Impacts of climate shocks on household consumption and inequality in India

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Online Appendix

The figure below shows the geographical variation in temperature increase across the Indian subcontinent over the 1981-2010 period.
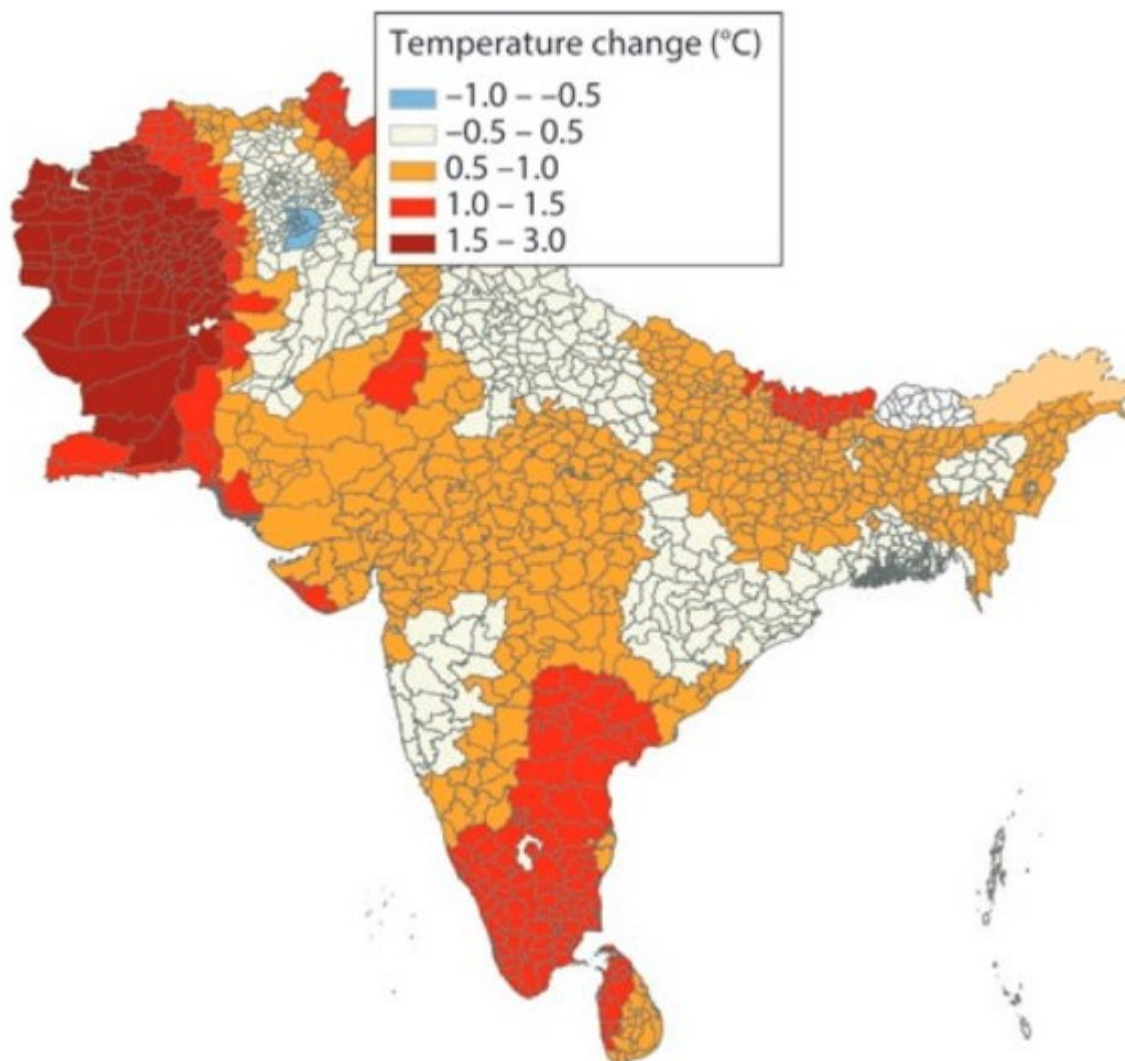

Figure A1. Temperature increase in South Asia, 1950-2010 (Mani *et al.*, 2018).

The histogram of real MPCE and kernel density plots for real MPCE, temperature and precipitation, presented in figures A2-A4, show how closely the underlying variables resemble a normal distribution. While skewness is limited (values are close to zero, particularly for the standardised Z-scores), the kurtosis values (table 1) are relatively large, implying a high peak of the distributions; hence, the climatic and expenditure variables do not strictly fit the normal density. As Deaton (2019) points out, this is typically the case in household survey data and perhaps the use of nonparametric or semiparametric estimators would ensure more robust hypothesis testing of the regression coefficients.
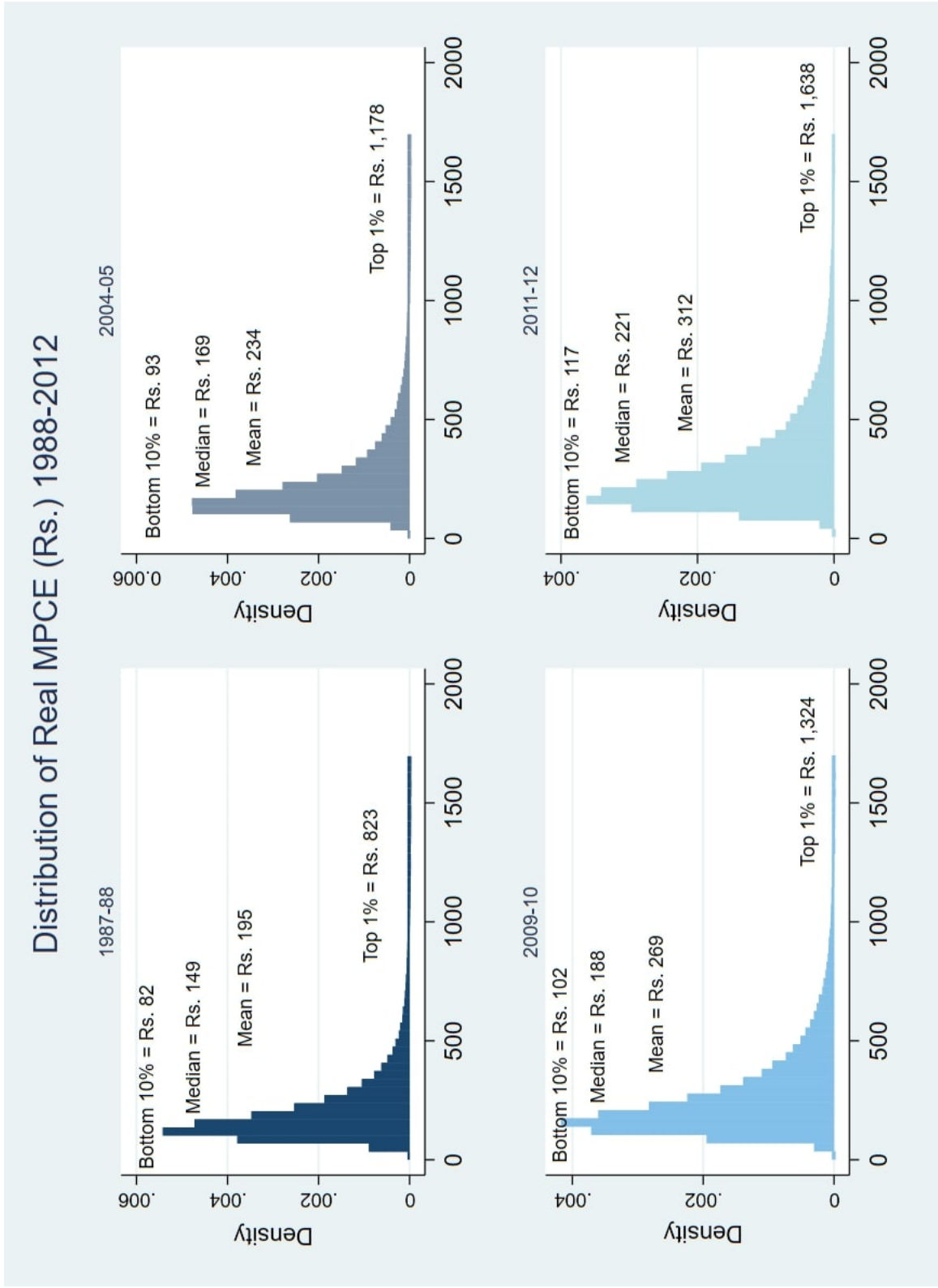
Figure A2. Histogram of real MPCE, 1988-2012 (excl. 1999-2000).

However, the OLS and quantile regression methods offer clear interpretations of results and are computationally less intensive than non-parametric estimators, particularly for large datasets, and are therefore the preferred estimation methods in this paper.

The kernel density plots of the residual error terms of select regressions are presented in figure A5 and show a large extent of overlap between the reference normal and the distribution of the regression residuals. However, the Jarque-Bera statistics[1] of the residuals remain large in magnitude and therefore do not strictly meet the criterion of normality. The regression coefficients may hence be considered upper bound estimates.
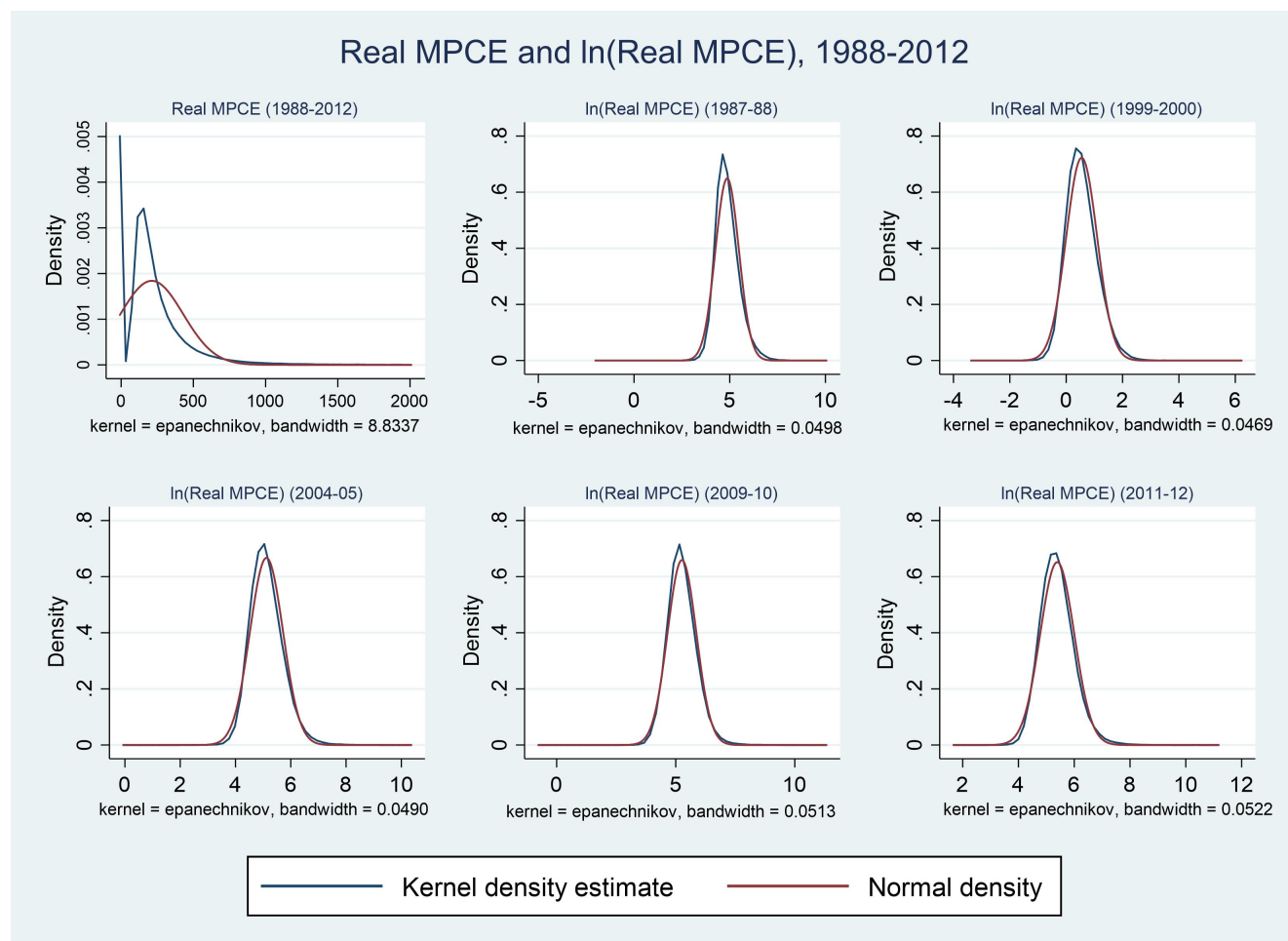

Figure A3. Kernel density plots of real MPCE and ln(Real MPCE), 1988-2012.

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[1]The J-B statistics for panels a,b,c and d are: 150000, 66, 160000 and 150000.
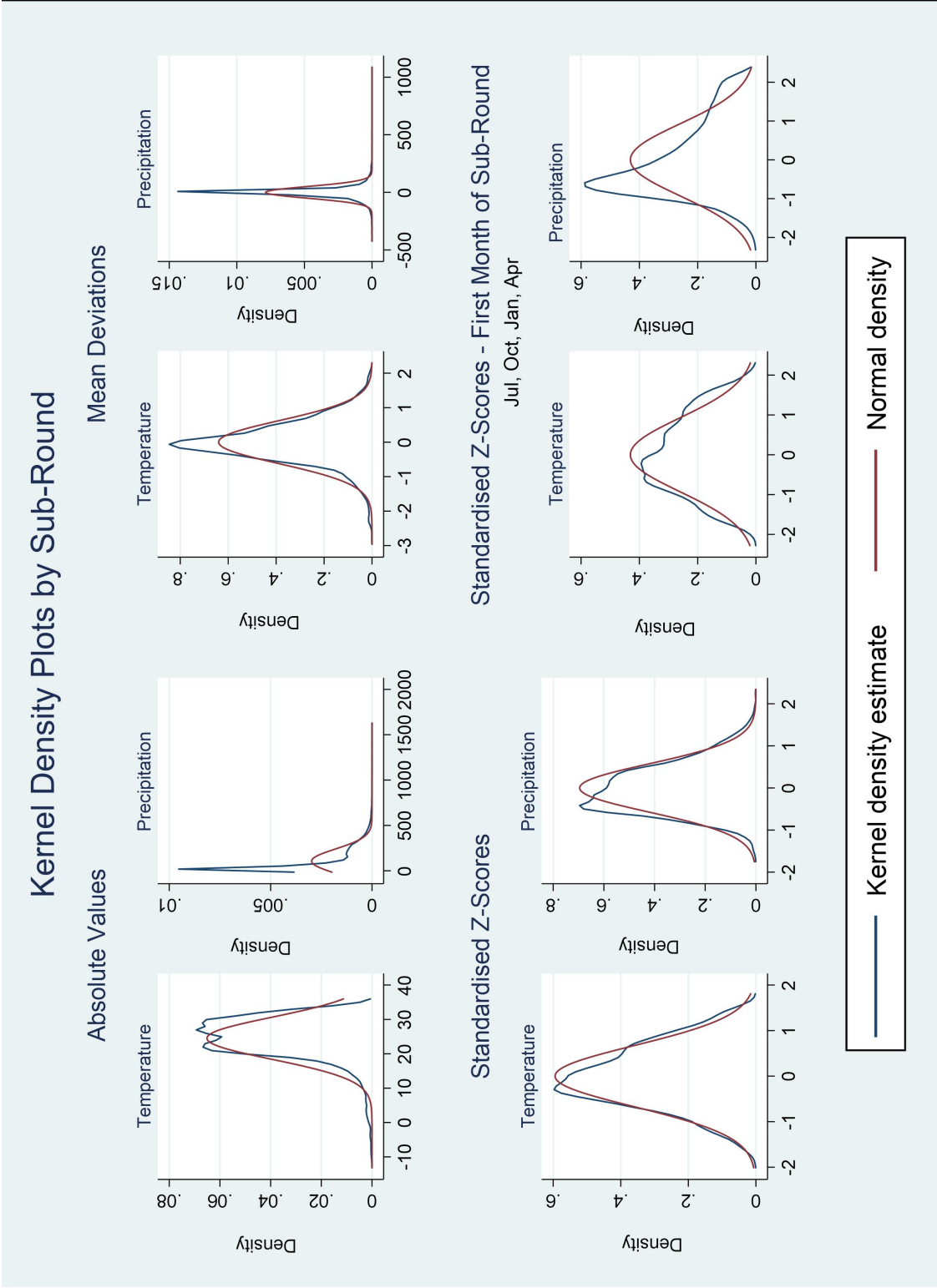
Figure A4. Kernel density plots of temperature and precipitation (all measures).
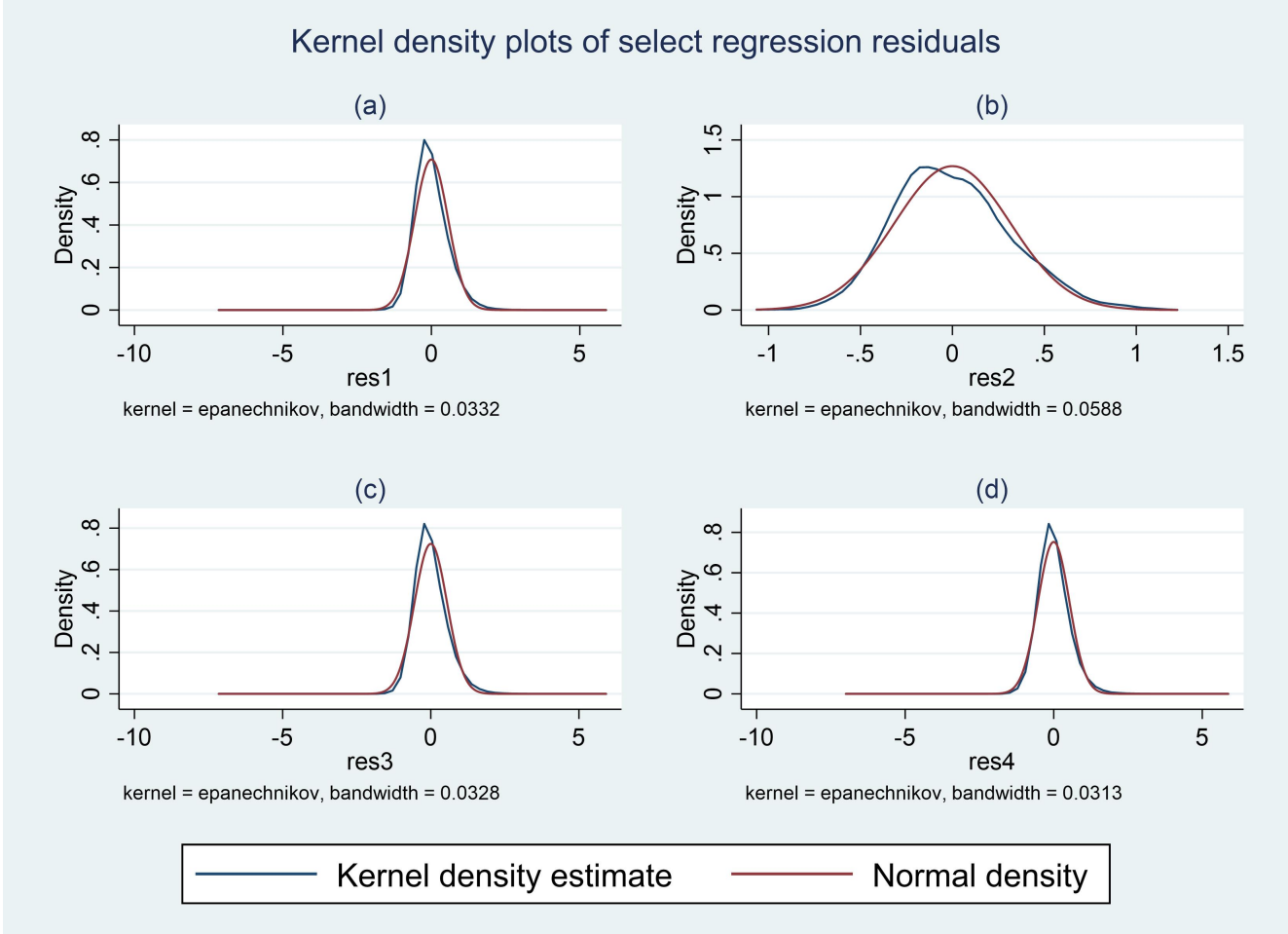
Figure A5. Kernel density plots of select regression residuals.

Panels a,b,c,d correspond to - pooled OLS ($dep.\ var.$ - std. temp.); panel fixed effects ($dep.\ var.$ - std. temp.); sector-region effects ($dep.\ var.$ - temp.) and sector-region effects ($dep.\ var.$ - std. temp.).

References

Deaton AS (2019) *The Analysis of Household Surveys: A Microeconometric Approach to Development Policy*. Washington, DC: The World Bank.

Mani M, Bandyopadhyay S, Chonabayashi S, Markandya A and Mosier T (2018) *South Asia's Hotspots: Impacts of Temperature and Precipitation Changes on Living Standards*. South Asia Development Matters. Washington, DC: World Bank.