

IT'S A PRICE! IT'S A VALUE!:

ECONOMIC MEASUREMENT ACROSS

ENVIRONMENTS

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WHAT IS THE ECONOMIC QUESTION?

Which fields must accompany a retained price so that the object can be revalued elsewhere?

- A price records one object-environment valuation.
- A later revaluation may depend on composition directions erased by that record.
- The paper chooses records by the target image of each source-record fiber.

HOW CAN TWO OBJECTS SHARE A PRICE AND DIFFER IN LATER VALUE?

- A source environment can assign the same retained price to two different compositions.
- A target environment can load differently on the composition direction erased by that price.
- The source-record fiber then contains more than one target value, so one more field is required.

HOW CAN ONE RETAINED PRICE HIDE LATER VALUE?

Source valuations



Residual fiber



Held-out revaluation

WHAT DISTINGUISHES A COMMON STATE FROM A TARGET RECORD?

- Common interaction coordinates summarize the relational profile across environments.
- Target-specific completion asks what remains after the chosen source valuations are known.
- A feasible menu and loss function turn completion counts into record choices.

HOW MANY ADDITIONAL FIELDS COMPLETE A TARGET?

Proposition (Exact recovery and minimum local information)

Target recovery holds exactly when the target is constant on every attained source-record fiber. Under constant ranks, the local completion count is $\text{rank } D(Y_O, Y_T) - \text{rank } DY_O$, and a certificate of that dimension is attainable.

The count is target relative: it can be smaller than the dimension of a common state.

WHAT IS THE LOCAL COMPLETION COUNT?

$$d_{O \rightarrow T}(x) = \text{rank } D(Y_O, Y_T)(x) - \text{rank } DY_O(x)$$

- Y_O is the retained source record and Y_T is the target revaluation.
- The rank difference measures target variation that remains inside the source fiber.
- Zero gives local smooth transport from the retained record alone.

HOW IS THE COMPLETION COUNT ATTAINED?

- Choose certificate fields whose differentials span the residual target image.
- In the bilinear system, a basis of the residual target map supplies completing exposure projections.
- A feasible record menu may restrict which of those projections can actually be stored.

HOW DOES THE THEOREM CHANGE RECORD DESIGN?

- The retained source record is evaluated relative to a declared target environment.
- The residual derivative counts the missing fields and identifies directions that complete the record locally.
- A feasible field menu turns that count into an auditable measurement frontier.

WHEN DOES A COMMON INTERACTION STATE EXIST?

Theorem (Relational representation characterization)

Stable mixed-derivative kernels are equivalent, locally, to submersions $u(x)$ and $v(z)$ and a representation $m(x, z) = a(x) + b(z) + F(u(x), v(z))$ with a nonsingular induced mixed derivative.

The theorem connects observable derivative structure to a common relational coordinate system.

WHAT IS THE VALUE OF ONE MORE RETAINED FIELD?

Proposition (Target-relative measurement frontier)

In the bilinear system, the residual target map gives the exact completion dimension, the worst-case affine-prediction loss at each record budget, and the marginal value of an additional exposure field.

Feasible menus turn the algebraic frontier into a measurement-design comparison.

WHAT UNCERTAINTY OBJECT IS REPORTED?

- Fixed-rule intervals evaluate a record rule selected before the evaluation sample.
- Loading-reselection ranges include the variation generated by choosing loadings again.
- The two objects answer different questions and retain separate labels in the evidence.

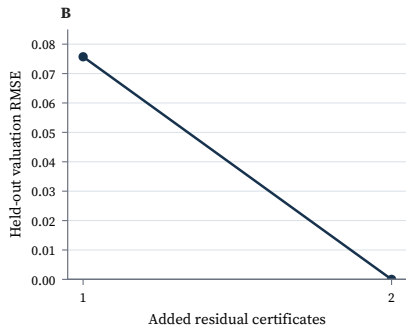
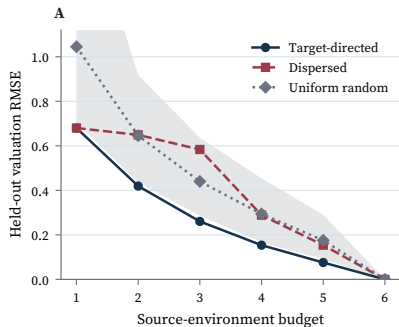
HOW DOES A MATHEMATICAL CERTIFICATE BECOME A RECORD RULE?

- The residual map ranks ideal fields by target information.
- Environment and composition menus restrict the available fields.
- Held-out revaluation evaluates the selected feasible rule under its stated reselection protocol.

WHAT DO FOOD BASKETS AND TREASURY CASH FLOWS CONTRIBUTE?

- The food-basket exercise uses a fixed accounting array and explicit environment menus.
- Treasury cash flows test how calibration-optimal records perform in later environments.
- Both applications separate source fit, target completion, and selected-rule evaluation.

HOW DOES RECORD CAPACITY CHANGE HELD-OUT REVALUATION ERROR?



Capacity and residual certificates in held-out revaluation.

WHAT DOES THE FIXED BASKET REVEAL?

- Four source valuations leave composition directions relevant for other environments.
- Two composition indices complete the targets on the six-dimensional centered support.
- The comparison uses the same accounting array across source and target menus.

WHICH LITERATURES HELP PLACE THE QUESTION?

- Schennach (2007) and Hu and Schennach (2008): latent recovery under measurement error and proxy structure.
- Chen et al. (2014): derivative-rank conditions for local identification.
- Varian (1982): economic restrictions expressed through the records needed for revealed behavior.
- This paper studies the smallest target-relative record needed for revaluation across environments.

HOW FAR DOES THE MEASUREMENT CLAIM TRAVEL?

- Stable kernels support the local common-state representation.
- Residual completion is relative to the source and target menus.
- Evaluation of a selected record rule remains distinct from its population recovery property.

WHAT SHOULD THE READER CARRY FORWARD?

1. A retained price is a source record, while revaluation is a target problem.
2. Residual fibers determine the missing information.
3. Record value depends on the feasible menu and declared loss.

TECHNICAL APPENDIX

WHICH DEFINITIONS AND ASSUMPTIONS ORGANIZE THE PAPER?

- Assumption: Smooth interaction and stable kernels
- Definition: Measurement profile
- Definition: Residual transport set

HOW DO THE MAIN RESULTS BUILD ON ONE ANOTHER?

Relational representation characterization



Exact recovery and minimum local information



Target-relative measurement frontier

WHICH FORMAL RESULTS SUPPORT THE ARGUMENT?

- Theorem: Exact recovery and minimum local information
- Theorem: Relational representation characterization
- Theorem: Sharp target-relative measurement frontier
- Proposition: Rotating-kernel example
- Proposition: Admissible information
- Corollary: Relational and full profile dimension
- Corollary: State-space record bound

WHICH SCOPE CONDITIONS GOVERN THE CLAIMS?

- Stable kernels support the local common-state representation.
- Residual completion is relative to the source and target menus.
- Evaluation of a selected record rule remains distinct from its population recovery property.