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Can Metaeconomics be a Framework for MCDA in Management?

Metaeconomics is a methodological system integrating MCDA to bridge the gap between economics and management. It assesses multidimensional cases such as competitiveness, sustainability, and resilience in management. The paper reviews its principles, evaluates its strengths and limitations, and considers its perspective.

Keywords: metaeconomics, management, Multiple Criteria Decision Analysis (MCDA).

Metaekonomika yra metodologinis pagrindas, užpildantis spragą tarp abstrakčios ekonomikos teorijos ir vadybos. Ja remiantis prasminga modernioje vadyboje integruoti atitinkamus daugiatikslių sprendimų priėmimo (DSP) metodus. Apžvelgiami DSP principai, įvertinami jų privalumai ir ribotumai, perspektyvos.

Raktiniai žodžiai: metaekonomika, vadyba, daugiatikslė sprendimų analizė.

Introduction

Metaeconomics Refinement in an Epistemological Context: Sense, Consensus and Essence

The escalating complexity of the global economy, characterised by the rise of the knowledge-intensive economy, the imperative of universal sustainable development, and the proliferation of intangible assets, challenges the explanatory power of neoclassical economic paradigms. Traditional analytical tools, often predicated on assumptions of rationality, market clearing, and easily quantifiable variables, prove inadequate for grappling with these multifaceted phenomena. The paper posits a compelling case for a renewed focus on methodological frameworks that transcend the limitations of post-war neoclassical synthesis, which, for all its analytical elegance, has faced persistent and growing criticism for its limited scope in explaining and guiding contemporary economic realities (Schumacher, 1973; Stiglitz, Sen, & Fitoussi, 2009). The author identifies that the *homo economicus* paradigm and a singular reliance on aggregate measures like GDP or Gross National Happiness are inadequate for addressing the complex, multidimensional challenges of the 21st century. The central argument – that *metaeconomics* should be understood not as a new economic theory, but as a *systemic methodological* framework with its axioms, postulates, and principles – is a sophisticated and crucial distinction

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that provides a strong foundation for the analysis and decision-making in complex socioeconomic systems.

In general, ***metaeconomics** is a **system of economics methodology***, a *criterion system* of specified approaches between the dynamics of the *real economy* and its *analytical research systems* within conventional economics (Buracas, 1968, 1970, 1985). The metaeconomics as a *systemic metatheoretical construct* generalising cognitive meta-approaches in the economic research includes *regulative principles* concerning, p. ex., the *comeasurability* criteria in the knowledge economy or developing intellectual potential (Buracas et al., 2025). This concerns the difficulty of making disparate, qualitative values (e.g., social utility, environmental health, creative potential) comparable within a single, quantitative framework.

The manuscript's core *contribution* is an attempt to formally define and taxonomically structure this metaeconomic framework as *a system of abstract regulative principles and analytical tools* designed to operate at a higher logical order than conventional economics. The management of global public goods, the valuation of intellectual and natural capital, and the formulation of sustainable development strategies demand an analytical apparatus that extends beyond the confines of marginalist optimisation. The author's work aligns with a growing body of literature that seeks to reintegrate normative and qualitative factors into economic analysis, moving beyond a purely quantitative, efficiency-focused perspective.

The output of some areas of the economy remains, for now, unmeasured due to the limitations of the methodology applied (this is true for the creative activity and some service sectors). As the structure of economic activity and the methodology of its scientific analysis change, its evaluation criteria must be refined for assessment of complex concepts such as intellectual capital, national competitiveness, and universal sustainability. On the one hand, it is necessary to interpret more strictly the categories of social utility and value when describing such non-traditional (from the perspective of economic research) areas of activity as healthcare, the satisfaction and the development of creative abilities and competencies, universal sustainability, etc., where the economic efficiency approach is increasingly being applied. For example, the value of intangible assets (education, ideas, inventions, culture) cannot be measured by the economic indicators of their material manifestations (books, paintings, etc.). The valuation of intangible assets – now comprising over 90% of S&P 500 market value compared to 17% in 1975 (Ocean, 2020) – requires exact methodological tools beyond marginal productivity theory. On the other hand, the socio-economic effect of some services, such as health prevention and treatment, professional education of talents, etc., is often equated with the social costs of these services. In some cases, indirect or partial criteria of the reproduction process are used to refine the qualitative research parameters of this process. For example, indicators of the development of social division of labour can be the number of professions or the number of stages of product processing (until final consumption).

The metaeconomics specifies the *interconnections* between economic axiomatic & system of principles and methods to be applied in its substantiation. It *conceptualises the main epistemological and ontological* positions (approaches) in terms of the relation between the economic activity (or reality) and its research. In such meaning, metaeconomics is interpreted as a *system of a higher logical order* concerning economics, similar to *metalogics.co, metamathematics, metaethics* (plato.stanford.edu/entries/metaethics).

The metaeconomics as a *systemic metatheoretical construct* generalising cognitive meta-approaches in the economic researches includes *regulative principles* concerning, p. ex., such as the *co-measurability* criteria in the knowledge economy or intellectual potential. In this context, metaeconomics determines the *general* and *specific* principles and criteria of economic sciences, the order of their *subordination* and their *distinction* from other social sciences, interrelations with management, sociology, psychology, demography, *gnoseological and normative conceptualisation* of constructs, etc. The metaeconomic approach was helpful when building the stochastic network model of universal sustainability by matching development interests, disposable resources' allocation and/or characteristics of complex adaptive systems.

The primary **contribution of this paper** is to synthesize the disparate elements of metaeconomic approach by: (1) augmenting this methodological interpretation to distinguish it from other, philosophical or behavioral, conceptions of metaeconomics; (2) articulating the core principles and methodological toolkit of metaeconomic view in management, with a focus on its reliance on MCDA; (3) demonstrating its empirical relevance through its application in influential global assessment frameworks; and (4) concluding of its core postulates and a critical evaluation of its strengths and weaknesses. The intended audience is academic economists and policy experts engaged in the challenges of evaluation and strategic management in a globalised, knowledge-driven world.

In the last years of the 21st century, interest in applying the metaeconomics term became more active. Now functioning *Metaeconomics Research Center* (El Centro de Estudios de Metaeconomia, Madrid), also *Meta Economics Consulting Group* (Canberra) are entities providing advisory and consultancy services but not developing metaeconomics itself. *Metaeconomics Asesores S.L.* (Madrid) is an international strategic and economic intelligence consulting firm advising governments, national and international institutions worldwide, mostly on the implementation of new web tools for collective intelligence and on policies for convergence and technological development.

Central Postulates and Conceptual Refinement

When analysing the principles of economic research at different levels of theoretical interpretation, it's essential to highlight the specific nature of certain methodological positions. The manuscript introduces a series of postulates

that form the core of its metaeconomic framework. To elevate the clarity and precision of these ideas, they can be more explicitly structured as a set of axioms and principles.

1. The Axiom of Hierarchical Epistemology asserts that metaeconomics is a meta-discipline, providing the regulative principles and axiomatic foundations for how economic knowledge is constructed and validated, rather than generating a new set of empirical propositions itself.

2. Metaeconomics as a Higher-Order System of Principles. Its definition as a *system of economics methodology* can be formalised as the *Postulate of Meta-Systemic Ordering.* Metaeconomics, in this view, functions as a system of a higher logical order, similar to metalogic or metamathematics. It specifies the regulative principles, criteria of developing construction, and interconnections between economic research and other disciplines, ensuring their epistemological and ontological consistency. This clarifies the framework's role not as a new theory competing with macro or microeconomics, but as the governing logic that structures and evaluates them.

3. The Ontological Duality of Economic Reality. The fundamental methodological problem in economics is the failure to reconcile *reistic* (object-oriented, material) and *social* categories. Economic reality is not reducible to reified, static, and material categories (e.g., capital, commodities). Economic phenomena are not merely the interaction of such reified "things" but are fundamentally expressions of human social relationships. These relationships cannot be fully captured by static, material-based categories alone. This postulate underscores the necessity of moving beyond a purely materialist interpretation of economic variables (e.g., Roy, 1996).

4. The Subsystemic Co-Substantiation (Normativity and Productivity). The challenge of aligning the *Normative-value subsystem* (goals, criteria, and social preferences) with the *realisation-applied subsystem* (the set of means, policies, and technologies) is also important to achieve defined economic outcomes. Economic policy and activity require a continuous, dynamic synchronisation of what we value with how we act. The point that unforeseen consequences arise in a highly complex division of labour due to a failure in this synchronisation is a critical insight, suggesting that the framework must be a predictive and regulative one, not just a descriptive one. The efficiency of an economic system is determined not just by its efficiency but by the congruence between its stated goals and its practical implementation.

5. The Primacy of Context and Time in Value Hierarchies. The value hierarchies are not a static quantity and are not only *discursive* from a logical analysis perspective. They are dynamically determined by their position within a time accounting system, influenced by the *chronological boundaries of causal relationships* of economic events and phenomena. This can be elevated to the *Axiom of Temporal-Contextual Value.* Economic value is not an absolute, but a dynamic, path-dependent phenomenon. The discussion of *temporal ontology* and *path-dependent processes* aligns with evolutionary and behavioural economics, which views

economic systems not as static, but as dynamic and adaptive (Lynne, 2020).

The use of financial instruments like interest and discount rates as measures for comparing future and present valuations is an excellent example of this. It also includes the peculiarities of combining as well as instantaneous and process-based categories within theoretical systems described as stereotyped expressions of functioning structures (elements). The framework must provide a methodology for the intertemporal comparison of present and future valuations, acknowledging that the value of an asset or policy changes with its chronological boundaries and causal relationships. The metaeconomics, therefore, incorporate a robust *time accounting system* to clarify the axiomatics of preference hierarchies and intertemporal decision-making.

6. The Inversion and Intraversion of Methodological Positions. Specialised literature discusses the application and effectiveness of *functional* and *causal* approaches at different levels of research. In the context of economic theoretical systems, this becomes relevant due to both the *inversion and intraversion* of individual methodological positions, and the intertwining of random and causal processes, which cannot be untangled through simple description alone. *Inversion* could be defined as the re-evaluation and reapplication of a methodological position across different levels of analysis (e.g., applying micro-level behavioural insights to macro-level policy). *Intraversion* could refer to the internal transformation of a methodological position itself, as new data or phenomena (e.g., unobservable knowledge objects) challenge its core tenets (Buracas, 1970, 2025).

A sufficient prerequisite for the transformation of methodological positions is the transition from one research level to another. For example, the same gnoseological empiricism that lends reality to hypothetical constructs can also limit the development of theoretical concepts, especially when they are applied more broadly to unobservable or unmeasurable objects of knowledge (competencies). The aforementioned inversions and intraversions are necessary precisely because the application of specific methods or principles changes in the managerial practice. The manuscript's point that gnoseological empiricism can both enable and constrain theoretical development is a sophisticated observation. This can be framed as a central methodological paradox that the metaeconomic framework is uniquely equipped to manage, by providing the criteria for when to transition from one research level to another. It seems that the scope of special research methods is also expanding, a process that accompanies the evolution of the methodological toolkit of knowledge.

A Refined Taxonomy and Regulative Principles

The *taxonomic* ranking of priorities in the multipurpose imitation of economic aspects of social development presupposes the *weighted comparability* of criteria functions on the qualitatively different levels – on the aspects of determining the alternatives of optimisation, also of multicriteria dynamic equilibrium, and the preferable managerial strategies.

Taxonomic structure of metaeconomics

The author's proposed taxonomic structure is a robust and well-conceived foundation. It can be streamlined into a more concise *Paradigmatic Framework* for maximum effect:

- *Theoretical Paradigm*: The identification of a coherent, informal "meta-generalisation" that fixes the main constituents of the economic system.
- *Axiomatic Principles*: The establishment of *general and special* economic principles, postulates, *procedures* and methods, both general and special, their *subordination, coordination* and interpretation, along with their hierarchy and interpretation.
- *Methodological Criteria* and *Principles*: Defining criteria for the taxonomic arrangement of economic methodologies – *subordination of the economic sciences, conceptualisation, and optimisation* of their *subsystems.*
- *Theory Construction Criteria*: Providing epistemological standards for the construction, comparability, and reliability of different economic theories and hypotheses.
- *Interdisciplinary Integration*: Establishing principles for the interconnectivity of economic research with other fields of inquiry or of integral reality.

Taxonomic interpretation of metaeconomics institutionalisation

- The *social criteria* and tasks may be arranged into a consecutive *conceptual system,* instituting its different levels and *with account of changing normative (or minimax) functions* detailing admitted *hierarchies of* those *preferences* at various periods of development.
- The specific problem is a *variety of functioning concepts* imitating or depicting the same real economic system: the methodological task then is to find a *non-contradicting solution* when interpreting the possible *intersection of multilevel utility criteria* and different hierarchies (of social preferences).
- Any socioeconomic development program *integrates* both: the rank of criteria based on the *common values* and other ranks *differentiating* these rational criteria according to the national, ethnic, sexual a/o features, depending on prevailing traditions, achieved level of development, geopolitical factors (climate also), cultural a/o behavioral stereotypes.

Regulative principles and postulates

The metaeconomics concept and instruments include regulative principles concerning, p. ex., such as the co-measurability criteria in the knowledge economy or intellectual potential. They are especially used for researches of *social preferences* and *intellectual resource efficiency*, *global talent competitivity* a/o interconnected with macroeconomics. Some of them are *similar to* concepts and principles used in *applied sciences,* like *minimax*, *elasticity*, and *synergy* evaluations (*see* Buracas, 1985).

Complicated multicriteria decisions are certainly often based on the

preference of a *more probable and less risky* socioeconomic alternative *to* a *more desirable* but *less probable* and sometimes *riskier* one. At the same time, the economic rationalisation of the managerial, investment or consumer solutions quite often may lead to *socially unacceptable limitations*.

The metaeconomics research and evaluation technique include many intellectual instruments similar to social sciences in general but more based on multicriteria expert evaluations of *social factor matrixes* and also multistage regressive analysis of surrounding social, psychological, and/or processes of economic activity, helping to take into account the impact of shadow economy, effects of sustainable intellectual development, not measurable side impact of financial bubbles, etc. Many of the methods adopted for the evaluation of intellectual capital and its economic effect are *complicated*, *not reliable for a longer period* and, by realistic recognition, require too many efforts. So, metaeconomics approaches facilitate their applicability, and they can be assessed more reliably by applying, p. ex., in *Knowledge assessment methodology* and so on (*see* Buracas, 2013).

The list of regulative principles is a key contribution and can be presented as the "operational rules" of the metaeconomic framework. The author's list is comprehensive and can be organised for greater logical flow:

Systemic Principles:

- Internal Structuralism and Complexity: Acknowledges the intricate interdependencies within an economic system.
- Negentropic Orientation: A focus on open morphologies that evolve towards increasing order, countering the entropic tendency of decay. It could be operationalised in a sustainability model where a criterion is the reduction of resource depletion over time.
- Nonlinearity: Recognises that systemic interactions are dynamic and not proportional, especially in relation to environmental or technological factors.
- Synergy: Highlights that the interactive integrity of system components yields multiplicative, non-additive efficiency.

Value and Purpose Principles:

- Multiplicity of Values and Purposes: Explicitly acknowledges that economic activity is driven by a diverse set of non-material values and goals.
- Coherence: Demands consistency across all structural levels, from normative goals to innovative practices.

Adaptation and Evaluation Principles:

- Equifinality: The system's ability to reach a specified final state from different initial conditions through dynamic, regulative mechanisms.
- Evaluative Congruence: The consistency and alignment between different socioeconomic systems and their outcomes.

Critical evaluation of the metaeconomic framework: Strengths of the approach

Conceptual Clarity: The central argument – that metaeconomics is a methodological, not a behavioural,

framework – is a strong and precise contribution. It clarifies a long-standing terminological ambiguity in the field.

Constructive Approach: The focus on MCDA provides a tangible set of tools for operationalising a more holistic form of economic analysis. This moves the discussion from abstract critique to a practical, solution-oriented approach.

Relevance: The framework is highly relevant to contemporary policy challenges. It offers a structured way to address issues that dominate modern discourse, such as sustainability, the valuation of intellectual capital, and social equity, which are inadequately handled by conventional economic models.

Methodological Sophistication: The framework correctly identifies that the most profound challenges in economics are not theoretical, but methodological. By proposing a metaeconomic structure, the author provides a powerful "grammar" for constructing and evaluating economic theories. This is a significant intellectual leap beyond simply offering a new theory of behaviour.

Transcendence of the Neoclassical Paradigm: The framework directly addresses the limitations of homo economicus and GDP-centric analysis by explicitly incorporating intangible assets, social utility, and value hierarchies into its core structure. This provides a formal basis for the qualitative and normative dimensions of economic life.

Actionable Policy Orientation: The principles, such as negentropic orientation and co-substantiation, provide a clear conceptual foundation for developing practical, multi-criteria decision-making tools for sustainable development, intellectual capital evaluation, and resilience in a volatile world. The author's mention of stochastic network models and applications in WEF/WB reports is an excellent demonstration of this.

Limitations and future research

Operationalisation and Measurement: While the framework is rich in conceptual detail, a primary weakness lies in the practical operationalisation of its principles. How, precisely, does one "co-substantiate" normative and realisation subsystems? How are "negentropic" tendencies measured and modelled in a way that is empirically testable? The manuscript alludes to some methods (e.g., expert evaluations, neural networks), but a more explicit mapping of concepts to quantifiable metrics is needed to make the framework a truly powerful tool.

Unified Terminology: The varied definitions of metaeconomics by different authors (e.g., Menger, Schumacher, Lynne) are now widespread. While the author correctly positions his framework as a "methodological" approach, the text occasionally conflates this with the "philosophical" or "synergetic" definitions. A more explicit and consistent argument for why this specific methodological interpretation is the most fruitful is needed to avoid terminological ambiguity.

Causality and Inference: The manuscript mentions the difficulty of disentangling "random and causal processes." While the framework provides a language for this, it does not fully detail how it would improve causal inference. A top-tier journal would require a more detailed discussion on how metaeconomics provides a superior method for

establishing causal links in complex, non-linear systems compared to, for example, existing causal inference techniques or Bayesian methods.

Some pragmatic problems in metaeconomics:

- weakness of smart investment ideology: how to use effectively the available nonmaterial resources to achieve the maximal added value and balance it with the interests of future generations (discount a/o approaches).
- absence of a digitalised analytical system enabling a reasoned assessment of the adequacy of the country development decisions to global progress interests on integral breakthrough.
- inadequate operational resilience decisions, adapting to the global risk and uncertainty conditions, in particular as a result of social innovation and technological inadequacy to achieve the selected national development tasks.
- enhanced development of a universal sustainability model as a constructive tool for the search for new social welfare opportunities and integration of different forms of capital for the optimal development potential of the country.
- provision of more intelligent assessment and rational development of professional competence, and its more effective use for innovative technology needs, suggestion of some recommendations to grow the talents and their innovative productive potential, and, as a result, to support the country's sustainable development perspective.
- social widening of block (crypto) chain technology and interactive managerial decisions alignment according to the subordination of different (political, economic, social, etc.) interests.

Main Divergent Streams in Metaeconomic Thought

The prefix "meta-" implies a discourse that is "about" or "beyond" its subject. Consequently, the term "metaeconomics" has been invoked by scholars to signify the extensions and formal organisation of economics, and their approaches diverge significantly in philosophy and purpose. The term was introduced by Karl *Menger* (1936), who developed the neo-Walrasian approach to the laws of return. The author tried to correctly identify the shortcomings of the neoclassical conception, specifically its struggles with the knowledge-based economy, sustainability, and intangible assets. Metaeconomic approaches address critical failures of traditional economics – handling intangible assets, incorporating value pluralism, managing systemic complexity, and balancing efficiency with resilience (Saarikoski et al., 2016). The three distinct but complementary intellectual streams in economics methodology can be identified:

The Moral-Ethical Foundation

The prominent normative stream of metaeconomics treats the field as a study of the moral and philosophical foundations of economic life. E.F. Schumacher (1973), in his seminal work *Small is Beautiful*,

used "meta-economics" to denote the integration of wisdom, ethics, and ecological awareness into economic thought. He argued that economics, as practised, was a "fragmentary" science, blind to humanity's dependence on the natural world and the higher purposes of human existence. For Schumacher, metaeconomics was a call to subordinate economic calculation to humanistic and ecological values. Meta-economics, in this context, integrates ethics, sociology, and natural sciences (like ecology) to create a framework that is more aligned with human and planetary flourishing.

Most known publications of Gary D. Lynne (1999, 2003, 2020) developed the most systematic metaeconomics concept grounded in a dual-interest theory of human behaviour, rooted in a re-reading of Adam Smith. Lynne challenges the purely self-interested *homo economicus*, positing that humans maximise "own-interest" *comprising both ego-based self-interest and empathy-based other-interest that must be jointly balanced rather than independently optimised*. This "humanomics" seeks to re-integrate ethics directly into the utility function, making empathy a core component of economic rationality. These foundations are extended by grounding dual interest in thermodynamics and non-allocable goods theory (2024). Metaeconomics' emphasis on bounded willpower aligns with behavioural findings on temporal decision-making, while bounded empathy concepts recognise limits in moral reasoning capacity. Dual-system thinking in metaeconomics parallels bounded rationality cognitive frameworks, with research demonstrating enhanced predictive power when incorporating empathy and moral reasoning. This approach provides empirical foundations through behavioural and neuroeconomic science while maintaining analytical rigour. Policy applications span elections, finance, family dynamics, health, natural resources, education, and inequality reduction.

The Evolutionary-Ontological Framework

A second, more recent stream approaches metaeconomics from the perspective of complexity and evolutionary theory. K. Dopfer, J. Foster, and J. Potts (2005) propose a "meso-economics" framework that can be understood as a form of metaeconomics dealing with rule populations and their actualisations, transcending traditional micro-macro dichotomies. They provide a concept based on *three axioms*: all existences are bimodal matter-energy actualisations of ideas, all existences associate, and all existences are processes. Economic evolution is the process of the emergence, diffusion, and decay of populations of rules. Their framework offers a new *ontology* for economics, one capable of explaining structural change, innovation, and economic development in a Schumpeterian vein. This approach is less about what economics *should* value and more about providing a new theoretical structure for understanding *how economies actually change* over time.

The Methodological-Pragmatic Approach

The stream, which is the central focus of this paper, is influenced by the works of P. K. Crosser (1974), F. Parkinson (2016),

A. Buracas (1968, 1985, 2012, 2015, 2017) interpret metaeconomics as a *methodological system of a higher logical order*. It is less concerned with rewriting the axioms of behaviour or ontology, and more concerned with providing a structured, pragmatic framework for analysing and managing complex systems where conventional methods fail. This stream is fundamentally a *normative and philosophical* project aimed at reforming the axiomatic foundations of economic behaviour. This approach integrates qualitative and quantitative methods based on research questions while focusing on actionable knowledge for real-world applications. Integration between traditions occurs through shared critique of reductionism, complexity recognition, normative integration, and methodological pluralism.

As L. Zsolnai (2013) succinctly summarised, the conventional metaeconomics choices of monetary economy as subject matter, material hedonism as basic value-commitment and positivism as methodology are erroneous. The methodological-pragmatic approach provides a direct response by creating a framework to incorporate non-monetary values and move beyond simplistic positivism. It is this third stream that will be elaborated upon. Future synthesis opportunities include dual interest theory integration with rule-based frameworks and blockchain implementation of participatory metaeconomic governance.

The approach presented in this article directly conflates *the methodological-pragmatic approach with normative-ethical considerations* in this paper and addresses the epistemological and practical challenges of measurement and decision-making. It specifies the interconnections between economic axioms and the methods used to validate them, particularly when faced with:

- Multiple, conflicting objectives (e.g., economic growth vs. environmental protection).
- The prevalence of intangible assets (e.g., intellectual capital, institutional quality).
- The need to integrate qualitative expert judgment with quantitative data.
- The management of systemic risk and uncertainty.

The sense of applying the metasystem approach to organisational decisions was successfully discussed by W. J. M. Kickert and J. P. Van Gigch (1979) and other authors.

Application and Empirical Evidence: The Essence and Methods of Metaeconomic View in Management (MEM)

The integrated application of multiple criteria methods, new achievements in stochastic and game theory, and neuroeconomics helps to evaluate more precisely and deeply the complicated aspects of intellectual potential and knowledge economy development, as a result, the competitiveness of sustainable growth and social progress under globalisation trends. The MEM becomes more important with social tasks to measure innovative processes such as the impact of shadow economies and the efficiency of intellectual potential, and to evaluate the prospective demand of rather individualised products (lasers,

nanotech products, most of sophisticated science, leisure, health or cosmetic services, etc.) and perspectives of new approaches like neuromarketing.

The theoretical aspects of MEM specify the *interconnections* between economic axioms and a system of principles and methods to be applied in substantiating practical analysis and decision-making. That is, MEM conceptualises the main epistemological and ontological approaches in terms of the relation between economic management and its research. At the same time, MEM argues the cases when direct managerial solutions are applied with economic evaluations deviated (or restricted) by higher political or other societal governing aims (financing research in knowledge fundamentals, strategic developments with account of territorial safety or under militarisation, etc.).

The successful revealing of new MEM approaches was demonstrated not only by multiple researches of individual authors but also by international comparisons of the global intellectual development indices in series of world-known UN SDG, INSEAD & WEF analytical publications dedicated to international assessment of global competitivity, innovations, IT and other (*The Sustainable Development Reports, The Global Competitiveness Reports, The Global Information Technology Reports*, *The Global Talent Competitiveness Index* a/o), in developing *The Global Innovation Index, Innovation scoreboards* a/o. The most interesting new trends in research also include the interconnection of the benchmarking tools of classical input-output and social matrices, as well as multistage regression analysis of the surrounding social and psychological processes of economic activity. Modern expert evaluations and SWOT analyses also help to take the shadow economy and the financial and sustainable effects that are still officially non-measurable into account more effectively.

Their priority is rather full totality of determining and surrounding impact factors, statistically determined solutions of official data integration with expert evaluations, and weighed co-measurability of qualitative and quantitative determinants of the main selected significant factors according to their importance and task function. It can also be used in subject or institutional ranking.

The economic determinants and managerial factors characterising every group of institutions, as well as parameters characterising innovation quality and intellectual creativity, are not identical; moreover, innovation *outperformers* and *achievers* can be revealed by their attitudes concerning innovation policy for development (Dutta et al., 2014). The innovation quality is dependent on intellectual potential or professional competency and creativity, plus necessary IT infrastructure, and entrepreneurship advantages, etc. (Lanvin and Evans, 2015; Metaeconomics, 2015). The activity of institutional innovators started to be analysed and/or evaluated by international teams as optimisers (those improving the efficiency of existing operations or reducing their costs), enablers (those developing the innovative technologies and infrastructure), and transformers (creating new offerings and/or new markets while eliminating resource dependency).

As a system, MEM underlies the formulation of strategic alternatives from a

sustainable socioeconomic development perspective. The practical utility of the framework may be revealed or demonstrated by referencing its application in a metaeconomic approach to management practice or applying prominent international indices. For instance, explaining how an index like the *Global Competitiveness Index* moves beyond simple GDP per capita by using a weighted composite of factors (e.g., institutions, infrastructure, innovation capacity) can serve as an intuitive illustration of MCDA in action. MCDA applications demonstrate implementation complexity; esp. valuable is their review, applicability and efficiency presented by E. Zavadskas and K. Turskis (2020). A brief case study of a specific country's performance on such an index, analysed through the metaeconomic lens, could provide compelling evidence of the framework's power.

MEM, as a methodological system, serves two functions: it is a set of regulative principles for structuring complex problems, and it is a toolkit of analytical techniques for their resolution.

Core regulative principles of MEM

The theoretical aspects of MEM specify the *interconnections* between economic axioms and the system of principles and methods to be applied in substantiating practical analysis and decision-making. That is, MEM conceptualises the main epistemological and ontological approaches in terms of the relation between economic management and its research. At the same time, MEM argues the cases when direct managerial solutions are applied with economic evaluations deviated (or restricted) by higher political or other societal governing aims (financing research in knowledge fundamentals, strategic developments with account of territorial safety or under militarisation, etc.).

The MEM framework is built upon principles derived from general systems theory, cybernetics, and complexity science (cf. W. J. M. Kickert). These principles are not laws of economics but rather methodical guidelines for modelling and managerial analysis. The author's proposed regulatory principles can be effectively implemented within a Multiple Criteria Decision Analysis (MCDA) process.

The extensive list provided can be consolidated into three thematic clusters:

Systemic Complexity*: Systemic risk management* recognises non-linear, emergent properties of economic systems through network effects, evolutionary processes replacing equilibrium assumptions, and adaptive capacity focus. Multiple criteria for risk assessment extend beyond financial metrics, while uncertainty handling uses fuzzy logic and probabilistic methods for scenario planning and early warning systems.

Internal Structurization and Complexity: Systems are composed of numerous interconnected and differentiated parts. This principle acknowledges the intricate interdependence within an economic system. In an MCDA model for assessing national *innovation capacity*, this would mean not just measuring R&D spending, but also including criteria for the quality of institutions, the strength of intellectual property rights, and the collaboration between universities and industry. The model would use a network analysis to weigh up these interdependent factors, recognising that a weakness in one area

(e.g., poor institutional quality) can undermine strengths in another.

Nonlinearity and Amplification: Causal relationships are not linear; small changes can have disproportionately large effects (e.g., via feedback loops). For an MCDA model on climate change policy, a nonlinear relationship might be modelled between carbon emissions and economic growth. A small reduction in emissions might have a minimal effect on GDP, but a large reduction could lead to a disproportionately large (and potentially positive) effect through the creation of new green industries. The model would use non-linear scoring functions to capture these relationships.

The efficiency-equity balance redefines economic efficiency to include moral dimensions, with stability and peace as efficiency components. Distributional justice becomes an efficiency component while intergenerational equity considerations and social cohesion function as economic performance metrics. This creates holistic efficiency concepts that optimise for sustainable prosperity over short-term profit maximisation.

Emergence and Synergy: System-level properties and efficiencies (1+1>2) arise from the interaction of components and are not reducible to the components themselves. A criterion for synergistic effect could be included in an MCDA model. For instance, a policy that improves public transport while simultaneously incentivising remote work (e.g., by providing free public Wi-Fi) would be scored higher than two separate, non-integrated policies, because the combined effect (reduced traffic congestion and increased productivity) is greater than the sum of its parts.

Goal-Oriented Dynamics and Adaptation related to the purposeful behaviour within the system: *Multiplicity of Values and Purposes:* Economic actors and systems pursue multiple, sometimes conflicting, objectives whose relative importance (hierarchy of preferences) shifts over time. This principle explicitly acknowledges that economic activity is driven by a diverse set of non-material goals. An MCDA model for *public investment projects* would not be limited to a cost-benefit analysis based on monetary returns, which often struggles to monetise non-market goods and services (Saarikoski et al., 2016). MCDA, in contrast, is designed to handle these *incommensurable values* by evaluating diverse criteria in their native units, thus providing a methodological solution to a fundamental measurement problem (Greco et al., 2016). It would include criteria for social equity, cultural preservation, and community well-being, with stakeholders assigning weights to each value based on their preferences.

Equifinality: A desired end-state can be reached from different initial conditions and via different pathways. This principle refers to the system's ability to reach a specified final state from different initial conditions. In an MCDA model for *national resilience*, a policy option could be scored on its ability to help the economy recover from a major shock (e.g., a pandemic, a financial crisis) through multiple pathways. For instance, a strategy that supports both a robust digital infrastructure and a strong local manufacturing base would be rated highly for equifinality, as it can achieve the goal of economic recovery through diverse mechanisms.

Negentropic Orientation: Systems tend towards increasing order and organisation, counteracting entropy, especially in risk management and organisational design. This principle focuses on open systems that evolve toward increasing order. In an MCDA model for evaluating *sustainable urban development*, a criterion might be the reduction of resource depletion over time. An option that leads to a more circular economy (e.g., waste-to-energy systems, advanced recycling) would be scored higher than a linear-economy option, as it moves the system towards a state of greater order and sustainability.

Analytical Coherence and Value guiding the process of research and decision-making: *Coherence:* Systemic integration of diverse elements, relationships, and values at all levels of analysis is required. This principle demands consistency across all structural levels, from normative goals to innovative practices. When evaluating a *corporate social responsibility (CSR) strategy*, a coherence criterion could be used to score how well the company's stated ethical values align with its actual supply chain practices, employee policies, and environmental footprint. A company with high-level ethical statements but poor on-the-ground practices would be penalised.

Evaluative Congruence: This principle ensures consistency and alignment between different socioeconomic systems. When evaluating a country's global competitiveness, an MCDA model would use this principle to ensure that the criteria used (e.g., institutional quality, infrastructure, innovation) are congruent with the measures used by international bodies like the WEF, allowing for meaningful cross-country comparisons. The model would check for consistency between national self-assessments and external evaluations.

Ambivalence: Managerial strategies must account for contradictory attitudes and find robust solutions under uncertainty.

Taxonomic Ranking: The establishment of clear hierarchies and weights for criteria is a prerequisite for rational decision-making in a multi-objective world (Saaty & Vargas, 2012; Zeleny, 1982).

From metaeconomics to methodological content and structure of MCDA

While the metaeconomic framework provides the guiding principles for analysing complex systems, acknowledging nonlinearity, multiple objectives, and intangible values, MCDA supplies the structured, transparent, and analytically rigorous toolkit required for its practical application. It is explicitly designed to evaluate alternatives based on multiple, often conflicting, criteria. The notion of *hierarchical epistemology and knowledge pluralism* (Kickert & Van Gigch, 1979) directly justifies why MCDA is the appropriate toolkit. MCDA's ability to integrate quantitative data, qualitative assessments, and expert judgments is not merely a practical feature; it is a principled response to the epistemological challenge of combining diverse forms of knowledge without reducing them to a single metric (Greco et al., 2016). The fundamental contents of MCDA outline the anatomy of a multi-criteria problem and the generic process for its resolution based on a taxonomy of key

MCDA methods (e.g., AHP, TOPSIS, ELECTRE) through applications in core metaeconomic domains such as national innovation policy, sustainable finance, and global competitiveness assessment. Also, the challenges inherent in the application of MCDA do not invalidate its status as the most robust methodology currently available for navigating the complex, multi-objective decisions central to 21st-century economic management and policymaking, looking at technology breakthroughs and risks, like reliability, commercialisation, and technology change.

MCDA is a sub-discipline of operations research that explicitly addresses decision problems involving a choice among a set of alternatives evaluated against multiple, often conflicting, criteria. Its fundamental purpose aligns perfectly with the central challenges identified by the metaeconomic framework (Belton & Stewart, 2002; Social Multi-Criteria Evaluation, 2025):

- *It embraces multiplicity*: Unlike classical cost-benefit analysis, which attempts to monetise all impacts, MCDA is designed to handle a dashboard of diverse criteria (e.g., financial, social, environmental, technical) in their own units.
- *It integrates the qualitative and quantitative*: MCDA methods can formally incorporate both objective, measurable data (e.g., project cost in Euros) and subjective, qualitative judgments (e.g., expert ratings of "political risk" on a 1-5 scale).
- *It structures complexity and promotes transparency*: The MCDA process forces decision-makers to explicitly define their objectives, criteria, and priorities (weights), making the rationale behind a decision transparent and defensible.
- *It facilitates stakeholder engagement*: By making trade-offs explicit, MCDA provides a common language for diverse stakeholders (e.g., government ministries, industry partners, civil society groups) to debate and build consensus.

Therefore, to understand the practical power of metaeconomics is to understand the contents and application of MCDA. The objective of this report is to provide a comprehensive exposition of this toolkit, detailing its core components, its general process, a selection of its most influential methods, and its application in domains central to the metaeconomic agenda.

The structure of an MCDA problem and the generic of its process

Alternatives (A): A finite set of decision options or courses of action from which one or more must be chosen. For example, in a policy context, alternatives could be different infrastructure projects (A1, A2, ..., Am).

Criteria (C): The set of attributes, objectives, or goals used to evaluate and compare the alternatives. These are the standards of judgment. Criteria should be comprehensive, non-redundant, and measurable. For an infrastructure project, criteria might include construction cost (C1), job creation (C2), environmental impact (C3), and public approval (C4).

Weights (w): Numerical values (w1, w2,...,wn) assigned to each criterion to reflect their relative importance in the eyes of the decision-maker(s). The

sum of the weights typically equals 1 ($\Sigma wj = 1$). The determination of weights is a critical and often subjective step, central to the decision process.

Performance Matrix (X): A matrix whose elements, xij, represent the performance or score of alternative Ai with respect to criterion Cj. This matrix forms the primary data input for the analysis. Some values may be quantitative (e.g., cost) while others are qualitative (e.g., public approval = "Medium"). The application of MCDA follows a logical, multi-stage process, ensuring rigour and replicability.

Problem Structuring: This initial phase involves defining the decision context, identifying the overarching goals, determining the set of viable alternatives, and selecting the relevant evaluation criteria, often collaboratively with stakeholders.

Performance Evaluation: Data is gathered for the performance matrix. This may involve quantitative modelling, database analysis, expert surveys (e.g., using the Delphi method), or focus groups to score each alternative against each criterion. A key step here is *normalisation*, where raw data is converted to a common, dimensionless scale (e.g., 0 to 1) to allow for comparability.

Preference Elicitation: The relative importance of the criteria is determined by assigning weights. This can be done through direct rating, but more sophisticated methods like the Analytic Hierarchy Process (AHP) use pairwise comparisons to derive weights with greater consistency.

Aggregation and Ranking: This method is applied to the performance matrix and weights. The procedure synthesises the information to produce a final ranking of alternatives, a classification of alternatives into categories, or the selection of the single best option.

Sensitivity and Robustness Analysis: testing the stability of the result. For example, how does the final ranking change if the weight assigned to "environmental impact" is increased by x %? If the top-ranked alternative remains the best across a wide range of plausible weightings, the decision is considered robust. This analysis provides confidence in the recommendation.

The final outcome, including the sensitivity analysis, is presented to decision-makers as a formal recommendation.

Beyond core MCDA, the MEM framework incorporates a broader set of sophisticated methods, including stochastic network modelling, game theory, and neural networks. These are particularly relevant for modelling complex adaptive systems, evaluating risk under uncertainty (e.g., in finance or the commercialisation of nanotechnologies), and capturing non-linear relationships in data. The integration of social accounting matrices and multi-stage regression analysis further allows for the formal inclusion of social, psychological, and institutional factors, including difficult-to-measure phenomena like the shadow economy.

A Taxonomy of MCDA Methods and their Application

A wide variety of MCDA methods exist, each with different conceptual underpinnings and mathematical properties (Figure 1) (Zavadskas & Turskis, 2011). They can be broadly grouped into three families, each suited for different types of decision problems.

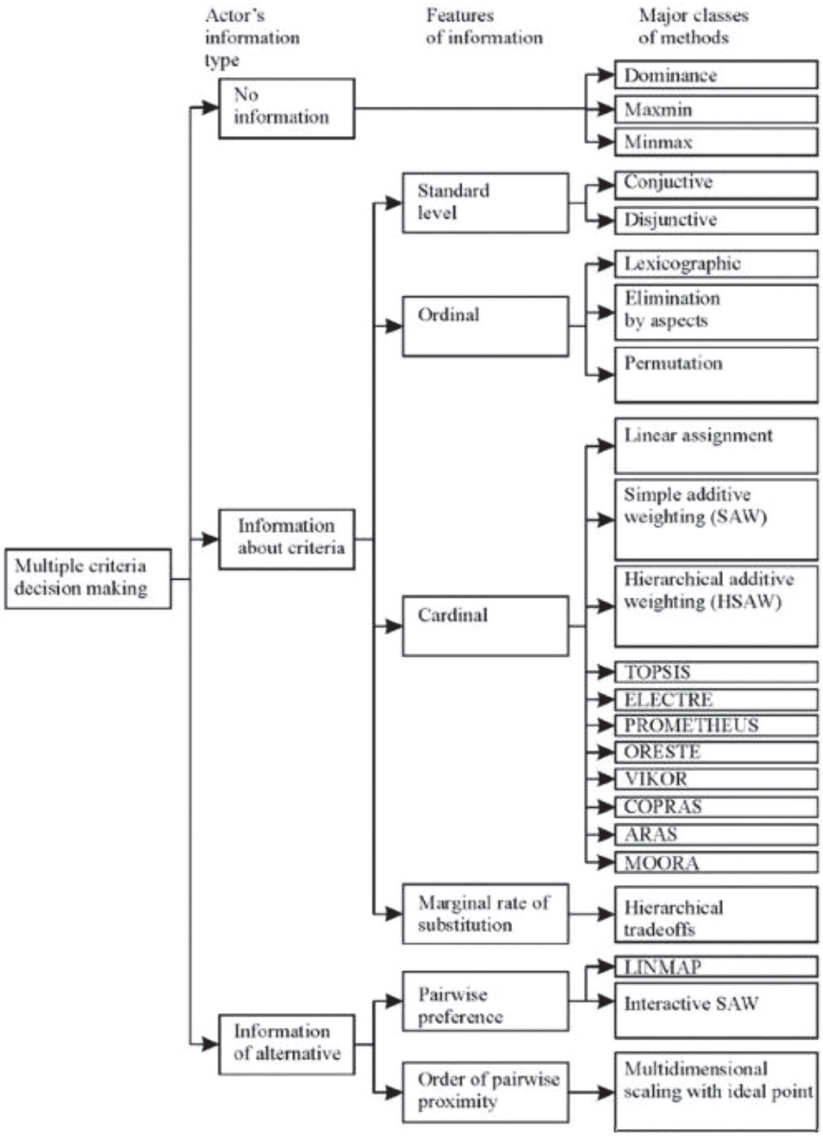

Fig. 1. **Grouping of MCDM methods**
(adopted by E. K. Zavadskas and Z. Turskis (2011) from K. P. Yoon and C. L. Hwang (1995))

Value measurement models (aggregation)

These methods aggregate the performance of an alternative across all criteria into a single, comprehensive value or utility score. The alternative with the highest score is ranked first.

Simple Additive Weighting (SAW): The different criteria are assigned weights, and alternatives are scored and summed; the overall value (Vi) for an alternative is

the weighted sum of its normalised performance scores:

$$Vi = j = 1\sum nwj \cdot xij',$$

where xij′ is the normalised score of alternative i on criterion j.

Its metaeconomic application: *Constructing Composite Indices* such as the UN's Human Development Index (HDI) or the WEF's Global Competitiveness Index. Diverse pillars (criteria) like "health," "education," and "income" have assigned weights and aggregated to produce a single score for country comparison, perfectly aligning with the metaeconomic goal of moving beyond GDP.

Analytic Hierarchy Process (AHP): it structures the problem into a hierarchy (goal, criteria, alternatives) and uses pairwise comparisons to derive weights and scores (Saaty & Vargas, 2012; Triantaphyllou, 2000). AHP calculates the weights from these judgments and checks for logical consistency.

Its metaeconomic application: *National R&D Project Selection.* A government can use AHP to select a strategic research project. Stakeholders from science, industry, and finance can engage in the pairwise comparison process to build consensus on the relative importance of criteria like "Potential for Commercialisation," "Scientific Novelty" and "Alignment with National Strategy". This makes the complex trade-offs in innovation policy explicit and manageable.

Outranking methods

These methods are based on pairwise comparisons of alternatives and have a unique ability to handle *incomparability*, which is particularly useful for public policy decisions where a trade-off is not always a viable option (Roy, 1996). Instead of yielding a single score, they build a "credibility" or "outranking" relationship (A>B, meaning "A is at least as good as B"). This approach is useful when decision-makers are unwilling or unable to make precise trade-offs between criteria.

ELECTRE (ELimination Et Choix Traduisant la REalité): a family of methods based on "outranking" relationships, suitable for problems where alternatives are difficult to compare on a single scale. For any pair of alternatives (A, B), ELECTRE calculates a *concordance index* (the weighted sum of criteria where A is better than B) and a *discordance index* (the strength of evidence against the assertion that A is better than B, particularly if A performs very poorly on one criterion). It uses thresholds and vetoes to establish the outranking relationship.

Its metaeconomic application: *Environmental Impact Assessment and Policy.* Choosing a location for a controversial facility like a nuclear power plant. Criteria include cost, efficiency, safety, public acceptance, and long-term waste storage. A "veto threshold" could be set for the public acceptance criterion, such that any location with overwhelmingly negative public opinion is eliminated, regardless of how well it performs on cost or efficiency. This reflects the metaeconomic principle of handling incommensurable values and societal restrictions that cannot be traded off.

PROMETHEE (Preference Ranking Organisation METHod for Enrichment of Evaluations): This method also uses pairwise comparisons but allows the

decision-maker to choose from six types of preference functions for each criterion, specifying how the difference in performance between two alternatives translates into a degree of preference. It calculates positive and negative outranking flows for each alternative, leading to a partial or complete ranking.

Its metaeconomic application: *Evaluating Sustainable Development Strategies.* A nation can compare different pathways to achieve its Sustainable Development Goals (SDGs), for instance, "Aggressive Renewable Energy Transition" vs. "Focus on Circular Economy and Efficiency." PROMETHEE can evaluate these complex strategies against criteria tied to various SDGs (e.g., poverty reduction, clean energy, economic growth), providing a nuanced view of which strategy offers the best overall performance profile.

Goal, aspiration, or reference-point methods

These methods compare alternatives to predefined targets or reference points (Triantaphyllou, 2000; Use of Multi-Criteria Decision Analysis, 2024).

TOPSIS (Technique for Order Preference by Similarity to Ideal Solution): this method defines a hypothetical "Positive-Ideal Solution" (PIS), which is the best performance across all criteria, and a "Negative-Ideal Solution" (NIS), which is the worst. The real alternatives based on their simultaneous closeness to the PIS and farthest distance from the NIS are then ranked by TOPSIS.

Its metaeconomic application: *Benchmarking and Improving Global Talent Competitiveness.* The top-performing country on each pillar implicitly defines the "ideal" state according to the Global Talent Competitiveness Index (GTCI). Other countries can use *TOPSIS* to see not only their overall rank but also their specific distance from the ideal on each dimension (e.g., "Our 'Vocational Skills' are close to the ideal, but our 'Attraction' of foreign talent is far from it"). This provides a clear roadmap for policy intervention, a key goal of metaeconomic analysis.

UTADIS (UTilit'es Additives) method that infers utility functions and thresholds from a set of classified examples, minimising classification error, and the MHDIS method (Multi-group Hierarchical DIScrimination). Both methods lead to the development of additive models that can be used to classify a set of alternatives (e.g., countries) into predefined ordinal groups.

The Multigroup Hierarchical Discrimination Method (MHDIS) – a sequential/hierarchical process to classify alternatives to groups using available information and holistic judgments. Model development in UTADIS is based on a linear programming formulation followed by a post-optimality stage. In MHDIS, the model development process is performed using two linear programs and a mixed integer one that gradually calibrates the developed model so that it accommodates two objectives: (1) the minimisation of the total number of misclassifications, and (2) the maximisation of the clarity of the classification.

The SAW method reflects the criteria values and their weights integrated into a single magnitude and may be applied when evaluating principally different

primary indicators (both quantitative and qualitative), i.e., their compound value. The values of primary indicators must be normalised. This method is suitable in case of all factors being independent in the system and when their interaction is not significant for the integral dimension (as observed in the case study). The sum of the significance of all factors (primary indicators) in every group must be equal to 1 (or 100%).

The *COPRAS* method may be ordered in case when the research is oriented both to maximising and minimising criteria within a systemic approach. This method assumes direct and proportional dependence on the weight and utility degree of investigated versions on a system of attributes adequately describing the alternatives with values and weights of the attributes.

If only maximising criteria are used (as in that case), the measurement may be fulfilled by the *SAW* method. The SAW method in this investigation is used when determining the value of the financial markets development level and evaluating the primary indicator groups (as some partial criteria). The possibility of including the additional primary indicators must be acceptable. An assessment may comprise the scenarios interpreting different government macroeconomic policies, the alternatives of state financial markets development and other comparative environmental challenges.

SWOT Analysis, PERT, and Critical Path Method: Classic management tools for strategic planning and project management that can be integrated into an MCDA framework to structure the problem and identify criteria.

Integrated case study: Empirical applications

Empirical analysis of metaeconomic applications across climate policy, innovation systems, sustainable development, financial stability, and technology governance reveals complex patterns of success and limitation. Notably, policy context and institutional design matter more than specific methodological choices, as both traditional cost-benefit and multi-criteria approaches achieved similar effectiveness levels.

Sustainable Development Goals implementation using multi-criteria frameworks shows significant variation in outcomes. European Union assessment using Multiple Reference Point "Weak-Strong Composite Indicators", found Nordic countries achieved the best sustainability performance, while Eastern European countries showed poor performance. The MENA region analysis using SWOT, coupled with Multi-Attribute Decision Making, revealed substantial implementation gaps requiring tailored regional approaches.

The multi-criteria frameworks have become institutionalised in both the IMF's Financial Sector Assessment Program, covering 29 systemically important jurisdictions, and the US Financial Stability Oversight Council's analytical framework monitoring eight vulnerability categories. These applications demonstrate sophisticated integration of quantitative indicators, qualitative assessments, and stress testing across multiple risk factors, validating the approach in a highly quantitative and risk-averse domain.

Weight elicitation problems represent the most significant technical limitation of metaeconomic approaches. Analytic Hierarchy Process faces inconsistency issues, rank reversal problems, and cognitive burden that increases exponentially with the number of criteria sets. Meta-analysis of 129 health management technology assessment studies found poor compliance with methodological standards, with less than 25% adequately addressing behavioural analyses and uncertainty handling (Oliveira et al., 2019).

Aggregation function challenges create additional complexity. Linear models widely used in practice can recommend extreme solutions, while product models may be overly conservative. Scale Loss Score approaches incorporate decreasing risk tolerance but prove complex to parameterise. Research demonstrates that model assumptions are rarely discussed adequately, value function modelling is often inadequate, and sensitivity analysis is limited. Institutional implementation barriers include resource and expertise requirements that exceed many organisations' capabilities. Political acceptance proves difficult, given the technical complexity that makes it hard to communicate with stakeholders. Limited availability of skilled practitioners constrains adoption, while software limitations often drive methodology choice rather than problem requirements.

Comparative assessment with traditional economic methods reveals contextual effectiveness patterns. Climate policy shows both approaches achieving similar outcomes, while innovation policy demonstrates superior theoretical properties for network-based approaches but limited practical implementation. Health technology assessment sees MCDA gaining traction as a complementary rather than replacement methodology.

Metaeconomic approach to Foreign Direct Investment (FDI) policy

To illustrate the integrated power of MCDA, consider a government in a transitional economy aiming to design a policy to attract high-quality FDI. A traditional approach might focus solely on maximising the monetary value of investment. A metaeconomic approach using MCDA would be far more sophisticated.

Problem Structuring: The goal is not just "more FDI" but "better FDI." The criteria, established with stakeholders from the Ministries of Economy, Environment, and Labour, might be:

- C1: Capital Invested (€) (quantitative)
- C2: High-Skill Jobs Created (quantitative)
- C3: Technology Transfer Potential (qualitative, 1-5 scale)
- C4: Environmental Impact (qualitative, low/medium/high)
- C5: Linkages to Local Economy (qualitative, 1-5 scale)
- C6: Regional Development Impact (does it go to an underdeveloped region?) (binary, yes/no)
- *Alternatives & Performance*: The alternatives are different policy packages:
- A1: Low corporate tax rates for all investors.
- A2: Targeted tax breaks and subsidies for high-tech and green-tech sectors.
- A3: Investment in high-quality infrastructure and workforce training to create an attractive ecosystem.

Preference & Aggregation: The government could use AHP to determine the weights, finding that "High-Skill Jobs" (w2) and "Technology Transfer" (w3) are more important than sheer "Capital Invested" (w1). They then apply a method like TOPSIS or PROMETHEE to rank the policy packages (Saaty & Vargas, 2012; Triantaphyllou, 2000). The analysis might show that while Policy A1 attracts the most capital, Policy A2 is much closer to the "ideal solution" when all six criteria are considered. Policy A3 might rank lower in the short term, but could be shown via sensitivity analysis to be the most robust long-term strategy.

This approach transforms the decision from a simple financial calculation into a strategic, multi-objective evaluation, epitomising the practical application of metaeconomics.

Multi-dimensional evaluation of Environmental, Social, and Governance (ESG) integration

It (ESG) represents a paradigmatic shift requiring sophisticated multi-criteria approaches that traditional financial models cannot adequately handle.

Environmental Criteria Sophistication. Beyond simple carbon footprint measurement, a comprehensive environmental assessment includes:

- Climate Risk Exposure: Physical and transition risk quantification.
- Resource Efficiency: Water usage, waste generation, circular economy metrics.
- Biodiversity Impact: Ecosystem services valuation and habitat protection.
- Innovation Capacity: Green technology development and patent portfolios.

Social Impact Measurement

- Human Capital Management: Employee satisfaction, diversity metrics, safety records.
- Community Relations: Local economic impact, indigenous rights, stakeholder engagement.
- Product Social Value: Health benefits, accessibility, digital inclusion.
- Supply Chain Ethics: Labour standards, conflict minerals, supplier diversity.

Governance Quality Assessment

- Board Effectiveness: Independence, diversity, expertise alignment with strategy.
- Executive Compensation: Pay-for-performance alignment and stakeholder considerations.
- Transparency and Disclosure: Quality of sustainability reporting and stakeholder communication.
- Risk Management: ESG risk integration and scenario planning capabilities.

Global competitiveness, talents and innovation indices

The reports published by the World Economic Forum (WEF), INSEAD, and the World Intellectual Property Organisation (WIPO) are examples of MEM applied in the practice of the multiple criteria decision approach. The taxonomic ranking of the priorities and the weighted comparability of criteria applied by international experts are among the core principles for

developing these indices. As an empirical basis for the evaluations and conclusions, the World Bank's *knowledge assessment methodology* and also the reports of WEF and INSEAD on knowledge-based economy (Bilbao-Osorio et al. 2014, 2015; Dutta et al. 2014, 2015; Inclusive… 2014; Lanvin and Evans 2014, 2015; Porter et al. 2015; Schwab and Sala-i-Martín 2015) a/o were analysed. In these reports, multiple criteria approaches were applied by teams evaluating the *Global Innovation Index*, *Network Readiness Index*, *Global Information Technology Index*, *and Global Talent Competitiveness Index* (the last one was developed by joint efforts of the World Intellectual Property Organisation, Cornell University, and Human Capital Leadership Institute).

The Global Competitiveness Index (GCI): It evaluates national competitiveness based on dozens of variables grouped into pillars like "Institutions," "Infrastructure," "ICT adoption," "Skills," and "Innovation capability." It aggregates these diverse, qualitatively different factors using a weighted averaging scheme - a direct application of MCDA. It goes beyond GDP to provide a more holistic diagnosis of a nation's productive potential. Global competitiveness measurement has evolved to incorporate sustainability considerations while maintaining productivity focus. The World Economic Forum's Global Competitiveness Index 4.0 *analyses over 110 variables across 12 pillars*, with the 2020 Special Edition emphasising transitions toward systems combining "productivity," "people," and "planet" targets. Critical success factors *include methodological rigour through stakeholder engagement, technical competency requirements, and transparency in trade-off decisions*. However, implementation barriers persist, including resource intensity, coordination challenges across government departments, and resistance to moving beyond traditional economic indicators.

The Global Innovation Index (GII) and Global Talent Competitiveness Index (GTCI): These indices function similarly. The GTCI, for instance, evaluates a nation's ability to attract, grow, and retain talent, including additional pillars such as Vocational Skills and Global Knowledge Skills. Analysis of the GTCI has confirmed, for example, that while social processes and reward levels are key drivers, significant deviations exist due to factors like *brain drain*, which require nuanced, multi-criteria interpretation.

The GTC index can be used as an analytical instrument for developing global talent management, distributing financial and labour resources, stimulating talented people, and programming taxation incentives for businesses to train employees, anticipating some shortages of human capital and highly skilled labour. It was revealed that global knowledge skills and levels of their implementation are substantially influenced by main social processes and levels of reward; for example, the brain drain of the talents mostly goes from less developed countries to highly developed ones, and that influences some deviations within the main dependencies of the GTC model. The practical evaluation of detailed comparisons of the GTC pillars for selected countries in the researches confirmed the reliability of the criteria used for evaluating the talent growth

determinants and for distributing investments in knowledge.

The "Beyond GDP" movement has gained substantial institutional momentum, with the OECD's WISE framework consolidating over 1 million data points across 244 metrics. The UN's 2024 *Summit of the Future* adopted Action 53, committing to develop comprehensive frameworks complementing GDP, while the World Bank's *Changing Wealth of Nations* 2024 series provides wealth accounting for 151 countries, incorporating human, natural, produced, and financial capital.

The Inclusive Wealth Index (IWI). It was proposed as a superior alternative to GDP for measuring sustainable development by the UN Environment Programme. The IWI conceives of a nation's wealth as the sum of its produced capital (machinery, infrastructure), human capital (education, health), and natural capital (forests, fossil fuels, minerals). This directly operationalises the MEM principle of multiplicity of values and co-measurability as an antecedent to the MCDA process, where criteria and their respective weights are explicitly defined and justified (Saaty & Vargas, 2012; Zeleny, 1982).

The findings from the *Inclusive Wealth Report* (2014) are striking and support the MEM thesis. For the 140 countries studied, human capital contributed 55% of the overall growth in inclusive wealth, while produced capital contributed only 32% and natural capital 13%. Furthermore, for the majority of countries, investment in produced capital yielded the lowest rate of return. This empirically demonstrates the inadequacy of traditional metrics that ignore or misclassify the most productive assets (e.g., the System of National Accounts treats education as an expenditure, not an investment). The IWI is a robust, metaeconomic tool for policy-making, shifting the focus from short-term output flows (GDP) to the long-term management of a diverse asset base.

These applications demonstrate that MEM is not merely a theoretical construct but a practical framework already in use for guiding high-level policy and strategic investment decisions, particularly for transitional economies seeking to build competitive advantage through knowledge-based strategies.

Core Postulates and Critical Evaluation

Based on the foregoing synthesis, we can reveal the central tenets of the MEM framework and subject them to a critical review.

Most important postulates and conclusions

Paradigm for Complexity: Metaeconomics provides a necessary paradigm for the complex assessment of economic phenomena that defy monocriterial optimisation. It serves as a bridge between abstract economic axiomatics and the messy reality of applied systems management.

Methodological Pluralism Centered on MCDA: The core strength of MEM lies in its methodological pluralism, which is anchored by the formal techniques of Multiple Criteria Decision Analysis (MCDA). This provides a structured,

replicable process for integrating quantitative data and qualitative expert judgment.

Essential for Intangibles and Sustainability: MEM is indispensable for formulating aim hierarchies and choosing optimisation criteria in areas dominated by intangible assets (intellectual capital) and complex goals (sustainable development). It formally allows for the inclusion of investments in human capital and the valuation of natural capital, which are largely absent from standard national accounts.

Demonstrated Empirical Relevance: The framework's utility is not hypothetical. It is demonstrably applied in leading international assessments of competitiveness, innovation, and wealth, providing a more robust foundation for strategic policy than traditional indicators. The creation of a knowledge-based economy, especially in transitional nations, depends on such multifaceted evaluations.

Critical evaluation of the framework

A scholarly assessment requires acknowledging the framework's balanced limitations as concrete research challenges for the field alongside its strengths.

Epistemological Grounding: By defining metaeconomics as a meta-system, the author provides a non-competitive, complementary approach that enriches rather than replaces existing economic theory.

Problem Relevance: The MEM framework directly addresses the universally recognised shortcomings of the neoclassical paradigm and its associated metrics (e.g., GDP) in the context of sustainability and the knowledge economy. It tackles a real and pressing problem.

Analytical Efficacy: The explicit integration of MCDA provides a practical, powerful toolkit for moving beyond unidimensional metrics. This makes the framework highly relevant for addressing real-world problems in management, policy, and development. The author's mention of stochastic network models and applications in WEF/WB reports is an excellent, concrete demonstration of this.

Pragmatism and Operationalisation: Unlike purely philosophical critiques, MEM offers a concrete, operational toolkit. MCDA methods provide a "how-to" guide for decision-makers, moving from abstract complaint to structured solution.

Empirical Grounding: The connection to influential indices like the GCI and IWI provides powerful validation. It shows that the world's leading economic and policy organisations are already thinking along metaeconomic lines, even if they do not use the label. *Conceptual Precision*: The clear distinction between the three streams of metaeconomic thought (moral-ethical, evolutionary-ontological, and methodological-pragmatic) is a crucial service to the field. It provides a taxonomy that clarifies the intellectual landscape and positions the current work with a high degree of precision.

Limitations of the Approach Presented and Aspects for Future Research. Despite its power, MCDA is not a panacea and must be applied with a critical awareness of its limitations. These challenges are central to the ongoing refinement of the metaeconomic framework.

The "Meta" Problem and Theoretical Purity: A significant critique is whether this framework is truly "meta" in a philosophical sense (i.e., a theory *about* economics) or if it is more accurately described as "applied complex systems analysis" or "advanced decision sciences for economics." The claim to be "meta" may overstate its theoretical novelty. It is primarily a methodology, not a new fundamental theory of economic behaviour or evolution in the vein of Lynne or Dopfer et al.

Causality and Predictive Power: The framework is currently strongest as a descriptive and evaluative tool. Its capacity for causal inference and predictive modelling requires further development. The limited causal inference capability is a particularly important point; metaeconomic analysis, like most MCDA, excels at description and evaluation, but it is not a predictive or explanatory model in the traditional econometric sense.

Institutionalisation and Standardisation: There is a need for standardised protocols, public datasets of meta-economic indicators, and a community of practice. The author's observation that consultancy firms use the term but are not advancing the theory highlights a critical challenge: a dedicated, interdisciplinary research program is needed to move the framework from a set of powerful ideas to a widely adopted and empirically validated methodology.

The Problem of Weight Elicitation and Subjectivity of Weights: The weights assigned to different criteria (e.g., the relative importance of "institutions" vs. "macroeconomic stability" in the GCI) are often based on expert opinion or statistical convention, not immutable theory. This introduces a normative, and potentially arbitrary, element into what is presented as an objective analysis. The choice of criteria and their weights can profoundly influence the outcome. Decision-makers may have cognitive biases, or in a group setting, they may weigh criteria strategically to favour a pre-selected alternative. This is the week side of many MCDA applications. The research could benefit from a more detailed discussion on how to develop a transparent and robust process for weighting criteria that is not susceptible to political or ideological manipulation.

The Problem of Commensurability: The framework's core challenge remains the operationalisation of its principles. While MCDA provides a method for aggregating criteria, the initial assignment of weights and the very definition of intangible variables (e.g., intellectual capital) are fraught with subjectivity. A key research agenda is to develop a robust, non-arbitrary methodology for deriving these weights and definitions, perhaps through a combination of expert systems, advanced survey techniques, and machine learning models. MCDA forces an explicit or implicit trade-off between potentially incommensurable values. Is a 5% increase in jobs "worth" a 10% increase in CO_2 emissions? MCDA provides a structure to answer this, but it does not resolve the underlying philosophical difficulty. Outranking methods like ELECTRE attempt to mitigate this by using vetoes, but the fundamental challenge remains.

Risk of Incoherent Eclecticism: By embracing a vast array of tools from SWOT to neural networks, the MEM framework risks becoming an intellectually

incoherent "toolbox" rather than a unified methodology. Without a strong underlying theoretical core, it could lead to ad-hoc model selection, where analysts simply pick the tool that gives them the desired answer.

Descriptive vs. Explanatory Power: While MEM provides a powerful apparatus for *describing* and *evaluating* complex systems (e.g., ranking countries by competitiveness), it has less inherent power in *explaining* the fundamental dynamics that lead to those outcomes. It is more of a diagnostic and prescriptive tool than an explanatory one.

Operationalisation of Intangibles: A key challenge, and an important area for future research, is the development of robust, standardised metrics for the qualitative variables the framework seeks to analyse. While MCDA provides the structure, the precise quantification of concepts like "social utility" or "human dignity" remains a significant hurdle.

Method Selection and Rank Reversal: The choice of the MCDA method can influence the final ranking. Some methods, notably AHP and TOPSIS under certain conditions, can suffer from the "rank reversal" paradox, where adding a new alternative can change the relative ranking of the original ones. This technical issue requires careful consideration.

Data Demands and their Integration. The credibility of an MCDA result is entirely dependent on the quality of the data in the performance matrix. Gathering reliable, unbiased data for multiple criteria can be time-consuming and expensive. Poor data will lead to a poor decision, no matter how sophisticated the aggregation method. The development of metaeconomic approaches would be more effective with the *integration of new statistical* (incl. expert) *evaluations* of intellectual potential into *national social accounts* assessment of shadow economies, and so on.

The Risk of Spurious Precision: The quantitative outputs of MCDA can create a misleading impression of scientific precision. It is crucial to remember that these scores are artefacts of the model's assumptions (especially the weights) and should be interpreted in conjunction with thorough sensitivity analysis.

Conclusion and Future Research Directions in Management: Metaeconomics and MCDM

This paper provides a paradigm for complex assessment, integrating MCDM (e.g., SWOT analysis, multi-objective optimisation) to analyse complex economic issues. It is a framework for bridging the gap between economic axiomatics (the foundational principles) and the practical systems and methods used in economic research. The main results of this research are: a) the core postulates of the metaeconomic concept actual for modern management; b) a critical evaluation of its analytical capacity to integrate multidimensional objectives and stakeholder perspectives; c) inherent limitations of MCDA in management, including challenges in weight elicitation, causal inference, and potential manipulation.

Metaeconomics becomes esp. significant when *formulating the aim hierarchies*, or choosing *the optimisation criteria,* the *restrictions* and *taxonomy*

of socioeconomic preferences. The creation of a modern *knowledge-based economy* and the enlargement of *competitive advantage* are the priorities of the sustainable economic development process.

The principles of metaeconomics diagnose the core deficiencies of the traditional economic paradigm in an era of complexity. They call for a more holistic, *multi-dimensional, and sustainability-oriented approach to analysis and management.* This research has argued and demonstrated that MCDA provides the indispensable operational toolkit to answer that call.

By systematically employing MCDA, *sophisticated statistical evaluations of intellectual potential and competencies*, and expert assessment of shadow economies a/o advanced techniques, it provides a *means to assess and manage complex, multi-objective systems*, from the sustainable wealth of nations to the competitive strategy of firms. Its application in high-profile global indices attests to its real-world relevance. By providing a structured methodology for defining problems, evaluating alternatives against conflicting objectives, and integrating diverse forms of information, *MCDA translates abstract metaeconomic principles into concrete, defensible policy and strategic decisions*. From shaping national innovation policy to *guiding sustainable investment and benchmarking global competitiveness*, its applications are already reshaping economic practice at the highest levels.

However, limitations of the metaeconomic concept, particularly the inherent *subjectivity in weighting criteria* and its status as a methodology rather than a fundamental theory, must be acknowledged. The challenges of subjectivity, commensurability, and data intensity in real economic systems are significant. They caution against a naive or mechanistic application of analytical tools. MCDA is not an automated decision-maker but a framework for structuring thought, facilitating debate, and making the rationale for complex choices transparent.

The further investigation and development of metaeconomics must therefore proceed along several lines. First, research is needed to develop more robust and transparent methods for criteria weighting within MCDA models, potentially using data-driven or stakeholder-consensus approaches to reduce arbitrariness. Second, there is great potential in synthesising the methodological MEM framework with the evolutionary-ontological approach; for instance, MCDA could be used to measure and track the "fitness" of evolving economic rules. Finally, this framework should be proactively applied to emerging fields such as the *economics of artificial intelligence, decentralised finance (crypto-management), and the circular economy*, where its capacity to handle *complexity, intangibles, and multiple objectives* is desperately needed. The Open Research Establishment by 2050 mission of the WIF is directly oriented to solve such tasks (A Holistic…).

This framework is important for a conceptual approach, but its utility for practical application and predictive modelling needs to be more thoroughly explored. Future research could focus on integrating the metaeconomic framework with *advanced econometric*

methods to move beyond correlation and demonstrate causal relationships in complex systems. By summarising, metaeconomics can provide a more comprehensive, realistic, and ultimately more useful guide to economic policy and management and achieving the Millennium Development Goals.

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AR METAEKONOMIKA GALI BŪTI DAUGIATIKSLĖS SPRENDIMŲ ANALIZĖS VADYBOJE PAGRINDAS?

S a n t r a u k a

Visuotinė ekonomika, kuriai būdinga žiniomis grindžiama gamyba, tvarumo būtinybė ir nematerialaus turto gausėjimas, meta iššūkį neoklasikinės ekonomikos paradigmoms. Straipsnyje pateikiamas tyrimas ir apibendrinimai remiasi platesnių ekonominės teorijos metafilosofinių vertinimų ir ilgamečio ekonominio modeliavimo patirties pagrindu. Dėl aukšto abstrahavimo lygmens dalis teikiamų apibendrinimų grindžiama platesnės ekonominės minties tyrėjų bibliografijos vertinimų integravimu ir tolesne vadybos pagrindų projekcija taikant DI daugiatikslių metodų srityje.

Autorius, vadovaudamasis šiuo požiūriu, apžvelgia ir sintezuoja metaekonomiką kaip aukštesnio lygio metodologinį pagrindą, pabrėždamas jos epistemologinius principus, išskiriančius ją iš tradicinės ekonomikos teorijos ir alternatyvių elgsenos ar vadybos požiūrių. Metaekonomika interpretuojama kaip sistema, skirta užpildyti spragą tarp abstrakčios ekonomikos teorijos ir šiuolaikinės taikomosios vadybos, kurioje sistemiškai integruojama daugiatikslės sprendimų priėmimo analizės metodologija.

Straipsnyje pateikiama išsami metaekonomikos ir ja taikančios vadybos aksiomų struktūra. Jame sistemingai diferencijuojamos trys intelektinės metaekonomikos srovės: moralinė-etinė, evoliucinė-ontologinė ir metodologinė-pragmatinė, siekiama įvertinti jų išliekamąją vertę. Trys pagrindiniai pokyčiai – žiniomis grindžiamos ekonomikos atsiradimas, visuotinio tvarumo imperatyvas ir nematerialaus turto gausėjimas – atskleidžia neoklasikinės ekonomikos paradigmų trūkumus. Pastarosios, remiantis racionalumo prielaidomis ir lengvai kiekybiškai įvertinamais kintamaisiais, yra nepakankamos. Be to, nemaža dalis ekonominės veiklos, pavyzdžiui, kūrybinė veikla, paslaugų sektorius ar žiniomis grindžiami procesai, lieka neišmatuota. Tradicinės analizės metodologijos riboja gebėjimą spręsti tokius iššūkius kaip nesuderinamų verčių integravimas, dinaminė verčių hierarchija ir sudėtingos tarpusavio priklausomybės. Neoklasikinės sintezės kategorijų painiavos kyla dėl prielaidų, neskiriant materialių gėrybių ir socialinių santykių, lemiančių institucinių organizacijų ypatumus, pobūdžio (vad. reistinis principas). Ekonominiai reiškiniai, kurie atsiranda dėl kolektyvinės žmonių veiklos, įgyja objektyvių savybių per institucionalizaciją, ir tam reikia analizės, kuria galima būtų vienu metu apdoroti abi dimensijas.

Hierarchinė epistemologinė struktūra nustato, kad skirtingiems analizės lygmenims reikia skirtingų vertinimo kriterijų. Norint suprasti ekonomiką, būtina integruoti įvairius žinių tipus: kiekybinius duomenis, kokybinius vertinimus, ekspertines nuomones ir suinteresuotųjų šalių pageidavimus. Šiame darbe pragmatiniais sumetimais integruojami svarbiausi metaekonomikos kriterijai ir principai, orientuojantis į sistemingą daugiatikslės sprendimų analizės (MCDA) metodologiją sudėtingiems socialiniams-ekonominiams reiškiniams ir vadybos sprendimams, susijusiems su nematerialiu turtu, visuotiniu tvarumu ir daugiatiksliais optimizavimo uždaviniais, formuoti. Tai detaliai aptariama

nagrinėjant vertės matavimo modelius, išankstinio rangavimo metodus ir atskaitos taškų prieigas, pritaikant juos vertinant pasaulinį konkurencingumą, tvarų vystymąsi bei inovacijų politiką. Pažymima, kad ekonominiam efektyvumui reikia nuolatinio vertybinių-normatyvinių ir realizacinių-taikomųjų posistemių sinchronizavimo, kad ekonominė vertė nėra absoliuti, bet dinaminis, nuo laiko ir priežastinių ryšių priklausomas reiškinys.

Šie postulatai sukuria tokius operacinius principus kaip vidinis struktūrizmas (sudėtingų sąsajų pripažinimas), netiesiškumas (sisteminių sąveikų netolygumas), sinergija (sąveikos visuma suteikia multiplikatyvinį efektą) ir negentropija (sistemos siekis didesnės tvarkos); nematerialių vertybių darnumas; ekvifinalumas (sistemos gebėjimas pasiekti tikslą skirtingais būdais), vertinimo atitikimas (nuoseklumas vertinant skirtingas sistemas) ir „dviprasmybės valdymas“ (sprendimų priėmimas neapibrėžtumo sąlygomis). Jų taikymo procese skiriami tokie MCDA elementai kaip alternatyvos, kriterijai, svoriai, našumo matrica ir agregavimo taisyklės. Analizės procesas apima problemos struktūrizavimą, našumo vertinimą, preferencijų nustatymą, agregavimą, jautrumo analizę ir sprendimų komunikavimą. Taikomi metodai skirstomi į vertės matavimo modelius (SAW, AHP), išankstinio rangavimo metodus (ELECTRE, PROMETHEE) ir atskaitos taškų metodus (TOPSIS, tikslinis programavimas).

Empirinis metaekonominių nuostatų taikymas iš dalies apibūdinamas per tokių svarbių tarptautinių rodiklių kaip Globalaus konkurencingumo, Globalių inovacijų, Įtraukaus turto ir kt. indeksai perspektyvumo analizę. Šie indeksai peržengia BVP analizės ribas, įvertindami institucijų kokybę, žmogiškąjį kapitalą, gamtos išteklius ir gebėjimą pritraukti talentų. Pavyzdžiui, analizuojant šiuos indeksus nustatyta, kad žmogiškasis kapitalas sudaro didžiausią (55 proc.) visuotinės gerovės augimo dalį, o investicijos į gamybinį kapitalą duoda mažiausią grąžą. Tai perkelia dėmesį nuo trumpalaikės produkcijos prie ilgalaikio turto valdymo. Straipsnyje pateikiami konkrečių atvejų tyrimai užsienio tiesioginių investicijų politikoje, tvarios plėtros ir inovacijų ekosistemos vertinime, kritiškai apibūdinami jos analitiniai privalumai ir apribojimai.

Tyrimo išvadose pateikiamas kritinis vertinimas, pripažįstant tiek šios sistemos privalumus, ypač jos gebėjimą integruoti daugiamačius tikslus ir suinteresuotųjų šalių požiūrius, tiek trūkumus, įskaitant iššūkius nustatant svarius rodiklius, priežastinio ryšio nustatymą ir galimą manipuliavimą. Straipsnyje nustatomi konkretūs tyrimų prioritetai, skirti metaekonominės metodologijos pažangai, taikant ją socialinės naudos integravimui nematerialaus turto vadyboje, įskaitant mašininio mokymo, blokų grandinės valdymo sistemų ir elgsenos neuroekonomikos įžvalgų integravimą.

Pagrindinis apžvalginio tyrimo indėlis – tai, kad jame a) apibendrinama daugiamačių vadybos sprendimų metodų ir kriterijų plėtotės, taip pat jų operacionalizavimo ir priežastingumo galimybės ir reikšmingumas moderniajai vadybai; b) išskiriami pagrindiniai metaekonomikos postulatai, vis plačiau taikytini šiuolaikinės vadybos metodikose, pvz., DI ekonomikoje modeliuose, blokų grandinės atvejais, decentralizuotuose finansuose ir žiedinėje ekonomikoje, ir c) pateikiamas kritiškas jos analitinių stiprybių bei vidinių apribojimų vertinimas, siūlant kai kuriuos MCDA tolesnių tyrimų metodus.