Bachelor's Programme in Business administration

The Underlying Problem Behind Modern Mainstream Economics, a Philosophy of Science Perspective

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Abstract
This paper analyses the most common critique issued towards modern mainstream economics, being that it adheres to neoclassical values. After unpacking the critique, along with defining neoclassical economics, it was apparent that modern economics is not inherently neoclassical, and the underlying problem being critiqued was in fact the use of mathematical deductivism in the discipline (a problem of misattribution and mislabelling on behalf of the critique). By unpacking the philosophy of science perspective that mathematical deductivism supports, being positivism, and the alternative perspective of critical realism, it is shown that this use of mathematical deductivism is problematic due to its predictive nature, a dangerous endeavour considering philosophy of science ideas on ontology, along with the flawed image of social reality that it paints. Going forward, economic research should define what constitutes their contextual social reality, take the relevant ontological and metaphysical insights discovered, and construct appropriate methodology for this context. This for example could be via the use of mixed methods.

Keywords  Philosophy of science, ontology, neoclassical economics, mathematical deductivism.
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1. Introduction

This thesis will attempt to discover what the underlying problems of economics are, and present ideas on how these could be remedied. This will come into fruition by first analysing the most common critique, economics being neoclassical, and how this neoclassical economics became mainstream economics. From there the thesis will uncover what the underlying problem of economics is and concurrently analyse it from a philosophy of science perspective. This will be done to get a holistic understanding of the problem, in order to construct the best possible solution.

The motivation for this subject is underlined by the fact that due to neoclassical economics being the core of mainstream economics, questions regarding its validity and generalizability come to surface if this perspective is flawed. This is entailed with questions that challenge the value of mainstream economics and its inherent limitations, due to it working in this very specific value framework. Naturally this type of economics brings a set of certain benefits, and the goal of this thesis is to precisely highlight this dynamic of pros and cons, and possibly highlight what is the consensus for what should be done going forward.

The importance of analysing the underlying assumptions and values of economic research is key when conducting and using the conclusions of said research. This is due to the fact that research regarding social sciences is impossible to separate from philosophical questions, due to each facet of research being connected with philosophical assumptions (Hubert Buch-Hansen and Peter Nielsen (2020)). These them show themselves in the research itself in a multitude of ways, such as what is in itself researched and with what purpose. This is then important to recognize between the lines of research as both a reader, in being able to understand the values behind the work and therefore its possible limitations, and as a conductor of economic research, by being able to realize how one’s own assumptions and values influence the undertaken work and the setting in which one’s research is conducted.

Furthermore, the importance of this topic shows itself as economic research plays an important role societally, due to the prevalence of the use of said research in conducting policy decisions (Hubert Buch-Hansen and Peter Nielsen (2020)). Furthermore, economic forecasts in themselves are commonly used when conducting said decisions, due to policy makers following the advice of economists (Hendry and Clements (2001)). Therefore, as a policy
maker, it is important to understand the implications and values of the evidence provided by the research, as these values would then come forth in the policies themselves. On top of this, economic principles are often used by companies in various facets of their work, leading to these assumptions being present in the decisions made by these companies.

There are a few problems that should be acknowledged in regard to researching this topic. These problems manifest in the manner that there is little research in relation to this subject of mainstream economics being flawed, along with no formal responses from economics practitioners in reference to this subject, even though said practitioners acknowledge this critique. This idea of mainstream economics being flawed seems to have been come into the eye of the public after the 2008 crisis, and moreover the discipline having deep rooted methodological problems came into the public eye in 2015, with Marion Fourcade’s paper: The Superiority of Economists. With the fact that the idea of economics being problematic has only recently entered the public consciousness, the amount of comprehensive research regarding the problem and solutions to it, is limited. This naturally leads to bias in the sense that there is a smaller pool of research to pull from, allowing for biases from the research itself a higher likelihood to be present in this thesis, due to a worse ability to cross-reference.

2. Understanding neoclassical economics

In order to conduct a proper argument regarding the nature of neoclassical economics and its position within modern economics, defining the key features of the school of thought is crucial. These key features actualize via the form of assumptions. Such as with many scientific discipline, economic theories are built upon assumptions and of those set of assumptions (Tirole, 2019), neoclassical assumptions are among the most popular in research (Pugh and Johnston (2014)). As said in the paper by Arnsperger and Varoufakis (2006) (p.1): “The critique of neoclassical economics is bound to be as effective as sophisticated is its definition of the opposition.”, placing the definition and concurrent analysis of these assumptions at the centrepiece for argumentation both for and against neoclassical economics. In terms of what are the key features/traits/assumptions of neoclassical economics, it is easy to overgeneralize and include as Arnsperger and Varoufakis (2006) claim “neoclassical features” into what the conception of what the school of thought fundamentally is. They continue with examples of how criticism of neoclassical economics that take aim at features such as market-clearing or perfect rationality within economic agents, never hit the mark in terms of being valid
criticism of the school of thought, leading to unfruitful dialogue. This is due to precisely the fact that while these features are present in research under the neoclassical economic label, they are not a fundamental part of the value framework (Arnsperger and Varoufakis (2006)). These same authors define the intertemporal foundations of neoclassical economics through three key axioms:

**Axiom:** “A statement that is taken to be true, to serve as a premise or starting point for further reasoning and arguments” (Oxford English Dictionary)

### 2.1 The cornerstones of Neoclassical economics in its early history

The first of the three axioms prevalent in neoclassical economics is that of methodological individualism, being the idea that structures, mechanisms and socio-economic phenomena observed at a macro-level, are to be explained via the individual level. Or in other terms, that individual agents are to be used to explain larger scale socio-economic phenomena. This axiom is, according to Arnsperger and Varoufakis (2006), still prevalent in all forms of neoclassical economics, despite the fact that social constructionism is somewhat universally accepted by mainstream economists. Despite this fact that the structures and agency are considered even by economists to be intertwined, as Arnsperger and Varoufakis (2006) claim: “the explanatory trajectory remains one that begins from the agent and maps, unidirectionally, onto the social structure” (p.3) within neoclassical economics.

The second axiom is that of methodological instrumentalism. As Arnsperger and Varoufakis (2006) define this, methodological instrumentalism refers to the methodology in which all behaviour is defined as a means of maximizing preference-satisfaction. In practice, this methodology comes to fruition by defining humans as homo economicus; a consequentialist concerned purely by the consequence of whether preferences-satisfaction is maximized. According to the authors, methodological instrumentalism was caused by the belief that humans can be effectively modelled by the idea that they have consistent exogenous preferences that deterministically guide their behaviour. However, the authors note that within recent times, these beliefs regarding preferences have shifted to a more nuanced view, being that nowadays homo economicus is seen to adapt their preferences based on events in their past, along with structures and underlying mechanisms present in their environment. Besides this holistic development regarding the nature of the preferences of homo economicus itself, homo
economicus is still according to the authors “exclusively motivated by a fierce means-ends instrumentalism” (p.5) within neoclassical economics.

**Methodology:** “Methodology concerns how (social) science is practiced. It relates both to abstract questions about what science is or is not and more concrete questions regarding how one can conduct scientific research in practice.” (“Critical Realism, Basics and Beyond” by Hubert Buch-Hansen and Peter Nielsen (2020))

**Homo Economicus:** “A theoretical abstraction that portrays humans as rational and full of self-interest, and who pursue their well-being to the fullest in all transactions.” (CFI, 2023)

The third and final axiom of neoclassical economics according to Arnsperger and Varoufakis (2006), is that of methodological equilibration. They claim that this stems from the idea that for economic models to achieve determinacy, it is necessary for agents’ behavioural patterns to be regular enough so that it is possible to determine an aggregate behaviour and concurrent predictions of it. However, without being overly reductionistic in regard to the behaviour of agents on an individual level, it is impossible to imply a causal one-way relationship for an equilibrium being a natural consequence of the true behaviour of the agents of interest. Nevertheless, this goal of determining a concrete definition for what happens at an equilibrium was still prevalent. This is where methodological equilibration comes in. Being a method of combatting the described problem, neoclassical economics tackle this equilibrium issue by first analytically deriving an equilibrium and secondly assuming that agents will also find themselves in this derived equilibrium. Finally, a stability analysis is conducted in order to discover possible factors that could disrupt the derived equilibrium. For Arnsperger and Varoufakis (2006) neoclassical economics is characterized by the moving away from answering the question of “Will rational agents behave according to the theory’s equilibrium prediction?” and focusing on answering: “If rational agents are behaving according to the theory’s equilibrium prediction, will they have cause to stop doing so?” (Both quotes from p.6)

It is important to note that while this classification of neoclassical economics into these axioms is generally agreed upon for determining what neoclassical economic has characteristically been in history, an exception lies in that of the methodological equilibration axiom. This axiom is debated upon in how fundamental it is in neoclassical economics, with other researchers putting forth the axiom of “perfect information among agents” to be more fundamental (Lawson (2013)).
Nevertheless, when considering this school of economics as described above, an argument can be made that neoclassical economics isn’t representative of what modern mainstream economics is today. The excerpt from Arnsperger and Varoufakis (2006): “It is hard to imagine how any standardly trained economist could deny that her theoretical practices digress from the three methodological moves mentioned above” (p.6) for example, is difficult to agree with when talking about economics in 2023. This hints towards the idea that neoclassical economics as we have come to understand it, is not respective of what modern economics is today, despite what many critics of modern economics have people believe with the large amount of criticism regarding the neoclassical values apparently held in modern economics (Lawson (2013)). This move away from these axioms in the modern day for example have been noted by Lawson himself along with studies such as Colander et al. (2004), which claims that economics is in this day and age distancing itself from these of axioms, and moving towards axioms of purposeful behaviour, sustainability and enlightened self-interest. Nevertheless, neoclassical economics as described above in its classical terms is the prerequisite to what is modern economics today and is important to breakdown in order to get a grasp on what is the nature of mainstream modern economics, and what features of neoclassical economics it still holds.

2.2 Neoclassical economics in practice

With these definitions of the key features that have been prevalent in neoclassical economics across its history, it is now possible to conduct the analysis of neoclassical economics in larger scale. This entails discussion in regard to answering a key question about the neoclassical assumptions: What kind of economics do these assumptions enable?

However, first of all, it is important to address the need that neoclassical economics developed into being the solution for: physics envy.

**Physics envy:** The envy felt by practitioners of other disciplines of the mathematical precision found in physics in reference to their fundamental concepts (Lo and Mueller (2010))

Physics envy being a common trend within the latter half of the 20th century, not only within social sciences, but also in fields such as biology (where the term originated from) and medical sciences (Datadeluge (2012)), it is no surprise that this trend was felt within economics as well. This term in itself is commonly deployed within discussion regarding neoclassical economics, but perhaps a more descriptive and appropriate term for this phenomenon would be
physics inspiration. This would be a way of detaching the connotation of enviousness towards physics, and would be more descriptive of the actual phenomena, i.e., the incorporation of quantitative mathematical methods.

This need for more precise foundations in economics (i.e., mathematical foundations) and also more harmony between theory and methodology within the field for example, has been highlighted in Tony Lawson’s book: Economics and Reality (1997). Within the first chapter of the book, Lawson highlights the general public distaste for economics in the latter half of the 20th century, citing many pieces of literature equating economics to pseudo-science. With this narrative in play, it is natural to understand where physics inspiration originates from. Being a science that is based upon rigorous mathematical explanations physics in itself reaps rewards from 3 key aspects. Firstly the fact that these mathematical explanations are free from values and political agendas, secondly, that these explanations are able to imply largely indisputable causations and as said in (Pugh and Johnston (2014)), in itself these explanations serve to better humanity by searching for fundamental truths about our reality. Due to the nature of the physics discovering fundamental truths that are also objective, it is also easy to understand why it developed the appraised status that it did from both the public and within academia. Furthermore, it is worth mentioning the fact that these explanations were and still are complex, meaning that they could only be challenged by figures within physics, giving the science a form of indisputability, and by proxy strengthening the aura of it being a valuable science of objective truths.

Here it is easy to see how neoclassical economics came to be so popular. As it was created with the desire of creating applicable scientific methodology for economics(Pugh and Johnston (2014)) by being deductivist in nature(Lawson (2013)), and furthermore strip economics of value judgements and political notions (Pugh and Johnston (2014)), it was the perfect match for the prevailing narrative within economics regarding physics inspiration, by which economics wanted to find similar fundamental truths of reality, to that found in physics. In the words of Mirowski (1989) p.250: economics wanted to “discover the hidden fundamental natural determinants of value that lay behind the veil of everyday phenomena of money prices and incomes”.

With neoclassical economics being a discipline that allowed for the inference of what can be perceived to be objective causation, all that was needed was for economics to become a
discipline of value, in the eyes of practitioners of economics, and no longer experience physics envy, was the rise of mathematical modelling.

Despite the belief of the creator of neoclassical economics, Thorstein Veblen, who believed it to be unsustainable due to social sciences gravitating towards evolutionary science practices in the early 20th century, neoclassical economics proved to be what was mainstream economics, due to mathematics so to say “breathing life” into the ontology of causal processes (especially in social sciences) (Lawson (2013)). According to Lawson (2013), the interpretation of what mathematics is changed in the early 20th century due to developments of theories that themselves took distance from traditional physics, examples being quantum mechanics and relativity theory. As Lawson continues, the outcome of this was a paradigm shift regarding mathematics no longer being a tool to be used in physics, and more of a discipline that provides a “pool of frameworks for possible realities” (Lawson (2013) p.973).

**Ontology:** Ontology is the theory or study of being and concerns what exists in the world and how it exists. An ontology is an abstract theory of what the world is like. (Critical Realism, Basics and Beyond” by Hubert Buch-Hansen and Peter Nielsen (2020))

With this new level of accessibility for mathematics, it became possible to conduct economics with precise mathematical foundations and mathematical deductivism for modelling of phenomena, in a manner that was similar in attributes to that of physics at face value. This meaning a type of economics that at face value does three things: Works within a causal ontology, employs mathematical deductivism and unpacks fundamental truths regarding reality.

**Deductivism:** “The doctrine that all explanation be expressed in terms of ‘laws’ or uniformities’ interpreted as (actual or ‘hypothetical’) correlations or event regularities” Lawson (2013)

### 2.3 How Neoclassical economics became mainstream economics

After understanding the need that neoclassical economics addressed, being the desire for more precise foundations within the science, and how that moulded the approach’s use of mathematical modelling and deductivism, it is important to understand how this economic perspective became mainstream economics. In understanding how neoclassical economics became so popular, it is important to understand its connection to the political ideology of neoliberalism. This connection can be understood to be somewhat symbiotic with Neoclassical
economics being the perfect “supporting science” for the ideology, and the neoliberalism being the validating political movement for the economic discipline. As put by Pugh and Johnston (2014) (p.25): “The neoliberal political philosophy which currently dominates policy-making can be seen as a complementary doctrine to neoclassical economics. With the success of neoliberalism came success for neoclassical economics”.

**Neoliberalism:** “A theory of political economic practices that proposes that human well-being can best be advanced by liberating individual entrepreneurial freedoms and skills within an institutional framework characterized by strong private property rights, free markets and free trade” Harvey (2005)

Continuing with the paper by Pugh and Johnston (2014), and adding on the definition provided above, the authors see neoliberalism to be culminated in the belief that demand and supply will always find equilibrium via the price mechanism, and that this should happen without governmental or other forms of intervention. Thinking back to the key axioms of neoclassical economics, we notice a clear similarity with neoclassical economics practicing methodological equilibration, which precisely analyses naturally found equilibriums. Building on this with Pugh and Johnston (2014), they claim that the fact that markets also spend so much time relative stability, the argumentative power of neoclassical economics is strengthened. Furthermore, considering the definition of neoliberalism provided above by Harvey (2005) and the axioms of neoclassical economics, it can be noticed how they both work within a similar value system. This is with the fact that both place the individual at the centre of their disciplines, making the both of them liberal in value. Considering the axioms of neoclassical economics, it can be furthermore understood that neoclassical economics models the economy using individuals as the basis for analysis and understands them to be maximizing their own preferences. Furthermore, the economy and society are understood to be in a sort of steady equilibrium precisely in which each individual is maximizing their own preferences on a micro level.

This liberty to maximize one’s preferences is a key feature of what is entailed in the ideology of neoliberalism, furthermore, showing how neoclassical economics and neoliberalism complement and benefit from each other. This being that neoliberalism served as a validating political movement for the values prevalent in the now mathematically backed neoclassical economics, and neoliberalism benefitted from the mathematical deductivism in neoclassical economics that built upon its value system, validating the ideology itself as well. (Pugh and
Johnston (2014). Considering the symbiosis between the two, it is of no surprise that neoclassical economics came to be what is mainstream economics, considering that neoliberalism became the leading political ideology in the 1980s with both Ronald Reagan and Margaret Thatcher being rooted in neoliberal tradition (Pugh and Johnston (2014)).

3. The nature of modern economics

When analysing the stature of modern economics, it is important to recognize how much of modern economics lives up to neoclassical economics practices. This is of importance due to the fact that majority of the criticism felt in modern economics, is due to how it subscribes to neoclassical values. This can be noticed when reading research of economics having a problem, as majority cite its neoclassical nature as the root of the problem. Unfortunately, as discussed in the introduction, formal research quantifying and showcasing this phenomenon is lacking.

If our goal is to determine what truly are the shortcoming of the science and improve it for the sake of improving society, this purpose is defeated if all criticism is rooted to the science holding neoclassical values, as mainstream economics did decades ago, and if in fact mainstream economics has evolved over time. Therefore, what next shall be done will be the comparison of modern mainstream economics to traditional neoclassical economics, with the goal of determining if whether the critique of modern mainstream economics being neoclassical is valid. If this in turn is not the case, then the task morphs into identifying the true underlying problems of the discipline.

In Tony Lawson’s 2013 paper, “What is this ‘school’ called neoclassical economics?”, Lawson argues for the idea that neoclassical economics in the form that in it’s been presented in this thesis, along with the form of neoclassical economics that the creator of it intended it to be, is in fact an outdated concept. He argues, as I presented in section 2.1, that since the popularization of neoclassical economics, economics has grown as a field of study and simultaneously has also outgrown that of what neoclassical economics has been throughout history. This fact that economics has outgrown its axioms can be captured poignantly with the quote: “In truth, modern mathematical economists have gone way beyond resting their attention on demand and supply conditions in the economy as a whole.” (Lawson (2013) p.978). Even though mainstream economics was respective of neoclassical economics, the same cannot be said for modern mainstream economics, considering the scope of the practice today.
So, what’s with all the critique of modern economics being neoclassical? I believe that this is in fact a problem of misplaced attribution and misuse of labelling. According to Lawson (2013), majority of the critique using the label of mainstream modern economics being “neoclassical” boils down to attributing a negative feature within economics to being neoclassical and inherently bad. This in itself leads to a mixed message within critique, as the message of the criticized negative attribute gets lost within translation and not properly understood, and furthermore neoclassical economics becomes misunderstood. Continuing on Lawson (2013), this is most prevalent with mathematical deductivism within economics. Because mathematical deductivism was popularised by neoclassical economics, many attribute mathematical deductivism to neoclassical economics, and therefore according to Lawson (2013) many critique economics for being neoclassical, when referencing the problems that mathematical deductivism has brought to economics.

This is problematic for two reasons. Firstly, as discussed in section 2.1 and section 3, neoclassical economics has historically been occupied with its own axioms (Arnsperger and Varoufakis (2006)). Therefore, when criticizing modern economics for being neoclassical, the term brings baggage by transforming the critique to also criticize modern economics for entertaining these axioms, even though that may not be the intention in the first place. However, as discussed above using Lawson (2013), this criticism would also be inherently wrong, due to modern economics not entertaining these axioms to such an extent as it did in the past, furthermore weakening the criticism, and distracting from addressing the underlying issues brought on by mathematical deductivism. This is therefore an issue of mislabelling.

The reason this mislabelling happens in the first place can be related to the second problem, the case of misattribution. This can be prominently seen in the case of mathematical deductivism, as it was popularized via neoclassical economics, leading to the belief that mathematical deductivism is a feature of neoclassical economics. By associating mathematical deductivism to being neoclassical, and then by critiquing economics of being neoclassical, when referencing how it uses mathematical deductivism, the interpreter of presented critique is misled. This is since the interpreter is made to believe that mathematical deductivism is inherently neoclassical, and not present in other forms of economics. This is not the case as described in Lawson (2013), it is a key feature of the “contemporary mainstream project” of economics, which as argued before in the end of section 2.1, is not neoclassical. This
misattribution then once again serves as a smoke screen for mathematical deductivism and how it is the root cause of the many of the problems within economics (Lawson (2013)), due to the critique being made being lost with it containing all the baggage of the neoclassical term.

Along with the use of the term neoclassical as a negative critique in economics taking away from having fruitful critique of the what the actual issues are in economics, it is also unrealistic. According to Tony Lawson’s 2013 paper, if all of the negative side effects felt from modern mainstream economics were to be attributed to practicing neoclassical economics, then clearly the correct way forward would be to stop adhering to neoclassical economics practices, being that adhering to them is a choice. If what presented were to be true, practitioners of economics would be consciously choosing to conduct economics that is as Lawson puts it “permanently in error”. This in itself is unrealistic, and paves way for the discussion of how the underlying issue within economics, mathematical deductivism (Lawson (2013)), is rooted in the ontological beliefs of economics practitioners, meaning that the problem in Lawsons eyes is one of subconscious alignment.

In terms of discussions regarding the state of modern economics, the most sophisticated of criticisms have come from a philosophy of science perspective, such as what was discussed above with Tony Lawson’s 2013 paper, “What is this ‘school’ called neoclassical economics?”; and also in the book: “Critical Realism, Basics and Beyond” by Hubert Buch-Hansen and Peter Nielsen (2020). This critique will be unpacked within the following chapters, with the aim of constructing a balanced view of how economics should be ideally conducted going forward from a philosophy of science perspective.

4. Philosophy of science perspective of economics

The idea presented above by Tony Lawson of mathematical deductivism being the real source of the problems within economics is a statement that requires a bit of unpacking. A brief summary of this argument found within Lawson (2013), can be understood like the following. According to Lawson (2013), mainstream modern economics is occupied by a tradition that values “repeated application of methods of mathematical modelling”. This modelling according to Lawson is useful for analysing certain conditions, but interestingly, he claims that these conditions in which mathematical modelling is useful, rarely occur in the social realm which economics analyses. This examining of this dynamic will be at the core of
chapter 4. Continuing, Lawson claims the inappropriate overuse of this modelling explains the numerous explanatory failings of economics, along with the idea that some of formulations created within economics, are typically recognized to be of an unrealistic nature. In order to understand if this is critique has any merit, a philosophy of science unpacking of the realm in which social sciences work in (keeping economics in mind) would be necessary, considering this critique deals on both ontological and methodological levels.

4.1 Mathematical deductivism and positivism

The first step in this process of attempting to unpack the discipline of economics from a philosophy of science perspective, would be by explaining in what realm the status quo of mainstream economics operates in. This explanation will be based upon the book: “Critical Realism, Basics and Beyond” by Hubert Buch-Hansen and Peter Nielsen (2020), and for this chapter, we will focus on chapter 2 from the book.

Spearheaded by mathematical deductivism, the Buch-Hansen and Nielsen use the quote that mainstream economics “can be seen as the home of positivism in the social sciences” (Brown 2007), and furthermore back this quote up with the claim that nowhere else in social sciences are positivist assumptions and methods found than in mainstream economics.

They relate this phenomenon to the term physics envy and to its rise the 1980s, being that according to the authors, this transformed economics into a positivist science that put mathematics and deductive modelling at the forefront. Furthermore, these deductionistic models serve as an equivalent for the lab conditions used in natural sciences, painting a picture of a world of event regularities and most of the time rational atomistic agents. Using Tony Lawson’s definition for atomism from Lawson (2013), the term “refers to anything that (if triggered) has the same independent effect whatever the context” (p.954). Finally, the authors claim that the purpose of said deductive models is to produce predictions regarding important societal forces such as employment, growth and inflation rates.

So far, this perception of mainstream economics is a summary that is in line with the perception built upon in this thesis. This perception is built upon further by the authors see this system of predicting based on deductive mathematical models to be flawed. This is due to the fact that many of these predictions being overly optimistic. An example provided of this misplaced optimism is the 2008 financial crisis, in which economists provided forecasts that predicted a brief downturn followed by a period of swift economic recovery. These predictions
proved to be wrong, with the global financial sector collapsing with deep and far-reaching recessive effects. Interestingly, Buch-Hansen and Nielsen believe that mainstream economists do not see these failed predictions as a sign of their positivist ontological and methodological systems being flawed, but more of an issue of having incomplete data in constructing an economic reality. The solution then to this problem would be in gathering more data and conducting more research based in value neutral mathematics.

Within this perception of what realm mainstream economics exists in, the term of positivism is mentioned constantly. Therefore, in order to understand the status quo, one must understand positivism, and if economics is actually positivist. According to the authors, a key feature of positivism is how they value observation to be the foundation of knowledge. Building upon this, positivism championed the verification principle, by which all claims deemed to be scientific, are able to be deterministically broken down into more simple elements that able to be verified via observation. On the flipside, this posits that claims that are unable to do this process are unscientific. In terms of what constitutes positivism, the book presents seven basic features:

1. The patterns in social reality are stable, being that patterns that exist today will also exist tomorrow. The Humean conception of causation (“causal relations are understood in terms of regular patterns of observable events (‘when event A, then always event B’), while causal analysis is restricted to the study of such patterns” p.14) is accepted, and therefore atomistic ontology is accepted.
2. The goal of social science is to identify causal laws and explain event regularities by demonstrating how causation is present.
3. Social scientists should study society in the same manner as how natural scientists study nature and adhere to the same strict methodological criteria.
4. Social sciences should not only explain, but also predict events. This is made possible due to social reality having constant fundamental laws.
5. Observations and logic are the foundations of knowledge.
6. Scientific knowledge grows via testing hypotheses that are derived from laws.
7. Scientific should be objective, being that it should be free from values, opinions and beliefs.

The authors furthermore state that these features form an outline of what positivism can entail, meaning that positivism doesn’t necessarily always incorporate all of these features, but
that it will always incorporate at least some of them. (The fact that if mainstream economics subscribes to these will be unpacked in ch.5, however these are important to establish in order to understand the philosophy of science perspective that contrasts these and by proxy criticizes mathematical deductivism (a positivist feature (see feature 6.))).

In terms of how these features manifest themselves in research, it can be seen with the conducted research being focused on quantitative data and methods, along with a focus on making statistically inferred predictions. According to the authors, this has come at the expense of discussion and reflection regarding ontological and epistemological assumptions used, as the emphasis of what resources should be expended on is more on the development and use of sophisticated methods.

**Epistemology:** *Epistemology is the theory or study of knowledge* (“Critical Realism, Basics and Beyond” by Hubert Buch-Hansen and Peter Nielsen (2020))

Interestingly, with this disregard for reflection of the philosophical assumptions used, the authors claim that the methods themselves serve as this reflection. What is meant by this, is that the workings of the methods themselves, along with the reached conclusions, are used to construct the image of the social reality lived in. This then is what forms and reinforces what could be positivist beliefs of social reality, in the manner respective of the features discussed above. The way I see this is that this means that positivist ideas on social reality are moreover provided and accepted via the mathematical models, and concurrently not actively challenged or thought about from the researchers’ point of view, making it again a more a subconscious alignment (similar to that of what happens in mathematical deductivism). However, it is important to mention this disregard to philosophical reflection regarding methodology is not uncommon, as the authors emphasize that along with the practitioners of mainstream economics believing that the practice is value neutral and scientific, this belief is also held by politicians, journalists and the general public.

Now that an idea regarding the philosophy of science perspective of positivism is established, its link with mathematical deductivism, and how that leads to an implicit link between positivism and mainstream modern economics, the natural next step would be to explore what an alternative perspective would entail for economics. This will be the topic of exploration for the next chapter.
4.2 Critical realist economics

When looking at the key features of positivism, it is clear that there exists flaws within in rigid views on how social sciences should be conducted, a fact that will be delved into during this chapter. Along with this, this chapter we will explore the perspective of critical realism, which places the ontology of social reality at its centrepiece, making it explore questions of how social science differs from natural sciences in how they conduct research and create knowledge (Hubert Buch-Hansen and Peter Nielsen (2020)). This chapter of 4.2 (consisting of 4.2.1, 4.2.2, and 4.2.3) will attempt to explain this perspective with the use of chapter 3 and 5 from the book: “Critical Realism, Basics and Beyond” by Hubert Buch-Hansen and Peter Nielsen (2020).

Considering this emphasis on ontology, critical realism requires quite a bit of explaining, and considering the scope of this thesis I will attempt to be concise, but also do the perspective justice. This will be done step by step by going through the perspectives ontological, epistemological and then methodological defining features.

4.2.1 Critical realist ontology

To begin, in contrast with the positivist view that observation and experience is at the centre of reality, critical realism contrasts this by considering two dimensions of science. The first of these dimensions is that of the transitive dimension, referring to knowledge that humanity possesses at a given point in time. The second then being the intratransitive dimension. The authors state this dimension as the knowledge produced via the labours of science is knowledge of ‘something’, this ‘something’ is what critical realism refers to as the intratransitive dimension. Elaborating on this ‘something’ term, it refers to what researchers’ study, such as economic phenomena, quantum mechanics or even the climate breakdown.

The authors make a key distinction here about the relationship between the two dimensions, being that the nature of the intransitive dimension will not change in real time with a change in the transitive dimension. Furthermore, in chapter 3, the authors make the example that our knowledge of the climate breakdown can change, but this will not necessarily correspond with a change in the climate breakdown itself. Conversely, a change in the climate breakdown can occur without a change in our knowledge of it. It is important to note that critical realists hold the intransitive dimension to a higher importance, than that of the transitive,
since research is conducted within the intransitive. This then leads to the high valuation of ontological reflection within the perspective.

Critical realism, furthermore, builds on this conception of reality by defining 3 distinctive domains of reality (Defined on page 29 and 30). Firstly, there is the empirical domain, consisting of experiences and observations. Secondly there is the actual domain, which then consists of the aforementioned, but also of events and phenomena, which can be, but are not necessarily observed. What makes critical realism special, is then how it defines a 3rd domain, the deep domain, which then incorporates both of the ones mentioned already, but also that of structures and mechanisms, which are not directly observable, but can affect and cause events in the actual domain. These definitions therefore determine that the actual and deep domains are what consist the intransitive dimension. Due to the nature the domains, focus within critical realism is placed in that of the deep domain, due to it causing phenomena or events, which then create our observable reality. Due to this relationship being unidirectional, it can be inferred that our observations and experiences are not exactly truthful reflections of reality, due to there simply being “a lot more going on” so to say.

Once again building upon our definition of reality, critical realism distinguishes that we live in a differentiated reality, being one where different entities within our reality have “different causal powers and liabilities” (Quoted from page 31.) On the topic of causation, it is important to unpack the nature of mechanisms that were introduced in the definition of the deep domain. In simple terms a mechanism is “something that makes something else happen”, but importantly the relationship between mechanisms and their effects is one of contingency, quoting the book: “meaning that it is a possibility but never given beforehand” (p.32). Preventative factors can for example be other mechanisms. Due to this uncertainty of the activation of mechanisms along with their multitude, reality is assumed in critical realism to be one of open systems. This constitutes the idea that constant/never changing empirical realities almost never happen. The authors constitute that this entails the fact that the question, that if a specific mechanism triggers an event, is not the same as the question of how common the mechanism/ event actually is. A simple example that clarifies this, is that the reason for someone buying a specific phone (being the event), may be entirely different than the reasons for someone else, and therefore, the idea of causality should be separated from the idea of generality. The opposite of this idea in reference to causation is that of closed systems, which is what positivism subscribes to. This idea of causation is entirely occupied within the actual
domain, entailing that causation is understood as: “when event A occurs, event B will occur”. The book provides a clarifying picture of this difference between systems, found on page 33, that also synthesises what critical realism is, in comparison to positivism:

This ontological reflection does not end here with critical realism, as the deep domain is interpreted to be divided hierarchically into four different strata, by which “higher strata presuppose lower and less complex ones” (Quoted p.36). The hierarchy can be understood by social reality being on top, premised by biological stratum, which is premised by chemical stratum and at the bottom we find the most fundamental stratum - the physical. This ordering can easily be understood in the way that it is impossible to think of our social reality existing without biological mechanisms and structures, and these are impossible to conceive without chemical mechanisms and structures and so on. Conversely, it is perfectly possible to conceive the existence of strata in the other direction, for example biological mechanisms and structures existing without our social reality. A key feature of critical realism in relation to this conception of the deep domain, is that it does not entertain the idea that the mechanisms of higher strata can be purely explained by that of lower strata (With the example provided that the laws of physics do not cause social phenomena). Instead, the combination of mechanisms from lower stratum form entirely new entities at the higher stratum, that as the authors claim: “have causal powers and liabilities that cannot be reduced to, and that are qualitatively different from, their lower stratum foundations” (Quoted page 37). These “irreducible causal powers and liabilities” are named as emergent properties. A simple example provided of this
emergence is for example the fact even though humans consist of genes, human behaviour has emergent properties that cannot be explained purely by genetics. Considering these definitions of reality, we can now move into interpreting critical realist epistemology, being their definitions of the nature of knowledge.

### 4.2.2 Critical realist epistemology

Firstly, in terms of the epistemological relevance of these ontological claims, the first pressing implication is that of the futility of prediction. Due to the nature of open systems, precise prediction becomes impossible, as the contingency condition of mechanisms make it impossible to precisely determine an outcome. This is not at the expense of the fact that patterns exist within society and nature, for example that people will go to work next week, but the authors underline that this, among other phenomena, will also fundamentally change over time. This can for example change in a manner that the nature of work will change or even more radically, for example because of crisis such as Covid-19 or 9/11. This leads into the fact that according to critical realism, researchers who do not research events that can occur in closed systems (such as the artificially closed systems seen in lab experiments), should focus on explaining past and present events and phenomena. This fact is further emphasised for social science research with the fact that it is incredibly difficult to determine which mechanisms have caused concrete phenomenon, and due to this fact, prediction is evermore increasingly difficult.

Continuing on this, a key feature of the critical realist epistemology that is relevant to those who practice economics, is the fact that the nature of the deep domains four strata entails that natural and social phenomena are very different. This can be attributed to social sciences only being able to study phenomena that can only ever be found in an open system. This is not necessarily the case with natural sciences, as the lab experiment can be used to form an artificial closed system and determine the nature of some mechanisms without interference from other mechanisms. This difference can be explained the strata which natural sciences occupy being the lowest and the strata which social sciences occupy being the highest. The relevance of this can be understood when returning to our strata definition, as higher strata have more mechanisms at play, leading to more possible combinations of mechanisms and emergences. Therefore, at a lower level, it is easier to isolate a mechanism (as there are fewer interfering mechanisms) with the likes of a lab experiment, and establish causation, reminiscent of those
found in closed systems. Due to social reality occupying a higher strata, this is not possible for social reality. Returning back to the topic of mathematical deductive modelling in economics, according to the authors, critical realists hold the stance that that this deductivism does not replicate the same kind of closed system setting that the lab experiment does. Instead, they claim that these models are in fact harmful for social sciences, due to the fact that these simplify human behaviour to such an extent that results in a “deeply flawed image of reality” (Quoted p.46). Considering this, the questions arise of what critical realist methodology would then look like.

**4.2.3 Critical realist methodology**

Methodologically, critical realism has a few key features of interest. First of all, it is at its core pluralistic, and will focus on explaining events and processes that are caused by the multitude of structures and mechanisms within the deep domain that influence social reality. This explanation will foremost come in the form of answering research questions such starting with terms such as ‘what’ or ‘why’. Continuing on this pluralism, critical realism is adamant on the idea that research should always be context-dependent, and that naming models/methods to be universal should be done carefully. Furthermore, on this pluralism of methods critical realism is also adamant on interdisciplinarity within research. This idea is based on the interpreted ontological nature of reality, in which naturally, social reality’s mechanisms are entangled in a manner that does not respect the boundaries set by humanity’s conception of disciplinary boundaries. Therefore, when trying to form a holistic understanding of a phenomena, it would be a disservice to approach a phenomenon from only one disciplinary point of view.

Interestingly, despite what might seem considering 4.2.1 and 4.2.2, critical realism isn’t entirely against the usage of quantitative methodology in social science research, precisely due to this context-dependency clause. For example, they are very useful for mapping and/or analysing social structures/conditions, but nevertheless, critical realism still holds strong to the claim that the deep domain cannot be quantified. In terms of then understanding this domain, critical realists tend to use qualitative methods such as, interviews, action research, case studies and critical discourse analysis. Nevertheless, the value of quantitative data among this ‘anti-positivist’ philosophy of science perspective has risen substantially. This can be attributed precisely to value of mapping out these social conditions numerically (such as
inequality or unemployment) and then via analysis being able to make seminal conclusions on said conditions. These numerical analyses can then play an important role in the initiation and framing of research conducted. All in all, critical realist methodology can be boiled down to being the use context-dependent mixed methods, that for example combine both qualitative and quantitative methods, in order to get a best of both worlds’ situation.

5. The validity of critical realism

When considering the narrative presented by “Critical Realism, Basics and Beyond” by Hubert Buch-Hansen and Peter Nielsen (2020), the values that the authors hold, and present are rather recognizable in the text. To put it briefly, the authors generally refer to modern mainstream economics in an overly simplistic manner, mostly in its connection to mathematics which is also made to seem to be a tool that can/will propagate positivism, a perspective that is an easy target for criticism. This simplification places the philosophy of science perspective as an antidote to that of this presented flawed status quo.

At the core of these values is the consistent implicit dismissal of the value of mathematics, perhaps as a means of promoting qualitative methods, which in itself is a value statement. Furthermore, this use of mathematics within economics is presented as an act by which economists attempt to simplify and detach economics and economic theory from value statements, and picture it more as a science. This completely dismisses the chance of math being used as tool for expressing and discovering phenomena, which is how majority of practitioners view it.

This phenomenon of value free neoclassical economics can be observed for example in the basic levels of what economics is taught as in universities, but it is a dangerous generalization to make for all economics is nowadays, as hardly any practitioner of economics would think of it to be value free, and not all economics is predictive and/or neoclassical. However, this bias is not something that economists are inherently immune to, as for example, the mathematical deductivism that can be noticed especially within macroeconomics suffers from the critique presented in the critical realist perspective.

Nevertheless, in a general sense, even though the perspective of critical realism in itself has merit, the way it presents itself as an antidote for modern mainstream economics is erroneous, as modern mainstream economics is already “critically realist” in many ways. This is because this link between positivism and economics isn’t as strong as the authors make it out to be, as
mainstream economics doesn’t inherently subscribe to positivism. This is because classifying economics to be only that of mathematical deductivism and positivism and of predictions is a crude simplification, as naturally, a significant portion of economics research is explanatory. Furthermore, a lot of the mathematics used in economics is used as a tool to uncover where more research should be conducted, i.e., as a tool for uncovering underlying phenomena, precisely as critical realism suggests that economics should be conducted. Furthermore, this is itself is contrary to the idea of deductivism being the status quo and shows an example of how economics is also “critically realist”.

In short economics is more “critically realist” than how the authors let it on to be, however it suffers from the use of mathematical deductivism in certain aspects of research, by which it subscribes to dangerous positivist ontological assumptions. This can be observed in fields such as macroeconomics.

6. Discussion

Considering the unpacking of critical realism and its key features, namely in how it understands reality and how it should be analysed, a lot of the concepts seem intuitive. For example, concepts such as there being many so to say dimensions of reality or that in fact many different underlying mechanisms cause events to occur in a social reality (Hubert Buch-Hansen and Peter Nielsen (2020)). Considering this, it is somewhat surprising that mathematical deductivism and by extension positivistic research tendencies are what constitute the mainstream economic project (Lawson (2013)). However, considering the claim made by Hubert Buch-Hansen and Peter Nielsen (2020), regarding the fact that researchers don’t spend time thinking about the philosophical implications of their research, it somewhat makes sense. If researchers spent time doing similar ontological reflections of seemingly obvious concepts of social reality, the research conducted would be inherently different in nature. Instead, and understandably so, the methods themselves constitute and define the social reality for both researchers, and for the people who make use of the findings (Hubert Buch-Hansen and Peter Nielsen (2020)). As determined before in this thesis, the problem with this type of mathematically deductive economics is two-fold, it is predictive in nature with its emphasis on causation and which in itself doesn’t fit any sophisticated definition of what social reality is, along with the fact that these models form answers from a flawed image of social reality (Hubert Buch-Hansen and Peter Nielsen (2020)). When predictions or decisions are made based off of
these incomplete/biased images of reality, the repercussions can be societally dangerous (Hubert Buch-Hansen and Peter Nielsen (2020)).

In terms of what should be done going forward, and considering the critical realism perspective on economics, the conclusion from Tony Lawson’s 2013 paper: “What is this ‘school’ called neoclassical economics?”, which already debunked the critique of economics being neoclassical, had good pointers of what should be done: Firstly, in a pragmatic sense by considering the context that the researcher finds themselves in, the researcher should uncover what constitutes their contextual social reality, and then should take any ontological or metaphysical insights discovered, and construct a suitable methodology to conduct economic research. In other words, quoting Lawson (2013) (p.981): “It is to understand the nature of society and then to ensure that research methods are appropriate to that nature” Furthermore, quoting the next sentence: “More concretely, it is to replace the current, yet long outlived fixation on seeking or constructing accounts of event correlations with a serious concern to develop an ontologically grounded causal-explanatory social science”. This final sentence corresponds perfectly with sentiment felt within critical realism, with the idea of straying away from prediction, causation, and correlation within economics, and more towards refocusing efforts on doing mixed method context-dependent research that encourages interdisciplinarity.

Considering the findings from Marion Fourcade’s paper, The Superiority of Economists (2015), economics as a discipline has a lot of work to do to in getting over mathematical deductivism, along with a lot of work to do in becoming a social science that deals with a more realistic image of social reality, considering how little it cites other social sciences. This sentiment is still felt today with Truc (2023) exhibiting similar findings of insularity within economics, while comparing it to other social sciences. Furthermore, considering the fact that there are no formal responses to these critiques from the side of economists, there are grounds for concluding that the implementation for mixed methods would do good for the discipline, in order to better understanding of the social reality which we occupy.

7. Conclusion

Within this thesis, the critique of modern economics has been unpacked with the goal of discovering what the underlying problems of economics truly are. After unpacking the most common critique of economics being neoclassical, along with how this came into fruition, it was possible to determine that the problem with modern economics was not in fact that it is
neoclassical, but in fact that it places too much value on mathematical deductivism, a symptom of inspired by physics. By analysing the ontology, epistemology, and methodology of the philosophy of science perspective critical realism, it became clear that mathematical deductivism is harmful due to reinforcing positivist world view and how these in combination form a flawed image of social reality. Considering where the flaws of the positivist perspective lie, the proposed solution going forward for economics as a discipline, is for economists to practice ontological reflection and to conduct corresponding mixed method context-dependent research.
8. References

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