Separating Risks to Cash Flows for Heating/Cooling

Objective: From a social-entrepreneurial perspective, lay the groundwork for a weatherproofing business model that uses specially-crafted weather and fuel derivative instruments to neutralize financial risk.

Background: If a weatherproofing business promises building owners that they will save on the costs of heating and air conditioning, how can these savings be credibly and tangibly delivered? Can they somehow be guaranteed? One strategy is for the parties to agree to "lock in" the heating/cooling costs of the building owner—a type of insurance. The owner and weatherproofer might agree on a plan whereby the owner would pay the weatherproofer 5% less than he/she currently pays, with further 5% decreases each successive year. The weatherproofer would pay the actual heating costs, and—assuming the weatherproofing is effective—keep the residual as profit. Nevertheless, there would be major financial risks for both parties: (i) weather variations could cause higher or lower demand for heat; and (ii) variations in fuel costs could cause higher or lower costs for the same heat. These risks can be separated and reduced with customized financial instruments: contracts in weather derivatives can cover some of the risk in weather variation; and contracts in heating oil futures and derivatives can cover some of the risk in fuel costs.

Suggested Approaches: In Phase 1, become familiar with three conceptual tools: basic models of how typical heating costs vary with regard to weather and to fuel costs; stochastic modeling of the impact of volatility on dynamic rebalancing of hedges; and quantification of basis risk. In Phase 2, develop a model that completely describes the trading costs of weather derivatives and heating oil futures and derivatives, and provides guidance on finding minimum feasible notional amounts for the basic contracts. In Phase 3, analyze capital financing needs and discuss the venture capital market; consider the amount of actual effective weatherproofing that can be financed in this manner; and estimate initial capital needs and financing costs.