

Technology Modeling: Curvature is not Sufficient for Regularity

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Recently there has been a growing tendency to impose curvature, but not monotonicity, on specifications of technology. But regularity requires satisfaction of both curvature and monotonicity conditions. Without both satisfied, the second order conditions for optimizing behavior fail and duality theory fails.

When neither curvature nor monotonicity are imposed, estimated flexible specifications of technology are much more likely to violate curvature than monotonicity, but we show that imposition of curvature induces violations of monotonicity that other wise would not have occurred. We also show that even when curvature is imposed globally on all component inner and outer subfunctions of a weakly separable technology, the resulting violations of monotonicity can cause the composite function to violate curvature.

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