



# The Simple Economics of Asymmetric Cost Pass-Through

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The phenomenon that, in response to changes in costs, prices often rise more strongly or quickly than they fall has attracted the attention of economists, policymakers, and the general public, for decades. The June 2014 referral by Ofgem, the UK's energy regulator, of the electricity sector to the competition authority (CMA) was influenced by the public perception, true or false, that “rockets and feathers” is endemic to this sector. Indeed, in British political circles and public debate, there seems to be a widely-held view that asymmetric pass-through of costs is a strong indicator for “anti-competitive” behaviour by firms. In the academic literature, it is often asserted that asymmetric price transmission cannot be explained by standard economic theory.

**Simple economics of asymmetric cost pass-through.** This paper argues against this conventional wisdom; it shows that simple price theory can, in principle, account for asymmetric pass-through—it is, as such, no “puzzle” for economists at all.

The intuition is simply stated. Consider some model of competition in an industry and let the equilibrium price depend on a marginal cost, which is common to firms and can vary over time. If this equilibrium pricing function is *linear*, then a change in marginal cost translates equally into some change in price, regardless of whether it goes up or down. However, if the pricing function is (strictly) *convex* in cost, then starting from any point, a *discrete* cost increase raises price by more than an identically-sized cost decrease cuts price. This paper shows that this convexity can arise, under natural conditions, in both perfectly and imperfectly competitive settings. Under perfect competition, asymmetric pass-through obtains, e.g., if the market demand curve is convex and the supply curve is concave in price.

Many theoretical models exclude the possibility of asymmetric pass-through by doing one of two things: (1) imposing *a priori* functional-form assumptions which imply that the equilibrium pricing function is linear in marginal costs (e.g., assuming that demand and supply curves are *both* linear), or (2) only considering infinitesimal

cost changes which, as a feature of calculus rather than economics, mean that pass-through must be symmetric.

**Relationship with the empirical literature.** Evidence for asymmetric cost pass-through has been found in a wide range of sectors, including markets for gasoline, various agricultural products, deposit markets in retail banking, and carbon emissions permits. A typical paper asserts that such asymmetric pricing is inconsistent with standard economic theory; some develop alternative explanations, e.g., based on consumer search costs, vertical integration, or collusive behaviour.

The key point is that the empirical literature to date has not actually *tested* whether or not simple theory can account for asymmetric pass-through. The simple theory is rejected out of hand at the outset; it then (implicitly) forms the basis for the null hypothesis of symmetric pass-through against which the empirical estimates are then compared. The point of this paper is that this symmetric “counterfactual” is misleading since even simple theory can yield asymmetric pricing.

A proper empirical test would have to compare the observed pass-through patterns with those predicted by a simple theory, which *itself* is calibrated to the demand and supply conditions estimated from market data and then determine to what degree pass-through patterns are *still* left unexplained. This is a much more challenging task which the existing literature does not appear to have taken up; nonetheless, this seems the real question for future empirical research.

**Policy implications.** From a policy perspective, knowledge of cost pass-through patterns in a market does *not* allow for strong inferences on the intensity of competition. Suppose you had perfect knowledge that pass-through in a market is 70% and symmetric, or that it is asymmetric with, on average, 80% on the upside and only 60% on the downside. This paper argues that this alone says little about the underlying mode of competition in the industry; asymmetric pass-through is, in itself, no clear evidence for market power.

The only robust inference appears to be the following: A pass-through rate *above 100%*, under wide assumptions, is inconsistent with perfect competition, and so is strong evidence for *some* degree of market power (but not necessarily of collusion). Saying more than this requires *much* more detailed empirical analysis of a market.

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