

An Austrian Critique of the Externality Doctrine

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Abstract

Considering there are questions remaining— such as, why is the market inefficient in this particular case when we know the market can never be inefficient—we will explore the theoretical aspects of externalities. I will analyze the reasoning of Henry Sidgwick and Arthur Cecil Pigou to understand what steps they made in constructing the theory of externalities. We also wish to examine Ronald Coase’s criticisms of Pigou, and the possible failures of Coase. I also wish to research a potential ‘invisible-hand’ explanation of externalities and find where the theory is lacking in understanding, especially in terms of price discovery. I hope to accomplish a concise positive argument in response to Pigou, considering that we know markets can never ‘fail’ *a priori*.

I Introduction

Throughout the timeline of the study of economics we have continually witnessed and watched the indoctrination of the ‘cost of production’ theory of value into the scope of our analysis. There are many plausible reasons as to why the economist, who wishes to appease his audience, introduces this concept, whether it is the ease of statistical analysis or a lack of understanding. These concepts, which are truly stimulating and are an enjoyment to study, are nevertheless counter-productive in our methods. The only gift they give the economist is a deeper understanding of what price discovery really is as he intellectually combats the unclear reasoning of the artistic statistician. For the points we wish to discover in this essay are not only the problems with the attempts to

enshrine economics as a ‘*continuous*’¹ science but also to understand some important arguments that have unveiled as a result.

To be quite honest, I have had the most enjoyment in my studies on the subject of externalities; it started with certain problems I began to notice and continued to develop into more subtle problems. I navigated through essays and debates, found myself reading arguments that would seem irrelevant but had the most beautiful kernels of thought that must be applied to our study². When I began to understand what issues I found in the arguments of the ‘Marshallian dialogue’ the most inner problems emerged that led Sidgwick, Marshall, and Pigou to the plausible conclusion of externalities.³ Though this essay is mainly concerned with what economists call externalities, I hope it brings fourth some new interpretations of certain dynamics within our study as a whole.

For the scholar must always be questioning what he is told, he must always attempt to answer problems he finds within framework and methods. There are certain problems I have found in my understanding of what is deemed an externality. While this essay might be more in depth than need be to convey my point, we must understand that externalities are the major argument for market failure. This argument is the defining method for institutional interference in the mutual exchange of actors while they act freely. The concept of external economies suggests that it is utterly impossible for the ‘free-market’ to achieve Pareto optimality.

The mathematical insights of Pareto are truly fascinating, though we must always heed the warnings of F.A Hayek:

The best illustration in the field of social sciences is probably *the general theory of prices as represented*, e.g., by the Walrasian or Paretian systems of equations. These systems show merely the

¹ A famous economist who attempted to make economic laws quantitatively continuous is

² See Salerno (1992) *Mises and Hayek Dehomoginized*

³ See Sidgwick (1969) *The Principles of Political Economy*, see Marshall (1997) *Principles of Economics*, see Pigou(2013) *Economics of Welfare*

principle of coherence *between the prices of the various types of commodities* of which the system is composed; but without knowledge of the numerical values of all the constants which occur in it and which we never do know, this does not enable us to predict the precise results which any particular change will have. [emphasis added] (Hayek, 1980)⁴

Initially, what Hayek is showing here is that the mathematical models constructed by the Pareto and Walrasian ⁵systems presuppose constants that can't be found. The purpose of Pareto optimality is by and large the understanding of how prices interact with each other. We can construct equations that show how prices can alternate between factors and we can show that prices are always relative. In order to make sense of these price relationships, economists attempted to find a general final static model to coordinate how the prices move in the first place. Now this might not have been the intentional 'gem' of Walras' equilibrium or Pareto's systems of equations, but it definitely seems that we can apply our current understanding of prices to these models and find that they show the truth of multi-variable prices, which is that prices are all relative.

The issuance we see with these mathematical suppositions will be explained further throughout the essay though we must point out the major differentials of price theory. For instance, if we can assume that prices are based on intrinsic and continuous values then ultimately we can achieve long-run equilibrium through, Pareto optimality. However, if we can take Pareto optimality and suggest that it will never be achievable simply because prices are always variable, due to the subjectivity shown by Menger, we can see how the models actually are meant to show the interconnectivity of the pricing structure. Understanding this key insight, we must then demonstrate how certain economists can take these long run models and construct plausible theories based off of what is shown by general equilibrium theory, and how these plausible

⁴ See F.A Hayek's *Counter Revolution of Science*, (1980), page 42

theories can grow in complexity and arrangement. However, the theories are based on a misunderstanding of the subtlest nature. It is our contention to demonstrate that a misunderstanding of utility has allowed economists to expand notions that are no longer in the realm of realism, but rather an oversimplification and misunderstanding of the *praxeological* laws demonstrated particularly by economists within the realm of the Austrian tradition.

This study will be structured in the following manner: We will give a brief explanation of our methodology used, we will conceptualize cost-value theory, we will construct Marshall's interpretation of the marginal revolution, we will then show where Pigou expanded on subtle problems missed by Marshall and Sidgwick, after we will critique the externality doctrine; and end with finally analyzing a variety of other critiques. It is our contention that the notion of externalities is a plausible evolution of minor misunderstandings of price theory, which have plagued the economics profession for years. Though this essay will never accomplish the rewriting of economic thought, we must understand this critique in order to advance plausible discussion into the core of economics.

II Word On Methodology

As we begin our travel through the multivariable structure of production we must start by slowing down the fast paced nature of time. We must see certain exchanges being made and apply a microscope. If we could, we would find an individual actor and attempt to understand his mental processes to demonstrate the most obvious questions. Why and how does this actor act? Whether it is from the buying of labor, of land, of any factor, or from deciding to give up his labor, sell his land or buy a commodity. While we continually ask these questions we can demonstrate that the actor must follow a certain structure of laws.

For instance, if we are to ask why must he buy land? We can deduce that he is planning to do something with the land that he would not have been able to achieve prior. Whether it be the production of fruits, the building of a house, or to withhold it

and simply sell it at a higher price. We can demonstrate that he is using the land as a means to achieve a certain and fundamental end. In order to achieve this end, this actor must partake in action. This would then ultimately lead to a conclusion that rationality exists with action. This is because rationalization is the understanding of cause and effect, and by knowing cause and effect humans can rationalize action to achieve ends. Therefore, anybody applying any means to achieve any end is showing rationalism and therefore anyone who acts demonstrates rationalism.

By understanding this point, then, we can see that human action by its nature shows a deeper understanding of *causal relations* by the actor⁶, we can begin to expand our analysis into an entity what we can call the ‘economy’. The economy is constructed with a multiplicity of individual actors that are at all times acting rationally and individually. This would suggest that we can never construct a system based on ‘collective values’ simply because all of human action is dependent on the individual level. Judgments can be constructed by influence of other people, of a whole network of exchange, but nevertheless actual action can only happen at the individual level. We can’t construct a theory of value on a collective level. If ‘group’ A wishes to buy product B and they are willing to pay ‘n dollars’, then ‘individual’ C is willing to pay n+1 dollars for product B, the seller will sell at ‘n+1’. Therefore, we see that value judgments, i.e. price ratios, can only occur on the individual basis. Understanding this element of human rationalism is important in our analysis of the failures of externalities because we will see that an externality is simply on the assumption of a cost value structure, and not a subjective structure.

III Historical Applications of Cost-Value

Before the marginal revolution, economists would unsuccessfully attempt to construct a value theory. Value, to them, must come in the form of an intrinsic nature because they

⁶ see Mises’ groundbreaking treatise, *Human Action*, (2008), especially pg. 1-69

were at a loss to explain concepts like interest.⁷ What is the point of interest, how can capitalists make money with labor if they aren't doing anything? This question would force the classics into circles, and cause fallacious arguments because the classics were working with an improper framework; they were incapable of explaining things like interest because they assumed that there had to be intrinsic value and not subjective value. This is especially true in the case of some of the most influential economists, John Stuart Mill, David Ricardo, and Adam Smith.

What these economists were attempting to show is that interest occurs through non-specific factor allocation, and through that non-specific factor allocation prices will occur higher than the factors themselves. By understanding this complexity, economists attempted to adopt an intrinsic value model because they were unable to explain interest. By suggesting that factor A has intrinsic value of \$18 when used in the process of production and can be sold for \$20 the factors will then receive a dividend of \$18. Capitalists received \$2 due to the differential between the productivity of the factors and the actual sales price. The famous Ricardian theory of rent is a proper demonstration of this to explain how intrinsic "production" value creates prices.

The great economist, Murray Rothbard, has said some very interesting things on this. He suggests:

It is, of course, peculiar to consider profits, even profits as long-run interest, as part of the 'costs' of production. Again, this usage stems from eliminating any consideration of entrepreneurial profits and losses, and focusing on interest as a long-run 'cost' of inducing savings and the accumulation of capital. (Rothbard 2006)⁸

⁷ see Eugen Von Bohm-Bawerk, *History and Critique of Interest Theories*, (1959), also see Murray Rothbard *Classical Economics: An Austrian Perspective on the History of Economic Thought Volume 2*, (1995) pg.1-101, and, 275-297

⁸ see Murray Rothbard, *ibid*

This is important to grasp because the lack of understanding, to the nature of interest and profit, led some classical economists to fall into a trap, to assume that all prices are not variable. By administering what a cost of production theory entails is a direct refutation of our present thesis, since it has been demonstrated that prices must be variable and subjective.

What Rothbard, and others, missed on this point of the Ricardian land rent theory is that it inexplicitly violates Say's law. This is because Say's law demonstrates that if there is an overabundance of supply in one good there must be an unmet demand in another good. Therefore, we can see that Say's law is a suggestion of price variation and the interconnectivity of prices as all *being relative*. Assuming that land yields x productivity, labor yields y productivity, and capital yields $(x+y)+n$ we see that entrepreneurs cannot 'over supply' factors into the production process, and seemingly will not obtain any excess income from marginal increases of capital. This is because increasing the supply of capital will necessarily create unmet demand for land, and the unmet demand for land will, assuming Ricardo's theory as true, increase the price of land and therefor push up the rents on the more productive factors and thus bring the price of the final product towards market clearing levels eliminating any 'glut' or 'surplus' of return on capital.

The first theorist to be credited with a truly subjective doctrine of value is Hermann Heinrich Gossen and his construction of Gossen's first law. This law finalized all inconclusive arguments in value theory. It suggests that the marginal increase of a homogenous good will always decrease the value ascribed to it. There seems to be a positive correlation that Gossen actually derived his law from the psychological roots of Ernst Heinrich Weber and Gustav Theodor Fechner, in what would be the called Weber's law.

While working on a historical reinterpretation of Weber and Fechner, cognitive psychologists Hans Colonius and Entibar Dzhafarov describe to us what *is* Weber and Fechner's laws. The authors state, "With an appropriate definition of JND, the ratio

a'/a of any two stimuli separated by the JND is constant, and so is the dissimilarity between these stimuli, $D(a,a')$ " (Dzhafarov 2011)⁹ This means that Weber and Fechner attempted to actually quantify stimuli relationships with sensations of consciousness.¹⁰ The similarities between these Weber's work, and Gossen's work, are truly striking¹¹. However, the subjective valuations of Gossen would set into motion a revolution of economics in a way that parallels the famous Copernicus revolution¹² and his abandonment of the geocentric galaxy. In order to understand Gossen's first law, we must apply what was said earlier in terms of rationalization. Meaning, if actors wish to partake in the sale or purchase of any good there is a subjective element. However, as we will see, the element of psychological quantitative ratios will play an important role in developing price theory. This is because certain economists wished to quantify the relationship between quantity of good and psychological utility derived from the good, and others¹³ wanted to focus more on the calculative rationalist process between quantity and subjective utility.

Gossen really began constructing subjective value answers to economic interaction. However; he interpreted utility as a psychological valuation of satisfaction in relationship to quantity, opposed to satisfaction in relativity to the marginal ordered unit. Most credit for finalizing the theory of utility goes to Menger, Jevons, and Walras, who simultaneously created what is called marginal utility theory. The law that values are subjective, and that prices are actually imputed upwards through the production structure demonstrates marginal utility theory in relation to our thesis. This feat of imputation has been mostly attributed to the works of Bohm-Bawerk and

⁹ See Colonius *The Fechnerian Idea*

¹⁰ Fechner's law is a derivation of this formula $dp = k dS/S$, which is a representation of the change of perceptual stimuli, will also change in physical stimuli. This is very similar to Gossen's second law algebraic derivation, which states that an actor faced with a change in the ratio of marginal utility, will allocate that change according to its price. Initially, it is quite easy to see the similarity of the two concepts. For the world of economics would understand the quantified relationships used by Gossen is related to Weber's and Fechner's laws.

¹¹ We contend that Mengers interpretation of Gossen satiability of wants is more in tangent with the understanding of the causal relationship of the good in question, while Walras and Jevons seemed to favor the actual psychological aspect of Gossen which is due to its similarities with Weber's law. See Hulsman, *Mises: Last Night of Liberalism*

¹² This is what Walras suggested. See Hulsman, *Mises: The Last Night of Liberalism*

¹³ Here I am directly referring to the Mengarian principle

Friedrich Wieser with the imputation theory of the production structure.¹⁴ Wieser and Bohm-Bawerk explicitly suggest that costs have an influence on price, it is our contention that their definition of cost is fundamentally different from other schools and their understanding of cost. This is because the subjective element, missing from the other schools framework, makes it extremely difficult to grasp the theory of imputation. Initially, what Wieser deems as a ‘supply index’ will be a quintessential different than the theories that this thesis will explore further.¹⁵¹⁶

IV Divergences of Marginal Utility Theory

What we have suggested above is that at the onset of the marginal revolution three separate interpretations of utility were constructed initially simultaneously. We find that Walras, Jevons, and Menger all construct utility doctrines and then their prodigies would expand on what the theorists say. For Walras we have the likes of the Lausanne school, which would expand the understanding of Walras’ teaching in Villfredo Pareto. Jevons would express his constructs of utility and that would fall to his prodigy of Alfred Marshall. Finally, Carl Menger’s disciples would be Bohm-Bawerk and Wieser.¹⁷¹⁸¹⁹

¹⁴ There are many discussions about Wieser’s actual role in the growth of Austrian economics, and as one that differs from Menger. It is our understanding that Wieser and further Schumpeter and Hayeks ‘divergence’ is because of a separate interpretation of the Walrasian systems with the main point as it shows the price relations, see Hayek counter revolution of science, Wieser social economics. Some economists lay the claim that he signified a different direction of Austrian scholarship and was actually a member of the Lausanne school. *see Salerno (2002). Also see Hulsman (2007), Mises: The Last Knight of Liberalism.* This is an intriguing interpretation, however we must contend that any divergence from the Mengarian tradition is because Wieser found the interconnectivity of prices as the main argument of Walrasian systems, and not abandon his understanding of how utility imputes price through the production structure. *See Wieser (1920) Social Economics.* Any other divergence from the Austrian school is not in the realm of this essay

¹⁵ *Wieser, ibid.*

¹⁶ For a complete, dense, articulation of what we mean by differences in cost-value *see G. Reisman. Eugen Von Bohm-Bawerk’s “Value, Cost, and Marginal Utility”: Notes On The Translation*

¹⁷ It must be attributed that Austrian influence has actually aided the likes of people like Lionel Robbins and Phillip Wicksteed who also were influenced by Jevons, and there is compelling arguments to suggest that a certain brand of Walras has influenced Wieser, as stated above. Sidgwick would also influence Marshall very much, yet it is our argument to

The role of Walras and Pareto would evolve into much controversy in the 20th century, which has evolved into multiple interpretations of the actual motives of Walras and Pareto. Walras, who initially constructed his own version of utility theory, has espoused concepts that have aided in the confusion of allowing a ‘cost of production’ theory to creep into analysis. Walras was capable of constructing a system of equations, to which we can find ‘general equilibrium’; he also suggested that ‘satisfaction’ or ‘utility’ were the main motive for pricing. Inadvertently, in Walrasian equations, general equilibrium can only be reached if we attribute a cost of production theory to the mix because the mathematical relations can only assume cost theories by the mere fact that it does not incorporate ‘human action’ into its model. The mathematician fails to understand the fundamental necessity of entrepreneurs. He fails to see their role in the calculation between costs and prices. Therefore, without understanding the necessity of entrepreneurship, and *money*, in the formation of the structure of production the mathematicians have inadvertently subscribed to an ‘intrinsic-value’ or ‘cost of production’ model similarly espoused by the classics above. By forgetting the entrepreneur, the prices are given and therefore the act of cost and price calculation has dissipated from the Walrasian system and forms a static model, a model that shows relativity but fails to show human action. Ludwig V. Mises demonstrated this beautifully when he states:

suggest that fundamentally the concept of utility passes through separate traditions and we find these differences in the writings of the economists described.

¹⁸ In Guido Hulsman’s enthralling *Mises: The Last Knight of Liberalism*. (2007) Hulsman points out that Gossen directly influenced Jevons and Walras with sophisticated algebraic insights that aided in the unraveling of utility theory. Hulsman also points out that Gossen directly influenced Jevons’ and Walras with a *psychological interpretation* of utility, while Menger understood utility as being relative in importance to other economic goods. See pg. 126-136. Also see Jaffre, (1976) *Menger, Jevons, and Walras De-Homogenized*.

¹⁹ However, Hulsman also suggests that Wieser was under the interpretation of a psychological definition of marginal utility that differs him from Bawerk and Menger. Yet, F. Wieser states, “One should especially emphasize the fact that Gossen’s law of satiable wants, the foundation of the modern theory of value, has nothing to do with Weber’s law. Economic theory would be benefited, had scientific psychology advanced further beyond its beginnings; but our discipline does not seek and could not find direct aid from this source. The task of the two branches of knowledge are entirely distinct” (Wieser 3). This would seem to put Wieser actually in the context of the Mengerian tradition in respect to the actual core understanding of Mengerian principles, or the ‘relativity’ of the utility doctrine. See *Wieser, Social Economics*, (2003), pgs, 3-9.

The prices of the factors of production, as the mathematical economist sees it, are determined by the intersection of two curves, not by human action. Moreover, in drawing his cherished curves of cost and price, the mathematical economist fails to see that the reduction of costs and prices to homogenous magnitudes implies the use of a common denominator of the exchange ratios of the factors of production. (Mises 2008)²⁰

Initially Mises suggests that by contributing to a misunderstanding of subjectivism, utility, and the role of money, economists like Walras failed to grasp the full implications of what a price is. Therefore, with Pareto adding to the Walrasian systems his ‘pareto optimality’ is never a possible theory and therefore equilibrium will never be reached. The interpretations of Pareto optimality would then influence Pigou who would construct an externality doctrine, which we will explore further down.

However, there seems to be an alternative understanding of Pareto and Walras that is attributed to the Austrian school. Mises suggests that Pareto’s equations were important in uncovering the problems of socialism because they seem to express something much more fundamentally important, that all prices are variables of other prices. So Mises suggests:

It is true that some eminent economists –Herman Heinrich Gossen, Albert Schafle, Vilfredo Pareto, Nikolass G. Pierson, Enrico Barone— touched upon the problem (entrepreneur calculation in socialist countries). But, with the exception of Pierson, they did not penetrate to the core of the problem, and they all failed to recognize its primordial importance. (Mises 2008)²¹

²⁰ See Mises, *Human Action* (2008)

²¹ *ibid*

This suggests that Mises sees Pareto's equations as showing a core concept of price variations, though the use of mathematics led astray to different interpretations. Hayek would then suggest that Pareto knew that equilibrium could never be reached, and therefore Pareto's systems show us a much more fundamental truth about prices. As Pareto says, in regards to his model:

It may be mentioned here that this determination has by no means the purpose to arrive at a numerical calculation of prices. Let us make the most favourable assumption for such a calculation; let us assume that we have triumphed over all the difficulties of finding the data of the problem and that we know the ophelimity's (utility) of all the different commodities for each individual, and all the conditions of production of all the commodities, etc. This is already an absurd hypothesis to make. (Hayek 1996)²²

It would seem that it was never Pareto's, or therefore Walras' intention, to bring forth a theory of value that would be reliant on mathematical models. Quite the contrary, Pareto's and Walrasian's systems were fundamentally an expression of the relevance of the interlay of pricing in the system of production. Pareto expands, "In this case the roles would be changed: it would not be mathematics which would assist political economy, but political economy would assist mathematics." (Hayek 1996). in regards to attempting to achieve general equilibrium.

Mises brings forth a fundamental point of the failures of the Pareto systems in terms of socialist calculation, yet the point of our thesis is to focus on why the concept of externalities exists, therefore, we must not digress. As been shown, we can say pretty confidently that the Walrasian understanding of general equilibrium created two

²² In Friedrich Hayek's essay, *Socialist Calculation 3: The Competitive "Solution"*, publish in Hayek's, *Individualism and Economic Order*, pgs. 181-182, Hayek directly quotes Pareto. See Pareto, *Manuel d'economie politique*, (1927), pgs.233-34.

separate interpretations. One where general equilibrium can be reached, and one where general equilibrium can't be reached, but is a tool to explore the complexity of the economy.

When Jevons was deducing his definition of utility there is a subtle difference between him and Menger.²³ Jevons suggests that there is no intrinsic values associated with utility, which is correct and helps alleviate the problems of the cost of production theory of value. However, Jevons goes on to promote Gossen's utility theory in a psychological aspect, "In the first place, utility, though a quality of things, is no *inherent quality*. It is better described as a *circumstance of things* arising out of their relation to man's requirements." (Jevons)²⁴ So this suggests that Jevons definition of utility is not intrinsic. Which is correct, however he suggests that utility is an expression of "pains and pleasures". He says, "We can never, therefore, say absolutely some objects have utility and others have not." He further states:

All that we can say, then, is, that water, up to a certain quantity, is indispensable; that further quantities will have various degrees of utility; but that beyond a certain quantity the utility sinks gradually to zero; it may even become negative, that is to say, further supplies of the same substance may become inconvenient and hurtful. (Jevons 1970).

This suggests that for Jevons, utility can be negative due to its supposed 'psychological' nature.

However, Menger suggests that all economic and noneconomic goods have utility because each good has a 'use-value' and 'exchange-value' and all goods can satisfy human needs. Menger suggests, "Utility is the capacity of a thing to serve for the satisfaction of human needs, and hence (provided the utility is recognized) it is a general prerequisite of goods-character. Non-economic goods have utility as well as

²³ As demonstrated by Hulsman the main difference is the understanding of utility as a psychological factor in the eyes of Jevons. However, for Menger it is a relative factor.

²⁴ See W. Jevons, *The Theory of Political Economy*

economic goods, since they are just as capable of satisfying our needs.” (Menger 119). This subtle difference of terminology has led to a complete misunderstanding. For Jevons, *prices show utility* and therefore the role of the entrepreneur as one who can calculate costs and prices vanishes from his system. This is because a theory demonstrating that prices show measurable utility, cost and price differentials within the interlay of production become utterly useless. For Jevons, he suggests, “Cost of production determines supply. Supply determines final degree of utility. Final degree of utility determines value.” (Jevons 1970)

However, Jevons goes on to say, “In many other cases it might be shown similarly that matter, we can hardly call it commodity, acquires a higher and higher degree of *disutility* the greater the quantity which has to be disposed of. Such is the case with the sewage of great towns, the foul or poisoned water from mines, dye-works, etc.” (Jevons) However, as Menger suggests, all goods have ‘utility’ and in the application of attributing means to production can only show that. If prices can show us utility, then something that is free must show ‘zero-utility’, and if something demonstrates ‘negative-utility’ it obviously means that the negative utility is a cost. Initially, by understanding utility as a differential between ‘pleasures and pains’, psychologically, Jevons’ misunderstands the very concept of utility. Utility is subjective satisfaction derived from consuming a good. All goods can create satisfaction by the nature of subjectivism; therefore there can never be a good that has negative satisfaction for that misunderstands the point and embraces an underlying feature of utility calculation that does not exist. This subtle difference would go on to influence the Marshallians, and others, in the ways of thinking utility can be measured by price. If we see that utility is inherently psychological we can assume that prices can measure this. However, when we understand that utility is the orderly valuation of goods on a purely subjective marginal level; we can introduce realist models into our equation and will understand the problems associated with the former method.²⁵

²⁵ It has been demonstrated to exhaustion the fundamental difference between Menger and Jevons and Walras. From now on, when we refer to measurability of utility we are discussing the ‘psychological’ interpretation of Gossen.

For Jevons, and his followers, there tends to be a failure to explain what actual money is. It seems that they think money is a measurement of pleasure and not an actual good itself. It is our contention that they fail to see this because of their misunderstanding of utility, as expressed above. However, Menger's insights into the subjective spontaneous creation of money, further elaborated by Mises, can explain the creation of money by use of marginal utility where we can leave this loop of Jevons' and climb deeper into where the problems arise. For it is easy to mistake that cost of production can determine supply, and that supply determines utility²⁶ if one is to assume that prices show utility. The way one can reason this is by suggesting that money shows 'a measurement of value'. However, Mises says:

But subjective valuation, which is the pivot of all economic activity, only arranges commodities in order of their significance; it does not measure this significance. And economic activity has no other basis than the value scales thus constructed by the individuals. (Mises 1912)²⁷

This suggests that utility in the sense of Jevons, and value in the sense of the Mengarian tradition is different. Initially, utility for Jevons is artificially defined by its price; however, for Menger utility creates the price through marginal imputation.

By taking Jevons concept of utility and applying it to a general equilibrium model, such as Walras' equations, we can begin to see where the problems arise. By assuming that price measures utility, and joining with general equilibrium we find that an 'intrinsic-value' understanding of utility will arise, and pushes us into *artificial* cost of production theory that negates the true subjective nature of price relativity.

²⁶ This is Jevon's method of producing a price. See W. Jevons *The Theory of Political Economy*

²⁷ See Ludwig V. Mises, *The Theory of Money and Credit*, (1912)

V Embryo of Market Inefficiency

When Sidgwick first constructed his concept of diseconomies, he interpreted Jevons' utility. Sidgwick rightfully criticizes Ricardo for the problems of the Ricardian theory of 'real cost of production'. He then suggests that German economists who use the means of 'Objective value' and 'Subjective value' are guilty of the same thing as the Ricardian cost theory. For this, Sidgwick makes a grievous error. He states:

In this way (e.g.) we may estimate the "objective" or "real" value in use of different kinds of fuel, or stone for building, or food for nutrition: and, similarly we might speak of the really higher value in "productive use" or "business-use" of certain instruments of production as compared with others, measuring their superiority by the extra quantum of produce obtainable by using them. Generally speaking, this "value in business-use" does not determine the value in exchange of such instruments. (Sidgwick 1969)

He goes on to say:

Therefore, if this notion of 'real value' as divergent from actual price is introduced at all, it ought at least be accompanied by a statement of the particular substitution of knowledge for ignorance or error, which is implicitly supposed. (Sidgwick 1969)²⁸

This suggests that Sidgwick does not understand what is meant by 'Use-value' and 'Exchange-value'. For Menger states, "the value of an economizing individual attributes to a good is equal to the importance of the particular satisfaction that depends on his command of the good" (Menger 64), and further he states:

²⁸ See H. Sidgwick *The Principles of Political Economy*

Whether a diamond was found accidentally or was obtained from a diamond pit with the employment of a thousand days of labor is completely irrelevant for its value. In general, no one in practical life asks for the history of the origin of a good in estimating its value, but considers solely the services that the good will render him and which he would have to forgo if he did not have it at his command. (Menger 64)²⁹

Here Menger is clearly suggesting that value is completely subjective, but the ‘objective’ or ‘exchange’ value of a good is the differentials of its use in relation to the other factors of production. For instance if good A is used in the production of x , the subjective value is the foresight of the possible yield³⁰; The objective value is the fact that the good was used in producing x as opposed to being produced in y . Both ‘values’ represent different things; but both come from utility and therefore are subjective and relative.

However, Sidgwick then constructs a plan to measure value based an index of prices because he does not find the differences in the subjective Mengarian theory of value. Therefore, when he attempts to refute Ricardian “real cost of production” theory with the “Objective costs” doctrine, he aggregates all prices and completely misses this important understanding attributed by Menger. Naturally, by making the price as an aggregate Sidgwick deduces utility as an aggregate measure of an index of prices. From this Sidgwick then suggests that:

Private enterprise may sometimes be socially uneconomical because the undertaker is able to appropriate not less but more than the whole net gain of his enterprise to the

²⁹ See C. Menger *Principles of Economics*

³⁰ Yield in this sense means consumption

community; for he may be able to appropriate the main part of the gain of a change causing both gain and loss, while the concomitant loss falls entirely upon others. Thus a company A having made an expensive permanent instrument—say a railway—to the advantage both of themselves and of their fellow-citizens, it may be the interest of another company B to make a new railway somewhat more convenient for the majority of travellers—and so likely to dray the lion’s share of traffic from A—*even if the increment of the new utility to the community is outweighed by the extra cost of the new railway*; since B will get paid not merely for this increment of utility, but also for a large part of the utility that A before supplied. [emphasis added] (Sidgwick 1969)

Therefore, by Sidgwick explaining that a firm can ‘profit’ from a cost that another firm incurred demonstrates a fundamental lack of understanding of prices and costs. In his context, costs are monetary costs and since they are monetary costs they are already assumed in the context of his analysis. Considering monetary costs are ‘negative utility’ he therefor inadvertently introduces the same problems associated with the ‘real value explanation’ of the classics by suggesting that utility is a measurable factor with intrinsic value. This misunderstanding of Sidgwick would go on to influence Marshall, and therefor redefine the marginal utility doctrine.

VI Marshall’s Failures

Marshall would then express Sidgwick’s understanding of utility by following in Jevons’ psychological tradition when he constructs his supply line. Marshall expresses that there exists a ‘real costs of production’ and a ‘monetary cost of production’. He suggests that the real cost of production are the ‘exertions of all different kind of

labor' and that the 'money costs of production' are the expenses paid by the firms in the production process.³¹ He goes on to suggest that:

Mill and some other economists have followed the practice of ordinary life in using the term cost of production in two senses, sometimes to signify the difficulty of producing a thing, and sometimes to express the outlay of money that has to be incurred in order to induce people to overcome this difficulty and produce it. But by passing from one use of the term to the other without giving explicit warning, they have led to many misunderstandings and much barren controversy.”
(Marshall 1949)

He then expands this and suggests:

The remainder of the present volume will be chiefly occupied with interpreting and limiting this doctrine that the value of a thing tends in the long run to correspond to its cost of production. (Marshall 1949)

Which cost is he talking about? Is Marshall discussing a real cost or a money cost? For this confusion can only be answered by the fact that he interprets Jevons understanding that prices measure utility, and in order to incorporate a *continuous* mathematical model Marshall must mean monetary costs. His famous scissor analogy will then suggest that it is possible for costs of production to influence price, and therefore we have moved from subjective laws of utility back into an intrinsic value of production and have fallen into the failures of Ricardo, Mill, and Smith. Murray Rothbard picks up on this failure of Marshall when he suggests:

³¹ See A. Marshall *Principles of Economics*

Marshall's great error here, and it has permeated the works of his followers and of present-day writers, is to regard costs and production exclusively from the point of view of an isolated individual entrepreneur or an isolated industry, rather than viewing the whole economy in all its interrelations. (Rothbard 2009)³²

This is very true, but it is our contention that the subtle differences in explanation of utility by Jevons and Menger have led the Marshallian economists astray. This is because Jevons' was incapable of formulating a plausible monetary theory with his marginal utility doctrine, and relied on mathematical constants, as stated above, in his framework to construct prices. Since Jevons could not form a monetary theory, it shows he misunderstood the subjective nature of utility. To show Jevons' influence on Marshall's utility doctrine we see Marshall state:

He applied the new name final utility so ingeniously as to enable relations between small increments of two things that are gradually changing in causal connection with one another. His success was sided even by his faults. For under the honest belief that Ricardo and his followers had rendered their account of the causes that determine value hopelessly he was correcting great errors; whereas he was really only adding very important... but he has led many of his readers into a confusion between the provinces of Hedonics and Economics, by exaggerating the applications of his favorite phrases, and speaking without qualification of the price of a thing as measuring its final utility not only to an individual, which it can do, but also to a "trading body" which it cannot do. (Marshall 1949)

³² Rothbard dismantles Marshallian arguments in a section in his revolutionary, *Man Economy and State*. See especially pgs. (355-362)

This suggests that Marshall distinctly assumed that cost of production, and prices determine utility. However, as suggested by Wieser, costs of production are not a monetary expenditure, but rather it is a ratio between non-specific factors of production. Wieser distinguishes between monetary costs, and natural costs much like Marshall, but Wieser insists that ‘natural costs’ are the differentials between the nonspecific factors of production. For Wieser, the importance of a cost is not a ‘direct effect’ on its ‘supply price’ rather it is the computation or calculation of the costs of production of the entrepreneur. He states:

All the propositions which have now been deduced with respect to changes of costs are already familiar in their effect on price. It must be borne in mind that they come into play as regards not only the price but also the computation of utility. Concretely they *affect the price by means of the computation of utility*. [emphasis added]
(Wieser 2013)

Initially, because Wieser is expressively concentrating on the relations between prices and factors in the production structure he focuses on imputation and calculation, for Marshall it is the price that measures utility and therefor the role of the entrepreneur leaves the equation all together.

VII Externalities as a Failure of Understanding Subjectivism

Pigou, the economist who is credited with the finalization of externalities, initially picks up where Sidgwick and Marshall left off with his concept of a ‘national dividend’ and ‘welfare economics’.³³ He starts with an array of mathematical formulas to designate that social income is on the lines of the social utility. He suggests that we

³³ See A.C Pigou *Economics of Welfare*

can use money to evaluate utility, and that money is the means to measure utility.

Pigou states:

In the preceding chapter economic welfare was taken broadly to consist in that group of satisfactions and dissatisfactions, which can be brought into relation with a money measure. We have now to observe that this relation is not a direct one, but is mediated through desires and aversions. (Pigou 2013)

For Pigou there is social utility, which is comprised of ‘desires and satisfactions’.³⁴ Pigou sums up the analysis of Sidgwick and Marshall when he constructs his ‘social net product’ and ‘private net product’. Initially, by indexing prices into an aggregate form and constructing these supply schedules Pigou has constructed two separate valuations based on utility. One is the *social utility*, and one is the *private utility*. The social utility is the utility to which all prices represent an index, and the private utility is the index of prices based on the Marshallian ‘costs of production’, while the social utility is based on a price index composed of ‘social’ costs of production³⁵. He would go on to say that there is a private net product and a social net product, which are represented by supply lines. What Pigou suggests is that there can be times where these two ‘utility schedules’ are not in tangent, and therefor create what is called a diseconomy.

If these two supply schedules are not in tangent, according to Pigou, someone is absorbing a ‘negative utility’ as expressed by Jevons. Initially Pigou suggests that costs are externalized onto society, and Sidgwick’s aggregation of utility has allowed Pigou to articulate this. Pigou states:

In general industrialists are interested, not in the social but only in the private, net product of their operations. Subject to what was said about costs of movement, self-interest will

³⁴ This concept was first articulated by Sidgwick

³⁵ We are assuming that social costs of production are the ‘real costs’ while the private costs are the ‘monetary costs’.

tend to bring about equality in the values of the marginal private net products of resources invest in different ways. But it will not tend to bring about equality in the values of the marginal social net products except when marginal private net product and marginal social net product are identical” (Pigou 2013)

Pigou goes on to give examples of how this could happen in the real world, through the manufacturing of durable goods based on rent never compensated for, deception by producers etc. However, what Pigou has done here has devised an argument for inefficiency. The main argument from Pigou is the doctrine with external economies is that the market, in Pigou’s opinion, can cause inefficiency because it does not allocate all resources based on social utility.

VIII Critique of the Doctrine

Pigou fails to see that utility is entirely subjective. How could there possible exist a social net product and a private net product with differentiable values³⁶? Again prices do not measure utility, utility drives price discovery by administering subjective ratios between other goods. Initially, what Pigou is suggesting, is that people outside the scope of the market must soak up costs because the supply curve of the social net product is not in tangent with the private net product, however as Rothbard states, “The businessman’s market-supply curve will depend on his *present opportunity cost*, not his past money cost.” (Rothbard 599) which is very much in line with what Wieser suggested above. Therefore, what has been deemed ‘spillover effects’ is only possible if we assume that prices measure utility, and therefor costs measure negative utility. So, how could a person be affected by a cost when we know that a cost is a calculative tool used by entrepreneurs to compute production based on utility? Should we refute

³⁶ Rothbard suggests that “the mythical distinction between ‘social cost’ and ‘private cost.’ Is actually an ethical judgement made by utilitarian economist who believe that all actors’ ends are the same. See M. Rothbard *Man Economy and State* (1361-1362)

Wieser's and Bohm-Bawerk's explanation of a cost as being a tool for computation of utility and act as a relation of 'use-value'? Once we realize this we start to see that the entire theory of externalities does not make any plausible sense, and by unraveling their doctrine we find that the problem is due to a complete misunderstanding and oversimplification of utility doctrine and faulty methodology. For Wieser states:

“However this may be, the fundamental law of the economic computation of utility is essential to theory. This laws for the simple economy of the individual. Without its aid no theory will be able to explain the factors which go to make up the price of diamonds or any other prices. There is no exception to the statement that all prices are the outgrowth of personal computations of utility on the part of the demanders.” (Wieser 2013)

Marshallian doctrine don't understand this fundamental law of utility, that the sole purpose of utility is not to 'measure prices', rather the purposes of prices are for the computation of the relative prices which can order utility based on the laws of subjectivism. Therefore, as stated above, costs are how the economizing actor determines his value judgments for computational purposes. Meaning, it's how an actor rationalizes his means to achieve his end.

To understand this point, we must see that the entire Marshallian doctrine relies solely on an *artificial cost of production theory*. This is because his theory suggests that an index of monetary costs is the defining factor of the supply schedule. By contemplating a theory that there exists a 'social optimal price' and a 'market price', the theory has inadvertently introduced a cost of production answer to what the Marshallians deem an endogenous problem. By saying that the 'society' at large is paying an added cost that the market is not accounting for does not make any sense. This is because costs are all relative, variable, and immeasurable. Additionally, Mises states:

At the bottom of many efforts to determine nonmarket prices is the confused and contradictory notion of real costs. If costs were a real thing, i.e., a quantity independent of personal value judgements and objectively discernible and measureable, it would be possible for a disinterested arbiter to determine their height and thus the correct price. There is no need to dwell any longer on the absurdity of this idea. Costs are a phenomenon of valuation. Costs are the value attached to the most valuable want-satisfaction, which remains unsatisfied because the means required for its satisfaction are employed for that want-satisfaction the cost of which we are dealing with. (Mises(2008) 393)

For instance, if a producer is producing more than is deemed 'optimal' the prices of the factors he is employing will begin to rise due to scarcity. While the factors begin to rise the law of diminishing marginal utility will take effect and influence the producer to not pay the higher prices due to diminishing marginal returns. This means the price mechanism, within the production process, will tend to not allow a producer to produce more than is needed because costs have no 'direct relation' on price. By assuming there is a social cost, we are assuming that a cost is something fundamentally different than what it actually is.

Therefore, within the vague attempts to attribute a concept of a 'social utility' the Cambridge school has inadvertently misunderstood what the core understanding of marginal utility actually is. When the Marshallian suggests that there is a spillover cost or a spillover benefit, due to market inefficiency, it is because Sidgwick, Marshall, and Pigou aggregated all prices under a singular index and forgot that all prices are relative. They have given us no reason to assume that the production structure deduced by Bohm-Bawerk and Wieser should be faulty; instead they took a mathematical approach and constructed a system that covers up the fundamental process of the market that shows the interrelations of prices. When factor of production A increases or decreases

in price it is because of subjective rationalization between other goods. This is the feature that a spillover benefit/cost actually captures, the relativity of pricing. Initially, when we look at a ‘spillover effect’, if monetary by nature, it is the remuneration of Say’s law and what the Walrasian system actually captures. Not that we can create an ultimate ‘equilibrium’, rather; when we see that prices do not clear markets there will be other effects on other markets and this will create pressure to finally clear markets. If there is a ‘non-monetary’ spillover effect it is outside the scope of the market because the argument is based on an understanding of utility as something that it is not.

When a railroad creates sparks that burn down a farmer’s crops³⁷, this does not mean that there is inefficiency in the market because the farmer has an added cost; it means that property lines have failed to protect the farmer from the railroad’s faulty technology. This has absolutely nothing to do with the theory of economic analysis because it is assuming that prices are a measurement of utility, and therefore added cost creates negative utility. The philosopher kings and false economic prophets cannot comprehend that prices do not measure utility, and therefore there does not even exist a ‘negative utility’. If person A has an ordinal scale based on his perceived utility his cost is the ordered good he gives up by consuming something more valuable to him. Person A is not succumbing to ‘negative utility’ by choosing the lower ranked good before the higher. If Railroad x forces person a to elect to consume a certain amount of goods, person a will then be forced to give up his lesser valued marginal alternatives. This does not mean person a receives negative utility, it means he is forced to reevaluate his preferences. Calculation still occurs regardless if farmer a loses his crops from a faulty railroad car, or a pack of coyotes, this does not show market inefficiency or does it show a failure of markets to allocate efficiently; it shows failure of legislation, law, or the individual to enforce property rights³⁸. Therefore, any intervention into the market will cause distortions of prices and will never be able to actually fix any supposed ‘inefficiency’ because it is attacking the wrong institution or entity.

³⁷ See Ronald Coase *The Problem of Social Cost* (2013)

³⁸ This concept, that externalities is a issue of property is held to Ludwig V. Mises. See Mises. *Human Action*, pgs. 650-660

IX Other Criticisms and Their Failures

Among some plausible criticisms of the externality doctrine that we must explore is one the most influential. The free market economist Ronald Coase suggests that government intervention proposed by Pigou could necessarily effect overall production. He goes through rebutting different cases that Pigou raises in his analysis, and does a magnificent job. He then suggests that there are cases where it is actually plausible to initially ‘ignore the externality’. When economists take the costs spent by a firm imposing externalities, and those costs are greater than the costs the externality actually caused, it is more efficient to allow the externality to continue because the costs are greater. He goes on to say:

This failure to take into account costs imposed on others is comparable to the action of a factory-owner in not taking into account the harm resulting from his emission of smoke. Without the tax, there may be too much smoke and too few people in the vicinity of the factory; but with the tax there may be too little smoke and too many people in the vicinity of the factory. There is no reason to suppose that one of these results is necessarily preferable. (Coase 2013)

And further to the context of Pigou’s attempt of government intervention,

“The aim of such regulation should not be to eliminate smoke pollution but rather to secure the optimum amount of smoke pollution, this being the amount which will maximize the value of production.”(Coase 2013)

However, Coase falls into the same trap as Pigou. He fails to see the subjectivity of the actor, who weighs his costs, as he is appealing to his subjective valuations in a calculative manner. As stated above, a cost is— as Wieser express—the application of a non-specific factor designated to the process of production. This is because applying that factor to the production process the producer initially gives up the next possible action. Coase fails to see this point because he does not see the subtle differences in utility doctrine as stated above, and therefor does not see the actual problems of the theory.

He beautifully discusses Frank Knight, rather correctly I might add, when he states, “As Frank H. Knight has often emphasized, problems of welfare economics must ultimately dissolve into a study of aesthetics and morals” (Coase 2013). This is obviously true, and we can see it with how Marshall and Pigou have constructed indexes in accordance with ‘utilitarian’ morals. Frank Knight obviously caught on to the normativity of the welfare school, but both Frank Knight and Ronald Coase fail to see that that normativity goes all the way to measuring utility via cost and price.

Another good criticism is by free market economists Art Carden and Steve Horwitz.³⁹ They suggest that market failures might happen, but so what? Initially, they argue, that the mere existence of an externality does not designate government intervention into the market. Rather, government intervention into the market might not even be able to remedy the problem and therefor the inefficient government could plausibly cause more problems. They demand, most ingeniously:

Therefore, those who use “negative externalities” as a justification for government action must show two things: first, that the supposed market failure cannot be corrected either through entrepreneurship or by changes

³⁹ See Horwitz, *Is Market Failure a Sufficient Cause for Government Intervention?*

in the rules of the game (e.g., more clearly defining property rights to solve the negative externalities associated with a commons); and second, that the government-imposed solution is both consistent with political incentives and superior to the imperfect market outcome. (Horwitz 2013)

However, Horwitz and Carden are missing the point suggested by this thesis, which is not that markets are imperfect, and that markets might not be able to capture externalized costs, but that markets can never externalize costs because costs again are subjective calculative tools in the production structure. When, as the railroad example stated above, a railroad causes a fire the fire is not an *added cost* in the economic sense of the term; rather, it is a failure of defined property rights. Horwitz and Carden are correct to suggest the property rights solution to ‘solve the negative externalities with the commons’, however it is no longer in the realm of economic analysis but rather now in the realm of legal analysis because it is entirely nonsensical for a market to ‘externalize a cost’.

Mises gives us a good reason to understand what an externality actually is when he discusses privileges granted from the government to induce investment industrialization by neglecting property rights. He suggests that this neglecting of property rights is what causes externalities, and as suggested above, should be the only solution of the externality. Mises states:

The laws concerning liability and indemnification for damages caused were and still are in some respects deficient. By and large the principle is accepted that everybody is liable to damages which his actions have inflicted upon other people. But there were loopholes left which the legislators were slow to fill. In some cases this

tardiness was intentional because the imperfections agreed with the plans of the authorities. (Mises 2008)

As Mises analyzes the argument that when external benefits are so great that the government must supply the good because the prices cannot supply the good themselves, he suggests:

It would hardly be necessary to say more about external economies if it were not for the fact that this phenomenon is entire misinterpreted in current pseudo-economic literature. A project P is unprofitable when and because consumers prefer the satisfaction expected from the realization of some other projects to the satisfaction expected from the realization of P. The realization of P would withdraw capital and labor from the realization of some other projects for which the demand of the consumers is more urgent. The layman and the pseudo-economist fail to recognize this fact. (Mises 2008)

And, he continues:

The gullible masses who cannot see beyond the immediate range of their physical eyes are enraptured by the marvelous accomplishments of their rulers. (Mises 2008)

While this goes in the extreme case of a 'positive externality', we can look at an extreme case of a 'negative externality' within the scope of the Misesian argument as stated above. For if P is profitable but begins to bring harm to non-consumers in its production it is due to the failures of legislation to define property rights. The consumers who wanted P, will then, be inadvertently harmed by the increased tax

on P. However, the tax will then force the production of P to be no longer profitable, in an accounting sense, and therefore will reallocate factors into different production goods and cause exogenous disturbances in the production structure. This disturbance in the production structure will then adjust the production of A to higher levels of production, than the market levels deemed satiable, and will inadvertently cause the same problems associated with externalities in a completely different market by artificially causing it to produce more than deemed in relation to consumer satisfaction.

X Conclusion

While we begin to conclude this essay I hope that I have succeeded in my task in making the reader rethink the role of externalities. For what has been shown is that the doctrine is a progression of a failure to understand marginal utility because utility, for the welfare economists, is merely another form of intrinsic value in production because they derive that psychology is the moving force. Therefore, satisfaction, for the Marshallians, is artificially intrinsic. Marshall abandoned land rent as the driving force for value and instead suggested that it was a combination of a demand for satisfaction of a good as measured by its price and the cost to produce that good. By failing to understand that utility is not a price measurement of psychological factors but rather a tool in the mind of an actor to calculate his means, Marshall and his follower's accidentally reintroduced intrinsic value methodology. However, by using complicated mathematical formulas to begin to attempt to find more quantitative understandings of the economy, present economists fail to see this important difference. The progress of the Walrasian systems showing the interconnectivity of prices therefore began to go unnoticed as the economics traditions began to gravitate to possibility of reaching an end state. This is the failures of the Walrasian system, for it induced future economists to attempt to strive for general equilibrium by adding new formulas, new mathematical models, and new statistical procedures. By doing so most economists misunderstand the true

problems with the externality doctrines. For the gem of the Walrasian equations is not the ‘general equilibrium’ but rather the showing of the relativity of pricing. If present economists can begin to see this point they will also be able to see what marginal utility truly is, entirely subjective valuation in an causal sense. They may also be able to see that prices and costs represent tools to calculate the interlay of the production structure in terms of marginal utility as the acting man moves through time. F.A Hayek points us to the failures of a pragmatic social science approach, he states:

We know, in other words, the general conditions in which what we call, somewhat misleadingly, an equilibrium will establish itself: but we never know what the particular prices or wages are which would exist if the market were to bring about such an equilibrium. We can merely say what the conditions are in which we can expect the market to establish prices and wages at which demand will equal supply. But we can never produce statistical information which would show how much the prevailing prices and wages deviate from those which would secure a continuous sale of the current supply of labor. (Hayek 1974)

Though Hayek’s context is in the form of the labor market, we must understand that this is applied to all markets. For I must reiterate that we can never truly know the costs of production because these costs are indistinctively subjective ordered valuations and not a constant price ratio. Hayek continues:

But, as Vilfredo Pareto, one of the founders of this theory, clearly stated, its purpose cannot be “to arrive at a numerical calculation of prices”, because, as he said, it

would be “absurd” to assume that we could ascertain all the data. Indeed, the chief point was already seen by those remarkable anticipators of modern economics, the Spanish schoolmen of the sixteenth century, who emphasized that what they called pretium mathematicum, the mathematical price, depended on so many particular circumstances that it could never be known to many but was only known to god. I sometimes wish that our mathematical economists would take this to heart. (Hayek 1974)

Hayek’s explanation of the problems associated with mathematical formulae is exactly the key point of our study. The mathematical method, the purposeful redefinition by the Marshallians to make economics a continuous physical science, created presuppositions that excluded the most fundamental, yet subtle, feature of economics. The role of human action, market calculation, and subjectivism; to which, I must submit to the reader, is the driving force for concluding that markets endogenously create inefficiency due to a fundamental misunderstanding of what cost is in respect to marginal calculation.

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