# A Global Analysis of Progress in Household Electrification: **Supporting Information**

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## S1 Introduction

This file contains the supplementary material for "A Global Analysis of Progress in Household Electrification." See our Harvard Dataverse page for data and replication material (`https://dataverse.harvard.edu/dataverse/electrification`).

## S2 Supplementary Tables

**Panel A: New Database**

| Region | Countries | Total Elec | Urban Elec | Rural Elec |
|---|---|---|---|---|
| Caribbean | 7 | 48 | 30 | 30 |
| Central America | 8 | 94 | 81 | 79 |
| Eastern Africa | 16 | 134 | 97 | 100 |
| Eastern Asia | 2 | 6 | 5 | 16 |
| Eastern Europe | 2 | 8 | 7 | 7 |
| Melanesia | 3 | 10 | 10 | 10 |
| Middle Africa | 8 | 33 | 27 | 26 |
| Northern Africa | 7 | 57 | 39 | 39 |
| South America | 12 | 164 | 119 | 137 |
| South-Eastern Asia | 11 | 117 | 51 | 60 |
| Southern Africa | 5 | 53 | 28 | 30 |
| Southern Asia | 8 | 73 | 43 | 46 |
| Southern Europe | 8 | 13 | 5 | 5 |
| Western Africa | 16 | 147 | 106 | 121 |
| Western Asia | 11 | 51 | 18 | 17 |

**Panel B: Existing World Bank Database**

| Region | Countries | Total Elec | Urban Elec | Rural Elec |
|---|---|---|---|---|
| Caribbean | 7 | 165 | 165 | 165 |
| Central America | 8 | 200 | 200 | 200 |
| Eastern Africa | 16 | 395 | 376 | 376 |
| Eastern Asia | 2 | 50 | 50 | 50 |
| Eastern Europe | 2 | 50 | 50 | 50 |
| Melanesia | 3 | 73 | 66 | 66 |
| Middle Africa | 8 | 198 | 191 | 192 |
| Northern Africa | 7 | 163 | 159 | 159 |
| South America | 12 | 300 | 275 | 275 |
| South-Eastern Asia | 11 | 274 | 258 | 258 |
| Southern Africa | 5 | 116 | 112 | 113 |
| Southern Asia | 8 | 198 | 193 | 193 |
| Southern Europe | 8 | 200 | 175 | 200 |
| Western Africa | 16 | 371 | 354 | 371 |
| Western Asia | 11 | 233 | 233 | 233 |

Table S1: Summary of the collected data. Panels A & B show information on the new and the existing World Bank data (restricted to those countries for which we collected total electrification rate data) respectively. The Countries column is the number of countries within a specific region; the Total Elec, Urban Elec, and Rural Elec columns are the number of country-years of available data for total, urban and rural electrification within each region.

| | Mean | Median | S.D. | Min. | Max | Obs. |
|---|---|---|---|---|---|---|
| Total Electrification (AHU) | 51.65 | 47.0 | 34.3 | 0.2 | 100.0 | 961 |
| Rural Electrification (AHU) | 32.60 | 18.6 | 33.8 | 0.0 | 100.0 | 647 |
| Urban Electrification (AHU) | 70.48 | 78.0 | 26.7 | 0.5 | 100.0 | 596 |
| Deviation from GDP Trend (Total Elec.) | 0.92 | 0.6 | 19.7 | -63.7 | 58.1 | 900 |
| Deviation from GDP Trend (Rural Elec.) | -0.04 | -4.1 | 25.4 | -62.4 | 73.4 | 621 |
| Deviation from GDP Trend (Urban Elec.) | 0.92 | 4.5 | 19.8 | -69.6 | 45.0 | 567 |
| Population Density (k/sqkm) | 0.15 | 0.1 | 0.5 | 0.0 | 7.4 | 1017 |
| Urban Pop. Share | 44.36 | 40.8 | 21.2 | 4.6 | 100.0 | 1024 |
| Oil, Gas, Coal Rents (% of GDP) | 4.88 | 0.1 | 17.5 | 0.0 | 327.3 | 933 |
| Hydro Potential per Capita (log) (kWh/k) | 1.92 | 1.8 | 1.4 | 0.0 | 6.1 | 1023 |
| Democracy | 0.94 | 1.0 | 6.4 | -10.0 | 10.0 | 980 |
| GDP per Capita (log) | 7.49 | 7.4 | 1.1 | 4.9 | 11.2 | 979 |
| Time | 48.50 | 52.0 | 13.4 | 0.0 | 66.0 | 1035 |

Table S2: Summary statistics. The summary statistics are only reported for country-years in which at least one of the three new electrification variables has data. The 99% cutoff used in the manuscript has not been used here.

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Time | 0.75*** | 0.74*** | 0.68*** | 0.77*** |
| | (0.09) | (0.10) | (0.09) | (0.10) |
| Oil Rents (% of GDP) | -0.43*** | | | -0.43*** |
| | (0.15) | | | (0.16) |
| Gas Rents (% of GDP) | | 0.20 | | 1.42 |
| | | (1.19) | | (1.25) |
| Coal Rents (% of GDP) | | | 0.00 | -0.83 |
| | | | (1.26) | (1.42) |
| Constant | -32.24*** | -33.30*** | -32.70*** | -33.28*** |
| | (5.05) | (5.15) | (4.78) | (5.31) |
| Observations | 650 | 644 | 841 | 633 |
| $R^2$ | 0.17 | 0.14 | 0.12 | 0.18 |

Table S3: Dependent variable: observed total electrification rate minus expected electrification rate based on logarithmized GDP per capita. Standard errors clustered by country. * ($p<0.10$), ** ($p<0.05$), *** ($p<0.01$).

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Time | 0.83*** | 0.78*** | 0.73*** | 0.78*** |
| | (0.16) | (0.18) | (0.16) | (0.18) |
| Oil Rents (% of GDP) | -0.43* | | | -0.54** |
| | (0.24) | | | (0.24) |
| Gas Rents (% of GDP) | | 7.00* | | 9.22** |
| | | (3.73) | | (4.08) |
| Coal Rents (% of GDP) | | | 0.14 | -0.18 |
| | | | (1.10) | (1.09) |
| Constant | -36.26*** | -36.64*** | -35.35*** | -34.87*** |
| | (8.46) | (8.54) | (8.17) | (8.98) |
| Observations | 446 | 448 | 573 | 438 |
| $R^2$ | 0.11 | 0.12 | 0.08 | 0.14 |

Table S4: Dependent variable: observed rural electrification rate minus expected electrification rate based on logarithmized GDP per capita. Standard errors clustered by country. * ($p<0.10$), ** ($p<0.05$), *** ($p<0.01$).

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Time | 0.47*** | 0.44*** | 0.36*** | 0.48*** |
| | (0.10) | (0.12) | (0.11) | (0.11) |
| Oil Rents (% of GDP) | -0.59*** | | | -0.56*** |
| | (0.18) | | | (0.19) |
| Gas Rents (% of GDP) | | 2.47 | | 4.80*** |
| | | (1.62) | | (1.62) |
| Coal Rents (% of GDP) | | | 0.70 | 0.01 |
| | | | (0.55) | (0.69) |
| Constant | -16.43*** | -17.34*** | -16.44*** | -17.39*** |
| | (5.77) | (6.49) | (6.00) | (6.14) |
| Observations | 399 | 398 | 519 | 389 |
| $R^2$ | 0.14 | 0.07 | 0.03 | 0.15 |

Table S5: Dependent variable: observed urban electrification rate minus expected electrification rate based on logarithmized GDP per capita. Standard errors clustered by country. * ($p<0.10$), ** ($p<0.05$), *** ($p<0.01$).

| | New Database | | | | | | WB |
|---|---|---|---|---|---|---|---|
| | (1) All | (2) East Asia | (3) Latin America | (4) Middle East/N Africa | (5) South Asia | (6) SSA | (7) All |
| Time | 1.27*** | 1.95*** | 1.08*** | 1.40*** | 1.85*** | 0.98*** | 0.82*** |
| | (0.08) | (0.45) | (0.08) | (0.16) | (0.07) | (0.13) | (0.08) |
| Country FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Observations | 961 | 138 | 223 | 129 | 65 | 383 | 2986 |
| $R^2$ | 0.69 | 0.68 | 0.84 | 0.69 | 0.89 | 0.56 | 0.48 |
| # Countries | 124 | 16 | 27 | 18 | 7 | 46 | 124 |

Table S6: Dependent variable: total electrification rate (0-100%). All observations are included in the analysis, including those after a country reaches a 99% electrification rate. Standard errors clustered by country. * (p<0.10), ** (p<0.05), *** (p<0.01).

| | New Database | | | | | | WB |
|---|---|---|---|---|---|---|---|
| | (1) All | (2) East Asia | (3) Latin America | (4) Middle East/N Africa | (5) South Asia | (6) SSA | (7) All |
| Time | 0.90*** | 1.27** | 0.70*** | 0.82*** | 1.36*** | 1.17*** | 0.71*** |
| | (0.07) | (0.51) | (0.09) | (0.15) | (0.15) | (0.12) | (0.11) |
| Country FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Observations | 596 | 68 | 142 | 62 | 36 | 271 | 2583 |
| $R^2$ | 0.55 | 0.48 | 0.72 | 0.43 | 0.86 | 0.55 | 0.23 |
| # Countries | 110 | 15 | 26 | 12 | 6 | 45 | 109 |

Table S7: Dependent variable: urban electrification rate (0-100%). All observations are included in the analysis, including those after a country reaches a 99% electrification rate. Standard errors clustered by country. * (p<0.10), ** (p<0.05), *** (p<0.01).

| | New Database | | | | | | WB |
|---|---|---|---|---|---|---|---|
| | (1) All | (2) East Asia | (3) Latin America | (4) Middle East/N Africa | (5) South Asia | (6) SSA | (7) All |
| Time | 1.51*** | 1.94*** | 1.57*** | 2.25*** | 2.11*** | 0.66*** | 0.85*** |
| | (0.10) | (0.29) | (0.14) | (0.21) | (0.16) | (0.13) | (0.10) |
| Country FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Observations | 647 | 85 | 158 | 63 | 37 | 289 | 2607 |
| $R^2$ | 0.70 | 0.79 | 0.82 | 0.85 | 0.86 | 0.37 | 0.38 |
| # Countries | 111 | 15 | 25 | 13 | 6 | 46 | 110 |

Table S8: Dependent variable: rural electrification rate (0-100%). All observations are included in the analysis, including those after a country reaches a 99% electrification rate. Standard errors clustered by country. * (p<0.10), ** (p<0.05), *** (p<0.01).

| | New Database | | | | | | WB |
|---|---|---|---|---|---|---|---|
| | (1) All | (2) East/ Southeast Asia | (3) Latin America | (4) Middle East N Africa | (5) South Asia | (6) SSA | (7) All |
| **Panel A: Total Electrification** | | | | | | | |
| Time | 1.33*** | 1.98*** | 0.96*** | 2.02** | 2.53*** | 1.12*** | 1.15*** |
| | (0.13) | (0.46) | (0.13) | (0.79) | (0.25) | (0.16) | (0.10) |
| Country FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Observations | 680 | 89 | 138 | 59 | 49 | 343 | 680 |
| $R^2$ | 0.54 | 0.58 | 0.71 | 0.50 | 0.88 | 0.56 | 0.62 |
| # Countries | 106 | 14 | 26 | 11 | 7 | 46 | 106 |
| **Panel B: Rural Electrification** | | | | | | | |
| Time | 1.33*** | 1.12*** | 2.16*** | 2.40*** | 2.48*** | 0.65*** | 1.27*** |
| | (0.17) | (0.27) | (0.26) | (0.69) | (0.41) | (0.14) | (0.17) |
| Country FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Observations | 492 | 59 | 105 | 39 | 27 | 261 | 492 |
| $R^2$ | 0.48 | 0.53 | 0.78 | 0.66 | 0.77 | 0.30 | 0.50 |
| # Countries | 97 | 14 | 20 | 10 | 6 | 46 | 97 |
| **Panel C: Urban Electrification** | | | | | | | |
| Time | 1.09*** | 0.92* | 0.30*** | 0.93* | 0.96** | 1.29*** | 1.09*** |
| | (0.14) | (0.47) | (0.09) | (0.40) | (0.27) | (0.19) | (0.16) |
| Country FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Observations | 371 | 39 | 50 | 21 | 27 | 234 | 371 |
| $R^2$ | 0.39 | 0.31 | 0.27 | 0.14 | 0.63 | 0.49 | 0.34 |
| # Countries | 82 | 13 | 15 | 5 | 6 | 43 | 82 |

Table S9: Dependent variable: electrification rate (0-100%). The sample is limited to observations present in the World Bank data and in the new database. Once a country reached an electrification rate above 99%, additional observations are dropped from the analysis. This criterion is applied separately for total, rural, and urban electrification rate. Eastern European countries are not analyzed as a separate region, but are included in Model (1). Standard errors clustered by country. * (p<0.10), ** (p<0.05), *** (p<0.01).

**Panel A: Total Electrification**

| | New Database | | | | | | WB |
|---|---|---|---|---|---|---|---|
| | (1) All | (2) East Asia | (3) Latin America | (4) Middle East/N Africa | (5) South Asia | (6) SSA | (7) All |
| 5 Years | 1.20*** | 1.86*** | 1.06*** | 1.38*** | 1.76*** | 0.89*** | 0.98*** |
| | (0.06) | (0.29) | (0.08) | (0.17) | (0.11) | (0.12) | (0.08) |
| Observations | 581 | 67 | 167 | 80 | 42 | 209 | 528 |
| $R^2$ | 0.73 | 0.72 | 0.84 | 0.74 | 0.87 | 0.57 | 0.57 |
| Country FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| # Countries | 124 | 16 | 27 | 18 | 7 | 46 | 124 |

**Panel B: Rural Electrification**

| | New Database | | | | | | WB |
|---|---|---|---|---|---|---|---|
| | (1) All | (2) East Asia | (3) Latin America | (4) Middle East/N Africa | (5) South Asia | (6) SSA | (7) All |
| 5 Years | 1.46*** | 1.86*** | 1.47*** | 2.26*** | 2.11*** | 0.63*** | 0.95*** |
| | (0.10) | (0.28) | (0.14) | (0.18) | (0.15) | (0.12) | (0.11) |
| Country FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Observations | 425 | 53 | 110 | 46 | 31 | 173 | 492 |
| $R^2$ | 0.70 | 0.79 | 0.81 | 0.86 | 0.85 | 0.39 | 0.44 |
| # Countries | 111 | 15 | 25 | 13 | 6 | 46 | 110 |

**Panel C: Urban Electrification**

| | New Database | | | | | | WB |
|---|---|---|---|---|---|---|---|
| | (1) All | (2) East Asia | (3) Latin America | (4) Middle East/N Africa | (5) South Asia | (6) SSA | (7) All |
| 5 Years | 0.92*** | 0.98*** | 0.74*** | 0.92*** | 1.37*** | 1.14*** | 1.00*** |
| | (0.06) | (0.23) | (0.10) | (0.20) | (0.14) | (0.10) | (0.14) |
| Country FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Observations | 402 | 45 | 106 | 40 | 31 | 170 | 414 |
| $R^2$ | 0.60 | 0.54 | 0.73 | 0.40 | 0.84 | 0.62 | 0.34 |
| # Countries | 110 | 15 | 26 | 12 | 6 | 45 | 109 |

Table S10: Analysis of the time trends when the data are collapsed by 5 year windows. Each observation is averaged over five year blocks (e.g. 1990-94, 1995-1999, etc.). Standard errors clustered by country. * (p<0.10), ** (p<0.05), *** (p<0.01).

**Panel A: Total Electrification**

| | World Bank Data | | | | | |
|---|---|---|---|---|---|---|
| | (1) All | (2) East Asia | (3) Latin America | (4) Middle East/N Africa | (5) South Asia | (6) SSA |
| Time | 1.02*** | 1.35*** | 0.69*** | 0.59* | 2.35*** | 0.98*** |
| | (0.09) | (0.19) | (0.08) | (0.32) | (0.50) | (0.11) |
| Country FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Observations | 2478 | 332 | 593 | 225 | 173 | 1075 |
| $R^2$ | 0.58 | 0.77 | 0.71 | 0.32 | 0.77 | 0.63 |
| # Countries | 124 | 16 | 27 | 18 | 7 | 46 |

**Panel B: Rural Electrification**

| | World Bank Data | | | | | |
|---|---|---|---|---|---|---|
| | (1) All | (2) East Asia | (3) Latin America | (4) Middle East/N Africa | (5) South Asia | (6) SSA |
| Time | 0.98*** | 1.18*** | 1.28*** | 0.76** | 2.57*** | 0.58*** |
| | (0.11) | (0.37) | (0.17) | (0.33) | (0.50) | (0.13) |
| Country FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Observations | 2337 | 318 | 550 | 254 | 143 | 1051 |
| $R^2$ | 0.43 | 0.44 | 0.68 | 0.37 | 0.81 | 0.29 |
| # Countries | 110 | 15 | 24 | 13 | 6 | 46 |

**Panel C: Urban Electrification**

| | World Bank Data | | | | | |
|---|---|---|---|---|---|---|
| | (1) All | (2) East Asia | (3) Latin America | (4) Middle East/N Africa | (5) South Asia | (6) SSA |
| Time | 1.00*** | 1.25** | 0.43 | 0.18 | 1.71** | 1.11*** |
| | (0.13) | (0.44) | (0.26) | (0.36) | (0.56) | (0.17) |
| Country FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Observations | 1857 | 253 | 352 | 137 | 142 | 956 |
| $R^2$ | 0.34 | 0.33 | 0.11 | 0.06 | 0.53 | 0.43 |
| # Countries | 109 | 15 | 25 | 12 | 6 | 45 |

Table S11: Analysis of regional patterns using solely World Bank data. The sample is limited to observations that are contained in the new dataset. Standard errors clustered by country. * (p<0.10), ** (p<0.05), *** (p<0.01).

**Panel A: Total Electrification**

| | New Database | | | | | | WB |
|---|---|---|---|---|---|---|---|
| | (1) All | (2) East Asia | (3) Latin America | (4) Middle East/N Africa | (5) South Asia | (6) SSA | (7) All |
| Time | 1.23*** | 1.80*** | 0.90*** | 1.36* | 2.53*** | 1.10*** | 1.02*** |
| | (0.13) | (0.47) | (0.12) | (0.65) | (0.25) | (0.15) | (0.09) |
| Country FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Observations | 735 | 93 | 152 | 82 | 49 | 350 | 2478 |
| $R^2$ | 0.51 | 0.53 | 0.68 | 0.36 | 0.88 | 0.54 | 0.58 |
| # Countries | 122 | 16 | 27 | 18 | 7 | 46 | 124 |

**Panel B: Rural Electrification**

| | New Database | | | | | | WB |
|---|---|---|---|---|---|---|---|
| | (1) All | (2) East Asia | (3) Latin America | (4) Middle East/N Africa | (5) South Asia | (6) SSA | (7) All |
| Time | 1.34*** | 1.12*** | 2.15*** | 2.26*** | 2.48*** | 0.72*** | 0.98*** |
| | (0.18) | (0.27) | (0.28) | (0.70) | (0.41) | (0.18) | (0.11) |
| Country FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Observations | 515 | 60 | 111 | 42 | 27 | 269 | 2337 |
| $R^2$ | 0.49 | 0.53 | 0.77 | 0.62 | 0.77 | 0.33 | 0.43 |
| # Countries | 105 | 15 | 21 | 12 | 6 | 46 | 110 |

**Panel C: Urban Electrification**

| | New Database | | | | | | WB |
|---|---|---|---|---|---|---|---|
| | (1) All | (2) East Asia | (3) Latin America | (4) Middle East/N Africa | (5) South Asia | (6) SSA | (7) All |
| Time | 1.00*** | 0.83** | 0.23*** | 0.81* | 0.96** | 1.31*** | 1.00*** |
| | (0.13) | (0.36) | (0.05) | (0.37) | (0.27) | (0.17) | (0.13) |
| Country FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Observations | 440 | 45 | 86 | 30 | 27 | 248 | 1857 |
| $R^2$ | 0.37 | 0.31 | 0.26 | 0.12 | 0.63 | 0.49 | 0.34 |
| # Countries | 102 | 15 | 22 | 10 | 6 | 45 | 109 |

Table S12: Replication of Table **??**, limiting the sample to post-1990 data. The sample is limited to observations that are contained in the new dataset. Standard errors clustered by country. * (p<0.10), ** (p<0.05), *** (p<0.01).

**Panel A: Total Electrification**

| | New Database | | | | | | WB |
|---|---|---|---|---|---|---|---|
| | (1) All | (2) East Asia | (3) Latin America | (4) Middle East/N Africa | (5) South Asia | (6) SSA | (7) All |
| Time | 0.08*** | 0.13*** | 0.07*** | 0.12*** | 0.11*** | 0.07*** | 0.07*** |
| | (0.01) | (0.03) | (0.00) | (0.01) | (0.01) | (0.01) | (0.01) |
| Country FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Observations | 961 | 138 | 223 | 129 | 65 | 383 | 2478 |

**Panel B: Rural Electrification**

| | New Database | | | | | | WB |
|---|---|---|---|---|---|---|---|
| | (1) All | (2) East Asia | (3) Latin America | (4) Middle East/N Africa | (5) South Asia | (6) SSA | (7) All |
| Time | 0.11*** | 0.13*** | 0.10*** | 0.16*** | 0.13*** | 0.09*** | 0.08*** |
| | (0.01) | (0.02) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) |
| Country FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Observations | 647 | 85 | 158 | 63 | 37 | 289 | 2337 |
| $R^2$ | | | | | | | |

**Panel C: Urban Electrification**

| | New Database | | | | | | WB |
|---|---|---|---|---|---|---|---|
| | (1) All | (2) East Asia | (3) Latin America | (4) Middle East/N Africa | (5) South Asia | (6) SSA | (7) All |
| Time | 0.07*** | 0.10*** | 0.07*** | 0.11*** | 0.08*** | 0.06*** | 0.07*** |
| | (0.00) | (0.04) | (0.01) | (0.02) | (0.01) | (0.01) | (0.01) |
| Country FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Observations | 596 | 68 | 142 | 62 | 36 | 271 | 1857 |

Table S13: Fractional response models. All dependent variables rescaled to the [0,1] interval. The sample includes all observations including those that reached 99% electrification rates. Standard errors clustered by country. * (p<0.10), ** (p<0.05), *** (p<0.01).

## Panel A: Total Electrification

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Time | 0.63*** | 0.58*** | 0.62*** | 0.62*** | 0.68*** | 0.63*** | 0.60*** |
| | (0.08) | (0.08) | (0.08) | (0.09) | (0.09) | (0.10) | (0.14) |
| Population Density (k/sqkm) | 23.34*** | | | | | | 28.69** |
| | (8.15) | | | | | | (13.65) |
| Urban Pop. Share | | 0.17*** | | | | | 0.23*** |
| | | (0.06) | | | | | (0.07) |
| Hydro Potential per Capita (log) (kWh/k) | | | -1.53* | | | | -0.05 |
| | | | (0.91) | | | | (0.99) |
| Oil, Gas, Coal Rents (% of GDP) | | | | -0.27* | | | 0.01 |
| | | | | (0.16) | | | (0.23) |
| Nat. Resource Rents (% of GDP) | | | | | -0.51*** | | -0.44** |
| | | | | | (0.11) | | (0.18) |
| Democracy | | | | | | 0.09 | -0.33 |
| | | | | | | (0.27) | (0.30) |
| Constant | -30.70*** | -33.70*** | -25.12*** | -26.93*** | -26.58*** | -28.87*** | -35.65*** |
| | (3.62) | (3.47) | (4.38) | (4.65) | (4.53) | (4.28) | (7.70) |
| Observations | 883 | 890 | 889 | 831 | 819 | 851 | 786 |
| $R^2$ | 0.18 | 0.17 | 0.15 | 0.10 | 0.15 | 0.14 | 0.23 |

## Panel B: Rural Electrification

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Time | 0.71*** | 0.75*** | 0.72*** | 0.65*** | 0.72*** | 0.75*** | 0.65*** |
| | (0.13) | (0.11) | (0.12) | (0.16) | (0.16) | (0.13) | (0.18) |
| Population Density (k/sqkm) | 60.54*** | | | | | | 55.92** |
| | (22.33) | | | | | | (25.65) |
| Urban Pop. Share | | 0.07 | | | | | 0.14 |
| | | (0.12) | | | | | (0.11) |
| Hydro Potential per Capita (log) (kWh/k) | | | -3.45** | | | | -1.33 |
| | | | (1.47) | | | | (1.67) |
| Oil, Gas, Coal Rents (% of GDP) | | | | -0.13 | | | 0.35 |
| | | | | (0.25) | | | (0.33) |
| Nat. Resource Rents (% of GDP) | | | | | -0.48** | | -0.49* |
| | | | | | (0.18) | | (0.27) |
| Democracy | | | | | | 0.05 | -0.22 |
| | | | | | | (0.43) | (0.42) |
| Constant | -37.91*** | -37.56*** | -25.96*** | -28.87*** | -28.80*** | -34.73*** | -34.19*** |
| | (5.95) | (7.68) | (7.38) | (8.38) | (8.26) | (5.76) | (10.30) |
| Observations | 604 | 612 | 612 | 573 | 565 | 601 | 560 |
| $R^2$ | 0.21 | 0.12 | 0.15 | 0.06 | 0.09 | 0.12 | 0.21 |

## Panel C: Urban Electrification

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Time | 0.29*** | 0.29*** | 0.30*** | 0.31*** | 0.39*** | 0.32*** | 0.39*** |
| | (0.09) | (0.09) | (0.09) | (0.11) | (0.11) | (0.10) | (0.15) |
| Population Density (k/sqkm) | 34.59*** | | | | | | 41.43*** |
| | (8.54) | | | | | | (11.98) |
| Urban Pop. Share | | 0.13* | | | | | 0.14* |
| | | (0.08) | | | | | (0.08) |
| Hydro Potential per Capita (log) (kWh/k) | | | -0.62 | | | | 1.07 |
| | | | (1.16) | | | | (1.19) |
| Oil, Gas, Coal Rents (% of GDP) | | | | -0.24 | | | 0.07 |
| | | | | (0.17) | | | (0.31) |
| Nat. Resource Rents (% of GDP) | | | | | -0.43*** | | -0.41 |
| | | | | | (0.15) | | (0.27) |
| Democracy | | | | | | 0.00 | -0.39 |
| | | | | | | (0.26) | (0.28) |
| Constant | -15.42*** | -17.33*** | -11.59** | -12.48** | -13.07** | -13.90*** | -24.65*** |
| | (4.50) | (4.48) | (5.67) | (5.71) | (5.54) | (4.86) | (8.42) |
| Observations | 551 | 559 | 559 | 519 | 511 | 548 | 506 |
| $R^2$ | 0.09 | 0.05 | 0.04 | 0.03 | 0.07 | 0.04 | 0.15 |

Table S14: All independent variables are lagged by three years. Dependent variables: observed total/rural/urban electrification rates minus expected electrification rate based on logarithmized GDP per capita. Two outliers (Singapore and Timor-Leste) are removed from the sample. Standard errors clustered by country. * (p<0.10), ** (p<0.05), *** (p<0.01).

## Panel A: Total Electrification

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Time | 0.63*** | 0.58*** | 0.63*** | 0.65*** | 0.70*** | 0.65*** | 0.64*** |
| | (0.08) | (0.09) | (0.08) | (0.10) | (0.09) | (0.11) | (0.14) |
| Population Density (k/sqkm) | 25.04*** | | | | | | 31.01** |
| | (8.73) | | | | | | (14.70) |
| Urban Pop. Share | | 0.18*** | | | | | 0.24*** |
| | | (0.06) | | | | | (0.07) |
| Hydro Potential per Capita (log) (kWh/k) | | | -1.62* | | | | 0.02 |
| | | | (0.91) | | | | (1.00) |
| Oil, Gas, Coal Rents (% of GDP) | | | | -0.29* | | | 0.05 |
| | | | | (0.15) | | | (0.23) |
| Nat. Resource Rents (% of GDP) | | | | | -0.53*** | | -0.50** |
| | | | | | (0.11) | | (0.20) |
| Democracy | | | | | | 0.06 | -0.38 |
| | | | | | | (0.26) | (0.30) |
| Constant | -29.89*** | -32.52*** | -24.10*** | -26.97*** | -26.15*** | -28.02*** | -36.30*** |
| | (3.56) | (3.58) | (4.46) | (4.70) | (4.62) | (4.61) | (7.84) |
| Observations | 879 | 881 | 880 | 817 | 806 | 839 | 771 |
| $R^2$ | 0.18 | 0.16 | 0.14 | 0.11 | 0.16 | 0.13 | 0.25 |

## Panel B: Rural Electrification

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Time | 0.71*** | 0.74*** | 0.72*** | 0.64*** | 0.70*** | 0.77*** | 0.64*** |
| | (0.13) | (0.13) | (0.13) | (0.17) | (0.17) | (0.14) | (0.18) |
| Population Density (k/sqkm) | 63.47*** | | | | | | 58.68** |
| | (23.32) | | | | | | (26.76) |
| Urban Pop. Share | | 0.08 | | | | | 0.15 |
| | | (0.12) | | | | | (0.12) |
| Hydro Potential per Capita (log) (kWh/k) | | | -3.63** | | | | -1.23 |
| | | | (1.48) | | | | (1.68) |
| Oil, Gas, Coal Rents (% of GDP) | | | | -0.20 | | | 0.35 |
| | | | | (0.25) | | | (0.34) |
| Nat. Resource Rents (% of GDP) | | | | | -0.53*** | | -0.55* |
| | | | | | (0.18) | | (0.30) |
| Democracy | | | | | | -0.01 | -0.26 |
| | | | | | | (0.42) | (0.42) |
| Constant | -36.60*** | -36.08*** | -24.26*** | -26.84*** | -26.48*** | -33.83*** | -32.56*** |
| | (6.03) | (8.01) | (7.70) | (8.74) | (8.68) | (6.25) | (10.25) |
| Observations | 601 | 604 | 604 | 563 | 556 | 592 | 551 |
| $R^2$ | 0.21 | 0.11 | 0.14 | 0.06 | 0.09 | 0.11 | 0.21 |

## Panel C: Urban Electrification

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Time | 0.30*** | 0.30*** | 0.32*** | 0.32** | 0.40*** | 0.35*** | 0.42*** |
| | (0.10) | (0.10) | (0.10) | (0.12) | (0.11) | (0.11) | (0.15) |
| Population Density (k/sqkm) | 36.07*** | | | | | | 42.28*** |
| | (8.77) | | | | | | (12.22) |
| Urban Pop. Share | | 0.13* | | | | | 0.14 |
| | | (0.08) | | | | | (0.08) |
| Hydro Potential per Capita (log) (kWh/k) | | | -0.82 | | | | 1.32 |
| | | | (1.17) | | | | (1.13) |
| Oil, Gas, Coal Rents (% of GDP) | | | | -0.26 | | | 0.19 |
| | | | | (0.18) | | | (0.31) |
| Nat. Resource Rents (% of GDP) | | | | | -0.50*** | | -0.56** |
| | | | | | (0.14) | | (0.26) |
| Democracy | | | | | | -0.01 | -0.43 |
| | | | | | | (0.26) | (0.28) |
| Constant | -15.37*** | -17.30*** | -11.28* | -12.30** | -12.40** | -14.66*** | -25.06*** |
| | (4.54) | (4.75) | (5.94) | (6.06) | (5.71) | (5.23) | (8.49) |
| Observations | 548 | 551 | 551 | 507 | 500 | 539 | 495 |
| $R^2$ | 0.09 | 0.05 | 0.04 | 0.03 | 0.08 | 0.04 | 0.17 |

Table S15: All independent variables are lagged by five years. Dependent variables: observed total/rural/urban electrification rates minus expected electrification rate based on logarithmized GDP per capita. Two outliers (Singapore and Timor-Leste) are removed from the sample. Standard errors clustered by country. * (p<0.10), ** (p<0.05), *** (p<0.01).

## Panel A: Total Electrification

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Time | 0.64*** | 0.58*** | 0.59*** | 0.65*** | 0.68*** | 0.62*** | 0.66*** |
| | (0.07) | (0.07) | (0.07) | (0.09) | (0.09) | (0.09) | (0.13) |
| Population Density (k/sqkm) | 2.03 | | | | | | -0.56 |
| | (2.07) | | | | | | (2.09) |
| Urban Pop. Share | | 0.16*** | | | | | 0.13* |
| | | (0.06) | | | | | (0.07) |
| Hydro Potential per Capita (log) (kWh/k) | | | -1.47 | | | | -1.15 |
| | | | (0.89) | | | | (1.00) |
| Oil, Gas, Coal Rents (% of GDP) | | | | -0.10 | | | 0.38* |
| | | | | (0.06) | | | (0.19) |
| Nat. Resource Rents (% of GDP) | | | | | -0.17* | | -0.49** |
| | | | | | (0.10) | | (0.19) |
| Democracy | | | | | | 0.10 | -0.04 |
| | | | | | | (0.28) | (0.29) |
| Constant | -31.00*** | -34.91*** | -25.85*** | -31.10*** | -31.32*** | -29.91*** | -32.18*** |
| | (3.54) | (3.52) | (4.34) | (4.47) | (4.50) | (4.14) | (6.45) |
| Observations | 905 | 910 | 909 | 859 | 848 | 874 | 816 |
| $R^2$ | 0.15 | 0.17 | 0.15 | 0.12 | 0.13 | 0.14 | 0.18 |

## Panel B: Rural Electrification

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Time | 0.70*** | 0.75*** | 0.71*** | 0.72*** | 0.77*** | 0.76*** | 0.75*** |
| | (0.11) | (0.10) | (0.11) | (0.15) | (0.15) | (0.12) | (0.17) |
| Population Density (k/sqkm) | 56.57*** | | | | | | 52.26** |
| | (20.85) | | | | | | (23.63) |
| Urban Pop. Share | | 0.06 | | | | | 0.13 |
| | | (0.11) | | | | | (0.11) |
| Hydro Potential per Capita (log) (kWh/k) | | | -3.41** | | | | -1.34 |
| | | | (1.47) | | | | (1.66) |
| Oil, Gas, Coal Rents (% of GDP) | | | | -0.10 | | | 0.40 |
| | | | | (0.07) | | | (0.26) |
| Nat. Resource Rents (% of GDP) | | | | | -0.21* | | -0.49* |
| | | | | | (0.12) | | (0.28) |
| Democracy | | | | | | 0.03 | -0.28 |
| | | | | | | (0.45) | (0.45) |
| Constant | -39.76*** | -39.78*** | -27.87*** | -34.76*** | -36.02*** | -37.55*** | -41.28*** |
| | (5.39) | (7.40) | (7.16) | (7.82) | (7.81) | (5.61) | (10.07) |
| Observations | 619 | 624 | 624 | 582 | 574 | 614 | 569 |
| $R^2$ | 0.22 | 0.14 | 0.17 | 0.08 | 0.10 | 0.13 | 0.22 |

## Panel C: Urban Electrification

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| Time | 0.30*** | 0.32*** | 0.32*** | 0.34*** | 0.39*** | 0.34*** | 0.43*** |
| | (0.08) | (0.08) | (0.09) | (0.11) | (0.11) | (0.10) | (0.14) |
| Population Density (k/sqkm) | 32.14*** | | | | | | 39.61*** |
| | (8.20) | | | | | | (11.75) |
| Urban Pop. Share | | 0.12 | | | | | 0.13 |
| | | (0.07) | | | | | (0.08) |
| Hydro Potential per Capita (log) (kWh/k) | | | -0.56 | | | | 0.99 |
| | | | (1.16) | | | | (1.27) |
| Oil, Gas, Coal Rents (% of GDP) | | | | -0.06 | | | 0.32 |
| | | | | (0.14) | | | (0.31) |
| Nat. Resource Rents (% of GDP) | | | | | -0.14 | | -0.37 |
| | | | | | (0.16) | | (0.29) |
| Democracy | | | | | | -0.01 | -0.37 |
| | | | | | | (0.26) | (0.29) |
| Constant | -16.60*** | -19.44*** | -13.54** | -15.21** | -16.80*** | -15.60*** | -27.97*** |
| | (4.21) | (4.45) | (5.68) | (5.98) | (5.67) | (4.63) | (8.58) |
| Observations | 564 | 569 | 569 | 528 | 520 | 559 | 515 |
| $R^2$ | 0.09 | 0.06 | 0.05 | 0.03 | 0.04 | 0.04 | 0.14 |

Table S16: The sample includes the two outliers (Singapore and Timor-Leste), which have been removed in the main analysis. Dependent variables: observed total/rural/urban electrification rates minus expected electrification rate based on logarithmized GDP per capita. Standard errors clustered by country. * (p<0.10), ** (p<0.05), *** (p<0.01).

## S3 Supplementary Figures

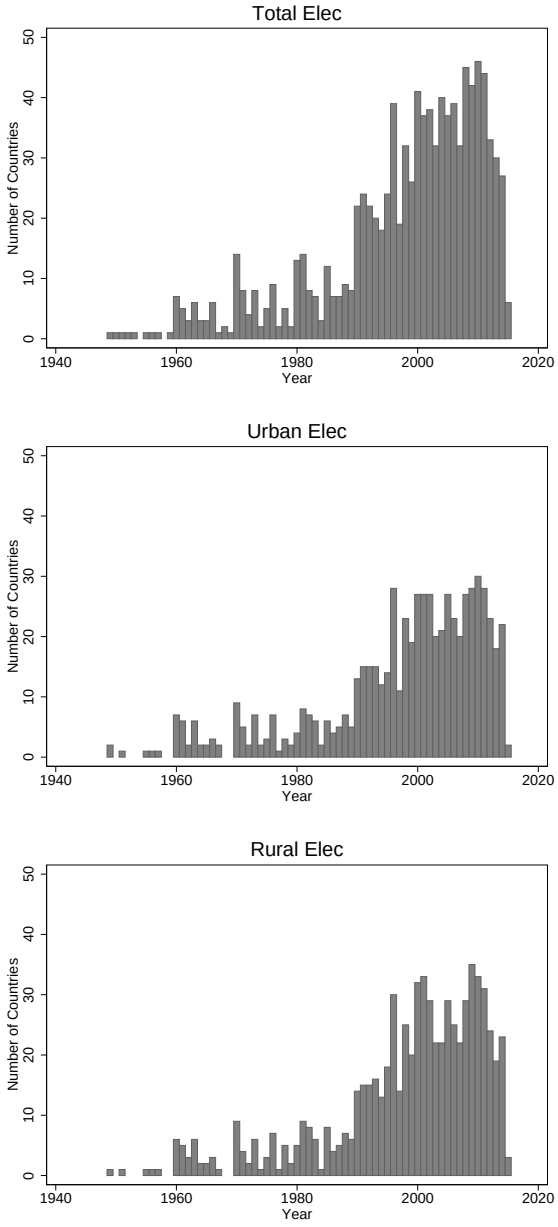
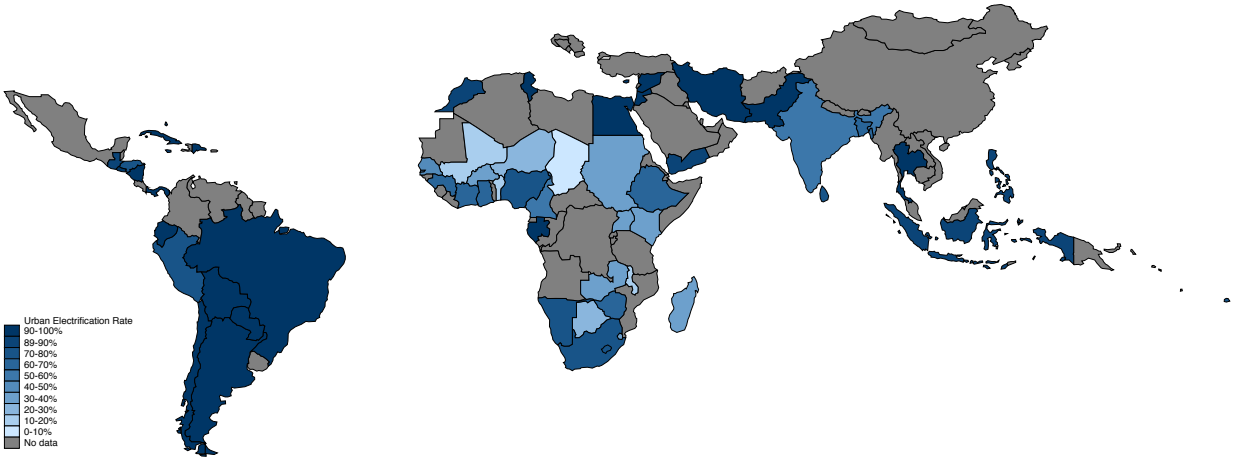
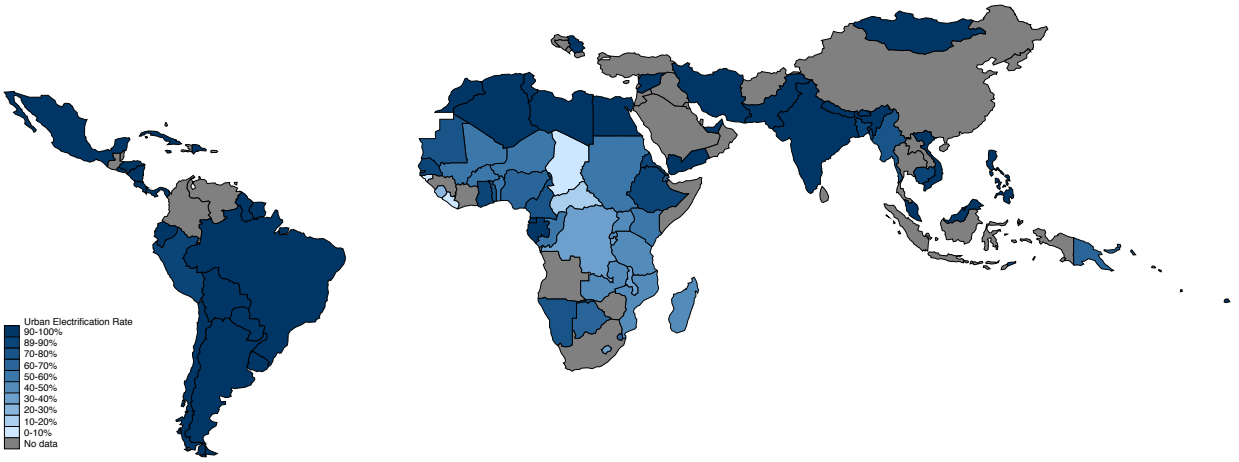



Figure S1: Data availability by year. The theoretical maximum number of countries in any given year is 124. The figures provide a distribution of the data coverage across the different years in the dataset. It shows that data availability has increased over time as more nationally representative household surveys (with questions on electrification) began to be fielded outside of the decennary census, and national electrification companies began to collect and disseminate electrification rates across both rural and urban populations.

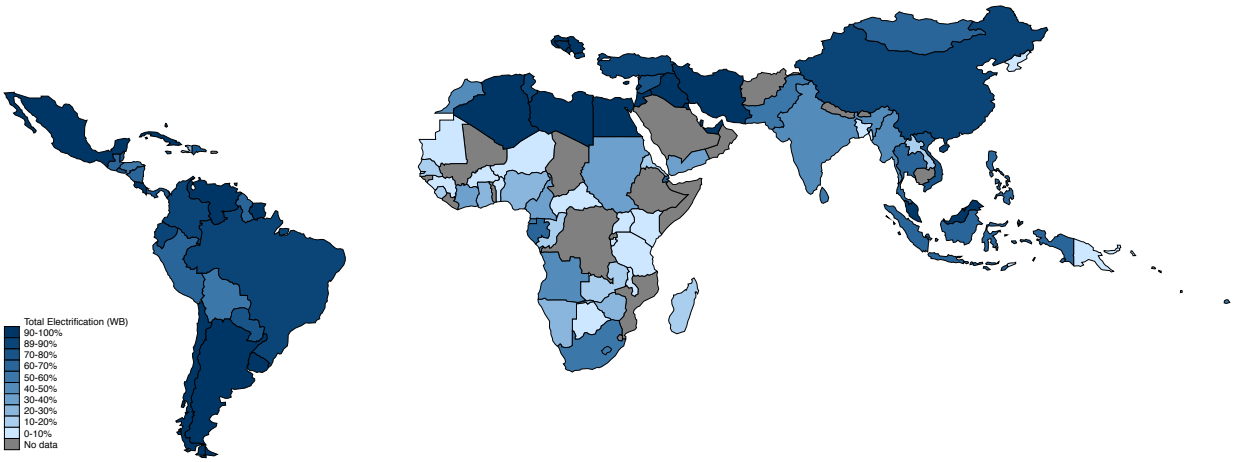



(a) 1986-1994

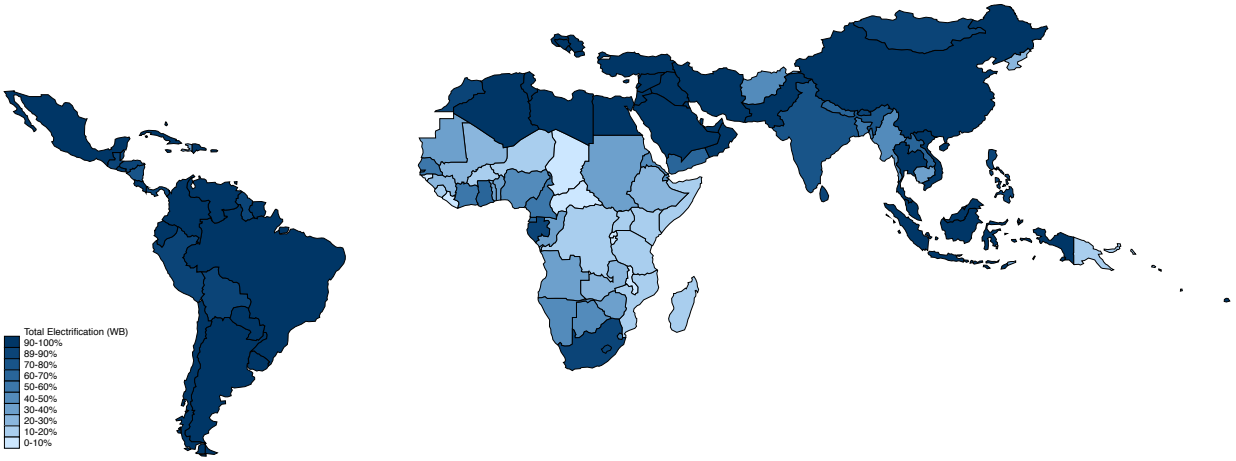



(b) 2006-2014

Figure S2: Urban electrification rates. Panel (a) shows the average electrification rates by country for all observations between years 1986-1994; panel (b) shows the same average for all observations between 2006-2014. Only countries in our sample $(N = 124)$ are shown.

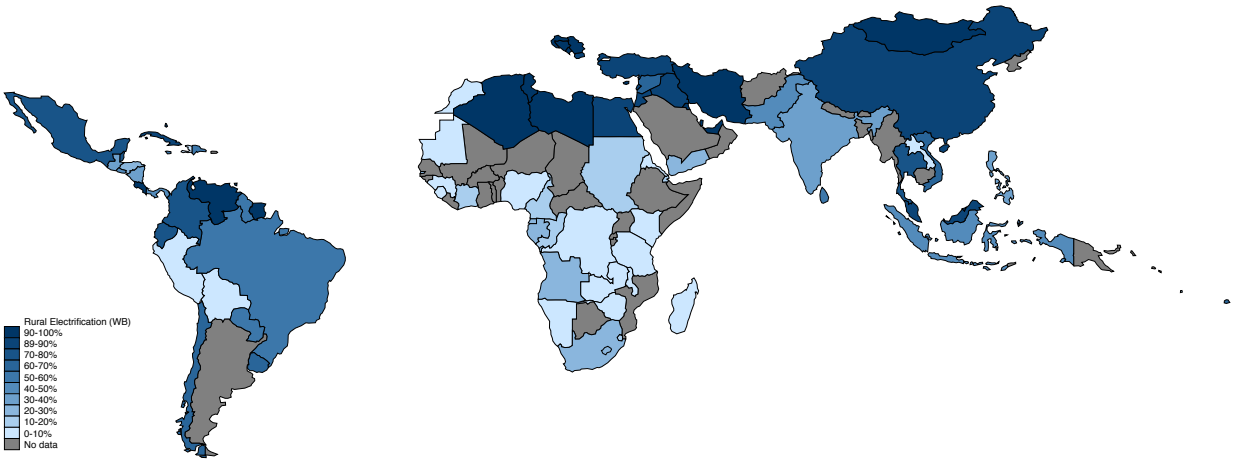



(a) 1990

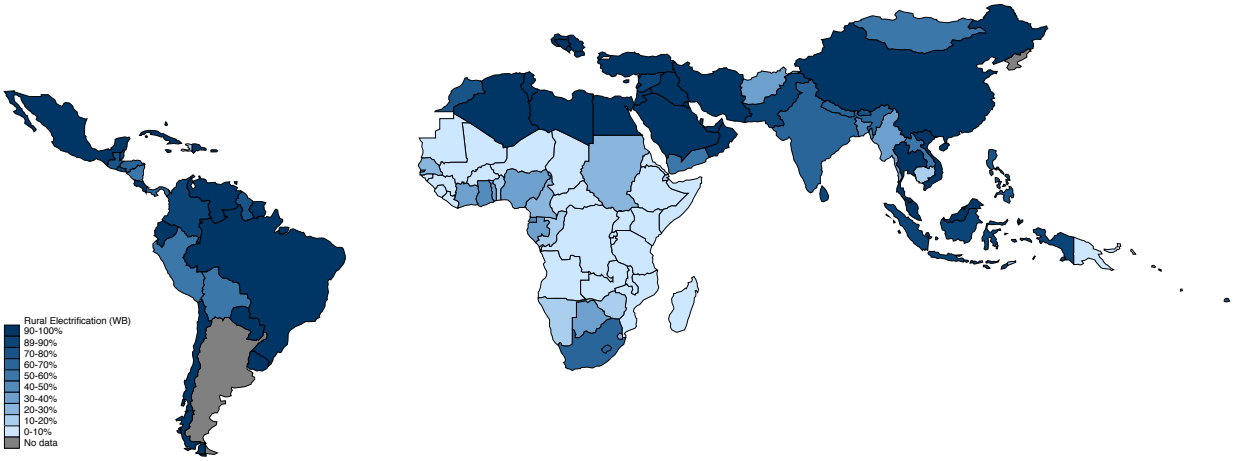



(b) 2010

Figure S3: Total electrification rates according to World Bank data. Panel (a) shows the average electrification rates by country for all observations in 1990; panel (b) shows the same average for all observations in 2010.

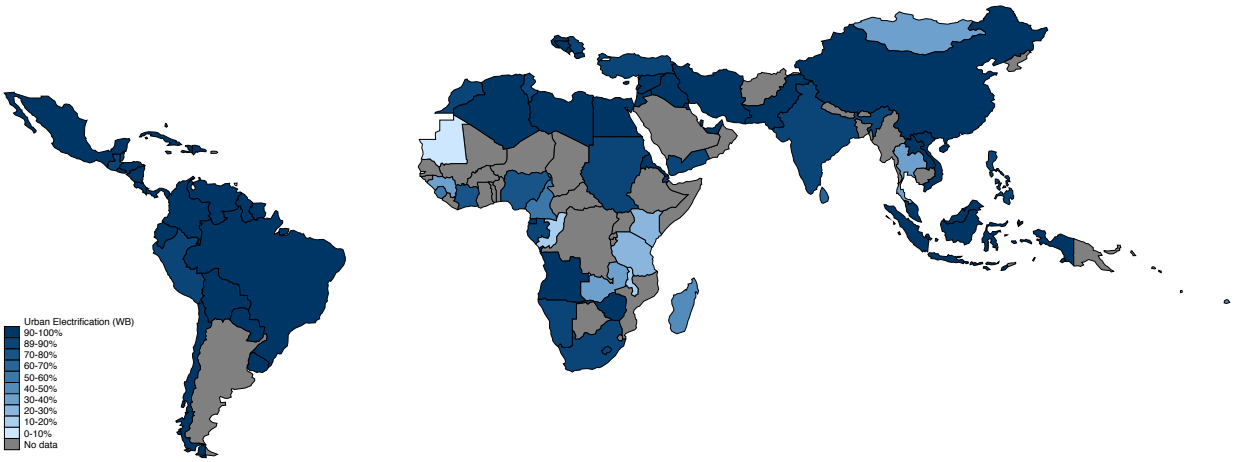



(a) 1990

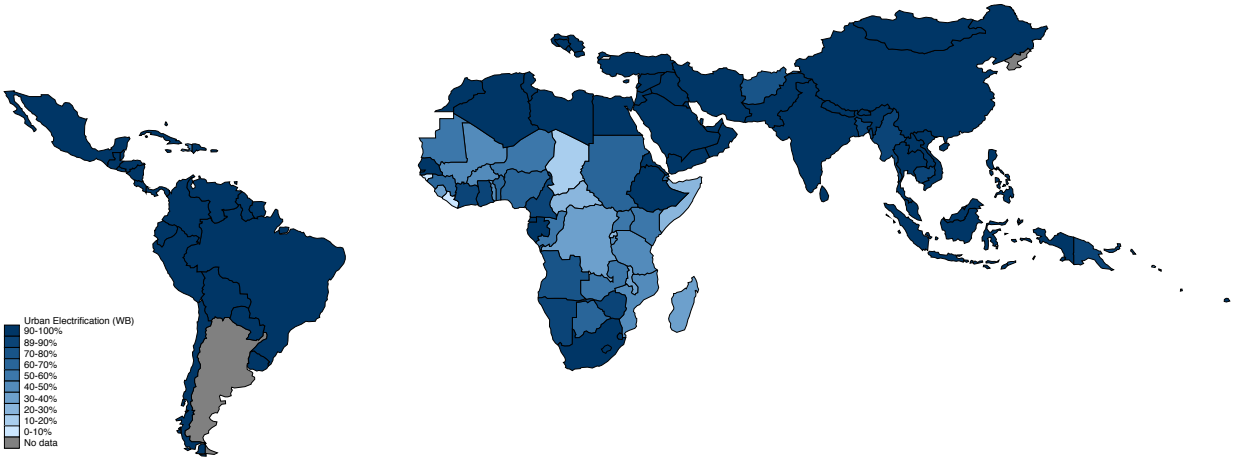



(b) 2010

Figure S4: Rural electrification rates according to World Bank data. Panel (a) shows the average electrification rates by country for all observations in 1990; panel (b) shows the same average for all observations in 2010.




(a) 1990




(b) 2010

Figure S5: Rural electrification rates according to World Bank data. Panel (a) shows the average electrification rates by country for all observations in 1990; panel (b) shows the same average for all observations in 2010.

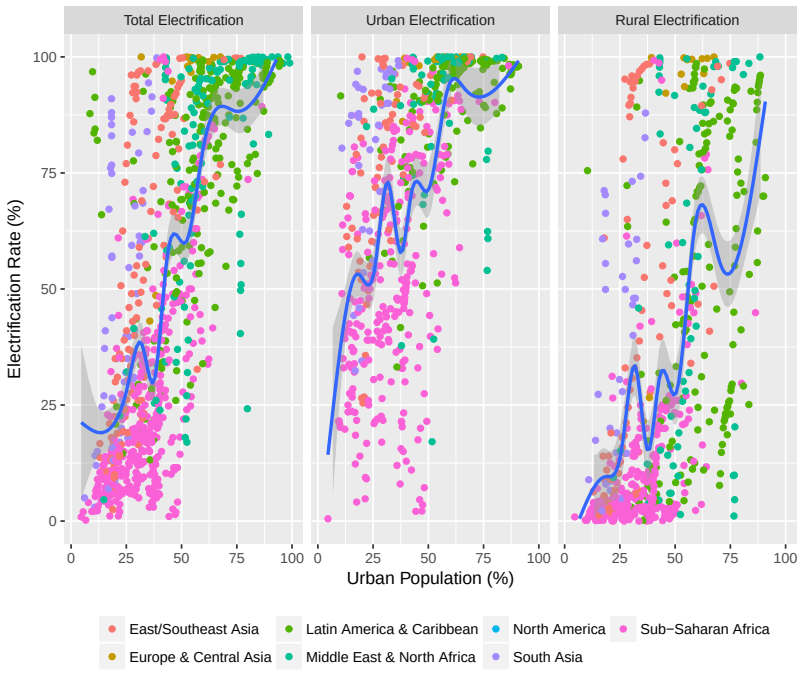



Figure S6: Electrification rates and urban population rates.

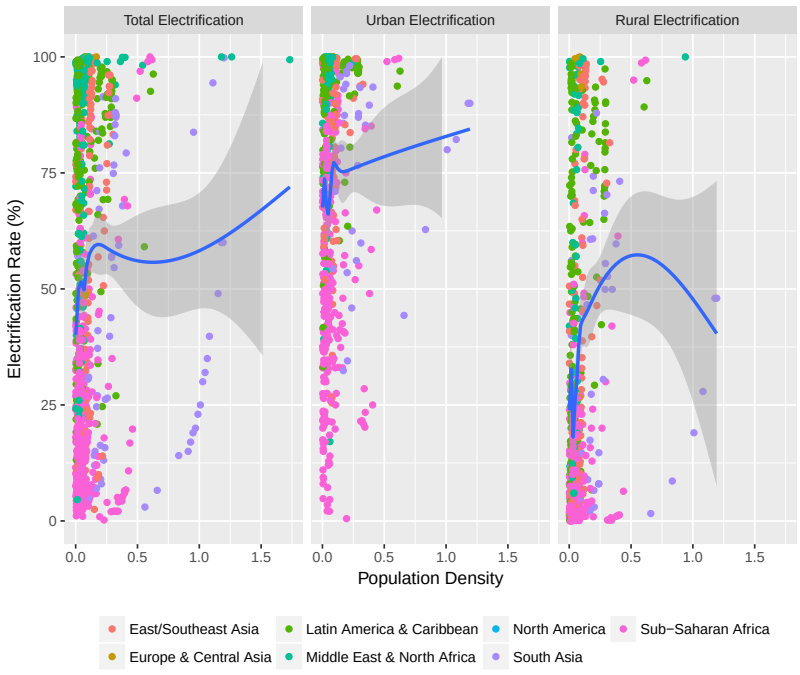



Figure S7: Electrification rates and population density (logged).

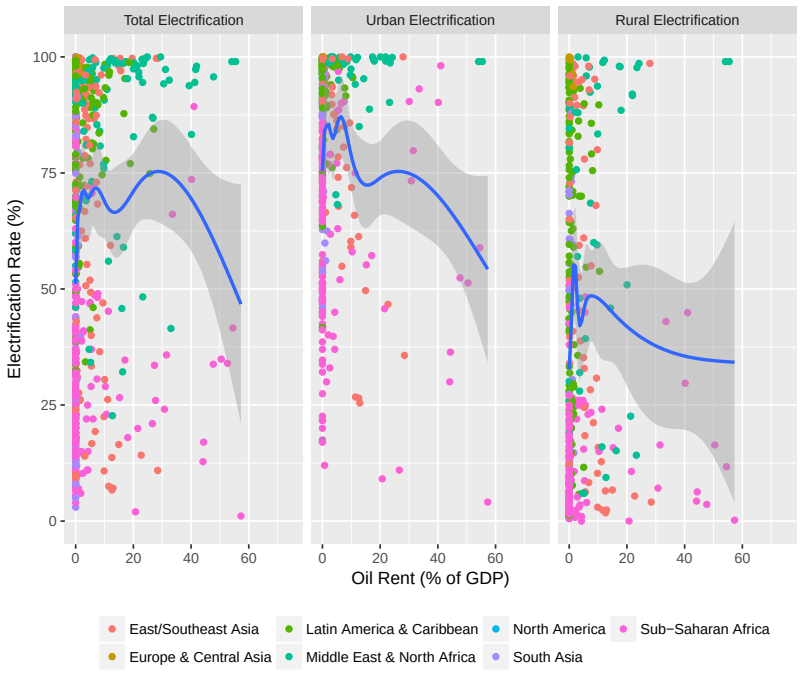



Figure S8: Electrification rates and oil rents (as a percentage of GDP).

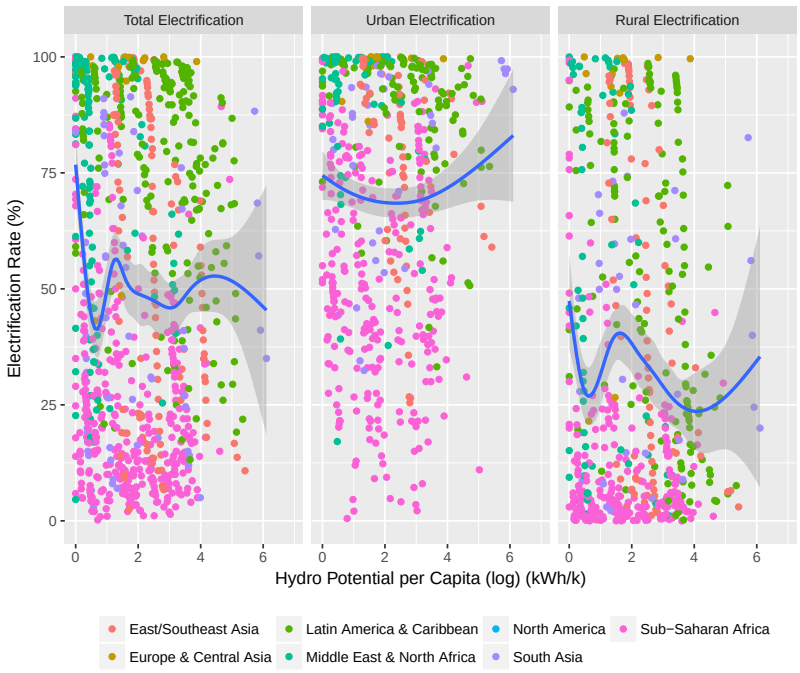



Figure S9: Electrification rates and hydro capacity (kWh) per thousands of inhabitants.

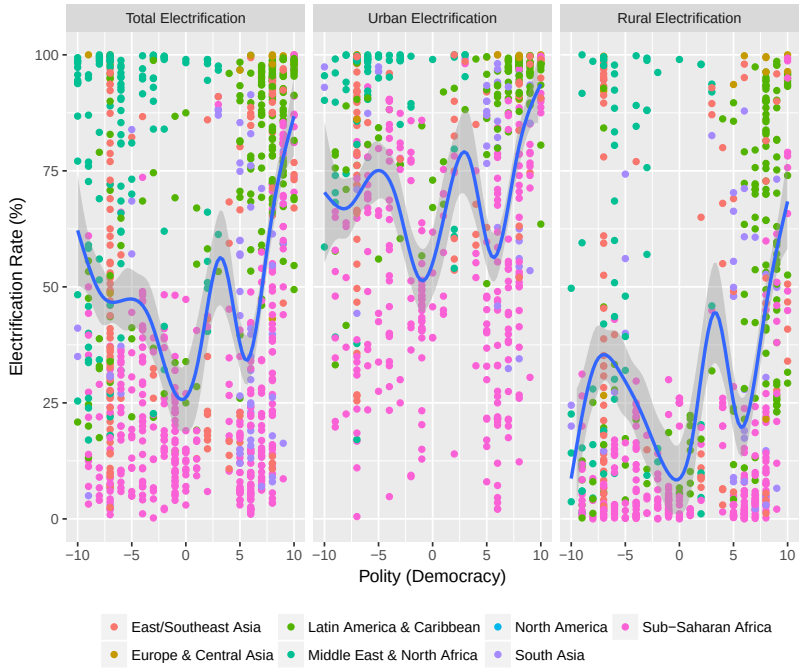
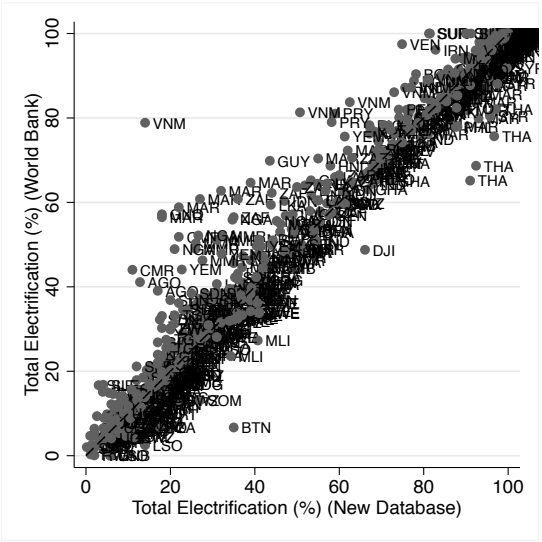
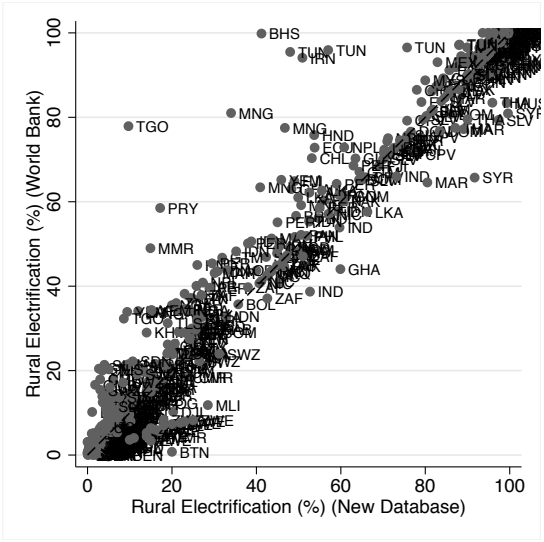


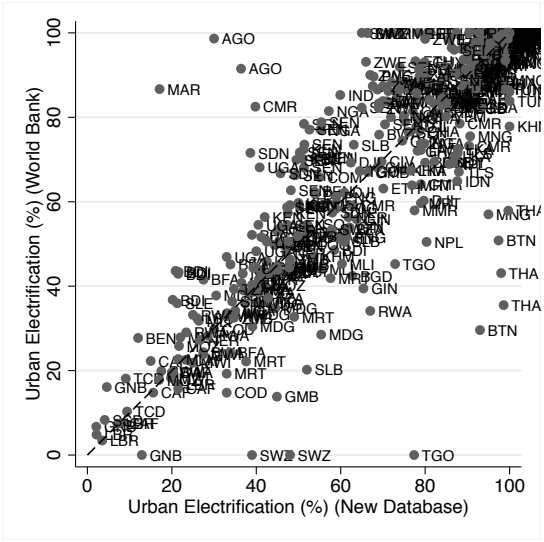

Figure S10: Electrification rates and democracy. The Polity score ranges from -10 to 10, with higher values denoting more democratic countries.




(a) Total Electrification




(b) Rural Electrification




(c) Urban Electrification

Figure S11: Comparison of the new database and the data from the World Bank, by electrification type. All existing observations were included. The three letter codes are IOS3 country names. A 45 degree line is added; observations that are identical in both datasets are located on that line. Observations to the bottom right of the line are cases where electrification rates are higher in the new database. Observations to the top left of the line are cases where electrification rates are higher in the World Bank dataset.

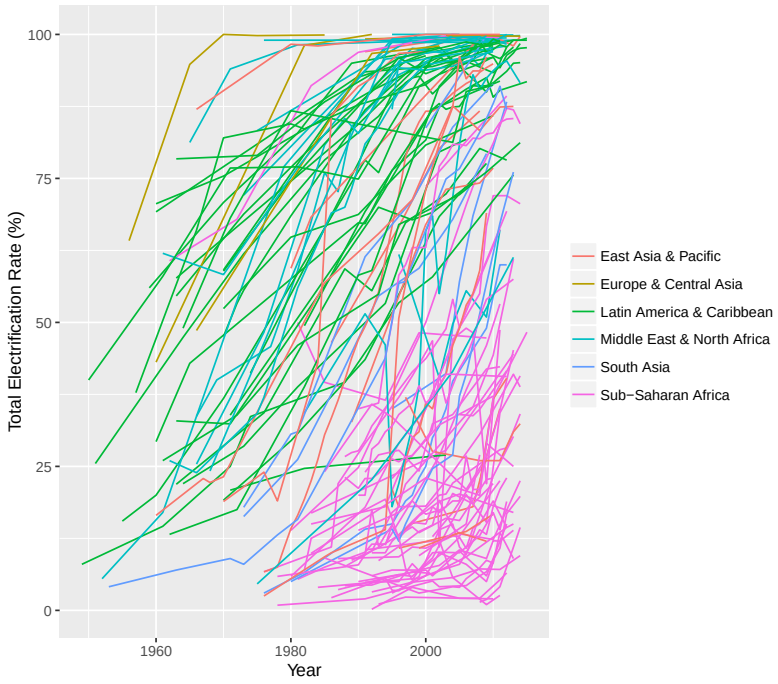



Figure S12: Patterns of electrification over time. The lines represent each one country. Note: the lines are computed using linear interpolation between actual observations. They are therefore a combination of observed and simulated values.

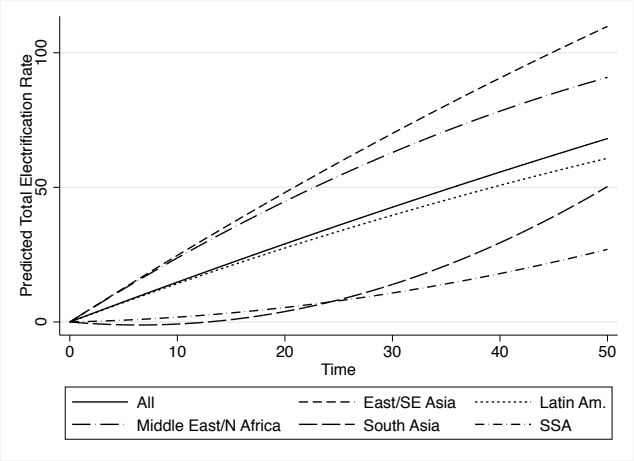
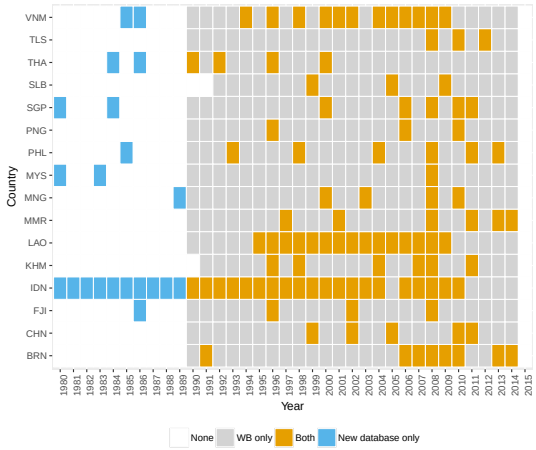
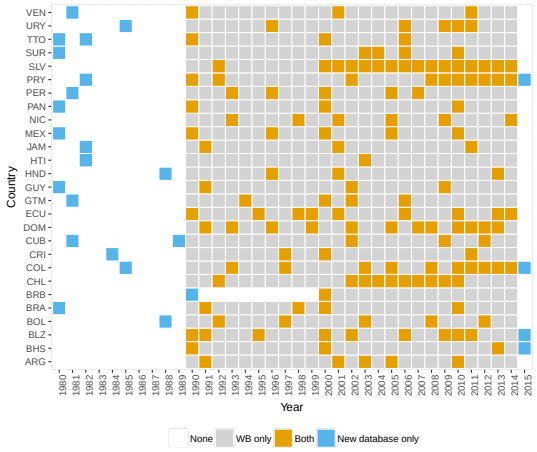


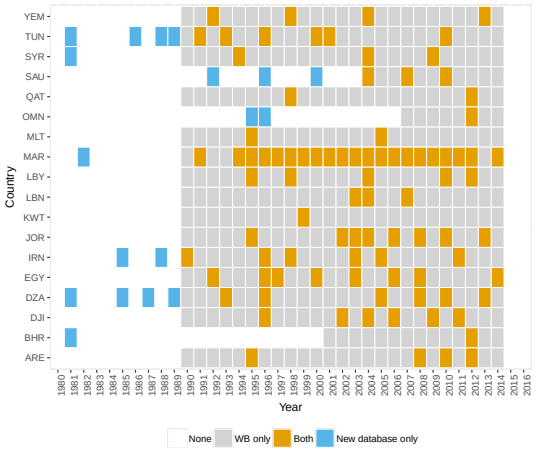

Figure S13: Simulated (nonlinear) time trend by region. The simulations are computed based on a model of the kind: $\text{Elec}_{i,t} = \alpha_i + \beta\text{Time} + \gamma\text{Time}^2$, where $\alpha_i$ are country fixed effects. We then plot the paths (using $\beta$ and $\gamma$) for each region over a 50-year period.



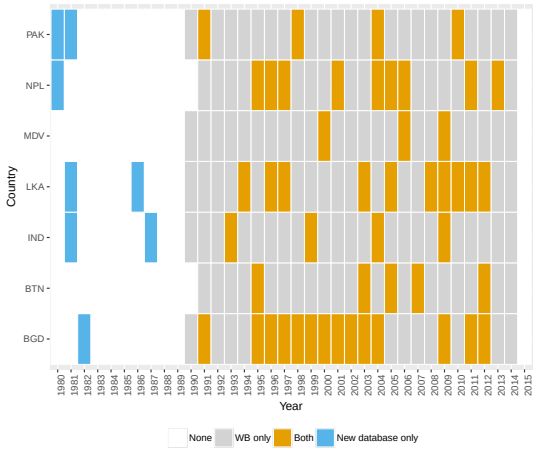

(a) East and Southeast Asia



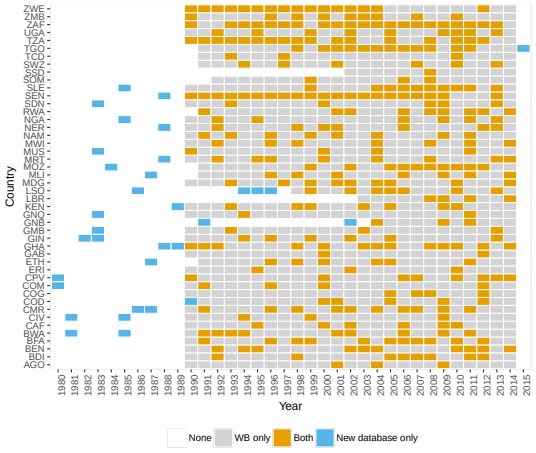

(b) Latin America




(c) Middle East and North Africa




(d) South Asia




(e) Sub-Saharan Africa

Figure S14: Heat map showing the overlap of data between the WEO and the new database. Only data on total electrification was used to determine the degree of overlap.

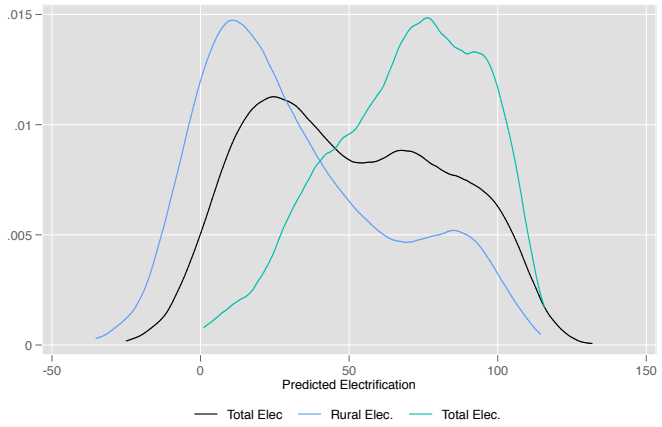



Figure S15: Distribution of predicted electrification levels (total, rural, and urban). The predicted probabilities are estimated using the estimates from Models (1) in Table **??**.