

Measuring the Contribution of Faith-Based Schools to Human Capital Wealth: Estimates for the Catholic Church

By Quentin Wodon

Abstract: This paper provides estimates of the contribution of faith-based schools to human capital wealth using recent World Bank data. Wealth is the assets base that enables nations to generate future income. Estimates suggest that human capital wealth accounts for two thirds of global wealth, a much larger proportion than natural capital and produced capital. This paper's analysis relies on an assessment of the share of human capital wealth attributed to educational attainment, and the share of contribution of Catholic schools to educational attainment. The analysis suggests that Catholic schools contribute at least US\$ 12 trillion to the changing wealth of nations.

Keywords: education, human capital, wealth of nations, Catholic schools, private schools

Investments in human capital are back at the top of the development agenda. In October 2018, the World Bank launched its Human Capital Project, an initiative to boost such investments in human capital not only in the developing world, but also in developed nations. Earlier the same year, the World Bank released analysis that suggested that people—or more precisely human capital wealth—is by far the largest component of the changing wealth of nations (Lange et al., 2018). Wealth is the assets base that enables nations to produce future income or Gross Domestic Product. Human capital wealth specifically, estimated as the present value of the future earnings of the labor force, accounts for two thirds of global wealth, a proportion much larger than that accounted for by produced capital (such as infrastructure, factories, and urban land) and natural capital (such as oil, minerals, agricultural land, and forests). The more countries develop, the more important human capital wealth becomes.

What are the drivers of human capital wealth? These drivers are complex, but since human capital wealth is estimated on the basis of expected future labor earnings, education, experience, and the number of years that workers are expected to work (which depends among others on their health) all play a role. However, decompositions based on regression analysis suggest that the benefits from higher educational attainment account for a larger share of human capital wealth than more experience on the job (Wodon 2018a). This may sound surprising, but it is due in part to the fact that a higher level of educational attainment often pays dividend for a worker's entire life, while the benefits from more experience tend to be larger, at least as measured through regression analysis, towards later years. As a result, when considering the present value of worker's future earnings, education plays a large role.

Given that educational attainment matters substantially for worker's earnings and the human capital wealth of nations, it seems interesting to assess the specific role that faith-based schools play in enabling the accumulation of human capital wealth through the workforce. Faith traditions would probably argue that the main contribution of their school networks is not economic, but rather spiritual and values-based. This would be fair enough. But the economic contribution of faith-based schools is likely to be sizeable, even though it is rarely recognized. While the contribution of private schools to human capital and development is well recognized and often discussed (see for example Patrinos et al. 2009; Steer et al. 2015; and OECD 2017), the specific contribution of faith-based schools is typically not acknowledged. The recent World

Development Report focused on education is a case in point (World Bank 2018). It mentions the word “faith” twice in more than 250 pages and not with reference to religion. The words religion or religious are mentioned a dozen times, but without analysis. Of course, the authors of the report had to choose their battles—they could not cover all topics related to education, so they decided to focus on the learning crisis affecting primary and secondary schools in most developing countries. Yet beyond the World Development Report, the importance of faith-based schools is often missed despite the fact that the schools have a large and growing enrollment.

Faith-based schools matter not only because they have a large market share, but also because they provide a wider range of options for parents to send their children to school. This can help in making sure that all children are able to go to school and learn while in school. The contribution of faith-based schools was noted in a special issue of this journal devoted to Africa a few years ago (see for example Tsimpo and Wodon 2014 on market shares and Gemignani et al. 2014 on the reasons why parents send their children to faith-based schools). In this paper, the focus is different. The aim is to measure the contribution of Catholic schools to estimates of human capital wealth worldwide.

The focus on Catholic schools as opposed to faith-based schools more generally is driven by practical considerations. First, the Catholic network of schools is the largest network of faith-based schools worldwide with 62 million children enrolled in K12 schools and another six million students enrolled at the tertiary level according to the latest issue of the annual statistical yearbook of the Catholic Church (Secretaria Status 2018). In addition, while data are available in these yearbooks on enrollment at various levels in Catholic schools, no similar data are available across countries for the contribution of other large faith-based networks of schools. Put simply, the analysis is conducted for Catholic schools because this is the faith tradition for which comprehensive data are available.

Methodology

To measure the contribution of Catholic schools to human capital wealth globally, the analysis proceeds in three steps. The first step in the analysis consists in measuring the contribution of human capital to the changing wealth of nations. This has been done by Hamilton et al. (2018), and only key results are reported here. Next, the paper relies on a simple decomposition of human capital wealth into the respective contributions of education and experience (Wodon 2018a). Finally, relying on enrollment data for Catholic schools, the contribution of Catholic schools to human capital wealth is estimated.

Essentially, the approach works as follows. Denote the human capital wealth of a country by HC , the share of human capital wealth attributed to education by SE , and the share of education provided by Catholic schools by SC . Then the contribution of Catholic schools to human capital wealth is measured as $HC \times SE \times SC$. Each of the three terms in this multiplication are worth exploring briefly.

Consider first human capital wealth (HC in the formula). According to the latest study on the Changing Wealth of Nations released by the World Bank (Lange et al. 2018; see World Bank 2006 and 2011 for previous studies), human capital wealth can be defined as the present value of the future earnings of the labor force. As noted in Hamilton et al. (2018), this approach follows the pioneering work of Jorgensen and Fraumeni (1992a, 1992b). The estimation is based on wage regressions to compute expected future earnings for workers by age, gender, and education level. Results are then calibrated to countries’ National Accounts to make sure that they are consistent with the share of earnings in GDP observed in these accounts. The advantage of the

World Bank methodology versus other studies such as those by UNEP (2014) and Ballah (2017) is that estimates are derived directly from household surveys.

Consider next the share of human capital wealth attributed to education (SE in the formula). As detailed in Wodon (2018a), simulations can be used to assess how much human capital wealth can be attributed to educational attainment, experience, and other factors. It turns out that across 135 countries for which these simulations were conducted, educational attainment accounts on average in the case of men for 48 percent of their human capital, while experience accounts for 38 percent, with the rest accounted for by other factors. For women, educational attainment accounts for 61 percent of human capital wealth with experience accounting for 29 percent. When both sexes are combined, the share of human capital wealth attributed to educational attainment is estimated at 53 percent, versus 35 percent attributed to experience, with the rest accounted for by other factors.

Consider finally the share of education provided by Catholic schools (SC in the formula). Given that human capital wealth is estimated using regressions that assign the same value to various years of schooling (simplest Mincerian model), the contribution of Catholic schools to education can be estimated as the share of the years of education in the work force that has been provided by Catholic schools. This share is measured using data from the statistical yearbooks of the Church. The yearbooks provide data on the number of students enrolled in primary, secondary, and tertiary education institutions managed by the Church in virtually all countries. To compute the share of total education provided at the country level by Catholic schools, estimates of the total number of students enrolled in primary and secondary schools nationally are obtained from UNESCO Institute of Statistics data. For tertiary education, direct estimates are not available, but they can be computed by multiplying gross enrollment rates at the tertiary level with the population for that age group.

The shares of total enrollment accounted for by Catholic schools by level need to be weighted by the number of students at each level to provide the aggregate share of the total number of years of education provided by the Church. For simplicity, an additional assumption is that children in primary schools complete on average five years of schooling (because some may not complete the cycle and drop out). The same assumption is made for secondary education (for the same reason), and for tertiary education (this may be on the high side, but it would account for those pursuing their education beyond a four-year bachelor degree, and it reflects the fact that in empirical work, the returns to higher education tend to be higher than at the primary and secondary level, even if this is not reflected with the simplest Mincerian regressions). Slightly different assumptions could be used, but this would not make a major difference in the overall estimates. The number of students by level of education and the share of Catholic schools at each level are taken into account and these are the key variables affecting results.

It is worth noting that the methodology makes implicit assumptions. One assumption is that controlling for educational attainment, expected earnings are not likely to be higher for children attending Catholic schools as opposed to other schools. It is often believed that students in Catholic schools perform better than those in public schools on national or international student assessments. If this is the case, and if better performance on these assessments leads to higher expected earnings in adulthood, for example through a better college to go to, then the estimates may underestimate the contribution of Catholic schools to human capital wealth. However, the question of whether students in Catholic schools indeed perform better (all other things being equal) remains debated. In the United States where much of the research on this issue has been conducted, some studies suggest better learning outcomes for students in Catholic

schools (Evans et al. 1995; Altonji et al. 2005), but others find few statistically significant differences between Catholic and public schools after controlling for student characteristics (Jepsen 2003; Elder and Jepsen 2014). In developing countries, the evidence is mixed as well (see for example the case studies in Barrera-Orsorio et al. 2009). More generally, even if there may be underestimation of the contribution of Catholic schools to human capital wealth in case students in Catholic schools perform better, this underestimation need not necessarily be large.

Another implicit assumption relates to the timing and internal coherence of the various sets of data used for the estimations. The estimates of human capital wealth represent the present value of future earnings for the current labor force. While some workers were educated recently, most were educated some time back. By contrast the estimates of the shares of students in Catholic schools by level of education are based on data for 2016. If the market share of Catholic schools were to change substantially over time, there could be a mismatch between both sets of estimates, in that current enrollment patterns may not reflect patterns at the time when today's labor force was in school. At the global and regional levels, as noted in Wodon (2018b), the market share of Catholic schools has not changed much over time. But at the level of countries, this is not necessarily the case. For example, as documented in the next section, the United States is the country with the largest contribution of Catholic schools to human capital wealth globally. This contribution is measured based on market shares of Catholic schools today, and these market shares in enrollment at various levels are lower than market shares in the past. In that sense, the analysis underestimates for the United States and probably globally the (past) contribution of Catholic schools to the (current) estimates human capital wealth.

A third implicit assumption is that students enrolled in Catholic and other schools have the same expected number of years of education by level. This may again lead to an underestimation of the contribution of Catholic schools because those schools tend to have higher rates of cycle completion than other schools in both developed and developing countries. Whether those higher rates are due to the characteristics of the students or the schools is another matter, but for computing the contribution of Catholic schools to human capital wealth, this may be another source of underestimation.

Results

Before presenting results on the contribution of Catholic schools to human capital wealth, it is useful to provide stylized facts on the composition of global wealth. This is done in Table 1 based on analysis for 141 countries that account for 95 percent of the world's population and a large share of total GDP given better data for middle-income and high-income countries than for low-income countries. In constant US dollars of 2014, global wealth was estimated at US\$ 1,143 trillion. Human capital wealth was estimated at US\$ 737 trillion, thus representing two thirds of total wealth. Natural capital was valued at US\$ 107 trillion. Finally, produced capital was valued at US\$ 304 trillion. Table 1 also provides the values in per capita terms. In 2014 per capita wealth was estimated at US\$ 168,580, of which US\$ 108,654 was accounted for by human capital wealth. There is of course a lot of inequality between countries in both human capital and total wealth per capita.

<Table 1 about here>

Table 2 provides the estimates globally (at the bottom of the table) and for the top 20 countries of the specific contribution of Catholic schools to human capital wealth. Note that the

data for human capital wealth are for calendar year 2014 and those for the shares of education provided by Catholic schools are for calendar year 2016 in order to take the latest data from the statistical yearbooks of the Catholic Church, but there is very little change in the shares of total education provided by Catholic schools between 2014 and 2016. The countries are ordered in the Table according to the value of contributions of Catholic schools to human capital in each country, from the largest contribution to progressively smaller contributions. The first column provides the estimates of human capital wealth per capita (in thousand dollars). The second column provides population sizes (in million inhabitants). The third and fourth columns provide the contributions of education to human capital wealth for women and men as a share of human capital wealth. As mentioned earlier, the contributions of education to human capital wealth by gender tend to be larger (in comparison to the share accounted for by experience) for women than for men, probably in part because women tend to work fewer years than men. The next three columns are the shares of education provided by Catholic schools at the primary, secondary, and tertiary levels. The penultimate column provides the total value of the contribution of education to human capital wealth, combined for men and women (in US\$ billion). The last column provides the contribution of Catholic schools to human capital wealth (again, in US\$ billion).

<Table 2 about here>

Globally, the analysis suggests that Catholic schools generate US\$ 12 trillion in human capital wealth. This represents 3.2 percent of the total contribution of education to human capital wealth. Interestingly, this value is slightly below the market share of Catholic schools globally, estimated at 4.5 percent for primary schools and 3.5 percent for secondary schools by Wodon (2018b). The reason is that over the last two decades, enrollment in Catholic schools has been growing fastest in the developing world, and especially in sub-Saharan Africa and South Asia, while it has been declining in the United States and parts of Europe. The fact that African and South Asian countries have lower levels of human capital wealth per capita than Europe and the United States yields a smaller contribution of the Catholic Church in percentage terms to human capital wealth than for the contribution to years of schooling.

The top 20 countries listed in the table account for 93.3 percent of the total contribution of Catholic schools to human capital wealth, but there are large differences between countries. The United States, despite a relatively small and declining market share for Catholic schools over time, accounts for almost US\$ 5.0 trillion of the generation of human capital wealth by Catholic schools. This is in part because levels of human capital wealth are high in the country, but also because of the country's large population size. Italy comes in second, with a contribution to human capital wealth of US\$ 1.2 trillion, due in part to its vast network of Catholic schools for both historical and training reasons. For example, at the university level, Catholic institutions in Rome play an important role in the training of priests and those called to religious vocations, thereby leading to a comparatively high market share at that level.

Despite a smaller population size, Belgium is ranked third, essentially because of an especially high market share of Catholic schools. Belgium is peculiar because the country's Constitution ensures that children benefit from a free education until the end of compulsory education independently of their family's philosophical, ideological, or religious beliefs. Specifically, the Constitution affirms that all children have a right to the moral or religious education of their choice at the community's expense. After tensions between secular and

religious groups, a School Pact adopted in 1958 ensured equal funding for all schools. In the United States by contrast, Catholic schools receive virtually no support from the federal government due to a strict separation between Church and State in the Constitution, and only limited support from states that have adopted school choice legislation, as demonstrated by school budgets compiled by the National Catholic Educational Association (NCEA 2018). This is also why the market share of Catholic schools has been declining over time in the United States due to affordability constraints during a long period of time when earnings for the middle class have stagnated.

The other countries in the top ten are Brazil, France, the United Kingdom, the Republic of Korea, Spain, Japan, and Colombia. Rounding the top 20 are Mexico, Germany, Chile, the Philippines, Ireland, Australia, India, Canada, Argentina, and finally the Dominican Republic. All these countries are high income or middle-income countries, and most have substantial population sizes. They reached the top 20 because of one or more of four factors: high levels of human capital wealth per capita, high population sizes, high market shares for Catholic schools, and/or high contributions of education to human capital wealth. Ireland has a small population size, but a long tradition of education in Catholic schools, with the schools benefitting from high levels of funding from the government as is the case in Belgium. Any change in these four variables affects the contribution of Catholic schools to human capital wealth since this contribution is simply measured as the product of these variables.

Before concluding, it is worth mentioning that parents often choose Catholic schools because of the emphasis placed by these schools on moral values and religious education. The fact that this paper focuses on the economic contribution of Catholic schools to human capital wealth should not be interpreted in any way as implying that other contributions of the schools are not equally important. There is for example some evidence that the schools may help in strengthening communities (Brinig and Garnett 2015) and civic participation (Dee 2005), but this is beyond the scope of this paper.

Conclusion

The objective of this paper was to estimate the contribution of Catholic schools to human capital wealth globally, by summing up estimates obtained at the country level for a large number of countries. In some countries such as Belgium or Ireland, Catholic schools benefit from substantial support from the government, leading to high market shares, and correspondingly high contributions to human capital wealth per person. But in many other countries like the United States, state support for Catholic schools is nonexistent or very limited, which makes it more difficult for households to send their children to those schools, and thus reduces the market share of Catholic schools.

Overall, the analysis suggests that Catholic schools contribute at least US\$ 12 trillion in human capital wealth globally. This represents 3.2 percent of the contribution of educational attainment to human capital wealth worldwide. This proportion is slightly below the global market share of Catholic schools in part because the presence of Catholic schools has shifted over the last two decades towards the developing world, with especially high growth in sub-Saharan Africa where levels of human capital wealth per capita are much lower than in developed countries. The economic contribution of Catholic schools globally is clearly substantial. If data were able to conduct the same exercise for all faith-based schools together, their estimated contribution to human capital wealth would be even larger.

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Table 1: Baseline Estimates of Global Wealth, 2014

	Total Wealth US\$ Trillions	Per Capita Wealth (US\$)	Shares (%)
Total wealth	1,143.2	128,929	100%
Produced capital	303.5	30,793	27%
Natural capital	107.4	9,803	9%
Human capital	736.9	88,874	64%
Net foreign assets	-4.6	-540	0%
Population (141 countries, billions)	6.78	-	-

Source: Lange et al. (2018).

Table 2: Contributions of Catholic Schools to Human Capital Wealth, 2014

	Human Capital Wealth Per Capita (US\$ 1,000)	Populatio n (Million)	Education Share in HC for Women (%)	Educatio n Share in HC for Men (%)	Catholic Share in Primary Education (%)	Catholic Share in Secondary Education (%)	Catholic Share in Tertiary Education (%)	Education Contribution to HC Wealth (US\$ Billion)	Catholic Contribution to HC Wealth (US\$ Billion)
United States	766.5	318.9	61.7	54.9	4.8	2.4	3.5	140,973	4,953.3
Italy	241.3	60.8	52.3	41.7	4.5	2.6	17.5	6,763	1,180.7
Belgium	405.0	11.2	57.1	41.3	52.7	45.6	39.7	2,192	869.7
Brazil	123.7	206.1	65.1	54.9	3.5	1.0	5.1	15,120	765.5
France	415.9	66.3	60.4	48.6	14.9	19.3	4.9	14,773	722.6
United Kingdom	457.2	64.6	73.0	52.6	8.8	4.6	3.7	17,846	657.2
Korea, Rep.	291.7	50.4	69.0	61.5	0.2	1.2	5.5	9,486	517.8
Spain	215.6	46.5	59.8	44.8	18.5	15.6	5.2	5,163	270.3
Japan	365.2	127.1	43.4	41.3	0.3	0.9	1.4	19,424	268.2
Colombia	87.7	47.8	69.5	53.9	11.0	14.0	9.7	2,598	252.2
Mexico	59.3	125.4	59.7	53.8	3.7	2.9	5.7	4,193	239.2
Germany	467.7	81.0	71.1	56.3	0.7	4.2	1.0	23,108	225.5
Chile	139.5	17.8	76.2	66.0	25.4	13.3	12.9	1,733	224.4
Philippines	17.8	99.1	67.6	41.2	2.7	9.5	23.2	922	213.4
Ireland	473.7	4.6	66.5	46.5	93.5	88.3	10.0	1,182	117.7
Australia	585.7	23.5	50.9	37.8	17.8	13.6	2.0	5,866	116.0
India	8.8	1,295.3	36.7	33.3	2.9	3.1	2.5	3,855	96.5
Canada	730.8	35.5	63.9	54.2	19.0	10.1	0.6	15,152	95.2
Argentina	71.4	43.0	64.1	52.1	13.9	11.4	4.9	1,773	86.9
Dominican Republic	73.1	10.4	66.4	49.8	11.4	12.8	17.7	431	76.2
Top 20 countries								387,435	11,948
All countries								395,482	12,808

Source: Author's estimation.