MAIMON WORKING PAPER No 25 NOVEMBER 2025 V3

EMBRACING SCHOLASTICISM: HEALTH TECHNOLOGY ASSESSMENT AS AN ADMINISTRATIVE CONVENIENCE

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ABSTRACT

Health Technology Assessment (HTA) emerged in the 1970s not from scientific advance but from bureaucratic necessity. Confronted with rising healthcare costs and pressure for rational allocation, policymakers sought a single quantitative metric that could justify decisions while appearing objective. The result was a technocratic apparatus that transformed complex human experiences into numerical artefacts. From the outset, HTA carried a foundational epistemic error: it treated ordinal preferences for health-state descriptions as if they were interval measures, institutionalizing a violation of the axioms of fundamental measurement. Rather than correcting this error, the field embedded it within an increasingly elaborate methodology whose authority derived from internal coherence rather than empirical validity.

This trajectory produced not a science but a modern scholasticism. Like medieval disputation grounded in unexamined theological premises, HTA constructed an ornate system around an untested axiom: that utilities and QALYs measure something quantitative. Its models, sensitivity analyses, and probabilistic refinements refine internal structure while leaving foundational assumptions untouched. The field prizes formal precision, procedural orthodoxy, and the appearance of rigor over falsifiable inquiry. Empirical data are admitted only insofar as they can be absorbed into a predefined evidence framework whose logic is immune to challenge.

The institutionalization of the reference case intensified this scholastic structure. Adherence to its procedural template became a surrogate for empirical demonstration, just as citation to Aristotle once substituted for proof. Violations of measurement axioms are recast as methodological nuances rather than as fatal contradictions. Graduate education, journals, and funding bodies reproduce this closure, training practitioners to compute without questioning what computation presupposes. The result is a self-referential discipline in which disagreement is licensed only within established boundaries and true critique is structurally excluded.

HTA's endurance reflects not scientific success but political utility. By converting moral and clinical complexity into administratively actionable numbers, it offers bureaucracies a veneer of quantitative legitimacy. To abandon the QALY would be to confess that decades of policy rest on non-measures. Thus, HTA survives as a technocratic theology: a system that equates numerical elegance with knowledge and confuses procedural rationality with science.

If HTA is to escape its scholastic inheritance, it must be rebuilt upon genuine measurement theory, distinguishing manifest from latent attributes and employing linear ratio and Rasch-based scales capable of falsification. Without such reform, HTA will persist as a historical curiosity—an

artefact of administrative convenience mistaken for science, and a cautionary episode in the history of measurement failure.

INTRODUCTION

Health Technology Assessment (HTA) did not emerge from scientific discovery but from bureaucratic demand. In the 1970s, governments sought a single, ostensibly objective measure to rationalize health spending. The result was a technocratic invention, an apparatus designed to translate complex human experiences into a numerical currency for resource allocation. From its inception, HTA carried an epistemic flaw. It claimed to quantify what could not be measured: preferences for health state descriptions. This foundational error, treating ordinal preferences and social valuations as if they were interval-level data, was institutionalized rather than corrected, giving rise to a culture of scholastic reasoning disguised as science.

What followed was not the progressive refinement of a discipline but the entrenchment of an administrative logic [1]. HTA's practitioners became custodians of a self-referential system, elaborating intricate models whose authority derived from internal coherence rather than empirical validity. The methods multiplied, the mathematics deepened, and yet the essential question, whether the numbers corresponded to anything measurable, was quietly set aside. Like the medieval scholastics who debated the quantitative structure of divine grace, HTA developed an ornate language of rationalization, sustained by consensus and insulated from falsification.

This embrace of scholasticism was not an intellectual accident but a response to institutional pressures. Bureaucracies require closure, not truth; numbers that enable decision, not measurement that invites doubt. The relativist ethos of late twentieth-century social science, exemplified by the relativist strong program, supplied the philosophical alibi: if all values are socially constructed, any quantification can be justified [2]. Thus, a field founded on administrative convenience came to mistake formal precision for epistemic legitimacy. To understand HTA's half-century of false measurement is to see how modern technocracy revived pre-scientific habits of thought; rebuilding the very scholastic edifice that the scientific revolution of the 17th century displaced [3].

THE SCHOLASTIC STRUCTURE OF HTA

Scholasticism, as an historical and philosophical mode of reasoning, emerged in the medieval universities of Europe between the twelfth and fourteenth centuries [4]. It was not defined by the pursuit of new empirical knowledge, but by the rational elaboration of pre-given truths. Within this system, theological or Aristotelian premises were taken as axiomatic; intellectual activity consisted in organizing, classifying, and reconciling them through formal logic. The scholastic method prized precision of argument, internal consistency, and exhaustive categorization, yet it operated entirely within the boundaries of established doctrine. Its practitioners built intricate conceptual architectures, systems of definitions, distinctions and disputation that dazzled in technical complexity while remaining insulated from empirical verification. The highest form of intellectual virtue was not discovery but coherence; the purpose of reasoning was to defend, not to test, the foundations of belief.

In this sense, scholasticism represents a particular epistemic posture: it privileges formal rationality over empirical correspondence, authority over falsifiability, and the perfection of internal systems over engagement with the external world. It is, as Max Weber might describe, a rationalization without empiricism, a method that transforms thought into an administrative exercise [5]. Its power lies in its self-referentiality; one must adopt the language of the system to be heard.

HTA reproduces this structure with striking fidelity. From its bureaucratic inception in the 1970s, HTA was designed not to investigate truth claims about health but to supply an administratively usable metric for decision-making. Its foundational assumption, that health states and preferences can be represented numerically on a common scale. functions as a theological premise. Around this untested axiom, an elaborate edifice of reasoning has been constructed: cost-utility analyses, QALY calculations, and probabilistic sensitivity models. Each addition refines internal coherence without questioning the original assumption. Like the scholastic disputations that parsed divine attributes within the limits of doctrine, HTA debates the correct weighting of utilities, the boundaries of uncertainty, or the optimal form of sensitivity analysis, while leaving untouched the question of whether ordinal data can ever yield interval measures; an impossible scenario as evidenced by Stevens in 1946 and formalized by Krantz *et al* in 1971 [6] [7] .

The field's technical virtuosity masks its epistemic closure. Journals, funding agencies, and graduate curricula reward conformity to established forms of calculation, not interrogation of their validity. Authority derives from procedural orthodoxy, the correct invocation of accepted models, rather than from empirical demonstration [8]. Disagreement, when it occurs, is managed within the boundaries of methodological decorum, producing a culture of "licensed dissent" that sustains rather than challenges the system. HTA thus embodies the scholastic logic of an internally self-sufficient discourse: it generates certainty through definition, not through testable correspondence with the world.

The scholastic structure of HTA is therefore both intellectual and institutional. It converts bureaucratic necessity into epistemic doctrine, transforming administrative convenience into methodological orthodoxy. Its practitioners are not charlatans but faithful clerics of a secular theology of quantification, preserving coherence at the expense of falsifiability. In doing so, HTA reveals the persistence of scholasticism within modern technocracy, the enduring temptation to mistake formal order for truth, and numerical elegance for knowledge.

This is not to say HTA lacks empiricism; it depends on empirical data. But the data are absorbed into a predefined narrative framework of appraisal reports, model structures, and guidelines whose internal logic is rarely challenged. What's "real" is what fits the established evidence taxonomy. In that sense, HTA can indeed be described as a modern scholasticism: a system that prizes formal coherence and methodological orthodoxy over exploratory empiricism or foundational measurement validity. The resemblance is more than rhetorical; it's epistemological.

NULLIUS IN VERBA

When the Royal Society was formally founded in 1660 and received its royal charter in 1662, its earliest members, including Robert Boyle, Christopher Wren, John Wilkins, and later Isaac Newton, were reacting against the intellectual dominance of medieval scholasticism and the

continued authority of classical sources such as Aristotle and Galen. In much of Europe, scientific claims still rested on citation to revered texts, not on experiment or measurement. The Society's founders wanted to define a *new* epistemic culture: one that relied on observation, experiment, replication, and demonstrable evidence.

During the drafting and refinement of the Society's identity, its statutes, seals, and formal symbols, the motto became central. It was proposed within the first several years (likely by John Evelyn or another close associate of the early governing council). The precise meeting at which it was formally adopted is not recorded, but it was in place by the late 1660s, appearing on early printed materials, insignia, and the Society's second seal. Its selection aligned perfectly with Boyle's methodological writings, such as *The Sceptical Chymist* (1661) and *Certain Physiological Essays* (1661), which argued that experiment, not authority, must ground natural philosophy.

The motto was therefore chosen as a direct repudiation of argument from authority. It signaled to Europe's intellectual world that the Royal Society would accept no proposition merely because a great thinker had asserted it. Every claim had to be open to inspection, measurement, experiment, and potential refutation. The emphasis was not on disbelief for its own sake, but on evidence as the sole arbiter.

Thus, *Nullius in verba* was the philosophical banner of a new scientific ethos. It enshrined empirical independence at a moment when scientific authority was shifting from inherited texts to testable claims. It remains one of the clearest institutional statements ever made about the nature of scientific inquiry.

MODERN SCHOLASTICISM: THE REFERENCE CASE

There is a very strong and historically meaningful equivalence, and in fact the analogy is one of the most accurate ways to characterize what happened in HTA after the institutionalization of the reference case. The parallel is not rhetorical; it arises from deep similarities in the *structure of authority*, the *status of evidence*, and the *method by which claims were validated*.

The scholastic world before the scientific revolution operated on a logic in which truth was grounded in textual authority: Aristotle, Galen, and the Church Fathers. Intellectual legitimacy came from correct citation, not from empirical demonstration. The method was deductive and exegetical; experimental refutation was unnecessary, sometimes undesirable, and often unthinkable. What mattered was conformity to the canonical framework, not whether claims matched the world.

The reference case in HTA reproduces this structure with astonishing precision. It provides a canonical template to which manufacturers and analysts must conform, not because its assumptions are empirically validated but because the framework itself has been granted authority. Just as scholasticism elevated Aristotle beyond challenge, HTA elevated the standard gamble, time trade-off, and the QALY to a status where questioning their measurement foundations became professionally disruptive and institutionally unacceptable. The issue was not whether these constructs measured anything; the issue was whether their use aligned with the accepted procedural form.

In both systems, methodological authority substitutes for empirical testing. The pre-scientific tradition treated appeals to Aristotle as evidence. HTA treats adherence to the reference case as evidence. Both systems mask the absence of true measurement beneath a veneer of procedural correctness. The scholastics believed that argument from authority resolved disputes. HTA behaves as if numerical conformity, producing QALYs, populating decision trees, running Monte Carlo simulations, constitutes empirical validation.

Most strikingly, both systems are closed epistemic environments. In scholasticism, anomalies were reinterpreted as interpretive difficulties rather than as challenges to underlying theory. In HTA, violations of measurement axioms are reframed as "contextual variation," "methodological flexibility," or merely "limitations," rather than as fatal contradictions that invalidate the construct. Neither system allows anomalies to accumulate into crises. Neither system has a built-in mechanism for falsification. Both rely on intellectual reproduction, through guilds, universities, and professional norms, to preserve their epistemic order.

This is where the Royal Society's motto exposes the fault line. *Nullius in verba* stands precisely against the idea that procedural or textual authority can legitimize scientific claims. It insists that claims be open to refutation through measurement, experiment, and publicly reviewable evidence. The reference case functions in the opposite way: it demands that claims be fitted into a pre-specified structure that itself has never been validated. Where the Royal Society rejected authority, HTA institutionalized it.

Thus the equivalence is not metaphorical but structural. HTA, through the reference case, recreated a scholastic epistemology inside a field that believed itself modern and quantitative. It inverted the scientific revolution's achievement by granting primacy not to testable propositions but to an inherited framework for imaginary claims. The resemblance is therefore direct: both systems elevate an authoritative template over measurement, both suppress falsification, and both perpetuate error through institutional continuity rather than a contribution to the evolution of objective knowledge.

THE REBIRTH OF SCHOLASTICISM IN THE 1970S

The rebirth of scholasticism in the 1970s occurred not in theology but in the bureaucratic machinery of welfare states. The post-war expansion of public health systems had created an administrative crisis: governments faced spiraling costs, rapid medical innovation, and demands for equity in access to care. Economists and policymakers sought a rational mechanism to decide which interventions deserved public funding. Out of this climate of managerial urgency arose the idea of a single, quantitative measure that could express the value of health and permit direct comparison across diseases, treatments, and populations. This was the bureaucratic cradle of HTA. Its purpose was never epistemic discovery, the evolution of objective knowledge, but administrative control. It aimed to translate moral and clinical complexity into a metric that could serve policy needs; an instrument of governance masquerading as a science of measurement.

In the 1970s, proponents of HTA ignored the principles of fundamental measurement, a disregard that had profound implications for the evaluation of medical interventions. At that time, HTA was emerging primarily from health economics, epidemiology, and policy analysis, and its focus was

on cost-effectiveness, clinical outcomes, and aggregate population-level decisions. The intellectual foundations of measurement theory, particularly the axioms of representational measurement for manifest and latent traits, which by the 1970s had established the rigorous criteria for lawful quantitative assessment as developed by Stevens, Krantz, Luce, Suppes, Rasch and Wright, were absent from the discourse [9] [10]

Instead, HTA practitioners routinely employed ordinal scales, composite indices, and other numerical indicators as if they were true measures capable of supporting arithmetic operations. Concepts such as unidimensionality, invariance, and the possession of a quantitative attribute were rarely considered, and statistical manipulations were applied without questioning whether the underlying data genuinely supported arithmetic operations. This pragmatic but theoretically unsound approach allowed the generation of numerical summaries, cost-effectiveness ratios, and QALYs; calculations that appeared precise but were not grounded in lawful measurement. The result was a body of assessment literature that treated numbers as measures while violating the axioms required for meaningful, interpretable quantitative evaluation, a legacy that continues to challenge the conceptual foundations of HTA to this day.

These conditions of HTA's birth guaranteed its failure as a science of measurement. Health, unlike temperature or mass, is not a manifest quantity but a composite of subjective states, functional capacities, and social meanings. Yet the drive for comparability demanded numerical commensurability. The architects of cost-utility analysis therefore borrowed from welfare economics and decision theory, adopting ordinal preference techniques such as time trade-off and standard gamble to elicit "utilities" for health states. These ordinal rankings were then treated as if they existed on an interval scale, allowing arithmetic operations, averaging, multiplication, and aggregation, that have no meaning outside genuine measurement. The result was an elaborate structure of quantitative reasoning built upon an unmeasurable foundation. HTA was born with the logic of scholasticism already encoded in its methods: it assumed what it could not prove and refined what it could not test.

The intellectual climate of the 1970s reinforced this transformation. The Popperian ideal of science as a process of bold conjectures exposed to refutation had already lost ground under post-Kuhnian notions of paradigm-dependence, and was further eroded by the sociological strong program, which replaced falsification with explanations of scientific claims in terms of their social origins. In this milieu, the claim that all values are socially constructed provided convenient justification for methodological shortcuts and, if they were aware, the dismissal of the axioms of representational measurement. If every valuation of health is a matter of preference rather than property, then the question of whether these valuations are measurable becomes irrelevant. The supposed epistemic humility of this relativist position quickly mutated into a shield against scrutiny. Once all methods were framed as equally context-dependent, HTA no longer had to defend its own foundations. Ordinal utilities, non-measures, and model-based fictions could persist unchallenged because criticism could be dismissed as just another "perspective." Relativism became the alibi that protected the field from confronting its own scientific impossibility. It allowed HTA's practitioners to treat numerical representations of preference as if they were genuine measurements of a latent construct, even though no test of measurement validity was possible. At the same time, HTA's advocates showed no interest in the fundamental distinction

between manifest and latent constructs, with no awareness that there was only one set of rules, the Rasch rules, for transforming subjective observations into interval measurement.

At the same time, the political economy of welfare administration demanded closure, not uncertainty. Policymakers required a single figure, a cost per quality-adjusted life year, that could translate complex moral and clinical judgments into budgetary decisions. The QALY became the bureaucratic equivalent of a theological axiom: unprovable, indispensable, and endlessly elaborated through formal reasoning. The field's early successes were bureaucratic rather than scientific. It supplied numbers where none existed, certainty where doubt would have been intolerable. The price of this convenience was epistemic integrity.

Thus, the 1970s witnessed the rebirth of scholasticism in a new form: a technocratic theology of quantification. HTA emerged not as a failure of later corruption but as a system designed from inception to guarantee measurement failure. Its procedures were precise yet meaningless, its authority procedural rather than empirical. What appeared as scientific innovation was, in truth, a restoration of pre-scientific reasoning; an elegant machinery of logic sustained by faith in numbers that could never measure what they claimed to represent,

THE SURVIVAL OF HTA SCHOLASTICISM

That the scholastic structure of HTA has endured for half a century is less a mystery of scientific evolution than a testament to the power of institutional self-preservation. From its origin in the bureaucratic pragmatism of the 1970s, HTA has functioned not as a science of discovery but as a system of administrative rationalization. It promised governments and health agencies a single, comparable measure through which to allocate finite resources. Once institutionalized, this promise became indispensable: it provided political justification for difficult decisions, a procedural veneer of fairness, and the reassuring illusion of quantitative objectivity. To abandon it would mean admitting that much of modern health policy rests on conceptually invalid foundations. Thus, what began as a technical convenience hardened into an epistemic necessity, and over decades this necessity became a straightjacket.

The endurance of HTA's scholasticism lies in its capacity to convert technical formalism into institutional legitimacy. Cost-utility analysis and the QALY offered not merely tools but a language, a grammar of policy rationality, that allowed bureaucracies to speak the idiom of science without confronting its demands. Numbers could be displayed, compared, and defended; uncertainty could be expressed through confidence intervals and probabilistic models. The aesthetic of calculation substituted for epistemic validity. This transformation from measurement to performance created a culture of procedural orthodoxy, where methodological rigor was equated with the faithful repetition of established forms rather than with falsifiable inquiry. In such a system, critique could only be expressed through the system's own vocabulary, ensuring that reform reproduced rather than disrupted the underlying logic.

The academic structure of HTA further reinforced its scholastic character. Graduate programs trained generations of analysts to master computation rather than question its premises. Doctoral theses replicated existing models with minor variations; journals rewarded statistical sophistication over theoretical clarity; funding bodies demanded deliverables that aligned with policy

frameworks already built on QALY-based reasoning. The profession became self-referential, with authority conferred through citation networks, methodological conventions, and adherence to canonical practices. This recursive system, knowledge validating knowledge within a closed circle, ensured that the field could reproduce itself indefinitely without epistemic renewal. The scholastic straightjacket thus operates through pedagogy as much as through policy.

Philosophically, the endurance of HTA's scholasticism has been underwritten by a wider cultural shift toward epistemic relativism and technocratic utilitarianism. The late twentieth century saw a weakening of the idea that scientific claims must be falsifiable and an increasing tolerance for context-dependent "truths." In the policy sciences, this relativism became convenient: if all measures are social constructs, then none need be tested for their ontological validity. HTA thrived within this permissive environment, where the appearance of rationality was more valuable than its substance. The rhetoric of "evidence-based policy" masked a deeper abandonment of the principle that evidence must correspond to measurable reality. The field's mathematical sophistication became the modern equivalent of scholastic Latin; a technical language that conferred authority through obscurity.

Institutionally, HTA's survival has been guaranteed by its political utility. Health ministers, insurers, and agencies require a framework that converts moral complexity into administratively actionable numbers. The QALY, even though mathematically impossible, provided a language of decision-making that transforms ethical dilemmas into cost-effectiveness thresholds. No policymaker can easily renounce such a tool without undermining the entire edifice of contemporary health economics. As a result, HTA's epistemic weakness is tolerated, even protected, because it serves the practical needs of governance. Its scholasticism is thus adaptive: it survives precisely because it constrains thought within manageable boundaries, preventing the emergence of alternatives that might destabilize bureaucratic order.

This survival, however, is not mere inertia, it is active reproduction. Every peer review, every funding call, every methodological guideline acts as a ritual reaffirmation of the system's legitimacy. The straightjacket is woven from consensus: to question the validity of measurement is to risk exclusion from the community, to lose access to publication, recognition, and career advancement. As in medieval scholasticism, heresy is not refuted but rendered invisible. The field sustains itself through repetition, a continuous circulation of formal knowledge untested by reality.

The endurance of HTA's scholasticism owes as much to ignorance as to institutional inertia. From its inception, the field has operated within an epistemic vacuum. its practitioners trained to manipulate numbers without understanding what makes numerical operations legitimate. The typical health economist learns to build models, run regressions, and compute cost-effectiveness ratios, yet rarely encounters the principles of measurement theory or the falsification standards that define scientific inquiry. The distinction between ordinal and interval data, between numerical labeling and quantification, is treated as a technical curiosity rather than a foundational truth. In this intellectual poverty, error becomes invisible, and false measurement passes for rigor.

Graduate education has been the silent engine of this ignorance. Students are taught to replicate accepted procedures rather than to interrogate their validity. Courses in econometrics and decision analysis fill the curriculum, while the logic of measurement and the philosophy of science remain

absent. The result is a professional culture that confuses calculation with knowledge. Without exposure to Popperian falsification or to the axioms governing lawful arithmetic, practitioners cannot recognize when their methods violate the conditions of science. They inherit a tradition without the tools to question it.

This educational failure has preserved HTA's scholastic character for half a century. It has created a discipline that perpetuates its own ignorance, a closed world in which mathematical ornament replaces epistemic substance. The audience for reference case claims is equally ill-equipped to challenge them, with payers and reviewers lacking the conceptual tools to interrogate measurement and manufacturers embracing the reference case as an expedient route to acceptable pricing and rapid market entry. The absence of education in measurement and falsifiability has not merely hindered progress; it has guaranteed the survival of error.

That HTA's scholasticism endures after fifty years is therefore a consequence of its perfect institutional adaptation. It has become the bureaucratic form of a modern theology, one that transforms uncertainty into authority through numbers, substitutes procedure for proof, and confuses administrative stability with epistemic truth. Its survival depends on the very straightjacket it created: a structure so tightly woven that to loosen it would be to unravel the illusion of rational governance itself.

CONCLUSION

After fifty years, the achievements of HTA are largely administrative rather than scientific. It has provided governments and insurers with a common language for rationing care, a formalized process for comparing interventions, and an aura of objectivity that lends legitimacy to difficult political choices. HTA has institutionalized a procedural rationality that allows policymakers to act as if health were measurable, as if moral dilemmas could be resolved by arithmetic. In that limited sense, it has succeeded: it created coherence within bureaucracy and predictability within policy. Yet these are the accomplishments of a clerical system, not of a science. They rest on the illusion of measurement, not its reality.

As a scientific enterprise, HTA has failed. It has never demonstrated that its central quantities, utilities, QALYs, cost-effectiveness ratios, measure anything in the technical sense of measurement theory. Its outputs cannot be falsified, its models cannot be verified, and its claims to precision are unsupported. What endures is not knowledge but ritual: the repetition of procedures that reproduce legitimacy while excluding critique. The field has thus become the bureaucratic heir of scholasticism; an institution devoted to maintaining the form of reason after reason itself has departed.

Where, then, do we go from here? Either HTA must be rebuilt on genuine measurement principles, linear ratio and Rasch-based scales capable of falsifiable claims, or it must accept its proper place as a historical curiosity, a moral lesson in how administrative convenience can masquerade as science. Without such reform, HTA will not evolve but merely persist, a monument to collective epistemic ignorance. It will rejoin the scholastic closet from which it came: not as a living science, but as a cautionary footnote in the history of scientific malpractice. An endless HTA future that endorses one reference modelled imaginary claim for cost effectiveness after another.

ACKNOWLEDGEMENT

The author acknowledges the use of ChatGPT (version 5, OpenAI) in drafting and editing portions of this paper. All AI-assisted text was reviewed, verified, and substantively revised by the author, who assumes full responsibility for the final content and interpretation.

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