large and complex countries such as India. Overall, after the governments of China and India, the Catholic Church may be the third largest provider of K12 education in the world. Two decades ago, in 1995, the estimates were at 25 million, 13 million, and five million children enrolled in Catholic schools at the primary, secondary, and preschool/nursery levels, respectively. This implies that on average, the annual

Journal of Catholic Education, Vol. 22, No. 1, Spring 2019, 135-153. doi: 10.15365/joce.2201072019

growth rate of enrollment in Catholic schools was at 1.9 % for nurseries and preschools, 1.6 % for primary schools, and 2.0 % for secondary schools over the last two decades globally.

Boosting enrollment should not be the primary goal of school systems. If children are in school but are not learning, or not learning enough, education systems are failing students, as noted by the World Development Report on the learning crisis in the developing world (World Bank, 2018). Still, growth in enrollment does matter for both the Catholic Church and broader societies. For the Church, the schools may contribute not only to its evangelization mission, but also to the core mission of the Church to serve the poor in priority (Congregation for Catholic Education, 1977, 2017). For societies, a healthy network of Catholic schools provides more options for parents in terms of the types of schools that they can choose for their children (on the role of faith-based schools in Africa as an example, see Wodon, 2014, 2015). In terms of learning and overall quality, there are indications that at least on average, students in Catholic schools perform relatively well, even if the evidence remains disputed on whether this is due to the schools themselves or other factors such as student characteristics.

In the United States for example, multiple studies suggest that there may be a Catholic school advantage. This literature dates back to at least Coleman et al. (1982), Greely (1982), and Coleman and Hoffer (1987), and subsequent work by Bryk et al. (1993), Evans and Schwab (1995), Sander (1996), Sander and Krautman (1995), Neal (1997), Carbonaro (2006), Hallinan and Kubitschek (2013), and Freeman and Berends (2016) among others. As another example, the recent study in this Journal by Fleming et al. (2018) suggests such an advantage. Yet there are also studies disputing the presence of a Catholic advantage (see for example Jepsen, 2003, and Elder & Jepsen, 2014). Outside of the United States, the literature is less extensive, but there are studies suggesting good performance in Catholic schools in specific countries or types of schools. This is the case for example for Fe y Alegría schools in Latin America (Alcott & Ortega, 2009; Parra-Osorio & Wodon, 2014; Lavado et al., 2016). In addition, Catholic schools provide major savings globally for state education budgets due to their lower operating costs and the fact that they are often only partially subsidized when they get any support from the state (Wodon, 2019b). Finally, there is emerging evidence that the schools may also contribute to stronger communities (Brinig & Garnett, 2015) and higher levels of civic participation (Dee, 2005).

Enrollment growth in Catholic schools may come from a greater number of schools, a larger number of students in existing schools, or both since the growth rate in enrollment is simply the sum of the growth rates for the number of schools and for the average size of schools. Similarly, in countries where enrollment is declining, the decline can be attributed to a reduction in the number of schools, a reduction in the size of existing schools, or both. Strategies to boost enrollment or stem declines can thus focus on the number of schools operated by the Church, the size of those schools, or both.

Different strategies for enrollment growth have different implications in terms of costs and who schools may be able to reach. Building new schools can help in reaching underserved populations, thus possibly contributing to better serving the poor. For the Church, this is an important consideration given its preferential option for the poor (e.g., Francis, 2015; Heinrich et al., 2008; Pontifical Council for Justice and Peace, 2004). When building new schools, different models can be considered, but if the objective is to reach excluded population in low density rural areas, it may be better to build small schools. In Uganda for example, an argument can be made that the best strategy to expand secondary education is probably to start with lower secondary schools and build small schools with four classrooms (one for each grade in lower secondary education) as feeder schools for larger and more distant upper secondary schools for the last two years of secondary education. Small schools can more easily be located in geographic areas where gross enrollment rates are at their lowest (Wodon, 2019c).

Another advantage of relatively small schools in low income counties (at least when network expansion is being considered to reach those still excluded) is that they may have more nimble facilities, for example in terms of the number of laboratories that are included at the secondary level, or whether a separate library room is needed. By reducing features that may not be essential to the quality of the education provided, construction costs can be reduced. This in turn enables school networks to reach within their budgets a larger number of students currently not served. Whether such strategies are feasible depends in part of the regulations that school networks must follow for the schools to be registered and accredited. But the point made here is that it is often feasible to keep costs low by avoiding unnecessary features (see Wodon, 2016, on Paraguay, and Theunynck, 2009, on Africa).

As an alternative to building new schools, expanding the capacity of existing schools may be an option, and it is often cheaper than building new

schools, not only because of the lower capital investments required, but also because with larger schools the recurrent operating expenditure for school administration can be absorbed by a larger number of students given economies of scale. The trade-off is however whether such a strategy makes it feasible to reach students in remote areas. In addition, for any of these types of approaches to work to increase enrollment in Catholic schools, there must be excess local demand for (Catholic) education in which the schools can tap.

What type of strategy should be used in any given country or specific locality depends on local context. But at the aggregate level, providing a few stylized facts as well as a brief discussion across countries of what has led to changes in enrollment in the last two decades, and whether enrollment growth has been sufficient to maintain market share, may be useful. This is the purpose of this paper. How has growth in enrollment varied across countries over the last two decades? Which countries have accounted for most of the growth at the regional and global level? What have been the contributions of the number of schools and the size of schools in enrollment growth? How has this affected the market share of Catholic schools, given trends towards higher enrollment especially in the developing world due to both population growth and higher educational attainment over time? The objective of this paper is to answer these questions. Section 2 analyzes the data at the global and regional level. Section 3 does the same at the level of countries for the top 20 countries by enrollment size. A brief conclusion follows.

Global and Regional Analysis

Every year, the Central Statistics Office of the Catholic Church publishes the Statistical Yearbook of the Church. The latest published edition provides data for 2016 (Secretaria Status, 2018). Data on a wide range of Church activities are collected. For K12 education, the yearbook provides for each country and some territories the number of the schools managed by the Church at three levels (nurseries and preschools, primary schools, and secondary schools), and the number of students enrolled in those schools. This makes it feasible to also compute the average size of schools in each country.

The data are collected through a questionnaire sent to the chancery offices of ecclesiastical jurisdictions worldwide. The data are self-reported and may not always be fully accurate, especially in contexts where local conditions are not favorable to data collection. In addition, not all ecclesiastical jurisdictions are able to fill the questionnaire every year. For the 2016 edition of the statis-

tical yearbook, the Church reports that 3,016 out 3,162 jurisdictions were able to fill the questionnaire. For the 1995 data, which are also used in this article, 2,747 jurisdictions filled the questionnaire out of a total of 2,893 jurisdictions at the time. In both years, the jurisdictions that were not able to provide data tended to be small, so that the missing data should not affect overall results substantially. Overall, while estimates in the yearbooks may not always be fully accurate, especially for large and complex developing countries[1], the data appear to be of good quality and reliable for looking at broad trends over time.

The analysis of the roles of the number of schools and average school size in enrollment growth is based on a simple decomposition. The number of students in Catholic schools, denoted by C, is the product of the number of Catholic schools, N, times the average school size or number of students per school, S, so that $C = N \times S$. As a result, the annual growth rate in enrollment between two points in time, denoted by g_C, is equal to the sum of the growth rates for the number of Catholic schools g_N and the average size of the schools g_S, with $g_T = g_N + g_S$. The paper simply documents patterns of enrollment growth for Catholic schools globally, regionally, and at the country level for countries with the largest enrollment and discusses some of the potential implications of these patterns for future enrollment.

Estimations are carried for the period from 1995 to 2016. The year 2016 is the last year for which data on enrollment in Catholic schools globally are available from the Catholic Church's annual statistical yearbooks (Secretaria Status, 2018). The start year, 1995, is chosen so that the analysis covers medium-term trends for a period of just above 20 years. Data are also provided for 2005, the mid-point between the start and end years. For most countries, findings would not be substantially different if a slightly longer or shorter time horizon were chosen for the analysis of trends in enrollment.

Table 1 provides estimates of enrollment in Catholic schools for nurseries and preschools, primary schools, and secondary schools globally and for five regions: Africa, the Americas, Asia, Europe, and Oceania. Estimates of the number of schools are also provided. The average size of the schools is obtained simply by dividing total enrollment by the number of schools. Table 2 provides the annual growth rates by ten-year intervals and overall for total enrollment, the number of schools, and the average school sizes. Estimates

1 As an example, Manipadam (2018) suggests that at the secondary level, the number of schools and thereby the number of students enrolled in Catholic schools in India may be underestimated in the statistical yearbooks.

have also been computed by country but are not shown in the Table given the large number of countries – some of the country data will be used in the next section.

The data indicate substantial growth in enrollment over time. The combined enrollment at all three levels (preschool/nursery, primary, and secondary) increased from 43.4 million students in 1995 to 62.5 million in 2016. The number of schools across all three levels increased from 173,292 to 217,261 over the same period. Most of the growth in the absolute number of students took place in Africa, and specifically in sub-Saharan Africa which is where demand for schooling is rising the fastest due to both population growth and rising enrollment rates. The annual growth rates in enrollment for Africa are estimated at 6.0 % for preschools and nurseries, 3.5 % for primary schools, and 6.1 % for secondary schools for the full period. Asia also contributed to substantial gains in enrollment, in both absolute terms and in terms of annual growth rates. In the Americas, the picture is mixed. While growth in enrollment took place in Latin America, there was a decline in the United States. In Europe as well, there was a decline for preschools/nurseries and primary schools, but not for secondary schools. In Oceania, there were gains, especially for preschools and nurseries in the first decade between 1995 and 2005. The growth in enrollment at the pre-primary level not only in Oceania but also in other regions is good news given the importance of investing in early childhood development (Denboba et al., 2014).

The simple decomposition of total enrollment growth into the contributions of the number of schools and school size suggests that the largest component of growth is attributed to a rising number of schools for preschools/nurseries and secondary schools, but not for primary schools. Specifically, for nurseries/preschools, the annual rate of growth globally is at 1.9 %, with 1.4 % attributed to the growth in the number of schools, and 0.5 % to growth in the size of schools. For secondary education, the annual rate of growth globally over the two decades, at 2.0 %, is also due more to a higher number of schools (1.7 %) than to an increase in the size of schools (0.3 %). Only in the case of primary education is the contribution of changes in the size of schools to enrollment growth larger at 1.0 % than the contribution of the increase in the number of schools at 0.6 %.

Table 1
Enrollment in K12 Catholic Schools by Region, 1995 to 2016

	Enrollment (Thousands)			Number of Schools			Average School Size		
	1995	2005	2016	1995	2005	2016	1995	2005	2016
Pre-primary									
Africa	646	1,149	2,195	7,436	11,576	19,806	87	99	111
Americas	1,042	1,542	1,379	14,322	15,176	15,617	73	102	88
Asia	1,327	1,651	1,841	8,941	13,139	13,673	148	126	135
Europe	1,901	1,715	1,835	23,648	23,061	22,389	80	74	82
Oceania	34	110	63	553	1,327	1,341	61	83	47
World	4,951	6,167	7,313	54,900	64,279	72,826	90	96	100
Primary									
Africa	9,356	12,436	19,174	27,688	32,643	39,893	338	381	481
Americas	7,198	7,045	6,286	23,121	23,325	20,841	311	302	302
Asia	4,540	4,908	5,968	13,271	15,547	15,956	342	316	374
Europe	3,608	3,004	2,949	18,454	17,013	15,569	195	177	189
Oceania	544	692	749	2,509	2,952	4,314	217	234	174
World	25,246	28,084	35,125	85,043	91,480	96,573	297	307	364
Secondary									
Africa	1,702	3,438	5,912	5,611	8,607	14,816	303	399	399
Americas	3,604	3,697	3,979	9,126	10,857	11,554	395	340	344
Asia	4,135	4,985	6,105	7,791	8,919	10,857	531	559	562
Europe	3,459	3,721	3,591	10,132	10,001	9,926	341	372	362
Oceania	333	391	460	689	712	709	484	549	648
World	13,232	16,232	20,046	33,349	39,096	47,862	397	415	419

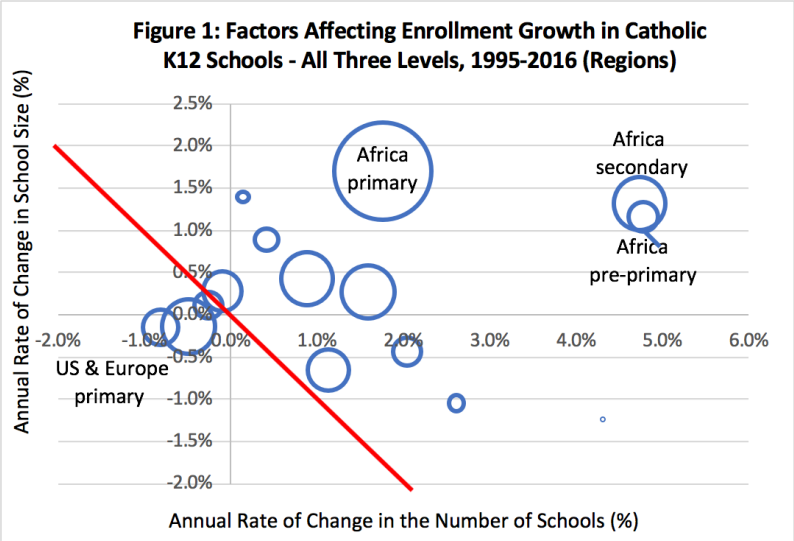
Source: Compiled by the author from the annual Statistical Yearbook of the Church.

Table 2
Enrollment Growth in K12 Catholic Schools by Region, 1995 to 2016 (%)

	Annual Enrollment Growth in Catholic Schools			Annual Growth in the Number of Schools			Annual Growth in the Average School Size		
	1995-2005	2005-2016	1995-2016	1995-2005	2005-2016	1995-2016	1995-2005	2005-2016	1995-2016
Pre-primary									
Africa	5.9	6.1	6.0	4.5	5.0	4.8	1.3	1.0	1.2
Americas	4.0	-1.0	1.3	0.6	0.3	0.4	3.4	-1.3	0.9
Asia	2.2	1.0	1.6	3.9	0.4	2.0	-1.6	0.6	-0.4
Europe	-1.0	0.6	-0.2	-0.3	-0.3	-0.3	-0.8	0.9	0.1
Oceania	12.5	-4.9	3.0	9.1	0.1	4.3	3.1	-5.0	-1.2
World	2.2	1.6	1.9	1.6	1.1	1.4	0.6	0.4	0.5
Primary									
Africa	2.9	4.0	3.5	1.7	1.8	1.8	1.2	2.1	1.7
Americas	-0.2	-1.0	-0.6	0.1	-1.0	-0.5	-0.3	0.0	-0.1
Asia	0.8	1.8	1.3	1.6	0.2	0.9	-0.8	1.5	0.4
Europe	-1.8	-0.2	-1.0	-0.8	-0.8	-0.8	-1.0	0.6	-0.1
Oceania	2.4	0.7	1.5	1.6	3.5	2.6	0.8	-2.7	-1.0
World	1.1	2.1	1.6	0.7	0.5	0.6	0.3	1.6	1.0
Secondary									
Africa	7.3	5.1	6.1	4.4	5.1	4.7	2.8	0.0	1.3
Americas	0.3	0.7	0.5	1.8	0.6	1.1	-1.5	0.1	-0.7
Asia	1.9	1.9	1.9	1.4	1.8	1.6	0.5	0.0	0.3
Europe	0.7	-0.3	0.2	-0.1	-0.1	-0.1	0.9	-0.2	0.3
Oceania	1.6	1.5	1.5	0.3	0.0	0.1	1.3	1.5	1.4
World	2.1	1.9	2.0	1.6	1.9	1.7	0.4	0.1	0.3

Source: Compiled by the author from the annual Statistical Yearbook of the Church.

There are differences between regions not only in overall enrollment growth rates, but also in the contributions of changes in the number of schools and school size. These differences are visualized in Figure 1. The two components of growth in enrollment are respectively on the horizontal axis (for the annual growth rate for the number of schools) and the vertical axis (for the annual growth rate for school size). The diagonal with negative slope crossing the original axis separates regions with positive growth for total enrollment (above the diagonal) from those with negative enrollment growth (below the diagonal). The dots on the scatter plots represent the five regions, with the size of the dots proportional to enrollment in 2016. The larger the dots are, the more important the regions are for their contributions to global enrollment in Catholic schools. Regions and levels of schooling further towards the top right quadrant have the highest growth rates. The three dots with the largest growth in enrollment are for Africa, underscoring just how much of the total growth took place in the region. By contrast, the dots for primary education in both Europe and the Americas are below the diagonal.

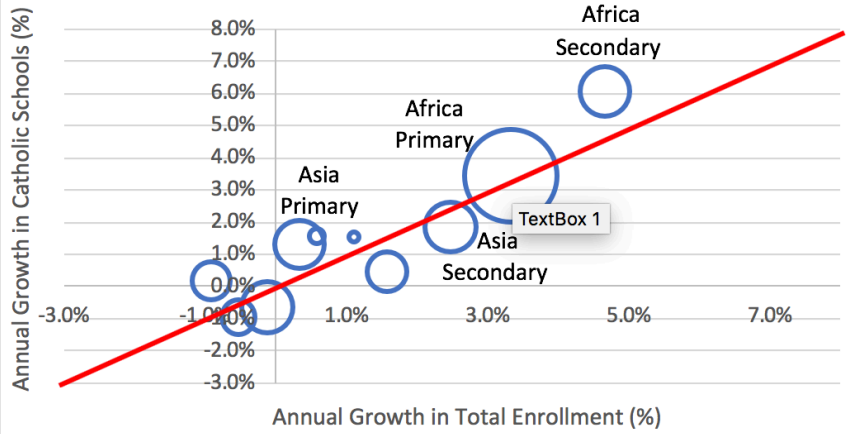


Source: Author, based on data from annual Statistical Yearbook of the Church.

Do high growth rates in enrollment ensure that Catholic schools maintain their market share, or even increase it? Not necessarily, since in the developing world, and especially in Africa, population growth and gains in enrollment rates have led to large gains in total enrollment in school. While Catholic schools have expanded their reach, this has also been the case for public schools and low-cost private schools, especially in the recent past (Heyneman and Stern, 2014; World Bank, 2017).

Figure 2 displays the growth rate in total enrollment for all schools combined (including not only Catholic schools, but also public schools, other faith-based schools, and private secular schools) on the horizontal axis, and for Catholic schools on the vertical axis. The growth rates for all schools is computed using data from the UNESCO Institute of Statistics on the total number of pupils in primary and secondary school. This is not done for preschools and nurseries due to data limitations on global enrollment across all types of schools at that level. The dots on the Figure are thus for primary and secondary schools only. Figure 2 illustrates how the growth rates for all schools combined, and for Catholic schools only, tend to be similar across regions and levels of schooling. Enrollment in Catholic schools is growing faster where this is also the case for total enrollment in all schools, as expected.

Figure 2: Enrollment Growth Overall and in Catholic Schools Primary and Secondary Levels, 1995-2016 (Regions)



Source: Author, based on data from annual Statistical Yearbook of the Church and data from the World Development Indicators.

The reasons leading to differences in the rates of growth in enrollment in Catholic schools differ between countries. Exploring these dynamics is beyond the scope of this paper, but as an illustration, consider the Democratic Republic of Congo, the country after India with the largest enrollment in K12 Catholic schools today. As noted in Wodon (2019d), many schools in the country were founded by the Church. After Independence, under a process of "Zaïrianisation", all schools were nationalized in 1974, but Catholic schools were returned to the management of the Church in 1977. Between 1977 and 1990, enrollment grew. Thereafter, severe conflict led to a stagnation in enrollment for more than a decade. Enrollment grew again after the end of the second Congo war in 2003, almost doubling between 2003 and 2016. This pattern of growth is specific to the Democratic Republic of Congo, but different countries clearly have had different patterns of growth in enrollment, with implications for the number of children enrolled as well as market shares. But what is clear overall is that the largest gains in enrollment have been observed in Africa, essentially because of the combination of three main factors. First, population growth has been higher in the region than elsewhere. Second, enrollment rates have been improving faster in Africa from a low base than elsewhere, in part thanks to the Education for All initiative. Third, many countries that were affected by conflict as well as economic downturns have benefited from more stability over the last two decades, which has also contributed to improvements in enrollment rates.

Table 3 provides data on the comparative growth rates for all schools and for Catholic schools. When the difference between the two growth rates is positive, Catholic schools are increasing their market share. Otherwise they are losing market share. Globally, enrollment in Catholic primary schools is growing slightly faster than in all schools combined, which means that Catholic schools are gaining in market share, albeit in a modest way. For secondary schools, the reverse is observed. Despite substantial growth in enrollment in Catholic schools, the schools are nevertheless losing market share, again in modest ways. There are again differences between regions. In Africa and Oceania, Catholic schools are growing faster than all schools combined, especially at the secondary level for Africa. In the Americas and Europe, Catholic schools are losing ground in comparison to other schools. In Asia, they are growing faster than other schools at the primary level, but not at the secondary level.

Table 3
Comparison of Growth in Catholic Schools and for All Students by Region, 1995 to 2016 (%)

	Annual Enrollment Growth in Catholic Schools			Annual Enrollment Growth for All Schools Combined			Difference in Growth Rates			Market Shares of Catholic Schools		
	1995 -2005	2005- 2016	1995 -2016	1995- 2005	2005- 2016	1995- 2016	1995- 2005	2005- 2016	1995- 2016	1995	2005	2016
Primary												
Africa	2.9	4.0	3.5	4.4	2.4	3.3	-1.5	1.6	0.1	10.4	9.0	10.7
Americas	-0.2	-1.0	-0.6	0.2	-0.4	-0.1	-0.4	-0.6	-0.5	7.8	7.5	7.0
Asia	0.8	1.8	1.3	0.2	0.4	0.3	0.6	1.4	1.0	1.2	1.2	1.4
Europe	-1.8	-0.2	-1.0	-1.2	0.1	-0.5	-0.6	-0.3	-0.4	7.8	7.3	7.1
Oceania	2.4	0.7	1.5	0.5	0.7	0.6	2.0	0.0	0.9	17.9	21.8	21.8
World	1.1	2.1	1.6	0.8	0.7	0.8	0.2	1.3	0.8	4.1	4.2	4.8
Secondary												
Africa	7.3	5.1	6.1	4.8	4.6	4.7	2.5	0.5	1.4	5.5	7.0	7.4
Americas	0.3	0.7	0.5	2.8	0.5	1.6	-2.5	0.2	-1.1	5.6	4.4	4.5
Asia	1.9	1.9	1.9	3.2	1.8	2.5	-1.3	0.0	-0.6	2.0	1.7	1.8
Europe	0.7	-0.3	0.2	-0.8	-1.0	-0.9	1.6	0.7	1.1	4.8	5.6	6.0
Oceania	1.6	1.5	1.5	1.5	0.8	1.1	0.1	0.7	0.4	11.6	11.7	12.6
World	2.1	1.9	2.0	2.6	1.6	2.1	-0.5	0.4	-0.1	3.5	3.3	3.5

Source: Compiled by the author from the annual Statistical Yearbook of the Church and the World Development Indicators.

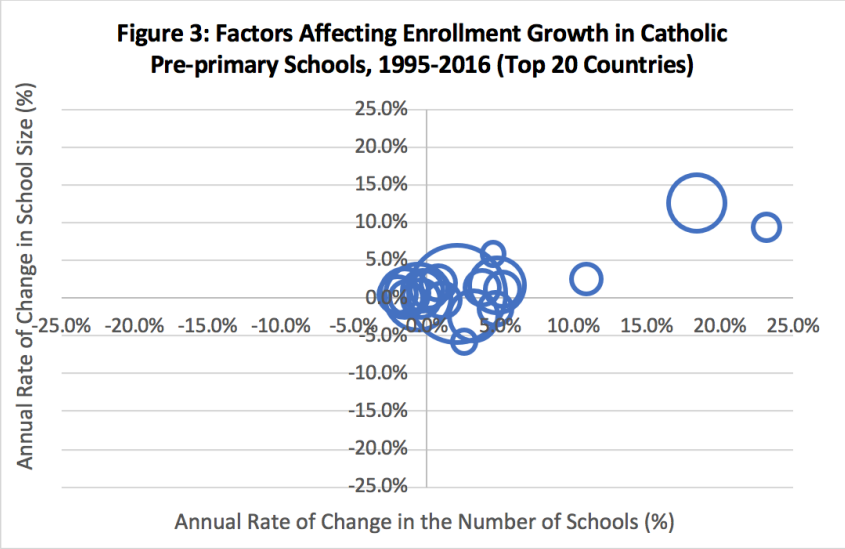
For perspective, based on an analysis of longer term trends in enrollment and market shares provided in Wodon (2019a), the market shares of Catholic schools are also provided in Table 3 at the primary and secondary level. The changes in market shares are not very large over time at the global or regional level, but of course, for any given country, they can be larger, as has been the case for example with the decline in enrollment that has taken place in the United States. Note also that at the regional level, trends over time in terms of market shares are not always similar between sub-periods. In Africa for example, enrollment in Catholic schools grew less than in all schools from 1995 to 2005, in part because of conflicts in countries with large enrollment in Catholic schools such as the Democratic Republic of Congo. But enrollment in Catholics schools grew faster from 2005 to 2016 than in all schools combined, with both effects partly offsetting each other over the full period for market shares.

Analysis at the Country Level

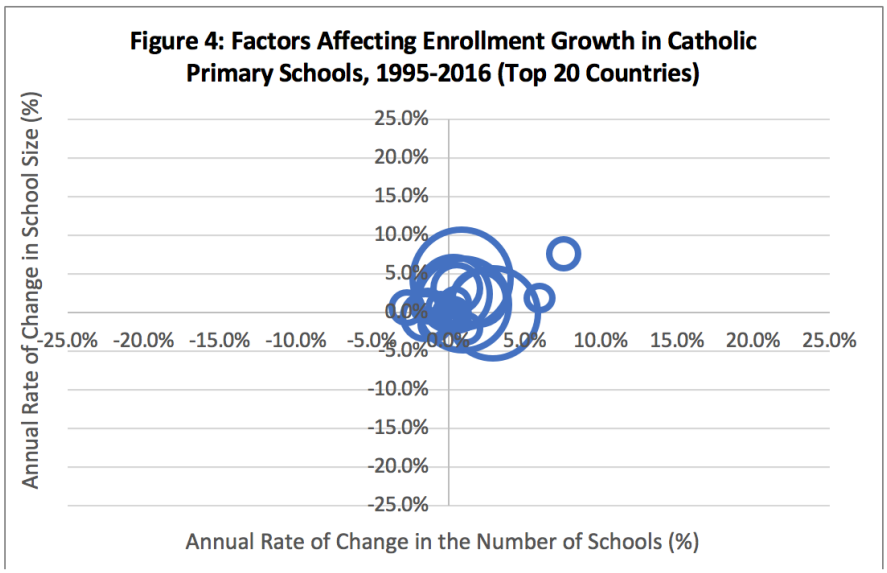
Behind broad patterns by region, analysis at the country level can be helpful to illustrate the heterogeneity that exists between countries in both the size of their Catholic school networks and their patterns of growth over time. Table 4 provides data for the 20 countries that have the largest enrollment for each of the three levels of education. For preschools and nurseries as well as secondary schools, India is the country with the largest enrolment. At the primary level, India is behind Uganda. The Democratic Republic of Congo also has high enrolment at the primary and secondary levels (as does Kenya), and when all three levels are considered together, the country ranks second only behind India in terms of total enrolment in K12 schools. Among Western countries, enrolment is high in Germany, Italy, France and Spain at the preschool and nursery level, while the United States still tops the list at the primary and secondary school levels despite a decline in enrolment for several decades. There are more African countries towards the top of the lists at the primary level than at the other two levels. This was expected given lower educational attainment and limited pre-primary enrolment in those countries. In many African countries, while progress has been achieved under the Education for All initiative at the primary level, much remains to be done at the pre-primary and secondary levels. This also means that growth in total enrolment in Africa will likely be faster than in other regions for the foreseeable future.

Figures 3 to 5 visualize the data by level of education in the same way as done for Figure 1, namely with the growth in the number of schools on the horizontal axis, and the growth in school size on the vertical axis. For ease of comparison across levels of schooling, the minimum and maximum values for the two axes have been defined in the same way for the three levels. The names of the countries are not marked in the Figures because of readability issues given the number of countries being considered, but the data are available in Table 4 (See Supplementary Materials). As mentioned in the previous section, globally the annual growth rate for enrolment in Catholic schools was higher for preschool/nurseries and secondary schools than for primary schools, reflecting the fact that enrolment rates are already high in most parts of the world for primary education. The lower rates of growth for primary enrolment can be seen through the fact that countries tend to be clustered around the origin on the Figure for that level. For preschools/nurseries, more countries are located towards the right part of the graph, reflecting both higher growth rates and a larger contribution from the growth in the number of schools at those levels of education. But the Figures also visualize

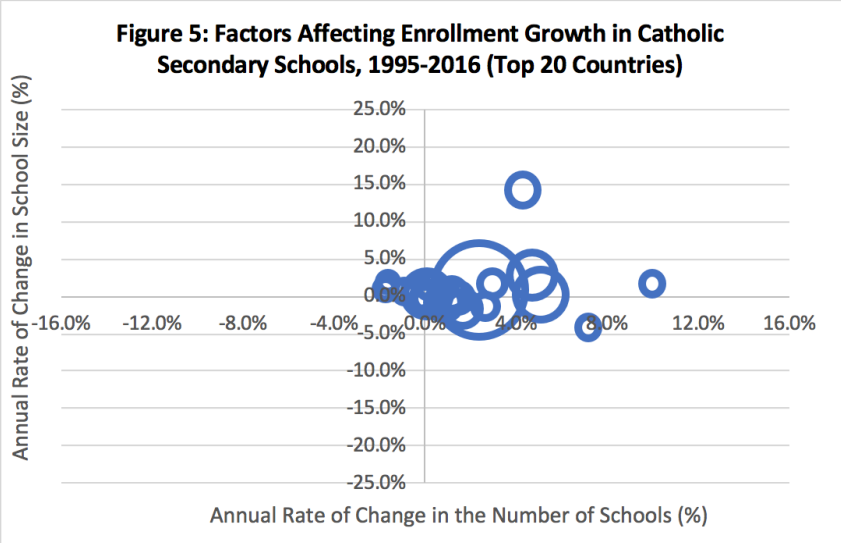
the heterogeneity between countries. For preschools and nurseries, Ethiopia and Malawi are outliers in terms of especially high growth rates in the upper right quadrant. For secondary schools, Rwanda is an outlier for the largest increase in the number of schools, while Zambia is an outlier for the largest increase in the average size of the schools.



Source: Author, based on data from annual Statistical Yearbook of the Church.



Source: Author, based on data from annual Statistical Yearbook of the Church.



Source: Author, based on data from annual Statistical Yearbook of the Church.

Conclusion

Given the evangelization mission of Catholic schools, and the desire of the Church to respond to the demand for education especially among the poor, providing basic education to many children matters to the Church. It also provides benefits for societies in a variety of ways. There is some evidence (but not undisputed evidence) of a Catholic school advantage whereby students in Catholic schools may perform better than students in public schools. There is also some evidence that the presence of Catholic schools in communities – historical or current, may have benefits for communities as a whole. How has enrollment increased over time? Where has enrollment grown, and where has it declined? Have changes in enrollment been reflected mostly in changes in the number of schools operated by the Church, or changes in average school size? This paper has answered those questions for preschools and nurseries, primary schools, and secondary schools. A few key findings emerge from the analysis.

First, enrollment in Catholic schools has increased globally at an annual rate of 1.9 % for nurseries and preschools, 1.6 % for primary schools, and 2.0 % for secondary schools between 1995 and 2016. Second, these positive trends at the global level mask differences between countries and regions. Enroll-

ment growth has been highest in Africa, followed by Asia and Oceania. In the Americas and in Europe, there have been in some cases declines in enrolment. Third, even where enrollment has increased, the market share of the Catholic Church has not necessarily increased, given gains in enrollment in other types of schools as well. Fourth, for preschools and nurseries and for secondary schools, most of the enrollment growth is attributed to an increase in the number of schools, while for primary schools, the gains in average school size played a larger role. This was to be expected given that for primary education, even 20 years ago the network of Catholic schools was already broad, so that there was less of a need to build new schools to respond to the demand for education from the population. For preschools and nurseries and secondary schools, this was less the case.

The simple decomposition used in this paper provides insights into the contributions of new schools and larger schools to enrollment growth. Different countries have followed different paths in this respect. Building new schools can be expensive but may be necessary in some areas to reach underserved populations. Expanding the capacity of existing schools is often cheaper, but this can be done only in areas where the demand for existing schools is sufficient. In most cases, both new schools and larger schools have enabled the Church to increase its footprint, especially in Africa where the needs are the greatest given high population growth and rapidly rising enrollment rates.

The analysis for this paper was conducted using national and regional level data. It could be replicated at the local level within any given country with more detailed data on the location of Catholic within the country. This could have several benefits. First, using local-level data on school location in combination with poverty maps based for example on census data makes it feasible to assess whether Catholic schools are located in poor areas or not. While there is often a perception that this may be the case, it is not necessarily so, as noted by Coulombe and Wodon (2013) for Catholic and other Christian health care facilities in Ghana. Second, using local level data can be beneficial for strategic decisions as to where to build new schools or expand existing schools. It seems obvious that Catholic school networks should make decisions on the creation of new schools based on a medium-term local assessment of demand for the schools, but this is not always the case. Third, local level data can also be used to tease out some of the drivers that lead students to choose various types of school. For example, one would expect that the market share of Catholic schools within a country would be higher

in geographic areas with a higher proportion of Catholics, but the magnitude of such effects need not always be large. While all these questions are beyond the scope of this paper, the basic analysis of patterns of growth as they relate to the number of schools and average school size is one part of the puzzle when trying to document patterns of growth or decline in enrollment. This type of analysis can in principle provide useful (even if limited) information for both country and local level analysis.

References

Allcott, H., & Ortega, D. E. (2009). The performance of decentralized school systems: Evidence from Fe y Alegría in Venezuela. In F. Barrera-Osorio, H. A. Patrinos, and Q. Wodon (Eds.), *Emerging evidence on private participation in education: Vouchers and faith-based providers*. Washington, DC: The World Bank.

Altonji, J. G., Elder, T. E., & Taber, C. R. (2005). An evaluation of instrumental variable strategies for estimating the effects of Catholic schooling, *Journal of Human Resources,* 40, 791-821.

Berends, M., Springer, M. G., Ballou, D., & Walberg, H. J. (Eds.). (2009). *Handbook of research on school choice*. New York, NY: Routledge.

Brinig, M. F., & Garnett, N. S. (2014). *Lost classroom, lost community: Catholic schools' importance in urban America*. Chicago: The University of Chicago Press.

Bryk, A., Lee, V. E., & Holland, P. B. (1993). *Catholic schools and the common good*. Cambridge, MA: Harvard University Press.

Bryk, A. S., Gomez, L. M., Grunow, A., & LeMahieu, P. G. (2015). *Learning to improve: How America's schools can get better at getting better*. Cambridge, MA: Harvard Education Press.

Carbonaro, W. (2006). Public-private differences in achievement among kindergarten students: Differences in learning opportunities and student outcomes. *American Journal of Education, 113*(1), 31-65.

Coleman, J. S., Hoffer, T., & Kilgore, S. (1982). *High school achievement: Public, Catholic, and private schools compared*. New York: Basic Books.

Coleman, J. S., & Hoffer, T. (1987). *Public and private high schools: The impact of communities*. New York: Basic Books.

Coulombe, H., & Wodon, Q. (2013). Mapping religious health assets: Are faith-based facilities located in poor areas in Ghana?, *Economics Bulletin*, *33*(2), 1615-31.

Congregation for Catholic Education. (1977). *The Catholic school.* Vatican City: Libreria Editrice Vaticana.

Congregation for Catholic Education. (2017). *Educating to fraternal humanism: Building a "civilization of love" 50 years after populorum progressio.* Vatican City: Libreria Editrice Vaticana.

Denboba, A., Sayre, R., Wodon, Q., Elder, L., Rawlings, L., & Lombardi, J. (2014). *Stepping up early childhood development: Investing in young children for high returns*. Washington, DC: The World Bank.

Dee, T. S. (2005). The effects of Catholic schooling on civic participation. *International Tax and Public Finance*, *12* (5), 605-25.
Elder, T., & Jepsen, C. (2014). Are Catholic primary schools more effective than public primary schools? *Journal of Urban Economics*, 80, 28-38
Evans, W., & Schwab, R. (1995). Finishing high school and starting college: Do Catholic schools make a difference? *Quarterly Journal of Economics*, *110*, 941-74.
Fleming, D. J., Lavertu, S., & Crawford, W. (2018). High school options and post-secondary student success: The Catholic school advantage. *Journal of Catholic Education*, *21* (2).
Francis. (2015). *Encyclical letter laudato si' of the Holy Father Francis on care for our common home*. Vatican City: Libreria Editrice Vaticana.
Freeman, K. J., & Berends, M.(2016). The Catholic school advantage in a changing social landscape: Consistency or increasing fragility? *Journal of School Choice*, *10*(1), 22-47.
Greeley, A. (1982). *Catholic schools and minority students.* New Brunswick, NJ: Transaction Publishers.
Hallinan, M. T., & Kubitschek, W. N. (2013). School sector, school poverty, and the Catholic school advantage. *Journal of Catholic Education*, *14*(2), 498-518.
Heyneman, S. P., & Stern, J. M. B. (2014). Low cost private schools for the poor: What public policy Is appropriate?, *International Journal of Educational Development*, *3,* 3-15.
Jepsen, C. (2003). The effectiveness of Catholic primary schooling. *Journal of Human Resources*, *38*, 928-941.
Lavado, P., Cueto, S., Yamada, G., & Wensjoe, M. (2016). *The effect of Fe y Alegria on school achievement: Exploiting a school lottery selection as a natural experiment*. (IZA DP No. 10431). Bonn: Institute for the Study of Labour (IZA).
Manipadam, J. (2018). C*atholic education Is India's biggest anti-poverty program – It Is value based and employment/career oriented.* Office for Education and Culture of the Catholic Bishops of India Conference. New Delhi: Catholic Bishops of India Conference.
McKinney, S. J. (2018). The roots of the preferential option for the poor in Catholic schools in Luke's gospel. *International Studies on Catholic Education, 10*(2), 220-232.
Neal, D. (1997). The effects of Catholic secondary schooling on educational achievement. *Journal of Labor Economics, 15*(1): 98-123.
Parra Osorio, J. C., & Wodon, Q. (2014). Performance of Fe y Alegría high school students in Colombia: Is it a matter of fe (faith) or alegría (joy)? in J. C. Parra Osorio & Q. Wodon (Eds.), *Faith-Based Schools in Latin America: Case Studies on Fe y Alegría*, Washington, DC: The World Bank.
Pontifical Council for Justice and Peace. (2004). *Compendium of the social doctrine of the Church*. Vatican City: Libreria Editrice Vaticana.
Sander, W. (1996). Catholic grade schools and academic achievement. *The Journal of Human Resources, 31*(3), 540-548.
Sander, W., & Krautman, A. (1995). Catholic schools, dropout rates and attainment. *Economic Inquiry, 33*(2), 217-233.
Secretaria Status. (2018). *Statistical yearbook of the Church 2016*. Rome: Libreria Editrice Vaticana.
Theunynck, S. (2009). *School construction strategies for universal primary education in Africa: Should communities be empowered to build their schools?* Washington, DC: The World Bank.

Wodon, Q. (2014). *Education in sub-Saharan Africa: Comparing faith-based, private secular, and public schools.* Washington, DC: The World Bank.
Wodon, Q. (2015). *The economics of faith-based service delivery: Education and health in sub-Saharan Africa.* New York: Palgrave Macmillan.
Wodon, Q. (2016). *School infrastructure in Paraguay: Needs, costs, and investments.* Washington, DC: The World Bank.
Wodon, Q. (2019a). *Enrollment in K12 Catholic schools: Global and regional trends and market shares.* Educatio Catholica.
Wodon, Q. (2019b). *Budget savings from Catholic and other private schools: Estimates for primary and secondary education in OECD and partner countries.* Washington, DC: The World Bank.
Wodon, Q. (2019c). *Where should developing countries build new lower secondary schools? A simple approach with application to Uganda*. Washington, DC: The World Bank.
Wodon, Q. (2019d). *K12 Catholic schools in the Democratic Republic of Congo: Enrollment trends, achievements, and challenges*. Washington, DC: The World Bank.
World Bank. (2017). *Providing low-cost private schooling for the poor. Inclusive Innovations Notes Series*. Washington, DC: The World Bank.
World Bank. (2018). *World development report 2018: Learning to realize education's promise.* Washington, DC: The World Bank.