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***Research article***

**Does human capital investment influence unemployment rate in Bangladesh: a fresh analysis**

**Mahinur Begum Mimi, Md. Ahasan Ul Haque and Md. Golam Kibria\***

Department of Economics, Noakhali Science and Technology University, Noakhali-3814, Bangladesh

**\*Correspondence:** Email: kibria.econ@nstu.edu.bd.

**Supplementary**

**Appendix**

**Table A1.** Variables descriptions and data sources.

|  |  |  |
| --- | --- | --- |
| Variables | Description | Source |
| HE | Unemployment, total (% of total labor force) (modeled ILO estimate) | WDI (2021) |
| EE | Government expenditure on health, total (% of GDP) | WDI (2021), Bangladesh Statistical Year Book (2020) |
| PG | Government expenditure on education, total (% of GDP) | WDI (2021), Bangladesh Statistical Year Book (2020) |
| GG | Population growth (annual %) | WDI (2021) |
| IF | GDP growth (annual % | WDI (2021) |
| HE | Inflation, GDP deflator (annual %) | WDI (2021) |

Notes: WDI: World Development Indicators.

**Table A2.** Descriptive statistics.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variables Name | Obs | Mean | Std. Dev. | Min | Max |
| HE | 25 | 3.828 | 0.6831988 | 2.47 | 5 |
| EE | 25 | 2.284 | 0.1794009 | 1.99 | 2.57 |
| PG | 25 | 2.023 | 0.2245708 | 1.54 | 2.47 |
| GG | 25 | 1.478 | 0.4184864 | 1.03 | 2.13 |
| IF | 25 | 5.883 | 1.123653 | 3.83 | 8.15 |
| HE | 25 | 6.244 | 3.061047 | 3.26 | 19.14 |

**Table A3.** Lag selection for ARDL model.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| lag | LL | LR | df | p | FPE | AIC | HQIC | SBIC |
| 0 | −13.2146 |  |  |  | 0.226722 | 1.35377 | 1.36457 | 1.40351 |
| 1 | −9.49426 | 7.4407 | 1 | 0.006 | 0.175063\* | 1.09469\* | 1.11628\* | 1.19417\* |
| 2 | −9.47325 | 0.04201 | 1 | 0.838 | 0.192438 | 1.18793 | 1.22031 | 1.33715 |
| 3 | −9.28729 | 0.37193 | 1 | 0.542 | 0.208522 | 1.26546 | 1.30863 | 1.46441 |
| 4 | −6.74494 | 5.0847\* | 1 | 0.024 | 0.180867 | 1.11857 | 1.17254 | 1.36726 |

Note: Unemployment rate.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| lag | LL | LR | df | p | FPE | AIC | HQIC | SBIC |
| 0 | 8.18689 |  |  |  | 0.029532 | −0.684466 | −0.673671 | −0.634727 |
| 1 | 26.6526 | 36.931\* | 1 | 0.000 | 0.005599\* | −2.34787\* | 2.32628\* | −2.24839\* |
| 2 | 27.542 | 1.7787 | 1 | 0.182 | 0.005666 | −2.33733 | −2.30495 | −2.18812 |
| 3 | 28.234 | 1.384 | 1 | 0.239 | 0.005851 | −2.308 | −2.26482 | −2.10904 |
| 4 | 29.4081 | 2.3482 | 1 | 0.125 | 0.005781 | −2.32458 | −2.27061 | −2.07588 |

Note: Health expenditure.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| lag | LL | LR | df | p | FPE | AIC | HQIC | SBIC |
| 0 | 5.40368 |  |  |  | 0.038496 | −0.419398 | −0.408603 | −0.369659 |
| 1 | 7.4958 | 4.1842\* | 1 | 0.041 | 0.034711\* | −0.52341\* | −0.50182\* | −0.423931\* |
| 2 | 7.49585 | 9.5×10−5 | 1 | 0.992 | 0.038232 | −0.428176 | −0.395792 | −0.278958 |
| 3 | 8.60478 | 2.2179 | 1 | 0.136 | 0.037941 | −0.43855 | −0.395372 | −0.239594 |
| 4 | 8.60508 | 0.0006 | 1 | 0.980 | 0.041924 | −0.343341 | −0.289368 | −0.094645 |

Note: Education expenditure.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| lag | LL | LR | df | p | FPE | AIC | HQIC | SBIC |
| 0 | −6.41621 |  |  |  | 0.118659 | 0.706306 | 0.717101 | 0.756045 |
| 1 | 38.709 | 90.25 | 1 | 0.000 | 0.001776 | −3.4961 | −3.47451 | −3.39662 |
| 2 | 56.7449 | 36.072 | 1 | 0.000 | 0.000351 | −5.11856 | −5.08618 | −4.96934 |
| 3 | 68.6633 | 23.837 | 1 | 0.000 | 0.000124 | −6.15841 | −6.11523 | −5.95945 |
| 4 | 72.0483 | 6.7701\* | 1 | 0.000 | 0.0001\* | −6.38556\* | −6.33158\* | −6.13686\* |

Note: Population growth.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| lag | LL | LR | df | p | FPE | AIC | HQIC | SBIC |
| 0 | −31.4502 |  |  |  | 1.28749 | 3.0905 | 3.10129 | 3.14024 |
| 1 | −20.6408 | 21.619\* | 1 | 0.000 | 0.506094\* | 2.15627\* | 2.17785\* | 2.25574\* |
| 2 | −20.4361 | 0.40927 | 1 | 0.522 | 0.546678 | 2.23201 | 2.2644 | 2.38123 |
| 3 | −20.2943 | 0.28377 | 1 | 0.594 | 0.594861 | 2.31374 | 2.35692 | 2.5127 |
| 4 | −19.7321 | 1.1243 | 1 | 0.289 | 0.623056 | 2.35544 | 2.40941 | 2.60414 |

Note: GDP growth.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| lag | LL | LR | df | p | FPE | AIC | HQIC | SBIC |
| 0 | −37.7549 |  |  |  | 2.347 | 3.69094 | 3.70174 | 3.74068 |
| 1 | −27.4435 | 20.623\* | 1 | 0.000 | 0.967384\* | 2.80414\* | 2.82573\* | 2.90362\* |
| 2 | −27.3544 | 0.17817 | 1 | 0.673 | 1.05652 | 2.89089 | 2.92328 | 3.04011 |
| 3 | −26.598 | 1.5128 | 1 | 0.219 | 1.08429 | 2.91409 | 2.95727 | 3.11305 |
| 4 | −26.4153 | 0.36528 | 1 | 0.546 | 1.17748 | 2.99193 | 3.04591 | 3.24063 |

Note: Inflation.

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