Implicit Price

Foundations • The Valuation Engineer

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Formal definition. The implicit price of a characteristic is the partial derivative of the hedonic price function with respect to that characteristic, evaluated at a point in the characteristics space; it represents the marginal market price of an incremental unit of the characteristic, holding all other characteristics fixed.

Intuitive framing. The hedonic price function $p(\mathbf{z})$ assigns a price to each bundle. Most practical questions in appraisal, however, are not about the price of a complete bundle but about the price of a specific *component* of a bundle. How much is the view worth? How much does an extra hundred square feet add? How much does the difference between "good" and "excellent" condition contribute?

The implicit price answers these questions. For each characteristic z_i, the implicit price is the rate at which $p(\mathbf{z})$ changes as z_i varies while all other characteristics are held fixed:

$$\pi_i(\mathbf{z}) \;=\; \frac{\partial p(\mathbf{z})}{\partial z_i}.$$

The implicit price has units of dollars per unit of the characteristic — dollars per square foot of GLA, dollars per square foot of lot, dollars per unit step of condition. For a binary characteristic like view, the implicit price is the full premium paid for moving from no-view (0) to view (1).

The word "implicit" captures the central fact: these prices are *not* posted. No one offers to sell "one square foot of GLA" for $575. The price is implicit in the equilibrium bundle prices that *are* posted, and the hedonic apparatus exists to extract it.

Implicit prices are the appraisal-relevant output of the hedonic framework. The adjustment in a sales comparison grid is, in principle, an estimate of an implicit price multiplied by a characteristic difference. Every adjustment is a wager about the value of π_i at the relevant point in characteristics space.

Where appraisers encounter it. The sales-comparison adjustment grid is a table of implicit-price applications, even when appraisers do not name them that way. A grid entry that adjusts a comp by "+$10,000 for 200 sf less GLA than subject" is asserting that the implicit price of GLA, at the relevant location in characteristics space, is $50 per square foot. A grid entry that adjusts "$100,000 for inferior view" is asserting an implicit price of $100,000 for the binary view characteristic. The entire defensibility of the sales comparison approach rests on whether these implicit prices can be supported from the market.

This naming also clarifies why paired-sales analysis is the foundational technique for adjustment derivation. Two comps that differ in exactly one characteristic give a direct estimate of that characteristic's implicit price: the price difference divided by the characteristic difference. The reliability of paired-sales analysis depends on whether the two comps are truly close enough in characteristics space that the implicit price recovered from them generalizes to the subject.

Three properties of implicit prices that matter for practice:

They are local. The implicit price of GLA at the 1,650-sf point is not necessarily the same as at the 2,500-sf point. The hedonic price function is generally nonlinear, so its partial derivatives

vary with location in characteristics space. An adjustment derived from a 1,500-sf paired-sales analysis does not necessarily apply to a 3,000-sf subject.

They are conditional. The implicit price of view in a beachfront submarket is not the same as in an inland submarket. The partial derivative is taken holding other characteristics fixed, but the value of that derivative depends on *where* the other characteristics are held fixed.

They are market-dependent. Implicit prices are equilibrium prices, so they reflect the preferences of the buyer pool at the time of the transactions. A market shift can change implicit prices even if the characteristics themselves are unchanged. Time adjustments are implicitly admissions that yesterday's implicit prices may not be today's.

Why it matters for defensibility. The implicit-price framing exposes adjustment defensibility questions that the informal grid can obscure:

Where in characteristics space are you? An implicit price is defensible only if estimated near the subject's location in characteristics space. A view premium derived from inland comps and applied to a beachfront subject is extrapolating across a region of the characteristics space where the function's behavior is unknown.

What is the local geometry? If two characteristics interact — for instance, if view is worth more on a larger lot — then treating them as additive separately is a misspecification. The implicit price of view depends on lot size, and an adjustment that ignores the interaction underestimates the function's actual structure.

How was the implicit price recovered? A paired-sales analysis, a regression coefficient, an industry rule-of-thumb, and a "professional judgment" all point to the same quantity — the implicit price — but with very different epistemic standing. The appraiser's defensibility depends on saying which source produced the implicit price used in each adjustment.

Worked appraisal example. For the Pacifica running example with the additive specification adopted in the previous entry, the implicit prices are simply the coefficients of the linear function:

$$\pi_{\text{GLA}} = \beta_{\text{GLA}}, \quad \pi_{\text{lot}} = \beta_{\text{lot}}, \quad \pi_{\text{view}} = \beta_{\text{view}}, \quad \pi_{\text{cond}} = \beta_{\text{cond}}.$$

With the estimated coefficients from entry 003:

Characteristic	Implicit price	Units
GLA	\$575	per sf
Lot	\$22.70	per sf
View	\$86,179	per yes/no
Condition	\$49,824	per step

These implicit prices imply a paired-sales analysis. Returning to the Comp A vs. Comp B difference from entry 001:

- Comp A has view ($\Delta z_{\text{view}} = +1$); contribution +\$86,179.
- Comp A has a 1,800-sf larger lot ($\Delta z_{\text{lot}} = +1{,}800$); contribution $1{,}800 \times \$22.70 = +\$40{,}860$.
- All other characteristics identical.
- Predicted price difference: $\$86{,}179 + \$40{,}860 = \$127{,}039$.

The observed price difference was \$145,000. The implicit-price decomposition accounts for about \$127,000 of it; the remaining \$18,000 reflects sampling variability in the small dataset (and, more generally, the kinds of unobserved factors that the latent variable entry will take up).

Two operational points are worth noting. First, the linearity assumption is doing real work: under a nonlinear $p(\mathbf{z})$, the same physical lot difference might be worth more on a small lot than on a large one, and the additive decomposition above would be biased. Second, the implicit price of \$22.70 per square foot of lot is the marginal value of an incremental square foot, not the total value of the lot. The total contribution of a 9,000-sf lot to the bundle price is $9{,}000 \times \$22.70 = \$204{,}300$, but adding one more square foot raises the bundle price by only \$22.70.

This distinction — marginal vs. total — is the source of considerable confusion in everyday appraisal language and is one of the most important conceptual gains from naming the implicit price explicitly.

Cross-references: heterogeneous good; *characteristics space*; *hedonic price function*; *hedonic regression.*