Background Paper
The Learning Generation

Education Financing Priorities

George Psacharopoulos  Georgetown University
Claudio E. Montenegro  World Bank, German Development Institute (DIE)
and Department of Economics, University of Chile
Harry Anthony Patrinos  World Bank
Education Financing Priorities

Report to the Education Commission

by

George Psacharopoulos, Claudio E. Montenegro and Harry Anthony Patrinos

November 2016
## Contents

Executive summary ........................................................................................................................................... 3  
Database ...................................................................................................................................................... 4  
Returns estimation ........................................................................................................................................ 5  
Findings ...................................................................................................................................................... 5  
Policy implications ....................................................................................................................................... 7  
References .................................................................................................................................................. 9  
Annex 1: Average Age-Earnings Profiles ................................................................................................. 10  
Annex 2: Smoothed Age-Earnings Profiles by Level of Education ........................................................ 11
Executive summary

We used the latest household surveys in 15 low, lower-middle and upper-middle income countries to estimate the private and social returns to investment in education using the full-discounting method reported below.

<table>
<thead>
<tr>
<th>Returns to Education by Country Income Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income level</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Low income</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Lower middle</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Upper middle</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

The returns are higher in low income countries where the quantity of schooling is scarcer. The range of social returns to education from 12 to 17 percent in low income countries is well above any alternative investment.

For lower middle income countries the private returns are high at every level. For upper middle income countries private returns are high only at the tertiary level. The low returns to primary education in upper middle income countries is due to the fact that primary education is becoming universal at this level of development.

Given the returns structure, primary education is an investment priority in low income countries, followed by secondary and tertiary in this order.

The difference between private and social rates of return, especially for tertiary education, calls for innovative financing mechanisms that will expand access and effective demand for enrollment, especially among the poor. Such mechanisms may include but are not limited to: selective cost-recovery, income contingent loans, human capital contracts, social impact bonds and conditional cash transfers.

To expand access and quality at the secondary level alternative models may be needed to reach the poor in remote and rural areas. Special measures may be needed to increase enrollment among ethnic minorities and indigenous peoples in some countries, such as bilingual education or tailor made delivery modes. Selected scholarships will play a role, especially for enticing girls to enter non-traditional fields at the upper secondary level. The much higher cost for secondary education, especially at the upper level, may require the use of public-private partnerships – for
example, industry links for skills formation and charter schools to reach the poor and disadvantaged, vouchers and scholarships to encourage enrollment to complete secondary.

**Database**

**Benefits.** We used the latest household surveys in 15 low, lower-middle and upper-middle income countries according to the World Bank classification.

The countries in each group were selected on the basis of their size (and the number of observations in each education-age category.

- Low income: Kenya; Congo Democratic Republic; Ethiopia; Gambia; Nepal
- Lower-middle: Indonesia; Sri Lanka; Pakistan; Vietnam; Zambia
- Upper-middle: Argentina; Brazil; China; Panama; Venezuela

We selected workers with dependent employment earnings. Earnings in local currency were converted to $US at the 2012 exchange rate.

For each country group we constructed age-education-earnings profiles for four levels of education – no schooling, primary, secondary and tertiary. Profiles were averaged within each country group weighted by the country’s population resulting in the graphs included in Annex 1.

The earnings (Y) profiles for each schooling level were smoothed out by using the following quadratic function (1):

\[ Y = a + b \times \text{AGE} + c \times \text{AGE}^2 \] (1)

**Costs.** We used the costs by level of schooling and country income group presented in Table 1. The costs refer to central government, local government and private expenditure.

For all country groups we assumed a 6–6–4 year cycle for primary, secondary and tertiary education, respectively.

<table>
<thead>
<tr>
<th>Table 1: Annual cost per student and per capita income, 2012 ($US)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational level</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>Primary</td>
</tr>
<tr>
<td>Lower secondary</td>
</tr>
<tr>
<td>Upper secondary</td>
</tr>
<tr>
<td>Post-secondary</td>
</tr>
</tbody>
</table>

Source: Education Commission, provisional estimates
Returns estimation

We used the full discounting method to estimate private and social returns to education where the social rate of return to investment in a given level of education is found by solving for $r$ in the following equation (2). For example, in the case of university education, lasting four years and a working life of 42 years, we estimate $r$ from:

$$\sum_{t=1}^{42} \frac{(Y_u - Y_s)_t}{(1 + r)^t} = \sum_{t=1}^{4} (Y_s + C_u) (1 + r)^t$$

(2)

$(Y_u - Y_s)_t$ is the earnings differential between a university graduate (subscript $u$) and a secondary school graduate (subscript $s$, the control group) at time $t$. $C_u$ represents the direct costs of university education (tuition, fees, books), and $Y_s$ denotes the student's foregone earnings or indirect costs.

Findings

The returns to education by country income group and level of schooling are presented in Table 2 and Figure 1. As expected, returns are higher in lower income countries where the quantity of schooling is scarcer. The low returns to primary education in upper middle income countries can be explained by the fact primary education has reached most of the population and there is not a sufficient number of illiterates to serve as control group. It may also mean that given near universal coverage of primary education in these countries there is no much room to further expand this level of schooling. It might instead make sense to increase investment in the quality of primary schooling.
Table 2: Returns to Education by Country Income Group

<table>
<thead>
<tr>
<th>Income level</th>
<th>Education level</th>
<th>Rate of return (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Private</td>
</tr>
<tr>
<td>Low income</td>
<td>Primary</td>
<td>17.1</td>
</tr>
<tr>
<td></td>
<td>Secondary</td>
<td>14.1</td>
</tr>
<tr>
<td></td>
<td>Tertiary</td>
<td>22.8</td>
</tr>
<tr>
<td>Lower middle</td>
<td>Primary</td>
<td>13.8</td>
</tr>
<tr>
<td></td>
<td>Secondary</td>
<td>9.4</td>
</tr>
<tr>
<td></td>
<td>Tertiary</td>
<td>17.6</td>
</tr>
<tr>
<td>Upper middle</td>
<td>Primary</td>
<td>2.3</td>
</tr>
<tr>
<td></td>
<td>Secondary</td>
<td>4.5</td>
</tr>
<tr>
<td></td>
<td>Tertiary</td>
<td>16.9</td>
</tr>
</tbody>
</table>

Figure 1: Returns to Investment in Education, Low Income Countries (percent)

In low income countries, the private returns to schooling are high at all levels. Given the social returns, the priority for expansion of schooling is at the primary level. In most low income countries the primary enrollment rate is significantly below universal. The net enrollment ratio for primary school in low income countries is just over 82 percent (Table 3).
Table 3: Enrollment Ratios by Income Group

<table>
<thead>
<tr>
<th>Country income level</th>
<th>Schooling level</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low income</td>
<td>Primary</td>
<td>74.7</td>
<td>76.8</td>
<td>78.7</td>
<td>80.3</td>
<td>81.0</td>
<td>81.1</td>
<td>82.0</td>
<td>82.6</td>
<td>82.8</td>
</tr>
<tr>
<td></td>
<td>Secondary</td>
<td>29.6</td>
<td>30.9</td>
<td>31.8</td>
<td>33.0</td>
<td>34.3</td>
<td>35.5</td>
<td>36.2</td>
<td>37.1</td>
<td>37.1</td>
</tr>
<tr>
<td></td>
<td>Tertiary</td>
<td>5.3</td>
<td>5.7</td>
<td>6.2</td>
<td>6.8</td>
<td>7.6</td>
<td>8.4</td>
<td>9.0</td>
<td>9.1</td>
<td>9.1</td>
</tr>
<tr>
<td>Lower middle income</td>
<td>Primary</td>
<td>83.7</td>
<td>84.7</td>
<td>86.6</td>
<td>86.3</td>
<td>86.9</td>
<td>87.3</td>
<td>87.0</td>
<td>86.9</td>
<td>86.6</td>
</tr>
<tr>
<td></td>
<td>Secondary</td>
<td>48.3</td>
<td>49.4</td>
<td>51.4</td>
<td>53.0</td>
<td>53.0</td>
<td>55.3</td>
<td>57.8</td>
<td>59.6</td>
<td>59.7</td>
</tr>
<tr>
<td></td>
<td>Tertiary</td>
<td>14.0</td>
<td>14.6</td>
<td>15.7</td>
<td>17.1</td>
<td>17.9</td>
<td>19.1</td>
<td>21.8</td>
<td>23.0</td>
<td>23.2</td>
</tr>
<tr>
<td>Upper middle income</td>
<td>Primary</td>
<td>94.7</td>
<td>94.1</td>
<td>94.6</td>
<td>94.5</td>
<td>94.5</td>
<td>94.4</td>
<td>94.4</td>
<td>94.2</td>
<td>94.3</td>
</tr>
<tr>
<td></td>
<td>Secondary</td>
<td>64.2</td>
<td>66.1</td>
<td>68.6</td>
<td>71.0</td>
<td>73.3</td>
<td>75.4</td>
<td>77.4</td>
<td>78.5</td>
<td>80.5</td>
</tr>
<tr>
<td></td>
<td>Tertiary</td>
<td>23.7</td>
<td>25.2</td>
<td>26.1</td>
<td>27.2</td>
<td>28.7</td>
<td>30.4</td>
<td>31.9</td>
<td>34.2</td>
<td>36.6</td>
</tr>
</tbody>
</table>


Note: Net enrollment ratios for primary and secondary; gross enrollment rate for tertiary

For lower middle income countries the private returns are at high at every level. Net primary enrollment for lower middle income countries is 87 percent, so there is justification for further expansion. For upper middle income countries private returns are high only at the tertiary level. Enrollment is near universal at the primary level, though it has stagnated at 94 percent since 2005. The returns to secondary are low, but the enrollment ratio at secondary is increasing rapidly, from only 64 percent in 2005 to over 80 percent today. Given the high private and relatively high social returns to tertiary education in upper middle income countries, an additional push at the secondary level to improve access for the poor would make sense, so that they may be able to take advantage of high private returns to tertiary education.

Policy implications

The pattern of the returns to education have several policy implications. Focusing on the social returns to education, primary education is an investment priority in low income countries, followed by secondary and tertiary in this order. This finding in in line with previous findings in the literature (Psacharopoulos and Patrinos 2004; Montenegro and Patrinos 2014). The range of social returns to education from 12 to 17 percent in low income countries is well above any alternative investment (Table 4 and Figure 2).
Table 4: Long Term Returns to Alternative Investments

<table>
<thead>
<tr>
<th>Investment type</th>
<th>Return (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>12 - 17</td>
</tr>
<tr>
<td>Long term bonds</td>
<td>2.7</td>
</tr>
<tr>
<td>Bank deposits</td>
<td>4.6</td>
</tr>
<tr>
<td>Stocks</td>
<td>4.6</td>
</tr>
<tr>
<td>Housing</td>
<td>2.8</td>
</tr>
</tbody>
</table>

Source: Education from, Table 3, primary, low income countries; Alternative investments from http://money.cnn.com/calculator/pf/home-rate-of-return/; http://data.worldbank.org/indicator/FR.INR.DPST; stern.nyu.edu/

Figure 2: Returns to Alternative Investments (percent)

Note: Education returns, average of private and social returns in low income countries

The difference between private and social rates of return, especially for tertiary education, calls for innovative financing mechanisms that will expand access and effective demand for enrollment, especially among the poor (Psacharopoulos, Jimenez and Tan 1985). Such mechanisms may include but are not limited to: selective cost-recovery, income contingent loans, human capital contracts, social impact bonds and conditional cash transfers.

To expand access and quality at the secondary level alternative models may be needed to reach the poor in remote and rural areas. Special measures may be needed to increase enrollment among ethnic minorities and indigenous peoples in some countries, such as bilingual education or tailor made delivery modes. Selected scholarships will play a role, especially for enticing girls to enter non-traditional fields at the upper secondary level. The much higher cost for secondary education, especially at the upper level, may require the use of public-private partnerships – for example, industry links for skills formation and charter schools to reach the poor and disadvantaged, vouchers and scholarships to encourage enrollment to complete secondary.
References


Annex 1: Average Age-Earnings Profiles

Low income countries
$US

Upper middle income countries
$US

Low middle income countries
$US
Annex 2: Smoothed Age-Earnings Profiles by Level of Education

Low income countries ($US)

<table>
<thead>
<tr>
<th>Age</th>
<th>No school</th>
<th>Primary</th>
<th>Secondary</th>
<th>Tertiary</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>179</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>191</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>202</td>
<td>207</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>213</td>
<td>231</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>224</td>
<td>254</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>234</td>
<td>276</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>244</td>
<td>298</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>253</td>
<td>319</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>262</td>
<td>340</td>
<td>646</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>273</td>
<td>359</td>
<td>864</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>279</td>
<td>378</td>
<td>882</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>287</td>
<td>396</td>
<td>699</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>295</td>
<td>414</td>
<td>716</td>
<td>1361</td>
</tr>
<tr>
<td>25</td>
<td>302</td>
<td>431</td>
<td>732</td>
<td>1439</td>
</tr>
<tr>
<td>26</td>
<td>309</td>
<td>447</td>
<td>748</td>
<td>1512</td>
</tr>
<tr>
<td>27</td>
<td>315</td>
<td>462</td>
<td>764</td>
<td>1582</td>
</tr>
<tr>
<td>28</td>
<td>321</td>
<td>476</td>
<td>779</td>
<td>1648</td>
</tr>
<tr>
<td>29</td>
<td>327</td>
<td>490</td>
<td>793</td>
<td>1710</td>
</tr>
<tr>
<td>30</td>
<td>332</td>
<td>503</td>
<td>807</td>
<td>1769</td>
</tr>
<tr>
<td>31</td>
<td>337</td>
<td>516</td>
<td>820</td>
<td>1823</td>
</tr>
<tr>
<td>32</td>
<td>342</td>
<td>528</td>
<td>833</td>
<td>1874</td>
</tr>
<tr>
<td>33</td>
<td>346</td>
<td>538</td>
<td>846</td>
<td>1921</td>
</tr>
<tr>
<td>34</td>
<td>350</td>
<td>549</td>
<td>858</td>
<td>1964</td>
</tr>
<tr>
<td>35</td>
<td>353</td>
<td>558</td>
<td>869</td>
<td>2003</td>
</tr>
<tr>
<td>36</td>
<td>356</td>
<td>567</td>
<td>881</td>
<td>2038</td>
</tr>
<tr>
<td>37</td>
<td>359</td>
<td>575</td>
<td>891</td>
<td>2070</td>
</tr>
<tr>
<td>38</td>
<td>361</td>
<td>582</td>
<td>901</td>
<td>2097</td>
</tr>
<tr>
<td>39</td>
<td>363</td>
<td>589</td>
<td>911</td>
<td>2121</td>
</tr>
<tr>
<td>40</td>
<td>364</td>
<td>595</td>
<td>920</td>
<td>2141</td>
</tr>
<tr>
<td>41</td>
<td>365</td>
<td>600</td>
<td>928</td>
<td>2157</td>
</tr>
<tr>
<td>42</td>
<td>366</td>
<td>604</td>
<td>937</td>
<td>2170</td>
</tr>
<tr>
<td>43</td>
<td>366</td>
<td>608</td>
<td>944</td>
<td>2178</td>
</tr>
<tr>
<td>44</td>
<td>366</td>
<td>611</td>
<td>951</td>
<td>2183</td>
</tr>
<tr>
<td>45</td>
<td>366</td>
<td>613</td>
<td>958</td>
<td>2184</td>
</tr>
<tr>
<td>46</td>
<td>365</td>
<td>615</td>
<td>964</td>
<td>2183</td>
</tr>
<tr>
<td>47</td>
<td>364</td>
<td>616</td>
<td>970</td>
<td>2174</td>
</tr>
<tr>
<td>48</td>
<td>362</td>
<td>616</td>
<td>975</td>
<td>2163</td>
</tr>
<tr>
<td>49</td>
<td>360</td>
<td>615</td>
<td>980</td>
<td>2149</td>
</tr>
<tr>
<td>50</td>
<td>358</td>
<td>614</td>
<td>984</td>
<td>2130</td>
</tr>
<tr>
<td>51</td>
<td>355</td>
<td>612</td>
<td>988</td>
<td>2108</td>
</tr>
<tr>
<td>52</td>
<td>352</td>
<td>609</td>
<td>991</td>
<td>2082</td>
</tr>
<tr>
<td>53</td>
<td>349</td>
<td>605</td>
<td>994</td>
<td>2052</td>
</tr>
<tr>
<td>54</td>
<td>345</td>
<td>601</td>
<td>996</td>
<td>2019</td>
</tr>
<tr>
<td>55</td>
<td>341</td>
<td>596</td>
<td>998</td>
<td>1983</td>
</tr>
<tr>
<td>56</td>
<td>336</td>
<td>590</td>
<td>999</td>
<td>1940</td>
</tr>
<tr>
<td>57</td>
<td>331</td>
<td>584</td>
<td>1000</td>
<td>1895</td>
</tr>
<tr>
<td>58</td>
<td>326</td>
<td>577</td>
<td>1000</td>
<td>1846</td>
</tr>
<tr>
<td>59</td>
<td>320</td>
<td>569</td>
<td>1000</td>
<td>1793</td>
</tr>
<tr>
<td>60</td>
<td>314</td>
<td>560</td>
<td>1000</td>
<td>1737</td>
</tr>
<tr>
<td>61</td>
<td>307</td>
<td>551</td>
<td>998</td>
<td>1676</td>
</tr>
<tr>
<td>62</td>
<td>300</td>
<td>541</td>
<td>997</td>
<td>1612</td>
</tr>
<tr>
<td>63</td>
<td>293</td>
<td>530</td>
<td>995</td>
<td>1544</td>
</tr>
<tr>
<td>64</td>
<td>285</td>
<td>519</td>
<td>992</td>
<td>1472</td>
</tr>
<tr>
<td>65</td>
<td>277</td>
<td>507</td>
<td>989</td>
<td>1396</td>
</tr>
<tr>
<td>Age</td>
<td>No school</td>
<td>Primary</td>
<td>Secondary</td>
<td>Tertiary</td>
</tr>
<tr>
<td>-----</td>
<td>-----------</td>
<td>---------</td>
<td>-----------</td>
<td>----------</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>479</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>506</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>533</td>
<td>599</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>559</td>
<td>638</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>583</td>
<td>675</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>607</td>
<td>711</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>630</td>
<td>746</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>652</td>
<td></td>
<td>902</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>673</td>
<td>780</td>
<td>1198</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>693</td>
<td>843</td>
<td>1054</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>712</td>
<td>873</td>
<td>1127</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>730</td>
<td></td>
<td>1266</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>747</td>
<td></td>
<td>2088</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>763</td>
<td>956</td>
<td>1332</td>
<td>2180</td>
</tr>
<tr>
<td>26</td>
<td>778</td>
<td>981</td>
<td>1395</td>
<td>2269</td>
</tr>
<tr>
<td>27</td>
<td>792</td>
<td>1005</td>
<td>1456</td>
<td>2356</td>
</tr>
<tr>
<td>28</td>
<td>806</td>
<td>1028</td>
<td>1515</td>
<td>2441</td>
</tr>
<tr>
<td>29</td>
<td>818</td>
<td>1049</td>
<td>1571</td>
<td>2525</td>
</tr>
<tr>
<td>30</td>
<td>830</td>
<td>1069</td>
<td>1625</td>
<td>2606</td>
</tr>
<tr>
<td>31</td>
<td>840</td>
<td>1088</td>
<td>1676</td>
<td>2686</td>
</tr>
<tr>
<td>32</td>
<td>850</td>
<td>1106</td>
<td>1725</td>
<td>2764</td>
</tr>
<tr>
<td>33</td>
<td>858</td>
<td>1123</td>
<td>1772</td>
<td>2840</td>
</tr>
<tr>
<td>34</td>
<td>866</td>
<td>1138</td>
<td>1816</td>
<td>2914</td>
</tr>
<tr>
<td>35</td>
<td>872</td>
<td>1152</td>
<td>1858</td>
<td>2986</td>
</tr>
<tr>
<td>36</td>
<td>878</td>
<td>1160</td>
<td>1897</td>
<td>3056</td>
</tr>
<tr>
<td>37</td>
<td>883</td>
<td>1177</td>
<td>1934</td>
<td>3124</td>
</tr>
<tr>
<td>38</td>
<td>887</td>
<td>1187</td>
<td>1969</td>
<td>3190</td>
</tr>
<tr>
<td>39</td>
<td>890</td>
<td>1197</td>
<td>2001</td>
<td>3255</td>
</tr>
<tr>
<td>40</td>
<td>891</td>
<td>1200</td>
<td>2030</td>
<td>3317</td>
</tr>
<tr>
<td>41</td>
<td>892</td>
<td>1211</td>
<td>2058</td>
<td>3378</td>
</tr>
<tr>
<td>42</td>
<td>892</td>
<td>1217</td>
<td>2083</td>
<td>3437</td>
</tr>
<tr>
<td>43</td>
<td>892</td>
<td>1221</td>
<td>2105</td>
<td>3494</td>
</tr>
<tr>
<td>44</td>
<td>890</td>
<td>1224</td>
<td>2125</td>
<td>3548</td>
</tr>
<tr>
<td>45</td>
<td>887</td>
<td>1226</td>
<td>2143</td>
<td>3602</td>
</tr>
<tr>
<td>46</td>
<td>883</td>
<td>1227</td>
<td>2158</td>
<td>3653</td>
</tr>
<tr>
<td>47</td>
<td>878</td>
<td>1227</td>
<td>2171</td>
<td>3702</td>
</tr>
<tr>
<td>48</td>
<td>873</td>
<td>1223</td>
<td>2181</td>
<td>3749</td>
</tr>
<tr>
<td>49</td>
<td>866</td>
<td>1222</td>
<td>2189</td>
<td>3795</td>
</tr>
<tr>
<td>50</td>
<td>858</td>
<td>1218</td>
<td>2195</td>
<td>3838</td>
</tr>
<tr>
<td>51</td>
<td>850</td>
<td>1212</td>
<td>2198</td>
<td>3880</td>
</tr>
<tr>
<td>52</td>
<td>840</td>
<td>1206</td>
<td>2199</td>
<td>3919</td>
</tr>
<tr>
<td>53</td>
<td>830</td>
<td>1198</td>
<td>2198</td>
<td>3957</td>
</tr>
<tr>
<td>54</td>
<td>819</td>
<td>1189</td>
<td>2194</td>
<td>3993</td>
</tr>
<tr>
<td>55</td>
<td>806</td>
<td>1178</td>
<td>2187</td>
<td>4027</td>
</tr>
<tr>
<td>56</td>
<td>793</td>
<td>1167</td>
<td>2178</td>
<td>4059</td>
</tr>
<tr>
<td>57</td>
<td>779</td>
<td>1154</td>
<td>2167</td>
<td>4090</td>
</tr>
<tr>
<td>58</td>
<td>764</td>
<td>1140</td>
<td>2153</td>
<td>4118</td>
</tr>
<tr>
<td>59</td>
<td>748</td>
<td>1125</td>
<td>2137</td>
<td>4144</td>
</tr>
<tr>
<td>60</td>
<td>730</td>
<td>1110</td>
<td>2119</td>
<td>4169</td>
</tr>
<tr>
<td>61</td>
<td>712</td>
<td>1091</td>
<td>2098</td>
<td>4191</td>
</tr>
<tr>
<td>62</td>
<td>693</td>
<td>1072</td>
<td>2075</td>
<td>4212</td>
</tr>
<tr>
<td>63</td>
<td>674</td>
<td>1052</td>
<td>2049</td>
<td>4231</td>
</tr>
<tr>
<td>64</td>
<td>653</td>
<td>1031</td>
<td>2021</td>
<td>4248</td>
</tr>
<tr>
<td>65</td>
<td>631</td>
<td>1008</td>
<td>1991</td>
<td>4263</td>
</tr>
</tbody>
</table>
### Upper middle income countries ($US)

<table>
<thead>
<tr>
<th>Age</th>
<th>No school</th>
<th>Primary</th>
<th>Secondary</th>
<th>Tertiary</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>1979</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>2107</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>2230</td>
<td>2485</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>2349</td>
<td>2666</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>2462</td>
<td>2644</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>2570</td>
<td>2719</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>2672</td>
<td>2791</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>2770</td>
<td>2860</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>2863</td>
<td>2925</td>
<td>3297</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>2951</td>
<td>2989</td>
<td>3399</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>3033</td>
<td>3049</td>
<td>3498</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>3111</td>
<td>3106</td>
<td>3594</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>3183</td>
<td>3160</td>
<td>3687</td>
<td>5614</td>
</tr>
<tr>
<td>25</td>
<td>3250</td>
<td>3211</td>
<td>3776</td>
<td>5916</td>
</tr>
<tr>
<td>26</td>
<td>3313</td>
<td>3319</td>
<td>3863</td>
<td>6210</td>
</tr>
<tr>
<td>27</td>
<td>3370</td>
<td>3305</td>
<td>3946</td>
<td>6495</td>
</tr>
<tr>
<td>28</td>
<td>3422</td>
<td>3347</td>
<td>4026</td>
<td>6771</td>
</tr>
<tr>
<td>29</td>
<td>3469</td>
<td>3386</td>
<td>4103</td>
<td>7038</td>
</tr>
<tr>
<td>30</td>
<td>3510</td>
<td>3423</td>
<td>4177</td>
<td>7297</td>
</tr>
<tr>
<td>31</td>
<td>3547</td>
<td>3456</td>
<td>4248</td>
<td>7547</td>
</tr>
<tr>
<td>32</td>
<td>3579</td>
<td>3487</td>
<td>4316</td>
<td>7788</td>
</tr>
<tr>
<td>33</td>
<td>3605</td>
<td>3514</td>
<td>4381</td>
<td>8020</td>
</tr>
<tr>
<td>34</td>
<td>3627</td>
<td>3539</td>
<td>4442</td>
<td>8244</td>
</tr>
<tr>
<td>35</td>
<td>3643</td>
<td>3561</td>
<td>4501</td>
<td>8459</td>
</tr>
<tr>
<td>36</td>
<td>3655</td>
<td>3579</td>
<td>4556</td>
<td>8665</td>
</tr>
<tr>
<td>37</td>
<td>3661</td>
<td>3595</td>
<td>4608</td>
<td>8863</td>
</tr>
<tr>
<td>38</td>
<td>3662</td>
<td>3608</td>
<td>4657</td>
<td>9052</td>
</tr>
<tr>
<td>39</td>
<td>3658</td>
<td>3618</td>
<td>4703</td>
<td>9232</td>
</tr>
<tr>
<td>40</td>
<td>3649</td>
<td>3625</td>
<td>4746</td>
<td>9403</td>
</tr>
<tr>
<td>41</td>
<td>3639</td>
<td>3629</td>
<td>4785</td>
<td>9586</td>
</tr>
<tr>
<td>42</td>
<td>3616</td>
<td>3630</td>
<td>4822</td>
<td>9720</td>
</tr>
<tr>
<td>43</td>
<td>3591</td>
<td>3628</td>
<td>4855</td>
<td>9865</td>
</tr>
<tr>
<td>44</td>
<td>3562</td>
<td>3622</td>
<td>4886</td>
<td>10002</td>
</tr>
<tr>
<td>45</td>
<td>3528</td>
<td>3615</td>
<td>4913</td>
<td>10129</td>
</tr>
<tr>
<td>46</td>
<td>3488</td>
<td>3604</td>
<td>4937</td>
<td>10248</td>
</tr>
<tr>
<td>47</td>
<td>3443</td>
<td>3590</td>
<td>4958</td>
<td>10359</td>
</tr>
<tr>
<td>48</td>
<td>3394</td>
<td>3574</td>
<td>4976</td>
<td>10460</td>
</tr>
<tr>
<td>49</td>
<td>3339</td>
<td>3554</td>
<td>4991</td>
<td>10553</td>
</tr>
<tr>
<td>50</td>
<td>3279</td>
<td>3531</td>
<td>5002</td>
<td>10637</td>
</tr>
<tr>
<td>51</td>
<td>3214</td>
<td>3506</td>
<td>5011</td>
<td>10733</td>
</tr>
<tr>
<td>52</td>
<td>3144</td>
<td>3477</td>
<td>5016</td>
<td>10779</td>
</tr>
<tr>
<td>53</td>
<td>3069</td>
<td>3446</td>
<td>5019</td>
<td>10837</td>
</tr>
<tr>
<td>54</td>
<td>2988</td>
<td>3411</td>
<td>5018</td>
<td>10886</td>
</tr>
<tr>
<td>55</td>
<td>2903</td>
<td>3374</td>
<td>5014</td>
<td>10927</td>
</tr>
<tr>
<td>56</td>
<td>2813</td>
<td>3334</td>
<td>5007</td>
<td>10959</td>
</tr>
<tr>
<td>57</td>
<td>2717</td>
<td>3280</td>
<td>4996</td>
<td>11082</td>
</tr>
<tr>
<td>58</td>
<td>2617</td>
<td>3244</td>
<td>4983</td>
<td>10996</td>
</tr>
<tr>
<td>59</td>
<td>2511</td>
<td>3195</td>
<td>4967</td>
<td>11001</td>
</tr>
<tr>
<td>60</td>
<td>2400</td>
<td>3143</td>
<td>4947</td>
<td>11090</td>
</tr>
<tr>
<td>61</td>
<td>2284</td>
<td>3088</td>
<td>4925</td>
<td>10986</td>
</tr>
<tr>
<td>62</td>
<td>2163</td>
<td>3030</td>
<td>4899</td>
<td>10966</td>
</tr>
<tr>
<td>63</td>
<td>2037</td>
<td>2969</td>
<td>4870</td>
<td>10936</td>
</tr>
<tr>
<td>64</td>
<td>1906</td>
<td>2905</td>
<td>4838</td>
<td>10898</td>
</tr>
<tr>
<td>65</td>
<td>1770</td>
<td>2838</td>
<td>4803</td>
<td>10852</td>
</tr>
</tbody>
</table>