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THE EFFICIENT MARKET CONJECTURE

RICARDO E. CAMPOS DIAS DE SOUSA AND DAVID HOWDEN

ABSTRACT: Although commonly misconstrued as a statement concerning the "correctness" of prices, the Efficient Market Hypothesis (EMH) is a statement about their informational content. The aftermath of the recent recession has brought renewed skepticism to EMH, even leading some to redefine it as the "inefficient" market hypothesis. We demonstrate that such a course of action is misguided, as it changes the nature of the input (i.e., the market) but not the truth value of the statement (i.e., whether markets are efficient). We outline further several logical fallacies of the Hypothesis which negate its usefulness. We conclude by showing that the EMH was never a hypothesis and as such is best considered a conjecture. As a conjecture, it is increasingly difficult to reconcile with market behavior in both theory and practice.

KEYWORDS: efficient markets, informational efficiency, EMH, equity returns

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1. INTRODUCTION

The Efficient Market Hypothesis (EMH) has just passed its fifty year anniversary. During this time, it has undergone some fundamental changes since its original exposition in Fama (1965). Originally formulated as a response to the supposed predictive power of technical market analysis, Fama laid a framework to explain that a price had no memory of prior prices (Fama, 1965, p. 34). Under this exposition, Fama continued a loosely Chicagoesque tradition of modeling prices as random walks—mutually exclusive events unrelated to previous data points.[1] Within five years, Fama defined more completely what conditions were necessary for the EMH to obtain, as well as what implications followed from the hypothesis (Fama, 1970). The Hypothesis was transformed to the now commonly accepted statement concerning the informational content of prices in an efficient market: "a market in which prices always 'fully reflect' available information is called efficient" (Fama, 1970, p. 383).

These two tenets taken together—the randomness of price movements and the completeness of the past information contained in them—have led adherents of EMH to advocate passive investment strategies. With future price changes randomly arising from as yet unknown information, investors would do better investing in a general market index rather than analyzing trends as efficient prices would already contain the content and meaning of any relevant and available information.

Any hypothesis must conform to two criteria. The first is that it must take the form of an "if-then" statement. The causal relationship specified in the statement is then able to be proven, usually empirically (if a testable hypothesis exists), or logically (in which case the hypothesis would really be better stated as a tautology). In contrast, conjectures are those statements unable to meet a rigorous logical proof or which cannot be formulated in a provable form. Conjectures are useful to the extent that they are a best guess of how the world works, but are forever limited to

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[1] Although there were scattered attempts to demonstrate the randomness of future stock price changes throughout the 20th century, Cootner (1962) is notable for bringing the theory academic rigor, thus making it palatable for financial economists to integrate into their own models.

being mere estimations. Although stated as a hypothesis, EMH cannot be logically proven nor can it meet any rigorous empirical test without serious reservations. As such, it is a conjecture about how the economic world works, which goes far in explaining why it has proven to be so controversial over the past 50 years.

In this paper we address the shortcomings of the EMH. Section 2 outlines why it cannot be considered to be a testable hypothesis, mainly because any proof of its validity requires a pricing model. The failure of actual prices to coincide with the pricing model can be either because of an erroneously specified model or because EMH is not valid. Section 3 outlines the historical assaults on the EMH fortress, and gives examples by way of apparent mispricings in financial markets and realized abnormal market returns which suggest that there are flaws with the conclusions of EMH. Section 4 gives a more rigorous proof for why EMH cannot be a correct description of markets by way of an exposition of the conflicts in its internal logic structure, instead of by relying on empirical results by way of pricing models. Section 5 concludes by noting that even though the hypothesis is better described as a conjecture, the EMH is difficult to reconcile with actual market phenomenon. Furthermore, any useful conclusion that could be derived from EMH is already better described through alternative equilibrium constructs. As such, the efficient market hypothesis is not only incorrect, but unnecessary.

2. A TESTABLE HYPOTHESIS?

Any relationship between information and price movements, although easily alluded to, is difficult to establish empirically. Indeed, to prove that stock prices, at every moment, "fully reflect" all available information is impossible, as even EMH proponents can attest (Fama, 1970, p. 384). A market that objectively prices subjective information would have to come into existence to allow measuring the speed in which this information would then be reflected into stock prices. As financial markets do not allow for this, economists had to search for something to measure. They found a solution in stock price movements themselves, in place

of information flows.[2] If no strategy could be devised *ex ante* that *always* leads to abnormal returns *ex post*, then this would imply that all information is fully priced and all price movements are random (as no consistent abnormal returns could emerge from random movements except by chance). Thus, a hypothesis about whether prices fully reflect all available information turned into a discussion to determine if investors could follow strategies that allowed them to obtain *ex ante* abnormal returns.

That EMH has become one of the most heavily scrutinized hypotheses in finance may give fuel to its detractors who claim that it cannot explain simple counter-evidence—prolonged abnormal returns by certain investors (e.g., Warren Buffett) or seasonal abnormalities such as the Monday or January effects. Yet it is unfair to say that the only reason empirical tests on the EHM were performed on investment strategies and their returns was the primeval rivalry between technical analysts and EMH advocates. This rivalry was not the reason but rather the motivation. The reason the Hypothesis has been so heavily scrutinized has little to do with its controversial conclusions, but because prices (and especially financial prices) are readily available to verify or negate the EMH (Ross, 1987, p. 30). With the abundance of financial price data, it is possible to test every single investment strategy one could conceive, both in and out of sample.

All that remained from the information side was to frame how efficient the market was depending on what sort of strategies would allow for abnormal returns. Fama (1970, p. 383) did so by dividing market efficiency into three subsets: 1) weak, in which no abnormal returns could be found from historical prices, 2) semi-strong, in which no abnormal returns could be obtained from publicly available information, and 3) strong, where not even private or "inside" information would give any investors an *ex ante* advantage. Thus, a general statement concerning the informational efficiency of prices was transformed into a testing procedure for market pricing within the framework of three sets of conditions.

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[2] Incidentally, this bifurcation between price data and information data plagues much financial literature. For example, despite claiming to be about unfair infor-mational advantages, economists assess the efficacy of insider trading laws by looking for abnormal equity returns instead of tracing the flow of information being reassigned from one individual (or group) to another (Howden, 2014).

3. THE ASSAULT ON THE EMH FORTRESS

In order to test the EMH, an underlying model of how individual stocks are expected to perform must be used. The Capital Asset Pricing Model (CAPM) gave EMH that opportunity, although the Hypothesis does not state that the CAPM is the required model to test it. In theory, any model that fits the existing data (and behaves consistently when tested out of sample) is sufficient, but the CAPM is generally used due to its shared or similar assumptions with the EMH (e.g., that all information is available simultaneously to all investors, no transaction costs, etc.). Thus, the existence of a model that determined ex ante expected returns of investment strategies provided an opportunity for a new generation of economists to try to invalidate the EMH. The simplest approach was to find a mechanical investment strategy that would consistently obtain abnormal returns given the expectations of the CAPM.

The aftermath of financial crises, such as the 23 percent decline in the Dow Jones Industrial Average on 19 October 1987, often led the popular press to proclaim the death of EMH. In its place a new cottage industry emerged to disprove its central tenets. Unfortunately, as with earlier attempts to empirically prove the existence of informationally efficient markets, many of these contrarian studies were also plagued by narrow analyses of episodes selectively chosen to invalidate EMH (such as the late 1987 stock market decline). Echoing Ronald Coase's famous dictum on torturing data, Burton Malkiel (2003, p. 72) criticized the opponents of EMH, stating that "given enough time and massaging of data series, it is possible to tease almost any pattern out of most data sets." (Malkiel fails to observe, however, that the statement runs both ways.)

Extreme market volatility on its own is not sufficient to refute EMH. After all, "EMH does not imply that asset prices are always 'correct.' Prices are always wrong, but no one knows for sure if they are too high or too low" (Malkiel, 2012, p. 75). The Hypothesis lays no claim to the correctness of prices, though it does imply that no arbitrage opportunity can exist in an efficient market, or if they do appear from time to time, they do not persist (Malkiel, 2003, p. 80). Still, if one were to view EMH as being a statement solely concerning informational inclusiveness but not about the "correctness" of the inclusion, it is tenuous whether the Hypothesis

has any empirical relevance. As a purely logical statement, it is easily refutable by relaxing the assumptions (and as we shall see, even without relaxing the assumptions the Hypothesis is problematic). As an empirical claim, without making a statement about the correctness of the information included in a price there is no way to test EMH (e.g., by comparing market prices to those predicted by a pricing model such as the CAPM).

Some investment strategies earning abnormal returns have proved durable, yet succumbed eventually to normalcy. Cochrane (1999), for example, assaulted EMH by way of the upward-sloping yield curve. Bond returns were predictable to the extent that an upward sloping yield curve provided a profit-earning spread by borrowing short-term and lending long. Alternatively, foreign exchange returns were predictable as money invested in countries with higher yields could earn abnormal returns under periods of exchange rate stability; the now infamous "carry trade" found intellectual justification. They are also widely recognized as instigating the economic collapse and credit crunch of 2008.

Other effects were persistent enough to puzzle the supporters of the EMH, such as the January effect (Rozeff and Kinny, 1976; Reinganum, 1993). More recently, Jegadeesh (2012) has found evidence of predictability in individual stock returns by way of a significant first-order serial correlation in monthly returns. The most famous anomaly is probably the size effect. Keim (1983) found that in the very-long run (his study went back to 1926), equities of smaller companies persistently generated higher returns than those of larger companies. (Fama and French [1993] found similar results in an analogous study.) The preferred solution, according to Fama and French, was that beta was perhaps not the best proxy for risk and that size could add some predictability to returns.[3] Seeing the problem as a lack of independent variables in the CAPM, Fama and French (1993) suggested a three-factor asset-pricing model (including price-to-book ratio and size as measures for risk) as the appropriate benchmarks against which anomalies should be measured. As cracks in the CAPM edifice formed, this became the

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[3] Malkiel (2003, p. 64) offered that some sort of survival bias could be acting upon the data and that any abnormal returns from such strategies were only transient, but accepted Fama and French's central conclusions.

preferred solution—multi-factor models to improve predictive power.[4] Paradoxically perhaps, this predictive power was not an affront to EMH. Rather it defined "predictability" within the context of the factors under study. Prices still followed a random walk to the extent that the influences on these factors could not be known in advance, and hence predicted.

This paradox of building a model that predicts return based on expected risk (as in CAPM) on the random returns that EMH provides for poses a problem. Since the only way to test EMH is by using an asset-pricing model, there is no way the hypothesis can be rejected (Cuthbertson and Nitzsche, 1996; Campbell *et al.*, 1997, p. 24). "The definitional statement that in an efficient market prices 'fully reflect' available information is so general that it has no empirical testable implications" (Fama, 1970, p. 384).[5] In its place, the problem could be and generally is attributed to the failure of the model testing it, and not due to the hypothesis under examination. Lacking a valid asset-pricing model to test the hypothesis, EMH (at least in its current form) is not a testable proposition. Indeed, as Campbell *et al.* (1997, p. 24) conclude:

> [A]ny test of efficiency must assume an equilibrium model that defines normal security returns. If efficiency is rejected, this could be because the market is truly inefficient or because an incorrect equilibrium model has been assumed. This joint hypothesis problem means that market efficiency as such can never be rejected.

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[4] These cracks continue to show, albeit under various guises. In testing the appropriateness of Fama and French's preferred beta-augmenting factors of a firm's market capitalization and book-to-market ratio, Griffin (2002) finds the coefficients to provide a better fit with country-specific data instead of cross-country analyses. In a more recent test of their original hypothesis, Fama and French (2012) found a similar result whereby local factors were more predictive than global ones. To improve on the deficiency of not thoroughly identifying the appropriate factors, other models with additional factors have been created. Carhart (1997) provides one such example which includes a momentum factor. However, none of these models accounts fully for the risk-return tradeoff in stock prices, nor explains certain anomalies, e.g., persistent abnormal returns.

[5] While modern tests of EMH use some form of CAPM to gauge efficiency, Fama was not clear on what type of model would be necessary. As a result, later reports by Fama that an empirical test either confirmed EMH or was incorrect are unsubstantiated to the extent that they are meaningless beyond a model specified by EMH (Leroy, 2004).

This line of criticism levied against EMH is reminiscent of Grossman (1976) and Grossman and Stiglitz' (1980) work on market efficiency. The reasoning in Campbell *et al*. (1997) boils down to the requirement of a functioning and accurate pricing model against which to test realized returns. Grossman and Stiglitz (1980) reckon that any level of informational efficiency must be gauged relative to the ability of the market to absorb new information. This ability to absorb information decreases as the level of information incorporated increases because of the increasing marginal cost of information gathering. Under this reasoning,

> [i]n the limit, when there is no noise, prices convey all information, and there is no incentive to purchase information. Hence, the only equilibrium is one with no information. But, if everyone is uninformed, it clearly pays some individual to become informed. Thus there does not exist a competitive equilibrium. (Grossman and Stiglitz, 1980, p. 395)

One conclusion is that the market could reach an equilibrium only if there is a profit to offset the cost of gathering information. Grossman and Stiglitz correctly observe that in order for information to reach the market someone must gather it, and identify that function as being performed by an entrepreneur (to earn a rent), which leads them to conclude that any equilibrium must be one which contains an "equilibrium degree of disequilibrium" (Grossman and Stiglitz, 1980, p. 393). One implication is that market efficiency will be determined by the costs of gathering and processing relevant information (Lo and MacKinlay, 1999, pp. 5–6) and that a fully efficient market will not incorporate all available information.

Yet this approach too runs into difficulties as an affront to EMH. There cannot be a premeditated search for information cognizant of its costs and benefits, because the entrepreneur in question does not know in advance what the benefits are (Huerta de Soto, 2008). As a critique of EMH it commits the error of *petitio principii*. By assuming that one can assign a cost to information sought, one also rules out EMH at initiation. Since EMH states that prices can only change due to the arrival of novel information, it is also impossible that one could estimate a cost for this as yet unknown information. As such, any approach to disprove EMH must take a different line of attack that does not itself rely on the knowledge of future information relevant to price formation.

4. LOGICAL CONTRADICTIONS

For EMH to prevail, one of two assumptions concerning price formation must hold true:

1. All relevant information must be interpreted by *all* market participants in the same way, or

2. A sufficient critical mass of market participants must interpret relevant information in the same way.

The first criterion seems too strict to describe most market processes. Price formation occurs under conditions where both sides of the trade—buyers and sellers—disagree about the price, either because they disagree about the relevance or about the interpretation of the information at hand. In this way, EMH is an impossible standard because of a constraint placed on it by the market (Collier, 2011). Since price formation occurs through opposed interpretations of information, at least one-half of market participants must disagree with the importance of the information absorbed at any given price. For price formation to occur, it must be that either: 1) sellers think that new information is relevant for the price, or that it has been incorrectly interpreted to erroneously price the good in question, or 2) buyers think that information is important, or that it has yet to be fully incorporated into the good's price. Due to differing interpretations of information, EMH cannot hold as prices are deemed incorrect or inefficient by half of participants. In the case dealing with the relevance of information, EMH would not hold because the market has yet to fully incorporate the information into prices.[6]

The second criterion falls prey to a similar criticism. Markets are informationally efficient if only a critical mass of participants

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[6] Alternatively, both sides could interpret the information identically, but differences in personal discount rates will invoke different actions. Consider two parties that believe the arrival of new information over the coming year will increase a share's price from $10 to $11. If one's discount rate is 9 percent, he will be a net buyer, while if the other's is 11 percent, he will be a net seller. We thank Rafael García Iborra for this insight. Interestingly, the only way two different investors can hold different discount rates in an efficient loans market is if they have different time-horizons for their investments. Yet, within the EMH framework the time-horizon is either irrelevant (when tests for abnormal returns are performed) or assumed to be the same for all investors (as it should hold true for all maturities).

factored the relevant information into prices previously. It must follow from this that either 1) the other market participants excluded from this critical mass lack the necessary information, or 2) this other group of participants disagrees with the relevance or interpretation of information. The first case will almost certainly hold true, and in and of itself is not a serious affront to EMH as it cannot seriously impair price formation. The latter is a more serious objection, and is closely aligned with the reasoning we gave previously to object to the first criterion.

The claim that a market is "efficient" if it fully incorporates all relevant information relies not only on the ability of the market to incorporate information but also on the interpretation of such information. If one group agrees with the relevance and impact of new information, and they trade on such information accordingly, then it follows that the market may be informationally efficient from *their* point of view. This efficiency is unique to them, however, as it is itself defined as consensus concerning the impact of information which, by inclusion in the group, members must agree with. The group which has refrained from trading on such information (or, has formed the opposite side of the trade from the group acting on new information) must disagree with either its relevance or importance (or both). The market will appear inefficient to this latter group in the sense that information was incorporated that has pushed prices away from the values they deemed appropriate (efficient) given the information at hand. Efficient prices for one group *requires* inefficient prices in the eyes of the other.

There could be recourse to a situation where everyone agrees with the impact of new information and acts accordingly. Positive news in the market concerning a good would cause *all* participants to attempt to purchase the under-valued good and push its price higher to its efficiently valued price. Yet since all units of a good must be owned by someone at any given time, it is not possible that everyone becomes a net purchaser simultaneously. If everyone's price assessment increases simultaneously, the price could only increase if some people sold upon higher offers. Yet the price could never get to its "informationally efficient" value if EMH held, as no one would sell at a price below the expected one (in which case no one would want to be a net buyer). Standard financial models treat the representative investor as both a potential buyer and seller at

the equilibrium (static) price. Coupled with EMH, such models are unable to explain why prices change without the arrival of new information (e.g., price gaps).[7]

Until recently (e.g., Collier, 2011) this constraint went rather unnoticed, most likely because buyers and sellers, in theory, do not have to disagree about the relevance or importance of information in order to trade (although it is also very unlikely, not to say impossible, that two individuals might actually possess the exact same information). This could happen either because they have differing ends or consider distinct time horizons and subsequent discount rates when making investment decisions. Yet, under the assumptions of EMH and the tests performed to verify the hypothesis all investors share the same goal (e.g., to outperform the market) and the time horizon and preferences are assumed equal to that of the representative investor.

This general flaw in the reasoning behind EMH can be summarized as a deficiency in the choice of relevant assumptions, leaving the subsequent theory with a logically coherent structure within only the narrow confines of its assumptions. Unfortunately, "the features typically omitted [by a model] are the very features that are crucial to understand how the market functions" (Long, 2006, pp. 3–4). While Long treats this as a general problem plaguing economic modeling, EMH is a case in point. By assuming market participants to be a homogenous group—in terms of their valuations and expectations—EMH achieves a definition of efficiency unable to obtain in reality. At the same time, it adds nearly nothing to our understanding of that same reality. Other important assumptions behind the hypothesis fare no better. If the assumptions that price changes are independent and that there is a distribution function for those prices were not relevant, they should have not been specified to start with.[8] Alternatively, one could view the assumptions as not essential to EMH, but rather to allow for the development of a pricing model

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[7] Alternatively, indifference can never be demonstrated by action. Quite the contrary, every action necessarily signifies a *choice*, and every choice signifies a definite preference. Action specifically implies the *contrary* of indifference (Rothbard, 1956).

[8] Theory should be weary of undue assumptions that needlessly pigeonhole the item under examination (Kuhn, 1962). Alternatively, the assumptions should not be in contradiction to reality as any success of the resultant theory could only be accidental.

against which to test the hypothesis. Again, specifying assumptions to provide a path to test the hypothesis is not only unwarranted, but misplaced given the futility of the testing procedure due to the joint-hypothesis problem.

Price changes create information, in the sense that market participants must alter their consumption and production activities to maximize utility or profit as relative valuations between goods change. No price change, as a result, can be independent of another as a feedback effect will alter the existing price constellation. As any price change creates information in and of itself, subsequent price changes (in its own price or that of other goods) cannot be independent.[9] As any future price change will rely on a potentially uncertain (and unknowable) event, even if these price changes are random they will not be probabilistically so. If no probability distribution can be identified to govern these price changes, then probability theory is useless in estimating future prices. As a result, future price changes could be moving randomly (something in which EMH adherents would find comfort), though they would not necessarily be moving independently of other prices, and this dependence could not be modelled according to any price distribution. This latter statement is a direct contradiction to EMH and related work, and also negates the use of probability theory in analyzing and providing estimates of future price movements.

One deficiency in the EMH framework is the confusion between prices as *embodied* information, and prices as *being* information. For active market participants—whether buyers or sellers—prices are summary statistics of their assessment of information on the market. Most commonly, as summary statistics these prices represent information concerning supply and demand conditions, which include both current physical conditions as well as the market participant's expectations concerning the future (Hayek, 1945). Yet for those not intimately involved with the pricing process, that is to say anyone who is not actively buying or selling the good in question, the price becomes a piece of information in

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[9] The lack of attention to relative price adjustments, endemic in much economic modeling, is due to the emphasis placed on two-good models (Bagus and Howden, 2012, p. 274 fn7). Since there is only one relative output price to equilibrate, other relative price effects are excluded. As a consequence, the complexity and interrelationships among multiple goods through their prices is often overlooked.

and of itself. While it is simple to think of these two groups as being concerned with the same thing, there is a distinction.

For participants actively engaged in the pricing process, the price that results from their actions is important to them only in the sense that it informs them of how close they are to their ultimate goal. Since the price itself is a summary of past actions by buyers and sellers, it cannot convey information concerning the future state of affairs. It is this expected future state of affairs that active participants are buying or selling to meet, in a bid to move prices to their own subjective assessment of what the future holds. In this sense, buyers and sellers are concerned with meeting unmet supplies or demands by monitoring for shortages or surpluses in the quantities of goods traded on the market, and are not directly concerned with the prices that these goods are correctly trading at (Hülsmann, 1997; Bagus and Howden, 2011, section 5).

For those participants not directly involved in the pricing process, the price becomes a summary of the past information concerning the good. The price is a form of information for this group, and represents the subjective assessments of those active market participants made objective through the embodiment of the price. These participants not involved in price setting may have no knowledge of any of the underlying information concerning the good or its value, though they will have an objective summary of these subjective assessments by others via a simple price (as in Hayek, 1945).

Note that from a market efficiency standpoint only one of these groups will consider prices to be accurate and complete summaries of the available information. The group of active participants— those transacting on information revealed through the market— are doing so precisely because the market *is not* efficient. At least, it is not efficient according to *their own* valuation assessment. Through their actions, they move prices to more closely align with the values they deem to be in accordance with their interpretation of the information. As long as active buyers and sellers are altering the price of a good, that price will forever be informationally *in*efficient. Inefficiency in this case would concern the lack of consensus concerning the true relevance for revealed information on price formation. With this line of reasoning, we can find much agreement with Mises's (1949, p. 338) emphasis on "false prices"

that exist in the eyes of individuals who are undertaking any purchase or sale decision at any moment in time.

Passive observers of price formation will, however, be in general agreement that the market is in a state of informational efficiency. If they did not believe that prices already fully and accurately summarized revealed information, they would actively trade on such knowledge to better align prices with their valuations.

Perhaps this bifurcation boils down to the distinction between objectively given information and subjectively derived knowledge. In this sense, information is that body of facts in existence at any given time, e.g., that the visual impression we refer to as "black" is defined as the absence of color, that Barack Obama was the President of the United States in 2015, or that water at sea level freezes at zero degrees centigrade. While these informational facts are mostly trivial, their relevance and potential impact on prices will change depending on the individual and the array of additional information at his disposal. This additional information specific to the individual makes the sum of information known to him highly subjective, and we may distinguish it from its objective source by referring to it as knowledge (Thomsen, 1992). To the active market participant, information revealed through the market is subjectively valued and traded on if relevant. The market could not, by this standard, be in a state of informational efficiency because each body of information known to an individual will be interpreted and valued distinctly. All prices being acted on by this group will be considered inefficient from an informational standpoint. EMH, to the extent that it describes any set of individuals, can only describe those individuals who act as passive receivers of information through prices, and who must deem these prices to be in a state of informational efficiency already as evidenced by their inaction in light of the new information. This description cannot explain how markets (that is, investors) act to reach such a state.

Some advocates of EMH may object to this characterization of markets as inefficient for those who are actively engaged in the price formation process, and could respond by saying that investors only "believe," erroneously, that the market is inefficient. The objection is a serious threat to the assumptions of EMH, and has been somewhat addressed by relaxing the Hypothesis's domain. Malkiel, for example, allows for some degree of short-run

inefficiency that must eventually give way, stating that "while the stock market in the short run may be a voting mechanism, in the long run it is a weighing mechanism. True value will win out in the end" (2003, p. 61).

Yet what would make one think that the long run should behave any differently from the present? Unless there is a definite "Judgment Day" in the market, there will forever be a state of over-lapping short runs grasping for that fabled end. Indeed, thinking that prices will converge in the long run to their informationally efficient state begs the question. Any long run is defined as that state where variables have fully adjusted to revealed information. Since an efficient market is defined as any whose prices fully reflect all information, this must by definition coincide with any market in its long-run equilibrium. To state that "true value," or correctly and fully incorporated information will bring long-run prices to their informationally efficient level is to assume what has to be proven. The question is really one of why any short-run price would be informationally efficient, which could only be the case if no one was motivated to either act upon it by changing his net demand for the good, or by changing his net demand for some other good in light of that price.

Under this rationale, EMH becomes at best a long-run hypothesis. It can define that state of affairs that would conceivably prevail if new information ceased and an equilibrium emerged. Yet as a theory aimed at describing the pricing process, this only opens the Hypothesis to deeper questions.[10] While describing an equilibrium state with the full incorporation of information already achieved, EMH leaves no explicit room for an entrepreneur (or even a Walrasian auctioneer, for that matter).

If an individual can be shown to have correctly forecast prices, the EMH explicitly states that this event will not disprove the hypothesis but is something that, given the assumptions, must be accepted. When coupled with the CAPM, a series of prices are obtained given the constraints considered (e.g., a risk-free interest

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[10] As an equilibrium state the EMH is less than satisfactory than some alternatives (Howden, 2009). While assuming away those data that it is seeking to explain, the EMH leaves one with little understanding of what factors influence price formation which is, after all, the heart of the phenomenon under examination.

rate, and a given risk correlation between assets). These two theories taken together are reckoned to yield "correct" risk-adjusted prices and should be a better estimator of value than individuals.

Yet anecdotal evidence suggests that some degree of price estimation is possible. Investors who have obtained above average risk-adjusted rates of return for extended periods of time (e.g., George Soros or Warren Buffett) can only be accounted by EMH by one of three explanations: 1) either their abnormal returns must be "normal" returns that other investors should be tending towards, 2) the asset-pricing model used to generate the expected returns must be deficient, or 3) the magnitude of investors is so large that, applying the law of large numbers, it is possible for one individual to have a track record that consistently beats the market while investors on average will not.[11]

In none of these explanations is there room to incorporate an individual (we may call him the entrepreneur) exercising good judgment or foresight (Pasour, 1989; Shostak, 1997). Indeed, good entrepreneurs can be found in either arbitraging away market mispricings (Kirzner, 1973) or discovering new elements relevant for future price movements (Mises, 1949). Both of these entrepreneurial roles are excluded from the EMH framework. The Kirznerian entrepreneur explicitly cannot exist in the EMH world as no mispricings can exist by definition. The Misesian entrepreneur could be thought of as the one who unearths new relevant information and incorporates it into the price constellation, though this belief can only be partially admitted by the EMH in its weak form.

Assuming away the entrepreneur *could be* useful in developing EMH, but it takes the Hypothesis one step further from that which it seeks to explain. Market participants are actively searching for, uncovering and incorporating new information into the array of existing prices. That they are not randomly searching for information, nor is random information the only influence on existing prices, suggests that markets are neither informationally efficient nor following a random walk in price formation.[12] Alternatively,

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[11] Bear in mind that over time the average performance of all participants is the average (ex-post) return of the market, so this argument cannot be falsified.

[12] Paradoxically, this result most closely obtains through the artificial fostering of insider trading laws on the market. By barring those intimately aware of the

the existence of two sides to any transaction—a buyer and a seller—suggests that informational efficiency cannot obtain in the sense that there is continual disagreement as to the correctness of current prices, as well as the relevance of new information.

The market is not efficient because it contains all relevant information in a more or fully-complete manner, but because it allows individuals to act in a socially-coordinated way. It is not that market prices gather all existing information. It is that individuals acting in those markets strive to do so and pay the cost if they are wrong.

If EMH is to be called into question today, the starting point should not be that markets or investors are irrational (as in, e.g., Farmer *et al.*, 2012).[13] Likewise, holding actual market returns to a standard set by a pricing model assuming a hyper-rationality applying to all individuals (as in CAPM) also seems misplaced. A more fruitful approach is to accept that investors are rational within the confines of their knowledge, and that this has not changed over time (Statman, 2005).

When market returns shift dramatically and seem to affront the EMH fortress, it is neither the standard of efficiency nor the reputation of a market which is at stake, but rather the claim that markets are informationally efficient. Likewise, criticizing the EMH on the basis of asset price volatility is conceptually wrong, as efficiency says little about volatility and is instead concerned with the concepts of rationality and information (Szafarz, 2009).

5. CONCLUSION

Although it makes a seemingly innocuous claim only about the informational efficiency of prices, the Efficient Market Hypothesis

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creation and importance of information (insiders) from trading on such information, it is up to outsiders to incorporate its importance into the price. Since outsiders have less knowledge concerning the relevance of information than insiders, prices will tend to be less informationally efficient as a result (Howden, 2014). Efficient in this sense would imply that information is not only fully incorporated into the price array but also rationally so, so as to foster correct prices given the facts at hand.

[13] A more extreme view can be found in blaming the EMH for causing the crisis (Fox, 2009).

is plagued with difficulties. Some of these problems lie in the logic behind its construction. Others are the result of the standard by which the efficacy of its claims can be measured. In this paper we have shed light on both of these aspects.

Any market with active price formation occurring will shield itself from any definition of efficiency by way of the diametrically opposed viewpoints of the participants. Those who are actively trading on new information are doing so because they feel the current prices are inefficient—inefficient in the sense that they do not contain all relevant information, or that prices have factored such information in an incorrect manner. Only those participants who are passive observers of the pricing process may be said to believe that prices are informationally efficient, because if they thought otherwise, they would be actively trading to align them with their estimated values and try to realize a profit opportunity.

Attempts to test the validity of the EMH are mostly misplaced as they define an abnormal return in terms of some other pricing model, commonly the capital asset pricing model. This testing procedure is misplaced as it relies on a model that is itself predicated on EMH. It furthermore suffers the deficiency that the correct price is what is tested for, and not the fullness of informational dissemination throughout the price complex. Since EMH only makes a claim about informational efficiency, something that is unable to be tested for directly, the Hypothesis does not lend itself to empirical verification. This is troubling because the defining characteristic of a hypothesis is that it takes either a testable form or can be stated as a tautology. Internal logical contradictions make the EMH unable to be proven as a tautology. The need for a pricing model to empirically test the Hypothesis leads the economist never to know if the pricing model is incorrectly specified, or if the EMH is incorrect.

In light of the theoretical deficiencies we have outlined in this paper, EMH is better referred to as a conjecture. Indeed, in the early stages of its development it was identified as a theory in search of evidence. The fact that the theory is still so widely disputed 50 years after its original exposition, and that ambiguous tests of its relevance plague the literature, bolster the doubts of those who see the EMH as intuitively flawed. Furthermore, any useful conclusion that the EMH could tell us is better described without theoretical or empirical difficulties by the concept of long-run equilibrium.

As a conjecture the EMH is misplaced. Logical inconsistencies internal to its formulation cast doubt that it could hold, even in isolated settings (such as a long-run equilibrium). The past few years have led to a rethinking as to how best to label EMH, with some claiming that it is really the *in*efficient markets hypothesis. Rather than recast EMH in terms of redefining how the market functions, it is better to discard it as the misplaced conjecture it is.

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THE AUSTRIAN BUSINESS CYCLE THEORY: A DEFENSE OF ITS GENERAL VALIDITY

MIHAI MACOVEI

ABSTRACT: The paper aims to defend the general validity of the ABCT against the assumption that the theory does not hold if entrepreneurs are able to anticipate correctly the inflationary effects of a fiduciary credit expansion. Hülsmann (1998) raises this critique and puts forward a general theory of error cycles centered on government intervention in the economy in order to overcome the perceived shortcomings of the traditional ABCT. The paper analyzes the main implications of this critique of the ABCT in terms of entrepreneurial foresight and the optimal course of action necessary to prevent a monetary induced business cycle, in particular in the context of fractional reserve banks operating under fiat currency. It concludes that within the general framework of human action, entrepreneurs cannot arbitrage away clusters of errors, and the ABCT remains valid. This paper also questions whether Hülsmann's essentialist approach can be a viable alternative to the traditional ABCT, and find that, despite its merits, the approach can be refuted as a stand-alone theory.

KEYWORDS: business fluctuations, credit and money multipliers, interest rate, rational expectations, government intervention

JEL CLASSIFICATION: E32, E51, E43, E03, P00

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INTRODUCTION

The Austrian Business Cycle Theory (ABCT) represents one of the most important contributions of the Austrian School of Economics to economic science. The originality and merit of the theory reside in using monetary factors, and particularly the flawed arrangements in the monetary and banking areas, to explain recurrent clusters of errors that trigger business cycles. The ABCT was primarily developed by Ludwig von Mises and received subsequent contributions from other prominent Austrian School economists, such as Friedrich von Hayek, Murray Rothbard, Jesús Huerta de Soto, Roger Garrison and Joseph Salerno.

Hülsmann (1998) questions the general validity of the ABCT in the form elaborated by Mises. He does not refute the theory *per se*, but rather its consequentialist explanation of how the entrepreneurial cluster of errors comes about. Hülsmann believes that the theory does not apply in the particular situation when entrepreneurs anticipate correctly the effects of an increase in the quantity of money on prices, in which case a business cycle can be avoided. In order to restore the general validity of the ABCT, Hülsmann proposes a new approach based on an essentialist justification of "error," arguing that it represents an intrinsic characteristic of government intervention. The latter reduces the stock of capital in the economy leading to recurrent economic breakdowns and business cycles as long as members of the society are not aware of this error. The paper investigates the soundness of Hülsmann's critique of the traditional ABCT and whether his essentialist approach represents a valid alternative to it.

THE ABCT RESTATED WITHIN AN ESSENTIALIST FRAMEWORK

Hülsmann does not challenge the main thrust of the traditional ABCT, and agrees with the sequence of events that make up the theory. According to him, the current monetary organization based on fractional reserve banks and a central bank operating as a lender of last resort for a fiat currency system explains the recurrent errors in investment decisions that lead to business cycles. A systematic error occurs when commercial banks unexpectedly increase the

quantity of money substitutes and push interest rates below the level which would prevail on a free market.[1] Due to this artificial credit expansion which is not backed by real savings, more projects are started that can be finalized or profitably carried out.[2] When the error is discovered, the boom turns into crisis. Unfortunately, the systematic error is bound to repeat as the current monetary arrangements are built to generate such behavior.

At the same time, Hülsmann claims that the traditional ABCT cannot provide a general explanation of how the recurrence of clusters of entrepreneurial error takes place. He disputes what he calls the "consequentialist" approach of the ABCT which explains the error of investors as a consequence of the increase in the quantity of money in the banking system and a decline in the bank interest rate below the natural interest rate. According to him, in the reasoning chain of the ABCT, one possible scenario is missing, i.e., the one under which investors are able to anticipate correctly the effect of an increase in the quantity of money on prices and interest rates. In this case, the cluster of errors would not occur anymore as "entrepreneurs would bid for higher interest rates; that is, they would create a higher price premium on the gross market rate of interest," driving up the interest rate back to its free market level. Therefore, under these assumptions, the ABCT is not generally applicable anymore.

Hülsmann backs his claim with the argument that people can definitely anticipate correctly future events and that includes also the effects of inflation: "If it is possible that the effects of inflation are correctly anticipated then inflation does not necessarily lead to error." He disagrees with Mises that a business cycle is unavoidable whenever the entrepreneurs do not refrain from using the additional fiduciary media and believes that an increase in the money supply does not imply an interest rate that is too low.[3] In Hüls-

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[1] Called the "free-market (interest) rate" by Rothbard or the "natural interest rate" by Wicksell. See Rothbard ([1962] 2009), p. 1003, note 112.

[2] Hülsmann dwells only briefly on the mechanics of the boom and bust in the real economy. For a comprehensive clarification of the essential features of the original ABCT (including the "overconsumption" and "malinvestment" determinant characteristics of the inflationary boom) see Salerno (2012).

[3] Mises's argument was twofold: (1) the price premium lags behind the changes in the purchasing power of the currency because of the delayed effects of the change

mann's view, the ABCT, although correct, is not generally valid and an alternative approach is necessary to correct the perceived shortcomings of Mises's "consequentialist" approach.

Hülsmann proposes an "essentialist" approach to the analysis of the business cycle, which does not investigate how the error is committed, but rather identifies a framework of action or an institution in which generalized error is inherent. He argues that the best candidate to induce widespread error in the actions of the people is the government, seen as a permanent violator of the property rights of its subjects. For Hülsmann, "government and recurrent clusters of error always go hand-in-hand" and "no consequentialist argument is needed to establish this connection" (p. 11). According to him, government intervention leads to general economic breakdowns as it reduces the capital stock of individuals. People are usually not aware that the capital stock has diminished, but when this error is uncovered, the crisis will begin. In case the error is not discovered in the short run, government arrangements are still bound to fail together in the long run, as part of a general economic breakdown. This is because socialistic government intervention lacks the capacity to perform proper economic calculations, and therefore the society cannot maintain a developed structure of capital.[4]

As a final step, Hülsmann proceeds to reconstruct the ABCT as a specific case of his general theory of government intervention in the economy. He explains that the inflationary process initiated by fractional reserve banks with the help of the central bank represents not only an aggression against the property of market participants, but can also lead to malinvestments. If the impact of the credit expansion on prices is not anticipated correctly, a business cycle as the one described in the traditional ABCT will ensue. However, if entrepreneurs anticipate correctly the conse-quences of the artificial credit expansion they will take up the new credit and bid up the bank interest rate to the free market

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in money supply upon the price structure and (2) it is not possible to quantify in advance the extent of the price changes brought about by the changes in the money supply without having perfect foresight. See Mises, ([1949] 1998), p. 540 and 545.

[4] This theoretical strand is built on Mises's famous theory on the impossibility of economic calculation in a socialist economy. See Mises ([1920] 2012).

rate. Thus no business cycle would emerge, but rather a mere redistribution of income via inflation. Under the new essentialist approach, the narrative of the business cycle is different: even if the inflationary effects are correctly anticipated, the redistribution of income defrauds certain market participants of their capital, and therefore initiates a business cycle where the entrepreneurial error is inherent in government intervention. In Hülsmann's view, the inflationary and redistributive activity of the government backed fractional reserve banks will not be tolerated *ad infinitum* and the boom would eventually come to an end.

In the remainder of the paper we will try to assess whether:

1) entrepreneurs can form correct expectations about the effects of an artificial credit expansion and act upon them by bidding-up the bank interest rate to its free market level in order to avoid the emergence of a business cycle;

2) a general theory of the cycle based on the essentialist approach can have a general applicability and be indisputable on its own;

3) a monetarily induced business cycle, as depicted by the ABCT, can take place in the absence of government intervention, in which case Hülsmann's essentialist general theory could not explain a monetarily induced business cycle.[5]

CAN ENTREPRENEURIAL ANTICIPATION PREVENT THE ABCT?

The main criticism brought to the traditional ABCT by Hülsmann targets its assumption that entrepreneurs cannot anticipate the inflationary consequences of the artificial lowering of the interest rate. He believes that if this were the case, entrepreneurs would be able to avoid a business cycle by bidding up the bank interest rate to its market level, so that the credit expansion would only result in price increases. Hülsmann thus disagrees with Mises that an increase in the money supply affects prices first and only afterward leads to an increase in the price premium of the interest rate.

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[5] Hülsmann states in the concluding paragraph of his article that an increase in the quantity of specie on the free market cannot be a source of business cycles.

Hülsmann's assumption of entrepreneurial anticipation in the case of ABCT bears certain similarities with the decades-long rational expectations critique of the ABCT, but the two differ in their essence. Hülsmann contends that it is possible that entrepreneurs may anticipate correctly the effects of inflation, whereas the rational expectations theory holds that the anticipations of economic actors are not systematically wrong—a much stronger position. According to Lachmann ([1943] 1977) and Tullock (1988, 1989), the most famous proponents of the rational expectations critique of the ABCT, if entrepreneurs had rational expectations, they would not produce systematic errors. That is, the forecasted outcomes would not differ systematically from the market equilibrium results. This argument represents the basic assumption of most macroeconomic models today and therefore, the theory of rational expectations can be better regarded as a statistical hypothesis or modeling technique rather than a school of economic thought.[6] Taken to its ultimate logical conclusion, the theory denies the possibility of the formation of clusters of errors and implicitly of business cycles. In his assumption about the entrepreneurs' capacity of antici-pation, Hülsmann certainly does not go that far—he himself tries to develop a general theory of error cycles. This paper does not dwell on refuting the rational expectations critique of the ABCT, because this has already been done by several economists, such as Evans and Baxendale (2008), Barnett and Block (2005), and Carilli and Dempster (2001). For those interested, Cachanosky (2015) provides a good review of their arguments. However, some of these arguments will prove useful also for assessing Hülsmann's assumption of the entrepreneurs' ability to arbitrage away clusters of errors. In addition, our analysis will integrate them in the praxeological framework of Austrian economics, and also deal extensively with the appropriate course of action in case the entre-preneurs' correct expectations materialize.

First argument

If all entrepreneurs were able to anticipate correctly the price premium of the interest rate, it would mean that they all had perfect foresight,

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[6] See Sargent (2008).

which is not plausible. Hülsmann himself concedes in his article that not all market participants can anticipate the effects of inflation and credit expansion.[7] There is also a time dimension of human action that cannot be ignored, which means that at least a part of the entrepreneurs, i.e. those who do not anticipate correctly, would still engage in malinvestments and trigger a business cycle because the foresighted ones cannot bid up the interest rate overnight.

The importance of expectations in the economic theory was recognized quite early by many economists, including Mises, who developed a theory of expectations within the praxeological framework of Austrian economics. He made use of an analytical instrument called "thymology" which allows us to understand how people value different conditions and form their expectations and actions.[8] In his expectations theory, Mises explains that every human action is intrinsically speculative because it requires time from its initiation until its completion. Economic actors adapt their actions to the events experienced in the past and try to anticipate the future actions of other market participants. As there are large differences between human beings, their economic and social background, and their capacity to interpret past events, it means that there are also large variations in their capabilities to anticipate and adjust to evolving economic conditions. Lachmann ([1943] 1977) puts forward a similar view when he claims that even in a stationary world the interpretation of a situation will always be different for individuals confronted with similar observable events. This is much more so in the case of a world in motion, wherein each individual forms the link between observable events and expectations by integrating his beliefs regarding "the major forces operating in this World, causing and governing change" (p. 72). The wide range of individual differences leads Evans and Baxendale (2008) to argue that since entrepreneurs are heterogenous, marginal entrepreneurs are still going to commit cluster errors, even if the representative entrepreneurs enjoy rational expectations. Hülsmann himself agrees in his article that not all

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[7] "Let us admit that it is impossible that all market participants anticipate the effects of inflation on all commodities…. Similarly, for a price premium to be established in advance, it is not necessary to stipulate that all market participants anticipate the effects of inflation." (Hülsmann, 1998, p. 5)

[8] Mises ([1957] 1985), p. 265.

entrepreneurs are equally capable of developing correct infla-tionary anticipations.

Moreover, as we explain further in this argument, the assumption of rational expectations is more plausible in the case of simple economic phenomena in contrast with more complex ones. As regards the complexity of economic phenomena, Garrison (1986, p. 444) notes that even trained economists cannot agree on how the economic system functions. This means that in a complex situation, such as the one described by the ABCT, there will be a non-negligible number of entrepreneurs that are going to be misled into malinvestments by the artificially depressed bank interest rate. At the same time, it is not plausible that the fore-sighted entrepreneurs can bid up the price premium of the interest rate overnight, because any human action takes time.[9] Thus, the formation of a cluster of errors and the ensuing business cycle cannot be stopped by a handful of entrepreneurs that may benefit from almost perfect foresight.

As regards business cycles, Mises (1943, pp. 251–252) noted that it is more intellectually demanding to understand the intricacies of their workings in comparison with more simple interconnections, such as the running of the printing press and inflation. Indeed, as regards the ABCT, the formation of correct expectations about the moment when the bank interest rate slips below the level prevailing on the free market seems much more difficult than forecasting an upcoming general increase in prices. According to Mises, the bank rate is composed of three components: the originary interest (reflecting the discount of future goods as against present goods and the social time preference),[10] an entrepreneurial component (related to the credit risk of the project) and a price premium (based on the forecast of the evolution of future prices). If entrepreneurs notice a decline of the gross market interest rate charged by banks, it may reflect a legitimate move in any of the three components and

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[9] In the real world there is an unavoidable lapse of time between the beginning and outcome of every human action. Moreover, in this specific case, the bank interest rate can be maintained below its free market level for prolonged periods of time under the contemporary monetary arrangements, as shown later in the paper.

[10] The originary interest is not a price determined on the loan market, but a human action category which determines both the demand for and the supply of capital and capital goods. See Mises ([1949] 1998), p. 524.

not an artificial expansion of credit. The interest rate decline may result from a favorable change in the time preference in society which lowers the originary interest rate. At the same time, it could also reflect an improvement of the credit risk or lower inflationary expectations. Moreover, the lowering of the interest rate does not need to occur in absolute terms, but rather as a relative decrease vs. what the free market level would have been without credit expansion (de Soto [2012], p. 349). Thus a rising bank interest rate may still be set below the natural interest rate if the latter were rising faster. In particular, in an inflationary boom, when the price premium of the interest rate advances as well, nominal interest rates may not appear unusually low to entrepreneurs any more.[11]

The above arguments explain why a majority of Austrian economists consider the interest rate as an "indispensable signal, in the time dimension, to the urgency of consumer wants" that "tells entrepreneurs how much and for how long savings are available."[12] This is a price which can only be determined correctly by the unhampered free market and cannot be "calculated" by market participants based on other market signals. Mises argues that entrepreneurs are not capable of computing in advance the effects of a monetary injection upon the various prices in the economy because they "would not be in a position to know beforehand whether and to what extent the demand for money for cash holding would change and in what temporal sequence and to what extent the prices of the various commodities would change" (Mises [1949] 1998, p. 540). In his opinion, this impossibility of quantifying correctly the inflationary effects applies also to the calculation of a price premium on the interest rate, whose increase could counter the credit expansion. He argues that "such computations cannot be established because their performance would require a perfect knowledge of future conditions and valuations" (pp. 540–541).

There is no doubt that the praxeological framework of Austrian economics operates with "human" and not with "superhuman"

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[11] See also Salerno (1995).

[12] Rothbard ([1962] 2009), pp. 997, 1003. Similar positions can be found also in Friedrich von Hayek (1933), pp. 126, 140–141; in Mises ([1949], 1998), pp. 394, 550; and in de Soto ([1998], 2012), pp. 351–352.

action, and correct anticipations in the sense of perfect foresight are hardly plausible within the ABCT framework.[13] Even under mainstream economics, the "rational economic actor" is not expected to have perfect foresight. Ordinary entrepreneurs are not able to calculate in advance the price changes brought about by fluctuations in the money supply—which require almost perfect foresight—and are even less able to "guess" the level of the interest rate that would prevail on the free market. O'Driscoll and Rizzo ([1985] 1996) emphasize this point very well by distinguishing between "micro" and "macro" prediction. For them, even though entrepreneurs may understand at an abstract or macro-level a business cycle, they still cannot predict the exact and unique sequence of events of the next cyclical expansion or contraction. Only perfect foresight would allow them to make accurate "micro" predictions, because it would imply "perfect prediction of the action of all other relevant parties" (p. 222–223). In the real world, this is close to impossible.

   This last reflection concludes our argument that it is not plausible to assume perfect foresight for ordinary entrepreneurs, in particular as regards anticipating levels of market prices under complex economic phenomena. Even if we concede that a majority of entrepreneurs anticipate correctly the economic trends, there will still be the marginal ones that are more error prone and would engage in malinvestments. In the next argument we will focus now on what would be the appropriate reaction of foresighted entrepreneurs that anticipate correctly the effects of inflation, in particular as Hülsmann seems to differ again from Mises on this point.

Second argument:

   Assuming that an entrepreneur is able to guess correctly that the bank interest rate is artificially lowered by the credit expansion, he still needs to take the right course of action in order to benefit or at least not lose from the anticipated inflation. If the foresighted entrepreneurs take up the additional fiduciary media, as argued by Hülsmann, the question is how they are going to use it without distorting the current structure of production.

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[13] In expounding the principles of human action, Mises is quite clear: "Economics deals with real man, weak and subject to error as he is, not with ideal beings, omniscient and perfect as only gods could be" (Mises [1949], 1998, p. 97).

They are bound to pass it via market exchanges to marginal entrepreneurs that may be more easily misled into expanding their activities and make new investments due to increased demand for their products. The increase in the money supply, which according to Austrian economics is not neutral, cannot take place without modifying the structure of production and investment, thus triggering capital misallocation. Unlike Hülsmann, Mises and Huerta de Soto argue that the right course of action to avoid a business cycle by foresighted and prudent entrepreneurs would be to refrain from taking the new credit. But the profit-maximization behavior of competing businesses may still push them into getting credit and making risky investments, hoping to cash in their profits before the boom turns into a bust.

Hülsmann believes that entrepreneurs would be better off by tapping new loans in a credit boom in order to keep abreast of inflation. In the process, they would also push up the bank interest rate to its market level, while avoiding the malinvestment of their capital. It is peculiar that he does not elaborate on how the borrowed money would be used in order to increase the price level without changing the consumption and investment patterns and affecting the allocation of factors of production. We believe that except for hoarding the borrowed money (not a wise decision if inflation is anticipated), all other investment alternatives are likely to lead to a distortion of the demand schedules and the structure of production, revealing a misallocation of capital once the credit expansion has stopped.

Let us assume that, while indulging in the new fiduciary credit, foresighted entrepreneurs wish, at the same time, to avoid capital misallocation by refraining from making new investments and expanding their capacity of production. What other investment choices would they have? The most straightforward utilization of a business loan would be to purchase raw materials or intermediary goods used in the production process of their businesses in order to hedge against inflation. In this case, entrepreneurs from the higher order industries would be faced with increased demand for their products and a favorable economic environment—low interest rates and rising prices—and it would not be realistic to assume that they would not expand their activity either.[14] We have shown

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[14] According to Mises, this ideological factor that rising prices and low interest rates are a prerequisite for prosperity is deeply ingrained in the minds of the

in the previous argument that not all entrepreneurs can benefit from perfect foresight. Ordinary businessmen cannot just continue their activity "business as usual" and wait for prices to increase to the maximum level they could attain, because each entrepreneur tries to increase his market share and maximize profits. Shostak (2003) notes that the ABCT is not only about variations in the interest rates, but also about changes in the monetary policy and in the money supply which are reflected in relative changes in the demand for various goods and services. Businessmen are bound to react to changes in the demand for their goods if they want to stay in business. For Shostak, not participating in the boom means "staying out of the business altogether." Therefore, entrepreneurs are likely to distort the structure of production by increasing investments in the industries for higher order goods, leading to capital misallocation. For more risk-prone rational entrepreneurs, a second option would be to invest in real estate or the stock exchange. Again, these investments could fuel a boom in construction and other lines of economic activity that would benefit from the increased demand.[15]

The artificial reduction of the interest rates applies not only to business credit but also to consumer or mortgage loans. Households are obviously less equipped than entrepreneurs to judge what the inflationary consequences of credit expansion would be, and one cannot realistically expect them to anticipate correctly the unfolding of a business cycle. And yet, by borrowing to finance long-term and capital intensive consumption goods such as real estate and durables, they are likely to distort consumption patterns and the allocation of factors of production. Again, it is difficult to see how all the businessmen whose products benefit from an increased demand are going to refrain from expanding their activity and avoid committing errors of capital misallocation that is an intrinsic

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entrepreneurial class and makes it very difficult for those economic actors untrained in economics to perceive the link between the artificially lowered interest rate and malinvestment. See Salerno (1995).

[15] The only investment that would probably not result directly in an expansion of economic activity would be the purchase of a store of value such as gold, art objects, etc. But again, as a second round, the sellers of these goods would use the money for other purchases, increasing the money supply in the economy and changing the relative demand for various goods and services.

characteristic of the ABCT. Even if the new household credit goes primarily into consumption, it will still increase the relative demand for consumer goods in the economy. In turn, this may put pressure on the supply of real savings necessary to complete the on-going capital projects.

In our view, a credit expansion cannot take place without engendering the business cycle, i.e. without bringing about a misallocation of capital. If that were not the case, the non-neutrality of money would be seriously challenged. Richard Cantillon was the first economist to suggest that inflation occurs gradually, with first recipients of the increase in the money supply enjoying higher wealth at the expense of later recipients. In addition to the wealth redistribution effects, inflation causes a disproportionate rise in prices among different goods in the economy. Thus, the concept of relative inflation leads to the "non-neutrality of money" theory, which explains how any monetary injection is punctual and distorts relative prices in the economy as prices adjust sequentially over time. Hülsmann seems to focus exclusively on the cyclical effects of inflation which are caused by errors of anticipation due to the manipulation of the interest rate, while overlooking the distributional consequences of inflation due to the "Cantillon effects." Shostak (2003) and O'Driscoll and Rizzo ([1985] 1996) make the point that monetary injections alter the patterns of consumption, drawing the attention of entrepreneurs who also change their investment schedules and production. Once the monetary injection stops, the demand patterns will change again, revealing the early distortion in investment patterns and the waste of capital. The cyclical effects of changes in the money supply are reinforced by the distortion of the interest rate as a secondary effect. According to Mises, the distortion of the interest rate occurs via the changed time preference of the new money holders which results from the process of redistribution of real income and wealth (Mises, [1949] 1998, p. 552). A similar position is held by Hayek when he argues that price changes are not "general," i.e., they do not impact all prices at the same time and in the same proportion. The money injections appear at "certain individual points," bringing about deviations in the individual price relations and shifts in the structure of production (Hayek, 1933, p. 123).

All these arguments support the position of Mises ([1949], 1998, p. 791) and Huerta de Soto ([1998], 2012, p. 422) who claim that only

by refraining from taking up the fiduciary credit entrepreneurs can avoid triggering a business cycle. Mises acknowledges the fact that entrepreneurs may learn from past experience and react differently to future credit expansions. The change in behavior would be that "they will avoid using for an expansion of their operations the easy money available." However, this seems to be a very remote possibility, because profits are always uncertain and temporary and entrepreneurs are not likely to forgo them in an inflationary episode. Several Austrian economists argue that even if entrepreneurs had perfect foresight, they would not make use of their correct expectations and would still engage in the boom because of the inherent competition between businesses to expand profits and market shares. Huerta de Soto explains that entrepreneurs have no reason to refrain from participating in the boom if they believe that they can withdraw in time and possibly count on receiving government support in case things go wrong (Huerta de Soto, [1998], 2012, p. 394). Therefore, they participate in the expansion of credit and, inevitably, commit to projects which later are proved to be unprofitable. Using a *prisoner's dilemma* type of analysis, Carilli and Dempster[16] make a similar point that both banks and entrepreneurs are likely to engage in the artificial credit expansion due to profit maximizing behavior even if they are aware that the boom is not backed by real savings and will eventually end up in a bust.[17]

Even assuming perfect entrepreneurial foresight, a correct anticipation of inflationary effects is no guarantee that the business cycle will not take place if the credit expansion is allowed to go forward. Monetary injections always trickle down in the economy and distort consumption patterns and relative prices—including interest rates as a second round effect—and eventually modifying investment patterns and the structure of production. In the next argument we are interested in finding out whether entrepreneurs could indeed bid up the interest rate ahead of the increase in prices by borrowing the additional fiduciary credit, which seems to be another point of contention between Hülsmann and Mises.

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[16] Anthony M. Carilli and Gregory M. Dempster, "Expectations in Austrian Business Cycle Theory: An Application of the Prisoner's Dilemma," *The Review of Austrian Economics* 14:4, 319–330, 2001, p. 322–327.

[17] The *prisoner's dilemma* is a canonical example from the game theory which shows how individual reward outweighs advantages stemming from a cooperative behavior.

Third argument:

Hülsmann's assumption that entrepreneurs can bid up the bank interest rate to the level prevailing on the free market may be consistent with the basic laws of economics, but it may break down under a very elastic supply of credit which the contemporary monetary and financial arrangements are able to produce. By creating money out of thin air, fractional reserve banks can pyramid credit on the liquidity provided by the central bank at virtually any cost, keeping the bank rates below their free market levels for prolonged periods of time regardless of an increase in demand. Under fractional reserve banking and fiat money, the power to set the bank interest rate rests with the bankers and central bankers and not with the borrowers. The latter must first exhaust the fiduciary credit that is ready to be supplied at a certain interest rate level by monetary authorities and banks before the interest rate can start rising. This is a powerful argument in favor of Mises's claim that changes in the price premium of the interest rate lags changes in prices.

Fractional reserve banking does not operate in accordance with property rights and economic laws when it expands credit out of thin air rather than intermediating real savings. Mises argues that fractional reserve banks can expand credit almost for free and keep the interest rate artificially depressed to very low levels that would merely cover their working expenses. He calls this phenomenon "the gratuitous nature of credit" and considers it to be "the chief problem in the theory of banking" (Mises, [1912] 1981, p. 390). In order to place the newly created credit, banks must decrease the interest rate below what a free market level would be. Mises explains how all borrowers are able to get credit at the free market interest rate corresponding to the riskiness of their projects and therefore "(a)dditional loans can be placed only at a lower gross market rate" (Mises, [1912] 1981, p. 549). Fractional reserve banks increase their market shares and profits in line with their credit expansion, given the very low cost of the creation of fiduciary credit. Accordingly, they have no interest in increasing the interest rate and its price premium before they have fully granted the additional fiduciary credit that the market demands. Therefore, the credit market finds itself in the odd situation of a highly elastic supply of credit which prevents the interest rate from reacting to increases in demand. Hayek takes a similar position when he notes that banks do not raise the interest rate when they expand credit before they are fully loaned up (Hayek,

1933, p. 174–175). Competition forces them to keep the interest rate close to the cost of funds, which is a fixed deposit rate unilaterally determined by banks based on the price of money supplied by the monopolist central bank.

In the absence of a monetary authority, the size of the expansion of fiduciary credit by fractional reserve banks is limited by the competition between themselves and the risk that a bank expanding too aggressively could go bankrupt (Mises, [1912] 1981, p. 788). The scope for credit expansion increases greatly once a second element of government intervention is introduced, i.e. the existence of a central bank that sets the interest rate and acts as a lender of last resort for the banking sector. Under a fiat money arrangement, the central bank sets the key policy rate at which banks can refinance themselves on the inter-bank market, implicitly coordinating the credit expansion and the uniform reduction in the bank rates to artificially low levels.

The contemporary monetary and banking arrangements are based on the full array of instruments of government intervention: fractional reserve banking, central banks, and fiat money, which has replaced commodity money. The checks and balances provided by the threat of gold outflows and bank runs disappear and the supply of credit in the economy can be increased without limits while interest rates are fully controlled by the monetary authorities. Even the mainstream economic literature admits that the focus of the central bank monetary policy has gradually shifted (starting in the 1980s) from a desired quantity of reserves and monetary aggregates to a specified level of the policy interest rate.[18] Nowadays, the main central banks such as the Federal Reserve System and the European Central Bank set an interest rate target, at which they accommodate all the demand for liquidity. Under fiat money, even the limit of banks being fully loaned up mentioned by Hayek does not operate anymore, both in terms of liquidity and capital ratios. Money is fungible and the liquidity injected by the central bank in the economy can easily be converted either in bank liquidity (deposits with the central bank) or capital, on top of which banks can pyramid additional credit.

In this context, the supply and demand relation between the supply of credit and bank interest rates breaks down completely.

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[18] See also Edwards and Sinzdak (1997).

Even if entrepreneurs had perfect foresight and tried to take loans until the bank interest rate reached its market level, they would first have to exhaust the entire supply of credit that the monetary authority and fractional reserve banks are ready to supply at a certain interest rate level before interest rates start to go up. As a result, the inflationary effects of the credit expansion are bound to hit the price of goods in the economy before the price premium of the interest rate would start to increase. This is a direct consequence of the process by which the current monetary arrangements ensure a maximization of the credit expansion in the economy in line with the governmental political aims. We consider it a strong argument in support of Mises's claim that "price premium always lags behind the changes in purchasing power," probably more insightful than his own explanation describing the formation of anticipations and prices and the lack of perfect entrepreneurial knowledge (Mises, [1949], 1998, pp. 541–542).

Hülsmann disputes Mises's claim that inflation impacts first the prices of goods and only later the price premium of the interest rate by referring to the period of the crack-up boom, i.e. the turning point from boom to bust, when Mises himself describes the increase in the price premium above all measures of inflation. In our view, Hülsmann's argument does not hold, because it fails to interpret correctly price developments in the two different phases of the business cycle. At the stage of the crack-up boom, inflation is slowing down and usually turns into deflation as the credit stops growing, and may even contract because banks go bankrupt or suffer heavy capital losses. The high price premium that exceeds in nominal terms the slowing rate of inflation can only be explained by the fact that its variation lags the variation of prices. Basically, the two variables are changing in trend, and the price premium of the interest rate is again reacting with a delay. Mises's argument that inflation always precedes changes in the price premium seems correct in both phases of the cycle, precisely because borrowers have only a marginal influence on setting the interest rate.

CAN THE ESSENTIALIST APPROACH BE AN ALTERNATIVE TO THE TRADITIONAL ABCT?

According to Hülsmann, a general theory of the business cycle based on the government intervention in the economy as the

main trigger for malinvestment would solve the perceived short-comings of the traditional ABCT. Hülsmann's general approach opens up the possibility of expanding the business cycle theory to the entire sphere of government activities, beyond the monetary one. He describes how government intervention leads to recurrent clusters of errors that induce specific business cycles when the errors are uncovered. The errors result in capital misallocation and economic breakdowns which are not necessarily followed by an abolition of government, thus making them recurrent. If the error is not uncovered or the course of action chosen to correct it is the wrong one, i.e. more government intervention, then the end of the road could be "total government." This scenario is part of a "long business cycle" that would end with the crisis of the entire governmental monopoly of power. This general case could be seen as an application of the progression theorem of political unification and government enlargement elaborated by Hülsmann shortly before writing this article (Hülsmann, 1997, pp. 81–96). If people do not abandon government as a monopoly on violence after such a collapse, then a new cycle can start again.

There are obvious merits in Hülsmann's new essentialist approach. It is an elegant way to explain the cyclical economic evolution of human communities as led by changes in the economic freedom of individuals with a direct impact on their capital accumulation. Nevertheless, Hülsmann's approach invites two questions in our view: (i) whether this theory can withstand criticism also from schools of economic thought that openly advocate government intervention in the economy, and (ii) whether specific cycle theories, among which we find the traditional ABCT, can be successfully integrated into this general approach without the support of a consequentialist demonstration.

As regards the first issue, we doubt the general validity of Hülsmann's essentialist approach. In the economic sphere, there are very few schools of economic thought, among which the most prominent one is the Austrian School of Economics, which consider that the government intervention in the economy reduces personal freedom, welfare and capital accumulation. At the same time, the majority of mainstream economic schools consider government intervention as welcome and necessary in order to correct all sort of alleged market failures. Under the assumption that error is not

inherent in government action, the theory of the business cycle proposed by Hülsmann loses its general validity. Therefore, it is difficult to see how the essentialist approach can be irrefutable without being backed by a concrete demonstration embedded in a consequentialist argumentation. The majority of mainstream economists would most likely dismiss the assumptions of Hülsmann's general theory out of hand, whereas the ones questioning the validity of the traditional ABCT could not come up with convincing counter-arguments based on deductive reasoning.

As regards the second question of integrating specific business cycles in the general theory, we note that except for the ABCT, Hülsmann only mentions two other possible examples, such as the "military-imperialistic cycle" and the "social security cycle." He does not develop them further in order to explain their workings, which is a clear shortcoming in terms of expounding a theory that claims to be general and all-encompassing. If we turn our attention to the concrete example of the reconstructed ABCT, we notice that Hülsmann explains the turning point of the cycle by arguing that "sooner or later [market participants] must discover their errors" and the cycle will end up with the elimination of the "unjust" institutions. In our view, this is a possible course of action, but by all means not a certainty that would lend general validity to a theoretical framework. Either the economic actors may not discover their error, or they may not be able to change the faulty institutional arrangements that generated it. One possible explanation for the solidity of the current monetary arrangements, despite recurrent failures, lies with the fact that the capital wasted and the welfare losses recorded so far have not been high enough to compel market participants to take serious action to understand the cause of the error and change the specific institutional framework in which it occurs. In general, the specific cycles of the essentialist approach may not materialize if the capital loss generated by government intervention in a specific cycle is outpaced by the capital accumulation in the rest of the economy free from intervention. In such cases, the error may remain hidden and uncorrected. It is also necessary to acknowledge that in the real world, the recognition and correction of an institutional error is a very cumbersome and painful process given the vested interests that sustain all institutional arrangements.

Moreover, Hülsmann's assertion has not been empirically validated so far. Despite recurrent business cycles that have

plagued economic activity for centuries, it appears that the mainstream ideologists and the majority of the market participants have not yet discovered where the fundamental error lies. The error prone monetary and banking arrangements are not only firmly in place, but the degree of government intervention in this sector has even increased over time. These are theoretical and empirical observations that question the validity of the essentialist approach as applied to the concrete case of the ABCT.

In conclusion, we believe that the new essentialist approach in explaining a monetary induced business cycle cannot attain general validity outside schools of economic thought that consider government intervention as detrimental to economic welfare. Such an approach would immediately be refuted on ideological grounds, whereas this is not the case for the traditional ABCT. Moreover, the theory still needs to be complemented by a specific consequentialist support in order to be valid as a stand-alone theory of government induced business cycles. The validity of each specific cycle theory depends on a thorough examination of the mechanism that uncovers the error and determines a change of the flawed institutional arrangement. Another way to test the validity of the theory of specific cycles is to analyze whether the traditional ABCT can be integrated consistently into the new essentialist approach. We will do it in the next sub-chapter when we investigate whether the traditional ABCT would hold also in the absence government intervention.

CAN THE ABCT ALSO HOLD IN THE ABSENCE OF GOVERNMENT INTERVENTION?

The traditional ABCT is incompatible with the new essentialist approach developed by Hülsmann in one instance, e.g., if the ABCT would also hold on a free market. As the essentialist framework is founded on government intervention in the economy and assuming that the business cycle could also take place without the error induced by government, it follows that the monetary theory of the business cycle could not be a specific case of the general essentialist approach. Hülsmann himself recognizes that the entire essentialist approach would be futile in this case and concludes his article by stating that "it is not money, but government intervention

that accounts for the business cycle." This is tantamount to saying that the monetary theory of the business cycle is not validated under free market conditions. We will look more closely into this issue, because the Austrian school has yet to give a definitive answer to this question.

Hülsmann's claim appears rooted in the Rothbardian tradition denying the possibility that a business cycle could derive from an increase in the stock of specie on the free market, although neither of them elaborates on their rationale. When defining inflation, Rothbard excludes increases in the stock of specie even though they lead to an increase in prices, because they do not represent an intervention in the free market that has redistribution effects and moreover "they do not lead to the processes of the business cycle" (Rothbard, [1962] 2009, p. 990).

Unlike Rothbard, both Mises and Hayek consider that an increase in commodity money can also lead to business cycles. Although Mises believes that credit expansion is without any doubt a problem of government intervention, he does not exclude the possibility that an increase in commodity money could also engender business fluctuations.[19] First, at a more theoretical level, Mises states clearly that the issues surrounding the business cycle theory should not be discussed in a government intervention framework, but rather in the context of the pure market economy, because this is primarily an issue of the relation between money supply and the rate of interest. Second, Mises goes a step further and claims that an increase in commodity money can also cause a business cycle (Mises, [1949] 1998, p. 571). The only differences he perceives in relation to bank credit expansion based on fiduciary media lie in the magnitude of the increase in the money supply and the temporal sequence of its effects on the market prices. We would also add that the frequency of recurrence of such a phenomenon on a free market would also be much lower because large shifts in the supply of commodity money happen only rarely.

…What differentiates credit expansion from an increase in the supply of money as it can appear in an economy employing only commodity

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[19] In order to prevent business cycles Mises recommends free banking that would limit the expansion of bank credit based on fiduciary media and a return to the classical gold standard. As fractional reserve banking had survived mainly due to government support, he did not consider it as a free market institution.

money and no fiduciary media at all is conditioned by divergences in the quantity of the increase and in the temporal sequence of its effects on the various parts of the market.

Hayek also believes that an increase in the quantity of gold can lead to a distortion in the interest rate and the structure of production that are prerequisites for a business cycle (Hayek, 1933, p. 149). In keeping with Mises, Hayek doubts that on a free market, in general, the deviations in the interest rate triggered by an inflow of gold can be large enough to cause strong and problematic fluctuations in the economic activity, but does not exclude this possibility in theory.

We note these diverging views among various high-caliber Austrian economists on this issue. The argumentation by the two sides is not overwhelming, which makes it difficult to give a clear-cut answer. The position held by Mises and Hayek follows naturally from other theoretical strands of Austrian economics, such as the already mentioned principle of the non-neutrality of money. Different scenarios can be envisaged as regards the points of entry of the money injection in the economy and the succession of impacts on the market prices. Undoubtedly, the increase in the supply of the commodity money would produce Cantillon effects, i.e. changes in relative prices and in consumption patterns, therefore distorting the structure of production and the investment schedules.[20] There is a high probability that some of the newly created commodity money will enter the credit market at some point, artificially depressing the interest rate and affecting the inter-temporal coordination of the structure of production as well. When the monetary injection stops, individual demand schedules and the structure of production will change again, resulting in capital misallocation, which is the key characteristic of the business cycle. Even if the newly created money goes predominantly into consumption, it is still likely to reduce the amount of savings necessary to complete ongoing investments. One can also not exclude the fact that even under free banking rules there may be cases when banks operate on fractional reserves. In such situations, the business cycle occurring due to the expansion of

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[20] Such as, for example, the large inflow of gold in Europe after the discovery of the New World.

fiduciary credit would also take place on a free market via the mechanisms described so aptly by the ABCT.

In practice, one has to concede that business cycles on a free market and under commodity money are likely to have low recurrence and low magnitude, but it does not mean that they can be excluded altogether. Despite the fact that further research on the workings of the ABCT on a free market seems necessary, the arguments advanced by Mises and Hayek seem more robust than the line taken by Rothbard and Hülsmann. As explained above, one can imagine scenarios where the monetary theory of the business cycle can be valid in the absence of government intervention. In this case, the general validity of the essentialist approach based on error inherent in government intervention would be compromised.

CONCLUSIONS

Hülsmann tries to develop a general theory of error cycles centered on the government intervention in the economy in order to overcome a perceived shortcoming in the reasoning chain of the traditional ABCT. We presented three main arguments why this critique is not well-founded and why the traditional ABCT remains generally valid in our view.

First, the capacity to anticipate correctly future events depends on the complexity of the economic process analyzed, and it differs widely among economic actors based on their experience and innate abilities. Business cycles are clearly among the most difficult phenomena to anticipate. Mises and other Austrian economists bring convincing arguments that ordinary entrepreneurs cannot have perfect foresight as to determine whether the credit expansion is artificial or genuine and to calculate the interest-rate prevailing on a free market. Even if one concedes that some entrepreneurs could anticipate correctly the business cycle and increase their demand for fiduciary credit, they still cannot bid-up the interest rate to its free market level instantaneously, because any human action takes time. In the meantime, less foresighted businessmen are likely to engage in malinvestments that end up in a capital misallocation.

Second, Hülsmann does not elaborate on how rational entre-preneurs are going to engage in the credit expansion without

causing distortions in the structure of production and capital misallocation. The fiduciary credit is likely to be passed on to both foresighted and less foresighted businessmen that are not going to miss the opportunity to expand their market shares and profits. The patterns of consumption and investment and the structure of production will be inevitably altered, leading to capital misallocation once the monetary injection stops. In this respect, refraining from taking the additional credit would be the right course of action to avoid a business cycle as argued by Mises and other Austrian economists.

Third, bidding up the interest rate by demanding extra credit may not have the expected results when borrowers face the abnormal situation of a highly elastic supply of credit manipulated by fractional reserve banks operating under fiat money. By creating money out of thin air, fractional reserve banks backed by a central bank can pyramid credit at virtually any cost, keeping the bank rates below their free market levels for prolonged periods of time until the demand for credit is fully met. In such a case, correct expectations cannot help avoid the formation of a business cycle. Moreover, this particular characteristic of the process of expanding fiduciary credit explains why Mises believed that the increase in the price of goods occurs before the price premium of the interest rate changes, thus misleading entrepreneurs into the wrong investment projects.

A brief analysis of the essentialist approach proposed by Hülsmann reveals its merits in terms of linking the cycles of economic development to the degree of government intervention in the economy. At the same time, its general validity will undoubtedly be rejected out of hand by the majority of mainstream economic schools that deny the negative role played by government intervention in the economy. This is not the case for the traditional ABCT, which held its ground well in the face of mainstream criticism.

As regards the specific cycles identified by the essentialist approach, Hülsmann does not explain why market participants would always recognize and dismantle the scheme behind the government intervention. If the capital loss generated by a specific cycle is small compared to the capital accumulated in other parts of the economy which are free from government intervention and

the cost of changing the existing institutional arrangements is large for a small number of interested parties, the identification and correction of the error are not straightforward. Therefore, the argumentation behind the "reconstructed" ABCT is not irrefutable. In our view, the essentialist approach is useful, but lacks convincing arguments to become a general theory of business cycles and needs to be complemented by a specific consequentialist support.

As a last observation, the traditional ABCT is incompatible with the new essentialist approach developed by Hülsmann in one instance, i.e. if the ABCT would also hold on a free market. There is no clear-cut answer to this question and the views among various high-caliber Austrian economists on this issue differ. Unlike Rothbard, both Mises and Hayek do not exclude the possibility that the mechanics of the ABCT can unfold also in the absence of government intervention. Indeed, several scenarios can be imagined where large fluctuations in the supply of commodity money can distort the structure of production and the interest rate, resulting in capital misallocation and business cycles. We believe that until this theoretical issue is settled without any doubt in favor of the Rothbardian position, Hülsmann's essentialist approach to explain monetary induced business cycles cannot be regarded as generally valid.

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DIVISION OF LABOR AND SOCIETY: THE SOCIAL RATIONALISM OF MISES AND DESTUTT DE TRACY

CARMEN ELENA DOROBĂŢ

ABSTRACT: Ludwig von Mises's social rationalist views on society, first discussed in Salerno (1990), do not appear to have any precursors in the history of economic thought. The present paper highlights the contributions of a French philosopher, A.L.C. Destutt de Tracy, to the theory of social development as one precursor of Mises's theory. I use extensive textual evidence to highlight the important similarities between the social theories presented in De Tracy's *Treatise on Political Economy* and Mises's *Human Action*. The systematic exposition of these social rationalist views focuses on three aspects: their praxeological foundation, the economic factors which bring about human association, and the global consequences of these social phenomena.

KEYWORDS: social theory, rationalism, human action, division of labor, Ludwig von Mises, Destutt de Tracy

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I. INTRODUCTION

Social theory, which includes sociology, economics, and political theory, among others, has had a long and complicated development, emerging as a distinct field of science only in the 20th century. From the pre-Enlightenment era to modern and post-modern developments, the evolution of these disciplines has consistently moved in one particular direction: from putting forth a worldview and creating overarching paradigms, towards developing only particular theories that explain only particular circumstances (Baert and da Silva, 2010). As one consequence of this trend, economics has gradually diverged from social theory: economists began using the tools of physical sciences, while other social theorists had little use for economic theory. Notwithstanding, a handful of economists have continued to consider economics and social theory as inseparable. One such case was Ludwig von Mises, perhaps best known for his comprehensive work on praxeology, i.e. the science of human action.

Only in the last decade of the 20th century has Mises's social theory been brought to the attention of modern scholars. In his seminal 1990 article, "Ludwig von Mises as Social Rationalist," Joseph Salerno argues that Mises elaborated "his own uniquely rationalist position" (1990, p. 26) on social evolution, different from the meliorism of liberal Enlightenment and the Hayekian spontaneous order approach. Salerno expounds a brief and clear summation of Mises's views, which he calls 'social rationalism': "all social interactions and relationships are thought out in advance and therefore, society originates and evolves as a product of reason and teleological striving... society is a consciously-devised "strategy," "a man-made mode of acting" in the war against scarcity" (1990, pp. 26–28). In Mises's own words, social evolution represents "the development of the division of labor" and one can "trace the origin of everything concerned with society in the development of the division of labor" (Mises, 1962, pp. 301, 303).

Mises's unique social theory does not appear to have had any precursors. However, in a lecture delivered in 2005, Salerno briefly hinted at an early member of the French Liberal School, Destutt de Tracy, as one author who preceded and shared Mises's rationalist and catallactic views on society.

Antoine Louis Claude Destutt, Comte de Tracy (1754–1836) was a French aristocrat of Scottish descent, philosopher and economist, who is best known for having coined the term *idéologie* for the science of ideas (Chisholm, 1911, p. 126). De Tracy belongs to the tradition of the French Liberal School, whose influence on the development of economics in France began with the publication of Jean-Baptiste Say's treatise in 1803, and extended over an entire century, roughly until the death of Gustave de Molinari in 1912 (Salerno, 1978, p. 65). The paradigm in which De Tracy and other French liberals operated diverged significantly from the British Classical School,[1] springing from the contributions of French physiocrats and having been "nourished by a long and glorious tradition which reached back through Condillac, Turgot, Quesnay and Cantillon to the Scholastics" (Salerno, 1978, p. 66). To this tradition belong also Frédéric Bastiat (2007) Michel Chevalier (1842), Jean-Gustave Courcelle-Seneuil (1858), Ambroise Clément (1867) and Paul Leroy-Beaulieu (1914).

Scholars have scrutinized in detail De Tracy's philosophical work on ideology and secularism (Kennedy, 1978; Head, 1985; Byrnes, 1991; Dekens, 2003), and his subjectivist approach and deductive methodology (Klein, 1985; Salerno, 1988; Patalano, 2015). Further attention was given to his views on entrepreneurship (Hébert and Link, 2006) or money and banking (Terrell, 2009), his liberal stance on government policy (Rothbard, 2006; Nemo, 2006; Faccarello, 2010), and even the impact of his philosophical system on Stendhal's novels (Alciatore, 1950; Smith, 1956) and J.-B. Say's social analysis (Forget, 2001).

Yet so far, no historians of thought have been spared to attend to De Tracy's views on social theory. His ideas on how society evolves and develops and how this process both originates from

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[1] By the 20th century, French economists had been exiled in a dark corner of the history of economic thought, wrongly dismissed as pamphleteers and popularizers of British classical economics. However, Rothbard (2006) has extensively shown that French liberal thought had not been an uninformed apology for British laissez-faire, but had important contributions to economic theory. Salerno (2001) also established that institutional factors—such as an unfavorable change in educational policies in France—had led the School into disrepute. Subsequent research (Hülsmann, 2001; Thornton, 2001) added evidence to Salerno and Rothbard's original claims, praising the contributions of French liberals on topics such as methodology, theory of value, entrepreneurship, and capital theory.

and reflects upon the human condition have suffered a similar fate to Mises's work on the topic. The purpose of this paper is to address this neglect, and to connect the contributions of Mises and Destutt de Tracy on social theory. I use the textual evidence found in the two authors' major works to flesh out Salerno's insight that De Tracy was a precursor of Mises's social rationalism.

A close scrutiny of De Tracy's *Treatise on Political Economy* and Mises's works, particularly *Human Action*, highlights striking similarities between De Tracy's and Mises's contributions, written more than 130 years apart, although no direct intellectual lineage connecting the two authors has been documented so far. Joseph Salerno (1988; 2001) shows that 19th century French liberals influenced prestigious economists such Carl Menger, Eugen von Böhm-Bawerk, or Knut Wicksell, and thus De Tracy's ideas could have reached Mises indirectly.[2] But Mises himself did not cite any precursors of his thoughts on the matter. The similarities between Mises and de Tracy's works raise thus some interesting questions: if there is indeed a filiation of ideas between the two authors, why has it not been acknowledged by Mises, or discovered later by scholars? Alternatively, if no such historical connection exists, why have the two authors developed congruent social theories? Although I do not attempt to answer either of these questions in the remainder of this paper, mapping the similarities between Mises and De Tracy's works can constitute a preliminary note on the subject, to be used as a basis for future research in answering those questions.

In my analysis, I follow three basic elements of both social theories, which the authors deal with explicitly: the paradigmatic foundation, the factors that bring about human association and cooperation, and the global consequences of these social phenomena. To this end, the remainder of this paper is structured as follows: I begin in section II with their views on human will, human action, and acquiring economic means, and highlight the praxeological foundation the two authors shared—which could

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[2] Hülsmann (2007, p. 112) shows that Condillac's treatise, *Commerce and Government*, has been one of the main sources of inspiration for Carl Menger's works, who was fluent in French. He also argues that Mises "continued the tradition of the British classical economists and of the great eighteenth- and nineteenth-century French économistes" (Hülsmann, 2007, p. 87).

explain many of the similarities between their theories. Section III delves into the rationalist and catallactic explanations of the evolution of society, where I argue that for both Mises and De Tracy, society is a gradual, reinforced development of economic exchange and division of labor. Section IV discusses the natural extension of society to a global phenomenon, exploring the analogous views of Mises and De Tracy on international trade, war, and peaceful cooperation. Throughout the paper, De Tracy's views are compared with those of Mises in a systematic, step-by-step exposition. As I rely extensively on the textual evidence found in the two treatises, critical analysis is limited to those cases where it facilitates a better presentation of the arguments.

II. A PRAXEOLOGICAL FOUNDATION

Destutt de Tracy's four-volume treatise *Elements of Ideology* was conceived as an exposition of the "complete knowledge of our intellectual faculties," from which we deduce the only solid "first principles of all the other branches of our knowledge" (De Tracy, 2009, p. xx). Understanding what these faculties are is fundamental, in De Tracy's view, to understanding how social relations and economic phenomena are established.

De Tracy begins the fourth volume, *Treatise on Political Economy* (also called *Treatise on Will*), by arguing that "we form judgments of that which we experience, of that which we feel, of that which we see, in a word of all which affects us; we distinguish the parts, circumstances, causes and consequences thereof; and this is to judge of it" (De Tracy, 2009, p. 60). The fundamental difference between humans and all other merely "sentient" beings De Tracy identifies as the former's capacity to act, motivated by a rational will, where intellectual faculties form our knowledge of the world and inform human judgment. He writes: "man… is a being willing in consequence of his impressions and of his knowledge, and acting in consequence of his will" (De Tracy, 2009, p. 23). Equally, Mises argues in *Human Action* that reason is a man's "particular and characteristic feature," and that "man alone has the faculty of transforming sensuous stimuli into observation and experience… [and] alone can arrange his various observations and experiences into a coherent system" (Mises, 1998, p. 177).

In De Tracy's view, therefore, human volition is one of the primary intellectual faculties and the fundamental mover of all action. He further defines human will as "the general and universal faculty of finding one thing preferable to another, that of being so affected as to love better such an impression, such a sentiment, such an action, such a possession, such an object, than such another" (De Tracy, 2009, p. 24).[3] Furthermore, he argues, this "faculty of willing produces in us the ideas of wants and means, of riches and deprivation, of rights and duties, of justice and injustice" (De Tracy, 2009, p. xxv). As a result, De Tracy's investigation of all subsequent social and economic phenomena—which are the result of human action directed by volition—begins from the choices of human beings.

Mises also positions human wants as the alpha and omega of any economic and social system. First, in the very beginning of his magnum opus, Mises gives a definition of human will similar to De Tracy's: "Will means nothing else than man's faculty to choose between different states of affairs, to prefer one, to set aside the other, and to behave according to the decision made in aiming at the chosen state and forsaking the other" (Mises, 1998, p. 13). On this precise definition, which underpins the more universal science of praxeology, Mises establishes his economic analysis: "Choosing determines all human decisions.... All ends and all means, both material and ideal issues, the sublime and the base, the noble and the ignoble, are ranged in a single row and subjected to a decision which picks out one thing and sets aside another.... No treatment of economic problems proper can avoid starting from acts of choice" (Mises, 1998, p. 3).

Human action is for both Mises and De Tracy the meaningful manifestation of reason and will, the judgment of observations and experiences thus materialized. De Tracy argues that "in the employment of our faculties, in our voluntary actions, consists all the power we have; …the *acts of our will* which direct these actions are the source of all our means" (De Tracy, 2009, p. 38; emphasis added).

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[3] De Tracy's definition of human will also indicates that his subsequent theory of exchange in the division of labor, discussed below, was underpinned by elements of a subjective value theory. For a brief explanation of De Tracy's views on subjective value—which he had acquired from J.-B. Say—see Terrell (2009, pp. ii–iv).

Hence, human beings are not only sentient and willing, but also able to act in a rational and conscious way. Mises concurs with this view in his own analysis: human action "is will put into operation and transformed into an agency, is aiming at ends and goals, is the ego's meaningful response to stimuli and to the conditions of its environment, is a person's conscious adjustment to the state of the universe that determines his life" (Mises, 1998, p. 11).

Both authors also find that what informs human will and thus motivates human action is the perpetual state of uneasiness in which all individuals find themselves at any point in time. De Tracy explains that we always have "the desire of being delivered from that state, whatsoever it is, in which we actually are; which consequently appears actually as *a state of uneasiness*, more or less displeasing. [...] While it exists it is a manner of being felt and incommodious, and from which we have consequently a want of being delivered" (De Tracy, 2009, p. 35; emphasis added).[4] Without this uneasiness, and without the conscious and rational desire to substitute the current state of affairs for another, human action would not be possible. Mises uses the same concept in his explanation: "acting man is eager to substitute a more satisfactory state of affairs for a less satisfactory. His mind imagines conditions which suit him better, and his action aims at bringing about this desired state. The incentive that impels a man to act is always *some uneasiness*" (Mises, 1998, p. 13; emphasis added).

Our actions can transform external resources into actual means for the attainment of ends because we can judge our observations and experiences, and organize them in a coherent system. This allows us to understand causal relations between elements of the natural world and their potential serviceableness to our satisfaction. In thus entering the sphere of economic science, both Mises and De Tracy emphasize this causal recognition, through action, as an essential step for material things to become economic goods—subject to the teleological, rational plans of men. The French philosopher explains this process as follows:

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[4] In the French edition of his treatise, published originally in 1823, Destutt de Tracy describes "uneasiness" using the French term "malaise," which can be defined as a feeling of general discomfort or unease. This is also the term used in the French translations of Mises's *Human Action*. Cf. De Tracy (2011 [1823]).

> We do not possess a good field or a good utensil, but because we have well recognized the properties of the first material, and rendered easy the manner of making it useful.... It is then always from the employment of our faculties that all these goods arise. [...] We could not appropriate one of those beings, nor convert the smallest parcel of them to our use, but by *our action on them* and *by the employment of our faculties* to this effect (De Tracy, 2009, pp. 38–40; emphasis added).

In a consonant explanation, Mises shows that "a thing becomes a means when human reason plans to *employ* it for the attainment of some end and human action really employs it for this purpose." He continues: "parts of the external world become means *only* through the operation of the human mind and its offshoot, human action" (Mises, 1998, p. 92).

In brief, human will, the intellectual faculty of choosing between different states of affairs, motivates human action; and action, in turn, transforms external things into economic means. In consequence, economic and social phenomena are the result of this conscious, rational, and purposeful behavior, where human beings interfere in the causal relations of the external world to create means for the satisfaction of their subjective goals.

We can thus argue that both De Tracy and Mises consider human action as the foundation of economic and social theory proper,[5] and in this regard we can identify De Tracy as a proto-praxeologist. Let us now analyze in detail the arguments put forth by Mises and De Tracy for a rationalist and catallactic view of society.

III. TWO RATIONALIST AND CATALLACTIC VIEWS ON SOCIETY

According to Mises, the fundamental task of any science endeavoring to determine the origins of society "can only consist in the demonstration of those factors which can and must result in [human] association and its progressive intensification" (Mises, 1998, p. 160). Both De Tracy and Mises have in fact been faithful

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[5] Rothbard (2006, I: 4; p. 7) explains that "for de Tracy, this 'science of human understanding' is the basic foundation for all the human sciences… the discipline studying all forms of human action, a study meant to be a respecter of individuals and their interaction."

to this principle in the construction of their theories. They began by delineating the object of their investigation and their approach, and continued by explaining the primary factors determining social evolution. Proceeding from these factors and from the social processes they engender, they reached a definition of society. Let us now discuss these steps in turn, and compare Mises and De Tracy's positions through the available textual evidence.

As we have seen above, human reason allows us to perceive causality in nature and adjust it for the production of means to achieve our ends. But man does not—and cannot—survive isolated, simply in relation with nature. Thus, any social theory must focus on man seen originally as a social being. De Tracy argues that it would be "superfluous, having the human species principally in view, to occupy ourselves longer with beings that should be sentient and willing, but living insulated. Man cannot exist thus. [...] Man can exist only in society. It is then the social state, which is our natural state, that with which we ought alone to occupy ourselves" (De Tracy, 2009, pp. 59–60; xxx). Correspondingly, Mises argues that "man appeared on the scene of earthly events as a social being. The isolated asocial man is a fictitious construction" (Mises, 1998, p. 164).

How should this social state be studied first and foremost? Destutt de Tracy begins his scrutiny of society "under its economical condition, that is to say relatively to our most direct wants, and to the means we have of satisfying them" (De Tracy, 2009, p. 60). Such an investigation, De Tracy argues, will "lead us surely to estimate the value and utility of all our actions, to judge of their merits by their consequences, and consequently of the merit of those sentiments which determine us to one action rather than another" (De Tracy, 2009, p. 61). Mises too gives primacy to economic considerations in his analysis of social development, arguing that "man becomes a social being… in aiming at an improvement in his own welfare" (Mises, 1998, p. 160). For both Mises and De Tracy, the ultimate reasons for social evolution are to be found in the economic sphere and thus the analysis of society must proceed from an economic point of view.

What are then the factors that determine people's decisions to associate? First, Mises and De Tracy both refer to the rational ability of human beings to perceive the benefits of their association

and cooperation. De Tracy writes: "It is then impossible that we should not soon be *aware of the utility* we may derive from the succour of our fellow beings; from their assistance in our wants, from the concurrence of their will, and of their force with ours... always, and every where [sic]" (2009, p. 60; emphasis added). Or, in Mises's words, "every step by which an individual substitutes concerted action for isolated action results in an immediate and *recognizable* improvement in his conditions" (Mises, 1998, p. 146; emphasis added).

If men can rationally and consciously choose between two states of affairs, they are then able to understand the benefits of cooperation in relation to those of isolated production. In consequence, the recognition of the benefits of living in a society does not have anything to do with instincts or happenstance.[6] Man, De Tracy writes, "has the intellectual means… to make conventions with his fellow beings… [and] he alone has a real society" (2009, p. 66). For Mises as well, "society is the product of thought and will. It does not exist outside thought and will" (Mises, 1962, p. 291).

Whence do the benefits of cooperation arise? The answer to this is detailed in Mises's exposition of the Law of Association, which according to its author "makes us comprehend the tendencies which resulted in the progressive intensification of human cooperation" (Mises, 1998, p. 159). Mises argues that cooperation is more productive than isolated labor for two reasons: "First: the innate inequality of men with regard to their ability to perform various kinds of labor. Second: the unequal distribution of the nature-given, nonhuman opportunities of production on the surface of the earth" (Mises, 1998, p. 157). He further shows that "if and as far as labor under the division of labor is more productive

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[6] Forget (2001) argues that De Tracy's *idéologie*—which influenced J.-B. Say to reject Smith's spontaneous order social analysis—"emphatically reject[ed] the idea that social institutions evolve and develop as an *unplanned* response to the *uncoordinated* behavior of many discrete and self-interested agents" (Forget, 2001, p. 194; emphasis added). However, Forget seems to misconstrue De Tracy's doubts about the spontaneous order of society as a call for social planning by a legislator or an educator (cf. Forget, 2001, 207–208). The more plausible interpretation, given the evidence in this paper as well as De Tracy's skepticism of government action throughout his body of work, is that his social analysis fits squarely with Mises's social rationalism, in which society is neither centrally planned, nor accidental, but the purposeful outcome of many discrete rational decisions to associate and cooperate.

than isolated labor, and if and as far as man is able to realize this fact, human action itself tends toward cooperation and association; man becomes a social being" (Mises, 1998, p. 160).

De Tracy agrees with Mises with regards to the factors that determine the superior productivity of labor under cooperation. The French philosopher writes: "When several men labour reciprocally for one another, every one [sic] can devote himself exclusively to the occupation for which he is fittest, whether from his natural dispositions or from fortuitous circumstances; and thus he will succeed better" (De Tracy, 2009, p. 67).[7] This social cooperation can also be understood, as Destutt de Tracy defines it, as an exchange of occupations: "[a man] exchanges one manner of occupying himself against another, which becomes more advantageous to him than the other would have been. [...] By the effect of social combinations, and by the separation of the different kinds of occupation, which is its consequence, every one devotes himself to a particular kind of industry" (De Tracy, 2009, pp. 61, 79). This exchange of occupations, always beneficial for both parties and undertaken precisely because men perceive and understand these benefits, brings about specialization or "what is called the division of labour, which in civilised society is sometimes carried to an inconceivable point, and always with advantage" (De Tracy, 2009, p. 67).

Under these circumstances, what is society? Both authors' definitions are worth quoting at length:

> I do not fear to announce it. Society is purely and solely a continual series of exchanges. It is never any thing [sic] else, in any epoch of its duration, from its commencement the most unformed, to its greatest perfection. And this is the greatest eulogy we can give to it, for exchange is an admirable transaction, in which the two contracting parties always both gain (De Tracy, 2009, p. 61).

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[7] De Tracy argues in terms of Smith's absolute advantage, likely due to the fact that David Ricardo's treatise was published in 1817, the same year as De Tracy's *Treatise*. Nevertheless, De Tracy's view is not as problematic as Smith's, for he writes: "we are all producers or manufacturers,—because there is no person so unfortunate as never to do any thing [sic] useful" (De Tracy, 2009, p. 79). We can then charitably reconcile De Tracy's position, from this point of view, with the comparative advantage approach that Mises held.

Equally for Mises (1998, p. 143), society is "division of labor and combination of labor,"

> an outcome of human action... the outcome of a purposeful utilization of a universal law determining cosmic becoming, viz., the higher productivity of the division of labor. As with every instance of action, the recognition of the laws of nature is put into the service of man's efforts to improve his conditions (Mises, 1998, p. 145).

> [...] seen from the point of view of the individual, society is the great means for the attainment of all his ends… [where] each participant sees the other partner's success as a means for the attainment of his own (Mises, 1998, pp. 164, 168).

The two authors also show that division of labor and specialization go, in time, through a process of intensification. According to De Tracy, the great benefits of society "augment in an incalculable ratio, in proportion as they are perfected, and every degree of amelioration, in the social order, adds still to the possibility of increasing and better using them" (De Tracy, 2009, pp. 67–68). Or, in Mises's words, division of labor "is itself a factor bringing about differentiation… [which] intensifies the innate inequality of men. [...] Vocational types emerge, people become specialists" (Mises, 1998, p. 164).

Last but not least, there is also a remarkable similarity between the two authors' critiques of alternative social theories. Destutt de Tracy comments in passing on Smith's concept of "propensity to exchange," drawing attention to the importance of understanding cooperation as rational and purposeful, and not spontaneous or accidental. He writes: "Smith… is the first who has remarked that man alone makes exchanges, properly speaking. [...] I regret that in remarking this fact he has not sought its cause with more curiosity. It was not for the author of the theory of moral sentiments to regard as useless a scrutiny of the operations of our understanding" (De Tracy, 2009, p. 66). De Tracy also charitably interprets Rousseau's social contract theory, elegantly reconciling it with his own view of society as a catallactic process: "It is evident [people] could not live together, if by a convention formal or tacit they did not promise each other, reciprocally, surety. Well! this convention is a real exchange; every one renounces a certain manner of employing his force, and receives in return the same sacrifice on the part of all the others" (De Tracy, 2009, p. 61).

Both remarks are echoed by Mises, who is, however, more dismissive of Rousseau's theory. Mises's critical views are contained in the chapter on society and the law of association in *Human Action*, where he argues,

> In order to comprehend why man did not remain solitary... we do not need to have recourse to... the empty hypostasis of an innate urge toward association. Neither are we forced to assume that the isolated individuals or primitive hordes one day pledged themselves by a contract to establish social bonds. The factor that brought about primitive society and daily works toward its progressive intensification is human action that is animated by the insight into the higher productivity of labor achieved under the division of labor (Mises, 1998, pp. 159–160).

IV. THE INTERNATIONAL DIVISION OF LABOR

The previous two sections have shown that according to Destutt de Tracy and Ludwig von Mises, society evolves through voluntary economic interactions between individuals, in which everybody rationally and purposefully strives for their own rightly understood interest. The two rationalist and catallactic theories of social evolution, written 130 years apart, can thus be briefly summarized in one central definition: society represents the complex inter-human relationships which result from the purposeful recognition of the mutual benefits of economic cooperation. In this view, division of labor and society are equivalent. "Commerce is the whole of society," writes Destutt de Tracy, because "society from its origin is essentially nothing but a continual commerce, a perpetual series of exchanges of every kind" (De Tracy, 2009, pp. 66, 98).

Let us now discuss the global consequences of social cooperation and of the progressive intensification of social and economic bonds identified by the two authors.

Destutt de Tracy and Mises trace in their writings the gradual development of society from the smallest areas to a global dimension. According to De Tracy, division of labor and commerce unite "in the first place inhabitants of the same canton. Then the different cantons of the same country, and finally different nations" (De Tracy, 2009, p. xxxiii). In the same way, Mises argues that society develops "subjectively by enlarging its membership….

Originally confined to the narrowest circles of people, to immediate neighbors, the division of labour gradually becomes more general until it eventually includes all mankind" (Mises, 1962, p. 314).

As a logical consequence of this reasoning, international trade is to be simply understood as the international division of labor. De Tracy writes that "the greatest advantage of external commerce, the only one meriting attention, is its giving a greater development to that which is internal" (De Tracy, 2009, p. xxxiii). The purpose of inter-national trade, De Tracy continues, is "to establish between different nations the same relations which interior commerce establishes between different parts of the same nation, to constitute them, if we may thus speak, in a *state of society with one another*; to enlarge thus the extent of market for all, and by this mean increase likewise the advantages of the interior commerce of every one" (De Tracy, 2009, p. 101; emphasis added). By the same token, Mises makes a more general, theoretical point about the separation between theories of domestic and foreign trade. Mises writes: "there is no basis for seeking a fundamental difference between the effects of freedom in domestic trade and in foreign trade. If the mobility of capital and labor internally differs only in degree from their mobility between countries, then economic theory can also make no fundamental distinction between the two" (Mises, 1983, p. 92).[8]

The logical conclusion which follows from the fact that international exchange is the natural extension of local cooperation is that international trade is necessarily beneficial to all parties involved in transactions across national borders. Mises puts it briefly and clearly: "The international division of labor is a more efficient system of production than is the economic autarky of

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[8] Mises's analysis is more sophisticated than De Tracy's on this matter, as Mises also challenges the restrictive assumptions of the Ricardian comparative cost principle. For instance, Mises argues that

> the tendency inheres in free trade to draw labor forces and capital to the locations of the most favorable natural conditions of production without regard to political and national boundaries… therefore, unrestricted free trade must lead to a change in the conditions of settlement on the entire surface of the earth; from the countries with less favorable conditions of production capital and labor flow to the countries with more favorable conditions of production (Mises, 1983, p. 92).

every nation. The same amount of labor and of material factors of production yields a higher output. This surplus production benefits everyone concerned" (Mises, 2010, p. 73). De Tracy also describes the benefits of international commerce as "owing to the better employment of every local advantage and of the faculties of every individual, without a necessity for [any] nation to have made the smallest profit at the expense of any other nation" (De Tracy, 2009, p. 100).

Notwithstanding these benefits of social cooperation, both De Tracy and Mises acknowledge with regret that men have many times in history tried to hamper its development through numerous economic and military conflicts. These conflicts undermine the basic premise of social cooperation, i.e. its peaceful, voluntary character. Destutt de Tracy laments the fact that amongst "the efforts of men, for the amelioration of their lot... always a great portion of the human power has been employed in hindering the progress of the other... [and] many times perhaps all has been lost and destroyed, even the knowledge acquired, even the capacity of re-commencing that which had been already done" (De Tracy, 2009, p. 65). Mises also asserts that "when men fight against men… there is, between the fighting parties, reciprocal effect and mutual relation, but no society" (Mises, 1998, p. 168).

At the same time, both Mises and De Tracy reveal that the progressive intensification of division of labor and international cooperation remain the surest ways to offset these anti-social initiatives. Mises, for example, explains that "all waging of war is dependent on the state of the division of labor reached at the time. Autarkic economies can go to war against each other; the individual parts of a labor and trade community can do so, however only insofar as they are in a position to go back to autarky. For that reason, with the progress of the division of labor we see the number of wars and battles diminishing ever more and more" (Mises, 1983, p. 182). It is likely De Tracy has similar arguments in mind when, continuing his discussion on the effects of war, he optimistically comforts his readers that there are "many reasons we ought to be assured against the fear of such misfortunes in future" (De Tracy, 2009, p. 65).

Government intervention remains, however, the one danger against which human society must fight from within, and to the

effects of which it is nowadays more exposed than ever. As laissez-faire political economists, both De Tracy and Mises repeatedly caution readers against the perils of partial or total state control over market prices. Through either conspicuous or subtle means—such as price controls or alterations in the purchasing power of money respectively—governments make economic organization based on the division of labor more and more impracticable.

Destutt de Tracy described the ultimate consequences of these actions as a world in which "society ceases and universal brigandage begins…. All trades are abandoned. There is no longer possibility of living on the produce of regular industry: every one subsists on what he can conceal, or on what he can lay his hands, as in an enemy's country.... We may say in the strictest sense, that society is dissolved; for there is [sic] no longer any free exchanges" (De Tracy, 2009, p. 113). Mises also believed that sustained government intervention in the structure of money prices could not be accomplished "without overthrowing the system of social division of labor" (Mises, 1953, p. 247). He argued that "it is the social spirit, the spirit of social co-operation, which forms, develops, and upholds societies. Once it is lost, the society falls apart again. The death of a nation is social retrogression, the decline from the division of labour to self-sufficiency. The social organism disintegrates into the cells from which it began. Man remains, but society dies" (Mises, 1962, p. 309).[9]

V. CONCLUSION

The purpose of this paper was to offer a preliminary note on some important similarities between Destutt de Tracy and Mises's theories on social evolution. As we have seen, the two authors share

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[9] For these ideas, Mises acknowledged an intellectual debt not to Destutt de Tracy, but to the French sociologist Jean Izoulet (1895), from whom both Mises and Herbert Spencer (1860) borrowed the imperfect analogy between human societies and the 'division of labour' among cells of biological organisms. Mises, however, qualified this analogy: "The process that differentiates and integrates homogeneous cells is completely different from that which led to the growth of human society out of self-sufficient individuals. In the second process, reason and will play their part in the coalescence, by which the previously independent units form a larger unit and become parts of a whole, whereas the intervention of such forces in the first process is inconceivable" (Mises 1962, 291).

a praxeological foundation for their theories, i.e. they understand human action, informed by human reason, as the prime mover of all economic and social phenomena. Consequently, both Mises and Destutt de Tracy advanced a catallactic and rationalist view of social evolution, in which society is the outcome of purposeful human behavior, of the rational discovery of the benefits of association and cooperation. For both authors, society was synonymous with division of labor and free economic exchange.

It remains a task for future research in the history of thought to establish whether Destutt de Tracy's *Treatise on Political Economy* should be considered the 'locus classicus' of the social rationalism which found its fullest expression in Mises's *Human Action*. This investigation should also be extended to reveal the yet undocumented influence of Destutt de Tracy on Misesian thought, as well as to assess the importance of social rationalism relative to other social theories. Yet even without a documented historical and intellectual link between the works of Mises and Destutt de Tracy, the contributions of both authors retain their originality and uniqueness in a panoply of social theories that originate outside the teleological realm of human rationality and economic cooperation.

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FROM MARSHALLIAN PARTIAL EQUILIBRIUM TO AUSTRIAN GENERAL EQUILIBRIUM: THE EVOLUTION OF ROTHBARD'S PRODUCTION THEORY

PATRICK NEWMAN

ABSTRACT: This paper analyzes a recently reconstructed proto-chapter of Rothbard's *Man, Economy, and State* (2009 [1962]) tentatively titled "Chapter 5: Producer's Activity" (Rothbard, 2015 [1953]). In it, Rothbard used many concepts of standard neoclassical microeconomic analysis that he would later criticize, such as perfectly competitive markets and the isolated firm. This paper juxtaposes the proto-chapter with Rothbard's finished work and argues that after grappling with the problems of Marshallian partial equilibrium production theory, Rothbard substituted it with an Austrian general equilibrium analysis. This distinctive approach did not construct production theory from the vantage point of an isolated price taking firm, but rather viewed the overall economy as a temporal and dynamic production structure with the capitalist-entrepreneur occupying the central role. This Austrian production theory has important consequences for understanding the efficiency of markets, the formation of output and input prices, and the profit-maximizing output level of an isolated firm.

[C]oncentration on a single firm and the reaction of its owner is not the appropriate route to the theory of production; on the contrary, it is likely to be misleading…. In the current literature, this preoccupation with the single firm rather than with the interrelatedness of firms in the economy has led to the erection of a vastly complicated and largely valueless edifice of production theory (Rothbard, 2009 [1962], p. 455).

I: INTRODUCTION

Murray Rothbard's *Man, Economy, and State* (2009 [1962]) is a landmark book in Austrian economics. Following earlier writers, especially Ludwig von Mises (2008 [1949]), it is written in the form of a treatise that derives the general body of economic theorems from the ground up, starting with isolated individual action, moving on to various forms of interpersonal exchange, and ending with government intervention. When developing this economic organon Rothbard synthesized the works of many economists working in the Austrian tradition, including Carl Menger, Eugen von Böhm-Bawerk, Frank Fetter, Phillip H. Wicksteed, Ludwig von Mises, and F.A Hayek. The Austrian approach concentrates on issues such as real world price formation, entrepreneurship and the market process, and the relationship between time and the production structure. It uses the praxeological method—deduction grounded on the axiom that humans act purposively along with other realistic assumptions, such as that there exists a variety of natural resources and that humans value leisure as a consumer good (Salerno, 2009, pp. xxxii–xxxiii).

One of Rothbard's monumental contributions was the construction of a systematic production theory that integrated various strands of thought developed by earlier writers working in this tradition, which included capital and interest, the structure of production, rent and factor pricing, and entrepreneurship theory (Salerno, 2009, p. xxvi). For example, one achievement was his integration of the Mises-Fetter pure time preference theory of

interest with the Hayek-Knut Wicksell structure of production analysis (Salerno, 2009, p. xxvii; Rothbard, 2009 [1962], p. lvii). In general, his production theory integrated all of the interrelations of the production structure and set out to actually explain the formation of output and input prices throughout the economy. This synthesized Austrian production theory is different from the more well-known Marshallian partial equilibrium approach. The latter approach is best represented in modern economics by Chicago production theory, which was mainly developed by George Stigler and Milton Friedman, who built off the works of Alfred Marshall and Frank Knight (Salerno, 2011, pp. 1–2). This theory analyzes equilibrium production decisions from the viewpoint of an isolated firm with given input and output prices.[1]

In contrast, Austrian production theory is the halfway house, or middle ground, between excessive microeconomic analysis, which is the Marshallian partial equilibrium approach that concentrates on a single firm facing fixed prices, and excessive macroeconomic analysis, which is the contrasting Keynesian aggregative approach that hermetically seals off sectors of the economy from each other. It shows that a change in any sector of the economy must always impart its influence through repercussions in the structure of prices and production in other sectors. This Austrian general equilibrium is starkly different than Walrasian general equilibrium for three important reasons. The first is that it is dynamic and not static because it shows the equilibrating processes between equilibrium states that are driven by profit seeking capitalist-entrepreneurs and emphasizes the importance of uncertainty and change. The second is that it recognizes the temporal heterogeneous capital structure. The third is that it expresses its theorems using verbal logic rather than non-causal mutually determined mathematical equations (Rothbard, 2009 [1962], p. 361; 2008 [1963], pp. 65–66). At the beginning of his treatise, Rothbard laid out this distinction:

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[1] In this paper the Chicago "theory of the firm" refers to the "black box" production function view where the firm is given a set of underlying data and chooses its output level through mathematical optimization (Klein, 2010a [1996], pp. 3–4; Foss and Klein, 2012, pp. 136–137). It does not refer to the Coasean theories that analyze the reasons for the existence, organization, and limits of the firm. With regards to the latter, Rothbard was heavily influenced by Coase and was one of the first economists to incorporate the Coasean framework (Klein, 1996, pp. 13–18).

> One "radical" feature of our analysis of production is a complete break
> with the currently fashionable "short-run" theory of the firm, substi-
> tuting for this a general theory of marginal value productivity and capi-
> talization. *It is a "general equilibrium" analysis in the dynamic Austrian sense,
> and not in the static, currently popular Walrasian sense* [author's emphasis]
> (Rothbard, 2009 [1962], p. lvii).[2]

What is unknown is that the original drafts of Rothbard's treatise
contained a production theory grounded in Marshallian partial
equilibrium theory, and that it was only after writing large parts
that Rothbard realized much of it was untenable. Only in a 1990
interview did Rothbard briefly mention the lost chapter, stating that
"I took Chapter 5 out of *Man, Economy, and State*, which included
the usual cost-curve analysis. I wrote the whole chapter before I
realized that the approach I was taking was nonsense. So I started
over" (Rothbard, 1990). Tentatively titled "Chapter 5: Producer's
Activity" (2015 [1953]), the chapter was recently reconstructed by
the present author from the Rothbard archives at the Ludwig von
Mises Institute. Among other things, what is particularly interesting
is that Rothbard constructed the chapter from the point of view of
an individual firm and based on four concepts he later changed his
mind about: the distinction between a free market competitive and
monopoly price; the model of perfect competition and the price taker
assumption for output prices; using the price taker assumption for
input prices and the isoquant-isocost framework to derive factor
demand curves; and using the isolated firm as a unit of analysis to
understand optimal production and investment decisions.

This paper traces the evolution of Rothbard's thinking on
these issues. It is important to realize that this is not merely an
arcane exercise in the history of economic thought, as juxtaposing
Rothbard's divergent production theories highlights important
differences and shows the weaknesses of modern Marshallian
partial equilibrium production theory using Austrian general
equilibrium theory. This reinforces the view of Klein (2010b [2008],
p. 149) that the "mundane economics" of the Austrian school is
distinct from the neoclassical paradigm.

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[2] Mark Blaug has similarly contrasted what he calls Austrian "total equilibrium
analysis" with both Marshallian partial equilibrium and Walrasian general equi-
librium analysis (Blaug, 1990, pp. 185–186).

The competitive-monopoly price distinction is inappropriate for analyzing free market situations because it arbitrarily assumes that a certain price is competitive and a higher price that increases revenue is monopolistic. Both prices still are market prices that are consonant with consumer wants, especially when one realizes the restriction of output that increases revenue releases factors of production that can be used elsewhere. The price taker assumption in perfect competition is unrealistic because every firm contributes to the total market supply and commands some influence on its output price. As a result, all firms are price searchers and engage in so-called "imperfect" competition, and the traditional efficiency benchmark of perfect competition is a poor standard because it is impossible to attain. The factor demand curve derived from the isoquant-isocost framework does not actually explain the formation of the input price it sets out to explain, nor does it show the causal influence of the output price on the input price. Lastly, the correct unit of analysis for understanding optimal production and investment in a firm is not that of the manager of a firm, but rather that of the capitalist-entrepreneurs who invest in the firm. This is because unlike the manager of a firm, the capitalist-entrepreneurs can invest in multiple firms. The most important implication of this is that, as opposed to a static general equilibrium where all investment returns are equal, in a dynamic world of multiple investment opportunities for capitalist-entrepreneurs with varying degrees of profitability, profit may not be maximized in a given firm where its marginal revenue equals marginal cost (MR = MC).

The rest of the paper is outlined as follows: Section II goes through a brief history of Rothbard (2015 [1953]) and his changing ideas on production theory; Section III juxtaposes Rothbard's analyses of monopoly prices and perfect competition; and Section IV compares Rothbard's analyses of the derivation of factor demand curves. Section V discusses the profit maximizing output level of a firm in a dynamic world, and Section VI concludes.

II: A HISTORICAL OVERVIEW OF ROTHBARD'S PRODUCTION THEORY

In the fall of 1949, the Volker Fund asked Rothbard to write a "college-style" economics textbook modeled after Mises's *Human*

Action (1949). After Mises reviewed and approved a sample chapter on money, Rothbard began working on the project. What was originally supposed to be a principles level textbook developed into an advanced economic treatise that would occupy a large part of Rothbard's intellectual efforts in the 1950s and would eventually be transformed into *Man, Economy, and State*.[3] The order in which he initially wrote the textbook mirrored the structure of his later treatise. By April 1953 he had written rough drafts of what can be considered Chapters 1-4 of *Man, Economy, and State* (Stromberg, 2004, pp. xxvi–xli).

Following this order, Rothbard then moved on to writing a large chapter on production theory, tentatively titled "Chapter 5: Producer's Activity" (2015 [1953]). Its main focus was the production decisions of an individual firm and an analysis of input and output pricing. It also contained a competitive versus monopoly price framework which included perfect competition. When discussing the production decision of a firm he derived constant outlay (isocost) and constant product (isoquant) schedules as well as rates of constant outlay and constant product substitution in order to show that the cost-minimizing level of output is where these two rates are equal. Rothbard also developed a theory of the optimal investment decision of the producer.

One important feature of the chapter is that it lacks a Misesian or Austrian "feel." As the original plan was for Rothbard to write a textbook version of Mises (1949), this is surprising and puts a unique perspective on the chapter. His earlier chapters had followed Mises and earlier Austrians more closely as they directly dealt with topics those writers concentrated on. His first chapter had tried to clarify Mises's analysis of the fundamental laws of praxeology, i.e., the means end relationship and the laws of marginal utility, time preference, and returns (Stromberg, 2004, p. xxxii). His other chapters, particularly those on exchange and pricing, built significantly on writers other than Mises, not because they were different, but because Mises had assumed his audience already knew the material, and as a result had not covered supply and demand analytics in depth (Stromberg, 2004, p. xxxv). For

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[3] Throughout this period Mises asked Rothbard to present some of the chapters at his New York University seminar (Hülsmann, 2007, pp. 936, 939).

example, when it came to basic price analytics, Mises simply assumed his readers understood the "marginal pairs" framework, and briefly cited Böhm-Bawerk (1959 [1889], pp. 207–256) for those who wanted more information (Mises, 1949, pp. 202, 324). Aside from citing Fetter on time preference, which Rothbard planned to elaborate upon in a later chapter, and citing Mises and others on monopoly price theory, for the bulk of the chapter Rothbard mainly utilizes the standard tools of price theory, in particular relying on Stigler (1947 [1946]) and Weiler (1952). This is interesting because Rothbard (2009 [1962]) would use these works as models for criticism of contemporary production theory. Rothbard's initial use of these writers and not Mises most likely stems from the fact that Mises did not talk about what Rothbard wanted to discuss, namely the optimal production decisions of an individual firm.

Ultimately, Rothbard decided that this approach was totally in error for reasons to be described in later sections, and as a result proceeded to completely rewrite his production theory. In particular, he realized he would have to forge a new path into areas that Mises did not explicitly develop, and in some cases—such as the competitive versus monopoly price distinction—correct his views. This decision was mainly responsible for his proposal in February 1954 to switch from writing a textbook of Mises (1949) to a full blown economics treatise. Writes Rothbard:

> The original concept of this project… was as a step-by-step, spelled-out version of Mises's *Human Action*. However, as I have been proceeding, the necessary elaborations on the sometimes sparse framework of Mises has led inevitably to new and original presentations. Now that I have been proceeding to the theory of production where the whole cost-curve situation has to be faced, Mises is not much of a guide in this area. It is an area which encompasses a large part of present-day textbooks, and therefore must be met, in one way or another. Mises, in his treatise, deals only tangentially with the problem[4] and really with good reason, but a more detailed treatise, or one that attempts to be a textbook, must tackle this issue. After much thought about the problem, and many false writing starts, I have come to the conclusion that the whole complex of cost curves… and the whole emphasis on the size of firm, cost curves to plant, etc., …is all erroneous speculation on technological irrelevancies. [T]his whole line of approach [is] now glorified in the texts as the "theory

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[4] Rothbard is most likely referring to Mises (1949, pp. 336–347).

of the firm". … [T]he first draft of Chapter 5… is now being completely rewritten to omit "the theory of the firm".… [It] has become evident from my work on the book, that the result cannot be a textbook of general principles in the traditional sense" (Rothbard, 1954, pp. 1–2; Stromberg, 2004, pp. xli–xliv).

By July 1955, Rothbard decided to split his work on production into multiple chapters, what are now Chapters 5–10 of Rothbard (2009 [1962]) (Stromberg, 2004, p. liv). Major work on the book apparently stopped around 1956, but by 1959 Rothbard had completed it (Stromberg, 2004, p. lxiii). As explained below, Rothbard's revised production theory did not suffer from the pitfalls of the partial equilibrium firm analysis of his early work. It is now time to turn to a discussion of Rothbard's evolution on some of these critical matters.

III: THE COMPETITIVE-MONOPOLY PRICE AND PERFECT-IMPERFECT COMPETITION

The original marginalist framework used to analyze the pricing decisions of firms was the competitive-monopoly price distinction. If a firm was able to restrict output and raise price above the competitive market price such that it increased revenue (i.e., the demand curve is inelastic above the competitive price), it was said to attain a monopoly price. This old competitive-monopoly price distinction was not exclusively neoclassical but also included prominent Austrian economists such as Mises, Menger, Fetter, and Wieser (Rothbard, 2009 [1962], p. 672). Kirzner (2013 [1973], pp. 15–18, 70–107) provides the most recent defense and elaboration of Mises's views. During the Monopolistic Competition Revolution in the 1930s, this approach was superseded by the familiar perfect-imperfect competition framework (Salerno, 2004; Rothbard, 2009 [1962], p. 720). Modern economics now analyzes markets as situations where firms engage in either perfect or imperfect competition. Under perfect competition, the individual firm is so small relative to the total market that it has no influence on the price of its product and takes the market price as "given," i.e., it can increase or decrease its output without changing the price. There are no barriers to entry, all firms in the given market produce a homogenous product, and all firms in the market have perfect

knowledge (Stigler, 1946, p. 21).[5] Under imperfect competition, the firm has an influence on the price of its product, because when it increases or decreases its output, the price has to change.[6] The important assumption for Rothbard (2015 [1953]) was the inability of the producer to influence the output price.

Rothbard's earlier production theory employed both frameworks in a hybrid fashion. In the first two sections of Chapter 5, titled "Section 1: The Demand for a Firm's Product" and "Section 2: Competitive Price and Monopoly Price" he discusses the various production possibilities that a firm can use to make Good A, and explains the scenario under different pricing situations. Rothbard presents possible combinations of inputs X and Y that can make varying amounts of Good A at a constant cost by assuming the prices of X and Y are fixed (Rothbard, 2015 [1953], pp. 494–95). Rothbard then analyzes the firm's output decision in various pricing scenarios (a), (b), and (c) for Good A. In (a), the firm's individual demand curve is horizontal, or perfectly elastic, as opposed to sloping downward as in (b) and (c). In (b) and (c), the demand curves the firm faces are downward sloping, but in (b) the point of maximum output from a given amount of money invested in the factors is the point of maximum revenue, while in (c) the point of maximum revenue is no longer at maximum output, i.e., the demand curve is inelastic above the point of maximum output, and it pays for the firm to restrict output relative to what it could have produced (Rothbard, 2015 [1953], pp. 495–501). Rothbard considers both case (a), which is traditionally described as perfect competition, and case (b) as where a competitive price would result, and case (c) as one where a monopoly price would result (Rothbard, 2015 [1953], pp. 501–02).

Rothbard grudgingly uses these terms, noting that their use in economics is unfortunate and misleading, but that they "must be used for traditional reasons" (Rothbard, 2015 [1953], pp. 503–04, 510). Much of his analysis in Section 2 on monopoly prices and monopoly are whole paragraphs later reproduced in Rothbard (2009 [1962]) in "Chapter 10: Monopoly and Competition." For example, Rothbard here notes that a monopoly was originally defined as a

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[5] The price assumption also applies to input prices, which are treated in the next section.

[6] Imperfect competition can still occur with no barriers to entry and perfect knowledge.

grant of state privilege to produce a good or service, that defining a monopolist as the producer of a single good is a poor definition, and that there is a built in tendency for cartels to break down. Rothbard even notes that a monopoly price is not in defiance of the consumers and is not immune from competition since all goods compete for the consumer's money. The exchanges are still voluntary because the consumers still voluntarily form their demand curves (Rothbard, 2015 [1953], pp. 510–12). Interestingly, Rothbard pins the unfortunate monopoly-competitive price distinction on Marshallian partial equilibrium theory, as he writes that "the terminology is the result of an old Neoclassical preoccupation with single "industries" (Rothbard, 2015 [1953], p. 510).

Rothbard later, quite famously, scrapped the entire competitive-monopoly price distinction and trenchantly critiqued it (Rothbard, 2009 [1962], pp. 672–704). Rothbard wrote that the entire distinction on the free market is spurious because it is impossible to define a competitive price. There is no way to look at the demand curve a firm faces and decide what is a competitive price and what is a monopoly price (Rothbard, 2009 [1962], p. 689). In order to show that a firm achieves a monopoly price by restricting output along an inelastic demand curve to increase revenue, one has to assume the original price was a competitive price. But this is completely arbitrary because a competitive price cannot be identified since in both cases the firm is trying to produce at the most profitable level of output. Rothbard notes that there is no way to distinguish the monopoly price situation from a situation in which the capitalist-entrepreneur has overestimated the demand for a given stock of a good and realizes he can earn more by producing less. Moreover, this analysis of a "restriction of production" is spurious in general once it is realized that the decreased production releases factors of production that can be used elsewhere in the economy. Those factors will go to more profitable uses that better satisfy consumer wants (Rothbard, 2009 [1962], pp. 638, 690). Even the requirement that the demand curve be inelastic above the competitive price is arbitrary, because as Méra (2010, pp. 51–55; 2015) points out, the demand curve could be elastic above the competitive price yet net revenue still increases because costs of production fall by even more. The competitive-monopoly price distinction that tries to show a violation of consumer sovereignty is a misleading partial

equilibrium framework that narrowly concentrates on one market instead of looking at the entire economy.[7]

What of case (a), a situation of perfect competition where there is a perfectly elastic demand curve? Rothbard initially also seemed to grudgingly use it and contradicted himself at times when he defended its applicability. Rothbard describes the perfectly competitive case (a) as a situation where regardless of how much the firm produces, "the market-supply curve will not be affected sufficiently to lower the price" (Rothbard, 2015 [1953], pp. 495, 499–500, 502). One could extend Rothbard's logic to the traditional neoclassical juxtaposition of the firm's perfectly elastic demand curve and the industry downward sloping demand curve (Stigler, 1946, p. 91). Figure 1 depicts the distinction:

Figure 1

Market Demand Curve   Individual Firm's Demand Curve
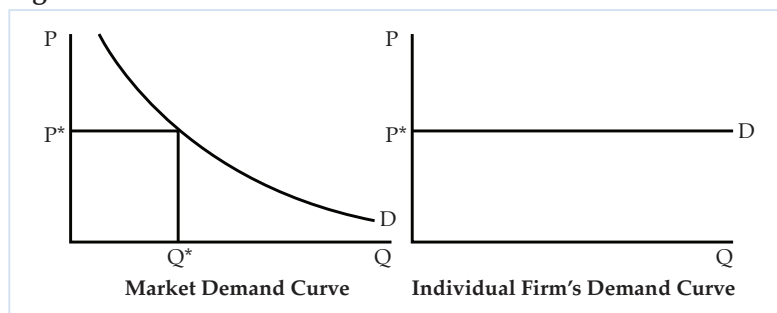
Such a comparison is done to highlight the fact that the firm's marginal contribution to output is "so" small it cannot affect the price. Only large enough increases in supply can accomplish that. Rothbard writes that even in case (a) with a change in output there had to be "some effect" on the supply curve that would "tend to affect the price," but that the overall change was "too small to alter the point of intersection" (Rothbard, 2015 [1953], p. 496). When later Rothbard reiterated that the market supply is always affected, he stated that "It

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[7] This is not to deny, as Rothbard emphasized, that the distinction is unimportant when a government intervention allows the firm to restrict output and attain a monopoly price. Here the element of coercion has tampered with the voluntary actions of consumers, and now the restriction is in defiance of their choices. For the consequences of factor pricing under such situations, see Méra (2010).

may well be, of course, that, within the relevant range, the action of the firm is not large enough in relation to the product as a whole, to change the market-price" (Rothbard, 2015 [1953], p. 539).

Rothbard's defense of the model is confusing. How is it possible that every change in supply must tend to affect the price, but in some scenarios when the change is small enough price does not change? Either every change must influence price, including those extremely small, or some marginal amounts of supply have no impact. Basic economic analysis shows that Rothbard's original logic is correct: every nonzero change in supply must change the market price. Total market supply is the sum of the individual supplies produced by the firms; an increase in the output of one must increase the supply and lower the price.

The error comes in approximating a very small number as zero. For example, Stigler compares a market with 10,000 sellers where each produces an equal quantity. If one firm increases its sales by 100 percent, then the total quantity increases by 0.0001 percent, which is so imperceptible that it can be treated as zero (Stigler, 1946, pp. 91–92). But 0.0001 percent is not equal to 0 percent. Stigler (1957, p. 8) recognizes this and writes that only when there are an infinitely large number of firms does every firm have zero influence on price and a perfectly elastic demand curve. Otherwise, every firm has an (albeit extremely small) nonzero influence on price and faces a downward sloping demand curve. However, he maintains that as the number of firms increase, the market approximates perfect competition.[8] But infinity is not a real number and can never be "reached," so it is impossible for a firm to have no influence on price. And approximating a very small number as zero has enormous implications that drastically changes how the market is analyzed. Every firm, no matter how small, must have an influence on supply: the perfectly elastic demand curve is impossible.[9]

The constant price assumption does seem plausible when taken from the real world perspective of an individual firm with many

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[8] See also Hirschleifer et al. (2007, p. 165) argues along similar lines: "While [perfect competition is] never literally true, this may approximate reality if the firm produces only a small fraction of the output in its industry."

[9] For more, see Keen (2011, pp. 76–77, 85–90, 95), who presents a critique very similar to Rothbard (2009 [1962]), although from a more mathematical perspective.

competitors. The firm, when entering the market, "looks around" at the going market price for a given homogenous product. It certainly uses this as an estimate and appraisement for the future selling price of its product. It may in fact sell all its stock at the ruling price. But this does not mean that the demand curve is horizontal; all it means is that the demand curve shifted slightly outward to accommodate the increased supply, or that some producers now have a surplus of unsold goods (which means that not all of the supply was sold at the market price). If all else could be held equal in the real world when the producer sells his additional supply, then the price would have to fall (Armentano, 1999 [1982], p. 23). The isolated firm approach is completely unhelpful and misleading when analyzing the formation of the output price. Only when one understands this and abstracts from the firm to look at the market as a whole is the fallaciousness of the approach revealed. Even though the output price is determined by the industry supply and demand curves, each individual firm within the industry confronts a downward-sloping demand curve that gives it some influence over price. Rothbard (2009 [1962], pp. 721–722) later realized this insight and as a result concluded that the perfectly elastic demand curve was a deceptive illusion and "utterly fallacious."

In addition to his critique of the competitive-monopoly price distinction, Rothbard's argument that the perfectly competitive framework is invalid because it is impossible for a firm not to have any influence on its output price is a unique criticism in the Austrian tradition. The most well-known Austrian work in this field is Hayek (2009 [1946]), which does not attack the price taker assumption but instead the assumption of perfect knowledge. Hayek emphasized that competition is not an end state but rather a dynamic process involving entrepreneurship and uncertainty. The capitalist-entrepreneur is not given the relevant knowledge, such as the demand curve, but instead must estimate and discover it in the market. Similar Austrian criticisms include Ludwig Lachmann (1977 [1954]) and Israel Kirzner (2011 [1963], pp. 312–315; 1973, pp. 71–74, 90–95).[10] Real world competition is not an optimization problem with given demand and cost curves, but rather requires

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[10] Kirzner notes that Mises thought the model was confusing and unrealistic, and intentionally avoided discussing it (Kirzner, 2001, pp. 100–101).

uncertainty bearing capitalist-entrepreneurs trying to estimate consumer wants and allocate resources using economic calculation, i.e., profit and loss accounting (Mises, 1949, pp. 349–354). This is not to say that Rothbard disagreed with their argument. In fact, he embraced it and emphasized it in his analysis.[11] Rothbard just added additional arguments regarding competitive prices and perfect competition.

Once it is realized that every firm's demand curve slopes downward, no matter how slightly, all firms engage in imperfect competition, and the differences between them are only of degree and not of kind. The degree refers to the relative slope of the demand curve, while the kind is the difference between a downward sloping demand curve and an impossible horizontally sloping one. There is no longer a difference in the kind of demand curve for the small wheat farm and the Hershey Chocolate Company, as both face a demand curve that slopes downward (Rothbard, 2009 [1962], pp. 721–22). This has important implications for some neoclassical efficiency analyses of competition. It is held that imperfect competition is less efficient than perfection competition because the former's most profitable level of output is only where MR = MC and not where P = MC. However, firms with downward sloping demand curves are not necessarily "inefficient," nor do they "restrict output" or necessarily "misallocate resources," because the efficiency benchmark of perfect competition to which they are compared is an impossible standard that cannot obtain in the real world. All firms face a downward sloping demand curve of some kind and are imperfect and therefore do not produce where P = MC (Armentano, 1982, pp. 22–25).

The contrast between Rothbard (2015 [1953]) and Rothbard (2009 [1962]) on competitive and monopoly prices and perfect competition is stark. In the former, the concepts were used to analyze actual markets in the unhampered economy. In the latter, in addition to emphasizing the older Mises-Hayek position that competition is a rivalrous process that involves efficient entrepreneurs earning

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[11] While agreeing with Kirzner's dynamic critique of the model, Rothbard did criticize his use of the perfectly elastic demand curve (Kirzner, 1963 [2011], pp. 98–99; Rothbard, 2011b [1961], pp. 14–15). See Mises (1949, pp. 356–357) for his limited remarks on perfect and imperfect competition.

profits and inefficient entrepreneurs sustaining losses, Rothbard emphasized that there are no differences in kind between various firms and their output prices. Every price is a market price that is based on entrepreneurs' estimations of the wants of consumers. Every firm exercises some influence on its output price and cannot take it as given.

IV: THE FACTOR DEMAND CURVE AND THE CAUSAL INFLUENCE OF OUTPUT PRICES

Like fixed output prices, fixed input prices are a tool used in much of neoclassical production theory. For example, they are prevalent in isocosts, cost curves, and perfect competition in factor markets. Rothbard (2015 [1953]) frequently employed this assumption, but later realized it was highly misleading and discarded it for a framework that explained the formation of input prices without taking them as given. This section surveys Rothbard's analysis of isoquants and isocosts in preparation for tracing out factor demand curves, and compares it with his later derivation of the factor demand curve, as well as his remarks on the causal influence of output prices on input prices.

After finishing Section 2 with a discussion on the competitive versus monopoly price distinction and possible definitions of monopoly, Rothbard returns to the individual production decisions of a firm in "Section 3: The Product and Outlay Schedules of the Firm." Aside from unique terminology, which will not be used in this paper for ease of exposition, it provides a fairly familiar exercise in production theory. Rothbard derives isoquants and isocosts, and shows that the slope of the isosquant is the marginal rate of technical substitution, and the slope of the isocost is the ratio of the fixed prices, and that the cost minimizing combination of factor inputs for a given level of output is where the slopes of the isoquant and isocost are equal (Rothbard, 2015 [1953], p. 521). Later, in a subsection, Rothbard engages in a mathematical and graphical formulation of the above exposition, and concludes with the following figure:

Figure 2
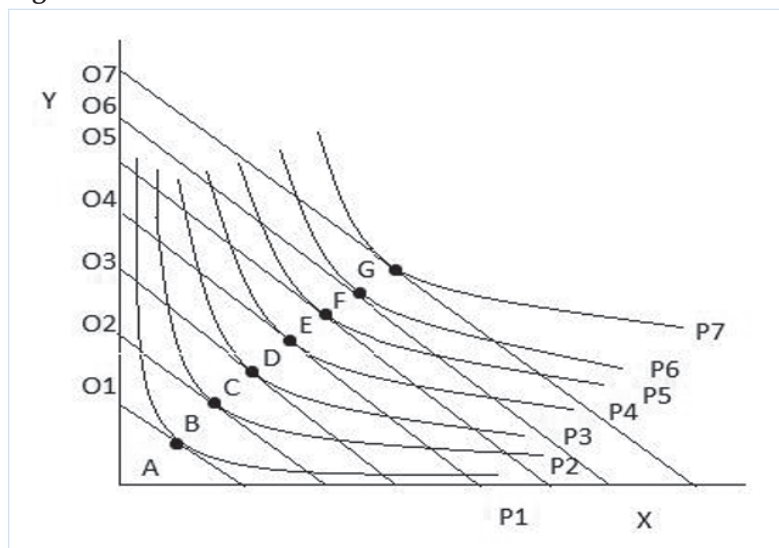
P1, P2... P7 are the firm's isoquants for given levels of production, while O1, O2... O7 are the firm's isocosts for given levels of expenditure based on the fixed input prices for X and Y. A, B... G represent the cost minimizing combinations of factor inputs for each level of output.

Aside from illustrating a firm's optimal production decisions, Rothbard seemed to have undertaken this analysis in order to draw out a firm's demand curve for a factor, which apparently was supposed to take place in another chapter that appears not to have been written. He initially writes that the isoquant-isocost apparatus is "essential to an analysis of the prices of factors of production" and then describes it as one that "will be handy in later analyses of the pricing of factors of production" (Rothbard, 2015 [1953], pp. 522, 530). The demand curve Rothbard appears to have wanted to derive would have been taken from Weiler (1952, pp. 154–161).[12] The modern analysis based on this approach described

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[12] Weiler (1952, pp. 147ff) was cited by Rothbard (2015 [1953]) when he discussed factor ratios and production coefficients, and Weiler (1952, pp. 141–161) was later cited in Rothbard (2009 [1962], pp. 589–590) when he critiqued cost curves. The

in Benjamin, Gunderson, and Riddell (2002, pp. 147–153)[13] incor-
porates both scale and substitution effects, which are similar to
the familiar income and substitution effects in consumer demand
curves, and is shown in Figure 3:

Figure 3
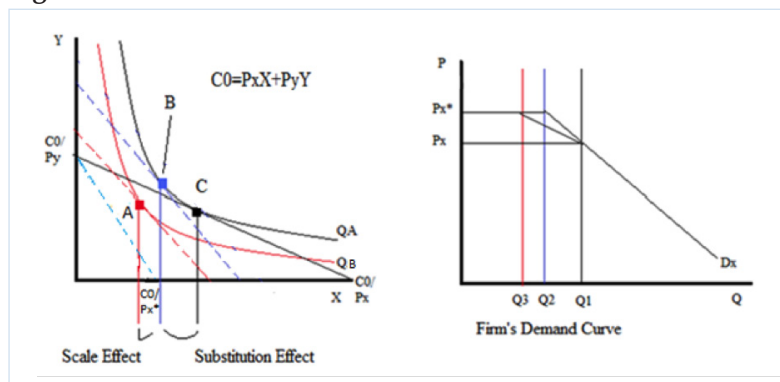
At prices Px and Py the firm originally demands Q1 of X. To
show the downward sloping nature of a factor demand curve with
the isoquant/isocost approach, let the price of factor X rise relative
to the price of factor Y from Px to Px*. This pivots the isocost
inward to reflect the higher price of factor X, which is then shifted
rightwards until it is tangent with the original isoquant at a new
cost minimizing combination B and as a result the firm demands
only Q2 of X now. The difference between Q2 and Q1 is the substi-
tution effect. There is also the scale effect which occurs because the
increase in the relative price of X increases the firm's marginal costs,
which causes it to produce at a lower level of output and raises its
price. Thus the firm's new isocost shifts leftward from where it was
tangent with the original isoquant to where it is tangent to the new
profit-maximizing isoquant. The cost minimizing combination is

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above citation is to a chapter devoted entirely to the analysis of the demand for
the factors of production. Although Rothbard also cited Stigler (1946) in both
places, his demand curve is derived differently and is discussed below. For an
explanation similar to Weiler, see Hicks (1979 [1946], pp. 89–98). Kirzner (1963
[2011], pp. 194, 215–216) also describes this approach.

[13] See also McGraw (2002) for another exposition of this factor demand curve.

now at A and the firm demands only Q3 of X now. The difference between Q3 and Q2 is the scale effect. Overall, at the higher price, the firm demands less of factor X and more of factor Y, and so the firm's demand curve for factor X slopes downwards (Benjamin, Gunderson, and Riddell, 2002, pp. 147–153).

It is important to realize that this process takes place from the perspective of an individual firm facing given input prices. Nowhere is it explained how this given input price was originally determined, or why it changed. Furthermore, there is no recognition of the fact that input prices are imputed from output prices. In fact, in this framework, the analysis implies the reverse. A rise in the price (for some reason) of input X leads to a decrease in the production of the output and a rise in its price. Rothbard (2009 [1962], pp. 454–455) realized the weaknesses of this approach and argued that "the chief error is that of basing a causal explanation of factor pricing on the *assumption of given factor prices* [emphasis Rothbard]."

For Rothbard, the correct method of deriving a demand curve for a factor of production was through marginal productivity analysis that did not assume the price of the factor was already given. Moreover, this procedure does not start from the perspective of a firm but rather from the general demand for the factor and its interrelations. In the Austrian static general equilibrium known as the Evenly Rotating Economy (ERE), the price of any given factor is its discounted marginal revenue product (DMRP). It must be noted that there is an important yet neglected difference between Austrian "Böhm-Bawerkian" input price theory and the neoclassical "Knightian" input price theory. This refers to the fact that the factor price is equal to the DMRP and not just the MRP. This is because the capitalist-entrepreneur, due to time preference, receives an interest return on his investment from supplying present goods in return for future goods.

To be fair, the MRP in both approaches refer to different things. The neoclassical view argues that the factors get paid their MRP if the MRP is taken to be the revenue from selling the immediate semi-finished product. However, this semi-finished product does not mean anything to the capitalist-entrepreneur; what he cares about is selling the *future* product for expected *future* money. And since future money is discounted due to time preference, he will only supply to factors in the present a smaller amount of

present money. This difference is interest (Block, 1990; Rothbard, 2009 [1962], pp. 504–507; 2011a [1987], pp. 265–266). The Austrian approach emphasizes the importance of time and futurity in production, as opposed to the Knightian view. The Knightian view is present in the works of Stigler and contemporary price theorists, and is traceable to the works of Clark, Marshall, and Walras. It neglects the temporal structure of production analysis involving heterogeneous capital goods, and as a result its capital theory is seriously deficient (Huerta de Soto, 2009 [1998], pp. 512–522).

This DMRP is the marginal physical product (MPP) of a factor times the marginal revenue earned from its employment discounted by the pure rate of interest. The DMRP of a factor in its general uses (among different production processes and in a single production process) as its supply increases is decreasing because both the MPP and the output price fall as output increases. The DMRP of a factor in a particular process is where the total stock of the factor intersects the general DMRP curve, and through the entrepreneurial process the price of the factor is brought into alignment with its marginal use (Rothbard, 2009 [1962], pp. 456–476). If the prices of a given factor are unequal, then entrepreneurs will shift factors from lower priced lines of production into higher priced ones to try and earn profits, thereby bidding up the price of the factor in the former and lowering it in the latter until the uniform DMRP is established.

The price of the factor of production is ultimately determined by the output prices of the goods they produce. The causal formation of prices is that anticipated future output prices determine present input prices, or the costs of production, not the reverse. This is Böhm-Bawerk's (1889 [1959], pp. 248–256; 1962 [1894]) "Law of Costs" that Rothbard emphasized in his analysis of the firm (Rothbard, 2009 [1962], pp. 361, 588–589). The fixed input prices a firm sees are not costs determined beyond its control. They are the prevailing prices of factors based on other capitalist-entrepreneurs' estimations of their marginal use elsewhere as determined by consumer demand. In short, these prices reflect the opportunity cost of using the factors in other lines of production. By entering into this factor market, the firm is directly influencing the formation of the new prices by bidding them up, which tends to increase them, which would result if other intervening processes did not occur

during the interim. This is like the firm's influence on its output price—the output price appears given, but in reality, by producing for the market the firm is directly contributing to the formation of the price and does exert an influence. As opposed to the original factor pricing theory that Rothbard planned to write, his revised theory of factor pricing was one that explained the formation of the factor price without assuming it was given and showed the causal influence of output prices on input prices (Rothbard, 2009 [1962], p. 476).

The above factor demand curve derivation is similar to the derivation of the short run demand curve for a factor where marginal productivity analysis is also used (Stigler, 1946, pp. 175–178). This is opposed to the long run demand curve for a factor, which was the isoquant-isocost method critiqued above. The short run refers to a period where some factors are fixed are unable to be changed, while in the long run all factors are variable. While Rothbard and Stigler's approaches are largely similar compared to the long run demand curve, there are important differences. Aside from the fact that the factor in Rothbard's analysis earns its DMRP while in Stigler's it earns its MRP, the main one is that the analysis begins from the vantage point of a firm facing a given input price (as determined in the general market). The firm then hires the factor along its diminishing MRP schedule until the MRP is equal to the price of the input, because that is the point where its MR = MC. It is true that in the ERE the firm will produce where MR = MC as any other output level will lead to negative profits (as opposed to where MR = MC, where the firm will earn zero). However, as will be explained below, in the dynamic world the profit-maximizing level of output for the capitalist-entrepreneurs investing in the firm is generally where the firm's MR is greater than its MC. When applied to a non-general equilibrium world, this factor demand curve derivation is incorrect, as the firm's MR and MC convergence does not always occur.

V: THE CAPITALIST-ENTREPRENEUR AND THE OPTIMAL LEVEL OF INVESTMENT IN A FIRM

This section is framed differently from the prior two because it presents an important critique of the Marshallian partial equilibrium

firm theorizing that Rothbard (2015 [1953]) described but did not fully emphasize in Rothbard (2009 [1962]) and only briefly mentioned in other writings.

In the final elongated section that was pieced together by the present author[14] and titled "Section 4: The Output and Investment Decision of the Producer," Rothbard strove to develop an optimal theory of investment of the capitalist-entrepreneur. The implication of this analysis is that in the dynamic world where there is a mélange of firms with varying degrees of profitability for the capitalist-entrepreneurs that invest in them, there can be no theory of optimal investment formulated for a single firm in isolation, which implies that a given firm's optimal production may not be where its MR = MC. This momentous realization undoubtedly contributed to Rothbard's later decision to discard the isolated firm analysis and completely rewrite his production theory.

Although in many ways Rothbard (2015 [1953]) was very similar to traditional neoclassical production theory, one major difference between the two is that the "producer" Rothbard concentrates on is a capitalist-entrepreneur investing his own money, while the neoclassical producer is a propertyless manager who can borrow an unlimited amount of money at a given interest rate and *only invest in the given firm*. When analyzing the firm, in Rothbard's framework the capitalist-entrepreneur is the controlling factor that earns an interest rate of return on his money invested, while the manager is a hired factor of production whose income is a money cost. The capitalist-entrepreneur can also earn a profit when his total rate of return is greater than the interest return (Rothbard, 2009 [1962], p. 510). In the latter framework, the propertyless manager is considered to be the entrepreneur and the controlling factor in the firm who pays an interest return on his borrowed money from capitalists that is counted as a cost of production. The manager still earns a management wage, which is also counted as a cost of production, but also can earn a profit, which is the difference between his total revenue and the principal and interest payments on his borrowed money. The former has been explicitly called the "Austro-Wicksellian" theory of the firm that views interest as an earning as opposed to the neoclassical theory that views it as a

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[14] See the editor's foreword of Rothbard (2015 [1953], p. 489).

cost (Gabor and Pearce, 1958, pp. 537–539; Moroney, 1972, p. 339; Salerno, 2009, p. xliii).

This difference is present even in the beginning of the chapter. In Section 1, before discussing the various production decisions and possible demand situations a single-product firm might face, Rothbard briefly looks at the optimal investment decision of a representative capitalist-entrepreneur who can invest in multiple lines of production. The capitalist-entrepreneur has a given stock of money that he can spend on consumption, investment, or keep in his cash balances. He will only invest if the rate of return is greater than or equal to his rate of time preference, or his specific premium on present money over future money that represents the minimum return the capitalist-entrepreneur requires in order to invest. For a given amount of money invested, the capitalist-entrepreneur will choose the line of production that maximizes his expected monetary return (Rothbard, 2015 [1953], pp. 490–94). Rothbard then postponed further analysis of the investment theory and for the rest of Section 1 through Section 3 turned to analyzing competitive prices, monopoly prices, perfect competition, and the isoquant-isocost apparatus that showed the cost minimizing level of output. This is what was described above in Sections III and IV of the present paper. After all of this was done, Rothbard then returned to investigating investment decisions in the final section of the chapter.

In Section 4, Rothbard considered a capitalist-entrepreneur who has chosen to invest in a given firm that produces Product P. Rothbard describes various amounts of expenditure, or total costs, which lead to various total revenues the capitalist-entrepreneur can earn by investing in the given firm. For ease of exposition, Figure 4 depicts Rothbard's (2015 [1953], p. 540) results with the familiar continuous and nicely shaped curves instead of jagged lines and discrete points without loss of importance:

Figure 4
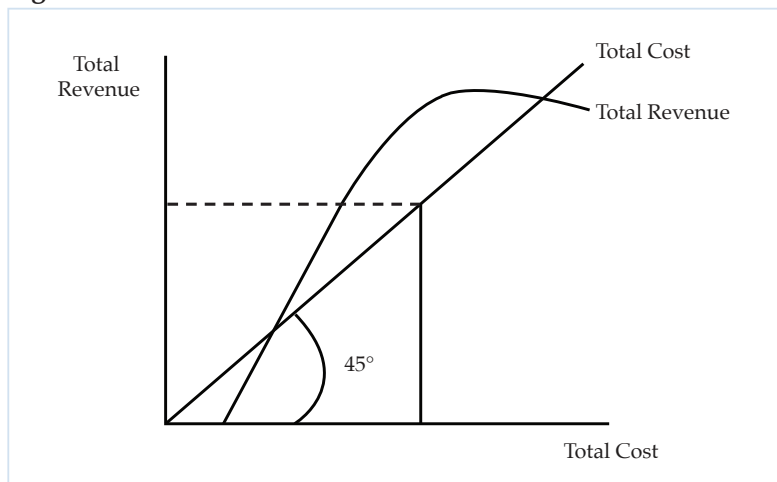
Rothbard calls the difference between total revenue and total cost "net income," and calculates the rate of return as net income divided by total cost.

Now Rothbard asks, what level of output will be chosen? How much will the capitalist-entrepreneur invest in the given firm, and consequently how much Product P output will the firm produce? What is the optimal level of output? The traditional answer is that the optimal level of investment and output is where net money income is maximized, i.e., the greatest distance between total revenue and total cost. In familiar terminology, using continuous curves, this is the point where MR = MC. As explained above, the usual perspective taken is that of the propertyless manager, with a fixed interest return to the investing capitalist included in the cost curve. The manager of the firm should borrow from the capitalist-entrepreneurs at a given interest rate and invest until MR = MC to maximize his profit amount.

However, the crucial problem in this analysis is that it neglects *whether or not the capitalist-entrepreneurs can invest their money in other firms that earn higher than the rate of return earnable in this firm.* The output level that maximizes the firm's profit amount may not be the output level where the capitalist-entrepreneurs who invest in the firm maximize their profit. This is because the capitalist-entrepreneurs

are not restricted solely to investing in the given firm but can also invest in other firms where they could potentially earn a more profitable rate of return on their marginal money invested. The rate of return that can be earned always varies, because in the real world there is uncertainty, and consequently profits and losses. Only in a static general equilibrium devoid of uncertainty are all rates of return uniform (and equal to the interest rate). The problem does not go away if we postulate that the given firm can produce multiple products, since the unit of analysis is still on "a firm" rather than the capitalist-entrepreneurs who can invest among multiple firms that produce multiple products. To maximize their total profits, capitalist-entrepreneurs may spend only a certain amount of money in one firm such that the firm produces where its MR > MC since they can invest their other funds in other firms to increase their total profits more than they could if they were to solely invest in the original firm up to where its MR = MC. As a result, one cannot look at a firm in isolation in the partial equilibrium approach and figure out how much will be produced or invested in it (Gabor and Pearce, 1952, 1958; Rothbard, 1961, pp. 7–8, 18; Rothbard, 1993; Klein, 2010c [1999], pp. 38–39; Klein and Foss, 2012, p. 238). Although Rothbard (2015 [1953]) does not frame it in terms of MR and MC this is clearly what he is getting at, as he trenchantly writes that "*there is no precise theory of the determination of the investment in, and output of, the firm*" (Rothbard, 2015 [1953], p. 543).

To clarify, this is not to say that in an isolated firm the maximization of the profit amount for the manager of the firm does not occur at an output level where its MR = MC. *Given a total revenue and total cost curve for the firm that includes interest payments, the optimum is clearly where MR = MC.* What it does say is that when the vantage point is now from the capitalist-entrepreneurs that supply the funds to the firm, and once the range of investment opportunities is broadened beyond the individual firm to the entire production structure, in a dynamic world where lines of production earn different profitable (i.e., above interest) rates of return, maximization of profit may occur where the firm's MR > MC since the capitalist-entrepreneurs can invest in other industries where they can reap potentially greater economic profits. Only in the ERE, where all profits are wiped out and all lines of production earn the same uniform interest return will the optimal level of

output be where the firm's MR = MC. This is because the capi-
talists cannot invest their funds in another firm to earn a higher
than normal rate as such opportunities do not exist (Rothbard,
2009 [1962], pp. 600, 695, 734–736). At such an output level, since
profit is zero total revenue will be equal to total cost, assuming the
capitalists' interest return is included as an opportunity cost. At
any other output level there will be negative profits. In order for
the firm to exist in general equilibrium, it must not earn negative
profits, so it will have to produce where its MR = MC. The problem
comes when the economy is out of general equilibrium, and all
lines of production do not earn the same uniform interest return.
Now the production of a firm may not be where its MR = MC, since
the capitalist-entrepreneurs who invest their money in it can invest
their money in other more remunerative firms. This dynamic
world is what the Austrian general equilibrium approach stresses,
since it is the dynamic world that we live in and consequently that
we try to understand. On this entire issue, we find much to agree
on with Gabor and Pearce, whose articles (1952, 1958) that heavily
influenced Rothbard stress this important distinction between the
Austrian and neoclassical approaches with regards to optimal
production in a given firm in disequilibrium. It is worth quoting
them in full:

> [T]here is much to suggest that a great deal has been lost by the failure
> to produce a more adequate synthesis of all that is best in the work of
> both the Austrian and the neoclassical schools. In the first place, the fact
> that two theories of profit lead to the same general equilibrium is not
> sufficient to make them the same theory. *The route by which equilibrium is
> attained is often as important as the equilibrium itself* [emphasis Newman].
> We have shown elsewhere [Gabor and Pearce, 1952] that, if general
> equilibrium has not been attained, and the fact that an investment is
> being contemplated in any industry implies that it has not, then the two
> theories of profit, the [Austro]-Wicksellian and the neoclassical, lead to
> different conclusions [Newman] (Gabor and Pearce, 1958, pp. 538–539).

Instead of trying to look at the optimal level of investment in
and output of a compartmentalized firm, Rothbard argues that the
correct approach is to develop an optimal theory of investment of
the capitalist-entrepreneurs who face a gamut of various firms in
which they can invest. (Rothbard, 2015 [1953], pp. 543–44). This
is what Rothbard seeks to do throughout the rest of Section 4.

Rothbard stresses that a theory of optimal investor decision needs to focus not just on maximizing the rate of return on a given amount of money invested, but on weighing the rate of return with the capitalist-entrepreneur's rate of time preference. Rothbard calls this the Law of Investment Decision (Rothbard, 2015 [1953], p. 552). The capitalist-entrepreneur will invest his own money *in general* up to the last discrete point where the average and marginal rate of return are greater than or equal to his average and marginal rate of time preference. *In each individual firm*, the capitalist-entrepreneur invests up to the last discrete point where his marginal rate of return in that firm is greater than or equal to the marginal rate of return of investing that money elsewhere (Rothbard, 2015 [1953], pp. 551–56).

Rothbard's revised production theory (2009 [1962]) unfortunately did not explicitly mention any Law of Investment Decision for the capitalist-entrepreneur. However, it did start with an initial analysis of time preference, interest rates, and the important function of the capitalist who invests in a temporal structure of production in the ERE (Rothbard, 2009 [1962], pp. 319–451). The starting point of the ERE is essential because it is what the economy always tends toward, and would reach if the data remained constant. The ERE is necessary to analyze in order to isolate the differences between profit and loss, on the one hand, and interest on the other. In addition, the ERE is indispensable for deducing economic theorems, as it allows the economist to mentally hold constant all changes in data except one in order to isolate the effects of that one change. However, Rothbard extended the edifice in order to describe the *processes to the ERE*, the processes that describe the dynamic world we live in. The capitalist-entrepreneurs take center stage by choosing to invest in various profitable firms with different periods of production and engage in a rivalrous process of efficient competition with each other that consequently distributes scarce resources according to the intertemporal preferences of consumers. In the end, Rothbard substituted an Austrian general equilibrium for a Marshallian partial equilibrium framework.

VI: CONCLUSION

This paper has provided a comparison of Rothbard's earlier production framework with his final system. The earlier theory was

closer to the Marshallian partial equilibrium theory. It analyzed production from the perspective of an isolated firm and employed many standard tools such as the competitive-monopoly price distinction, perfect competition, the isoquant-isocost framework used to derive factor demand curves, and the isolated firm. His later revised theory, and in some cases parts of his earlier theory, criticized these tools.

It was shown that Rothbard argued that the competitive-monopoly price distinction is inappropriate for analyzing free market situations because it arbitrarily assumes the existence of a competitive and a monopoly price. In addition, all firms are price searchers that exercise some influence on their output price and consequently engage in "imperfect" competition. Thus, the traditional efficiency benchmark of perfect competition is a poor standard because it is impossible to obtain. The factor demand curve derived from the isoquant-isocost framework does not show that expected output prices determine input prices, and assumes the input price it tries to explain. Finally, and most importantly, in order to understand optimal production in a firm, the correct perspective is not that of the borrowing manager of the isolated firm who seeks to maximize his profit, but rather that of the capitalist-entrepreneurs who supply the money for the firm while seeking to maximize the rate of return on their total capital invested. This is because—unlike the manager—the capitalist-entrepreneurs can invest in multiple firms, which means that in a dynamic world, capitalist-entrepreneurs may not maximize their profit in a given firm up to where its MR = MC.

Ultimately, the evolution of Rothbard's production theory is from the Marshallian partial equilibrium approach to the Austrian general equilibrium approach. This is because Rothbard shows the causal influence of input and output prices and actually explains their formation, and his mature theory does not analyze production from a single isolated firm that can treat prices as fixed in a static world, but rather from the decisions of competing profit-seeking capitalist-entrepreneurs who invest in the entire production structure in a changing world.

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MAN, ECONOMY AND STATE, ORIGINAL CHAPTER 5: PRODUCER'S ACTIVITY

MURRAY N. ROTHBARD

(EDITED BY PATRICK NEWMAN)

EDITOR'S FOREWORD

The present work is an unpublished chapter of Murray N. Rothbard's *Man, Economy, and State* (hereafter MES) (2009 [1962]). Titled "Chapter 5: Producer's Activity," it was meant to be the fifth chapter of the book and the first on production theory. In it, Rothbard discussed the optimal production and investment decision of the producer, and used familiar analytical tools such as perfect competition, the isoquant-isocost framework, and the competitive versus monopoly price distinction. It was written when Rothbard still planned to write a textbook of Ludwig von Mises's *Human Action* (1999 [1949]) before deciding to write a full blown treatise. Rothbard's decision to do so was heavily influenced by his concurrent decision to abandon the chapter and rewrite his production theory, as he thought that the new material he would have to present and argue for would be unsuitable for an introductory textbook. In particular, the above mentioned analytical tools were all subject to trenchant criticism by Rothbard in his final production theory.

The chapter is meant to serve as both a compendium for Newman (2015), which is the concurrent paper written by the present author that discusses the evolution of Rothbard's thought on production theory and its implications for modern theory, and as a source for scholars interested in Rothbard's thought, Austrian economics, and historians of production theory to use for their own research projects.

The chapter was found and reorganized by the present writer at the Rothbard archives at the Ludwig von Mises Institute in Auburn, Alabama. Over the years, Rothbard had saved many of his draft pages for MES on various topics, including those that would eventually be put in the book and those that would not. Rothbard did not neatly organize his draft pages, so many of the pages that could be found in the archive boxes and were right next to each other could concern completely different topics. Fortunately, Rothbard did number his pages, so the present writer was able to reconstruct the chapter by sifting through the archive boxes and linking up pages based on their number and whether the sentences which ran from one page to the next corresponded with each other. The document that follows pieces together the missing chapter as much of what was possible from the available surviving resources.

The chapter is in a rough stage, as Rothbard appears to have written only one draft before deciding to revise his production theory and remove the chapter from his planned work. However, it was written very clearly and is easy to understand, so in terms of editing the paragraphs for the most part I have only had to make a few grammatical and stylistic changes regarding his numerical examples. In some cases, exclusively in the last section, I had to add a few words and sentences in order to clarify Rothbard's argument. The largest of such additions occur towards the end of the chapter, where several of Rothbard's draft pages could not be found. Consequently, I had to fill in with some summary transitional sentences and in one case a paragraph of what I believe Rothbard discussed in these pages, based on what Rothbard referred to later in the chapter. All additions I have made are in brackets [ ], and the observant reader will see that I have faithfully written what can be inferred from the rest of the chapter and in a style consistent with it. In addition, I have provided information in footnotes (prefaced with *Editor's footnote*) about various references Rothbard makes to either previously written or planned chapters of MES.

I have also had to make some minor changes to the structure of the chapter. The three sections I could find were sections 1, 2, and 4, as there was a missing third section of the chapter that I could not find. Furthermore, Section 4 included all of the material that is now Section 3, which made it considerably large and unwieldy. Therefore, I have split up Section 4 into two based on respective topics and given Section 3 an appropriate title so that there are four well organized parts that smoothly flow from one to another.

In the first section, titled "The Demand for a Firm's Product," Rothbard concentrates on the production function of an individual producer for a given good. With fixed prices for inputs, Rothbard investigates the optimal production choices in situations where the firm either has or does not have an influence on the output price. In Section 2, "Competitive Price and Monopoly Price," Rothbard introduces the terms perfect competition, competitive price and monopoly price, and defines a monopolist as someone who receives a grant of state privilege. In Section 3, titled by the present author "The Product and Outlay Schedules of the Firm," Rothbard returns to the firm's production decisions and analyzes factor ratios and production coefficients. Rothbard derives constant cost (isocost) and constant product (isoquant) schedules as well as rates of constant outlay and constant product substitution. Rothbard shows that the cost minimizing level of output is when these two rates are equal. In a subsection he presents a mathematical and graphical formulation of the above theories and briefly mentions the relation of them to the determination of factor pricing. Rothbard finishes up the chapter with Section 4, titled "The Output and Investment Decisions of the Producer," by constructing "The Law of Investment Decision" using the concepts of rates of net income, marginal, and average rates of return. Rothbard argues that the investor will not produce at the outlay where either his profit amount or percentage rate of return is maximized, but rather up to the last outlay where the average and marginal rates of return are greater than or equal to his average and marginal rates of time preference. This theory may be useful for those scholars interested in an Austrian "Theory of Investment" as it is a portfolio theory of how the capitalist-entrepreneur allocates his money across various enterprises. This is linked with a brief criticism of firm analysis, which undoubtedly influenced him to drop the chapter and revise his production theory.

In conclusion, this chapter will be a fertile source for both historians of thought and contemporary theorists interested in Austrian economics and production theory.

–P.N.

SECTION 1: THE DEMAND FOR A FIRM'S PRODUCT

We have seen that the money prices of goods on the market are set at the intersection of the demand and supply curves. Setting aside the relatively simple problem of the market for old stock, the market price and quantity exchanged are determined by the intersection of the market supply curves of the producers, and the demand curve. We have seen above that the stock thrown on the market in any given period is largely determined by *previous* anticipations of market conditions in this period. This notion has been presented in terms of the "final supply curve" of producers. In other words, if the selling price of a certain line of washing machines is expected to be 20 ounces of gold next September, how many washing machines will Smith begin to invest in *now* so that the final product will emerge next September? We have described this final supply in terms of the *present* price calling forth a *present* investment for a *future* production; strictly, of course, it is the *expected future price* that calls forth investment now for future production. All present production is necessarily the result of such previous anticipation.[1]

Thus, all producers' activity—the central nexus of the economy—is based on certain anticipations of future selling prices. We have analyzed above the determinants of market price for consumer goods, durable and nondurable, and now we must analyze the "final supply curve," and the process of producers' activity. Consumers' goods, the end of human activity, must be produced by producers, and the overwhelming number of *exchangeable* goods must be produced through the monetary exchange process outlined

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[1] *Editor's footnote*: Rothbard's reference to his earlier presentation of the "final supply curve" is absent from MES. Rothbard's discussion of supply and demand for an already produced stock of goods and his introductory analysis of entrepreneurship and production can be found in Rothbard (1962, 153–161, 249–257). See below (pp. 557–59) for Rothbard's further discussion of final supply curve.

in Chapter III.[2] Therefore, analysis of producer activity is vital; not only will it provide the final clue to the analysis of consumer goods' prices—through discussing the determination of the size of the stock thrown on the market—it is also the key to the analysis of the determination of the money prices of factors of production. All other goods but consumer goods are factors, and all of these are demanded and bought solely by producers. It is producers that purchase with money, capital goods, land, and labor, and it is producers that use other factors to produce the capital goods. It is only through a more detailed analysis of producer activity, therefore, that the prices of factors can be explained.

To analyze the actions of a producer let us take a hypothetical case, Mr. Jones. Jones, like all others, must decide on the allocation of his money assets to investment expenditures, consumption expenditures, and to his cash balance. Let us postpone discussion of changes in cash balance to a later chapter on the demand for money and its utility.[3] Jones must allocate his expenses between consumption and investment expenditure. The motive that impels him to spend money on present consumption is the gratification of his desires through present consumption. What is the motive that impels him to *save* a certain amount of money by restricting his possible consumption, and invest that money in expenditure on various factors of production? This motive must be the expectation of *greater* money income in the future. We have already seen that every man prefers a satisfaction of a desire earlier than later, and therefore that a given amount of present money is always preferred to the same amount of money in the future.[4] At any given point, he will have a certain rate of time preference, a rate by which he will prefer *present money* to the *present prospect of money at some date in the future*.[5] We have seen that the more he allocates

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[2] *Editor's footnote*: See Rothbard (1962, pp. 187–231).

[3] *Editor's footnote*: See Rothbard (1962, pp. 755–874).

[4] *Editor's footnote*: See Rothbard (1962, p. 219).

[5] "In every case the choice made is, at the moment when made, a present choice. We have no future desires though we may have a present forecast of a future desire. 'Future desires' means desires that will be present at some future time. Present desires are all those desires now being weighed in choice. Present desires may be either desires for present uses or for future uses (either in the same or in different goods). A present desire for future uses is but the anticipation of a future

to investment, the greater will be the marginal utility forgone of present consumption, and the less will be the marginal utility of each additional future ounce of money income.[6]

"Investment opportunities" for a greater supply of future consumer goods are always open to man, because investment in capital goods adds to the capital structure, and increases future product of consumer goods. On the other hand, man must satisfy his present needs first. Thus, men must always balance their prospect of future gain as against their rate of time preference for present as against future satisfactions. The primary activity in deciding whether or not to be a producer is the weighing of the anticipated future gain against the person's rate of time preference. In the words of Professor Fetter, "The different time-periods, present and future, and their different economic situations are bought into comparison… by conscious choice between the thing actually present and the future good more or less clearly pictured in the imagination."[7]

We must postpone detailed consideration of time preference and its effects to later chapters of this work.[8] Here it suffices to point out that each individual has his own rate of time preference, expressed as a percentage premium of present over future goods, and that the more he saves at any time, the greater his subjective premium will tend to be.

Let us suppose now that Jones is considering whether or not to invest 1000 ounces of gold, or spend this money in consumption. Let us say his rate of time preference for these 1000 ounces is 6% per annum. In other words, if he anticipates a return on this investment of 6% or less for the following year (assuming for simplicity that only one year is taken into account), he will not make the investment. Thus, in deciding on productive investment or not, his minimum return for the year will be an anticipated 1060

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desire, though the two may be of unequal magnitude. It appears therefore that all time-choices are, in the last analysis, reducible to choices between present desires for psychic incomes occurring at different time-periods" Fetter (1915, p. 247). See also Fetter (1915, p. 239).

[6] *Editor's footnote*: See Rothbard (1962, p. 220).

[7] Fetter (1915, 240).

[8] *Editor's footnote*: See Rothbard (1962, pp. 367–451).

ounces. If he anticipates this or less, "it will not pay for him" to make the investment.[9]

Now Jones surveys the prevailing conditions, and estimates that he has available four different lines of investment. For the sake of simplicity, we will now assume that all of these lines are in the production of consumer goods (since we have not yet explained the determination of any capital goods prices), and we will also assume that the *period of production* for each of these processes is exactly one year. This period of production, as explained in Chapter I, is the length of time from the beginning of the action—the investment—to the reaping of the final product.[10] It should be clear that it is a simple task to make the necessary adjustments in calculation if one or other of the processes takes more or less time to complete. The four lines of investment open to Jones he estimates will net him, in the year to be considered, net money returns of 10%, 8%, 7%, and 5% respectively.[11] In other words, with an investment in factors of 1000 ounces now and in the near future, Jones will be able to reap the following returns for lines of investment A, B, C, and D:

Table 1

LINE	GROSS MONEY RETURN	NET RETURN	% OF NET RETURN ON INVESTMENT
A	1100	100	10%
B	1080	80	8%
C	1070	70	7%
D	1050	50	5%

It is clear that Jones will not invest in line D in any case, since his rate of time preference is *6%*, and he would prefer to spend his 1000 oz. on consumption now rather than make the investment. If all of his prospects were like D or worse, he would make no investment at all. In this case, it is clear that he will invest the 1000

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[9] *Editor's footnote*: See the editor's footnote below on p. 552.

[10] *Editor's footnote*: See Rothbard (1962, pp. 13–17).

[11] It is of course likely that Jones will weigh his decision on the basis of expected returns over a much longer period, say a decade, in which these returns may be considered to take place for a ten year period. We can adjust his calculations to cover any desired time period.

oz. in line A, where the greatest percentage net money return is to be found. Here, we must remember the qualification that he will only choose such a course if other psychic factors are neutral. Thus, if he has a special fondness for the production of Good B, or a special hostility toward the production of Good A, the 8% money return may be worth more to him on his value scale than the 10% return to be made in Good A. Noting this qualification, however, it will be convenient for us to set it aside, and assume that psychic factors are neutral in our example, in which case the investor will always choose the greatest prospects for money return.

We must now investigate the line of production more closely. Suppose that we confine our attention to the line of production that produces Good A. Jones is eager to maximize the percentage return from his investment. What are the factors that will determine the size of his return? These factors are: a) the money prices of the factors purchased b) the selling price of his product c) the physical productivity of the factors in their transformation into the product. It is obvious that, other things being equal, the *lower* the prices he must pay for the factors, the greater will be his return; the *higher* the price of his product, the greater his return; and the *greater* his physical productivity the greater his return. Let us assume for the moment that the prices of the factors are given. Jones also discovers that there is available to him a range of technical possibilities in the production of the particular good. For the sake of simplicity, let us suppose that only two factors, X and Y, are required in the production of Good A. The money price of X and the money price of Y are fixed on the market—say it is 4 ounces per unit of X, and 10 ounces per unit of Y. Jones knows (or believes) that there are several possible proportions of X and Y that he can buy with his 1000 ounces in order to produce Good A. These may be the following:

Table 2

1)	40 X plus 84 Y
2)	50 X plus 80 Y
3)	60 X plus 76 Y

With prices at 4 and 10, these combinations will all add up to expenditures of 1000 ounces. In the first combination, Jones spends

160 ounces on X and 840 on Y; in the second, he spends 200 ounces on X and 800 ounces on Y, etc. Now the question arises: which combination does Jones choose to adopt? First, this depends on the physical productivity of each combination. This physical productivity is the effect of the production *recipe*, a recipe which is known to the producer in making his decision. The relationship between physical input and product is sometimes known as the "production function."[12] Let us say that the above combinations of input would yield the following products:

Table 3

	COMBINATIONS OF INPUT	RESULTING PRODUCT
1)	40X plus 84Y	96 units
2)	50X plus 80Y	100 units
3)	60X plus 76Y	110 units

It would certainly seem that Jones will pick that combination which will yield him the *maximum physical output*. In this case, it would be Combination 3, by which we can produce 110 units from 1000 ounces' worth of factors. There is one qualification to this course of action, however, and that would be if his increase in units produced would so lower the market price of the product as to *decrease* his gross revenue from the sale of the produced stock. In other words, suppose as Case (a), that the price of his product will be 10 ounces per unit, and that he correctly estimates it as such. Furthermore, suppose that regardless which production process he chooses, the market price will continue to be 10 ounces. In other words, whether he chooses to produce 100 or 110 or 96, etc. units, the market supply curve will not be affected sufficiently to lower the price. In this case, the gross revenue from the various combinations will be as follows:

Table 4: Case (a)

	COMBINATIONS OF INPUT	RESULTING PRODUCT	PRICE OF PRODUCT	GROSS REVENUE
1)	40X plus 84Y	96 units	10 oz. /unit	960 oz.
2)	50X plus 80Y	100 units	10 oz. /unit	1000 oz.
3)	60X plus 76Y	110 units	10 oz. /unit	1100 oz.

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[12] See Boulding (1941, pp. 456–457) and Stigler (1946, p. 109ff).

Jones will choose Combination 3, yielding the largest gross revenue and hence the largest net revenue with a given investment (1000 oz.) and the largest percentage net revenue on the investment. It is evident that, regardless of the number of alternative combinations available, where the price is constant, the combination chosen will be the one that maximizes the physical product from a given amount of money invested in factors.

Now suppose Case (b) where Jones' production is important enough in the market supply of his product so that a change from one combination to another *does* affect the market price at which the product will be sold.[13] Within the range of choice of combinations, a larger output will increase the market supply curve enough to lower the price of the product. It is evident that this is the usual rule on the market. Strictly, indeed, even in Case (a) there must have been *some* effect on the market supply curve from the change in output, however small, and this minute change will tend to affect the price. In Case (a), however, the change was too small to alter the point of intersection. In Case (b), the price is affected by the change in quantity, but not so much as to lower the gross revenue with an increased output. Thus, a typical situation might be:

Table 5: Case (b1)

	COMBINATIONS OF INPUT	RESULTING PRODUCT	PRICE OF PRODUCT	GROSS REVENUE
1)	40X plus 84Y	96 units	10.5 oz. /unit	1008 oz.
2)	50X plus 80Y	100 units	10.4 oz. /unit	1040 oz.
3)	60X plus 76Y	110 units	10.0 oz. /unit	1100 oz.

In this case, the increase in product and supply of the producer lowered the market price, but not in any case enough to lower revenue. Strictly, this condition only need prevail, in Case (b), *at and above the point of maximum output*. Thus, it would have been possible for the price, at a supply of 96 units, to have been 11 oz. per unit, and the gross revenue therefore to have been 1056 ounces.

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[13] Here it must be noted that the constancy of price assumed in Case (a) did not necessarily follow for all possible decisions of Jones. Thus, if he decided not to produce the good at all, the price might well be affected, and be, say 12 ounces instead of the 10 ounces if he did go into production. But the constancy of price is only assumed for the *relevant range of choice*—in this case between the three different combinations. Case (a) only needed to assume that, between a product of 96 and 110 units, market supply would not be affected enough to change the price.

In this situation:

Table 6: Case (b2)

	COMBINATIONS OF INPUT	RESULTING PRODUCT	PRICE OF PRODUCT	GROSS REVENUE
1)	40X plus 84Y	96 units	11.0 oz. /unit	1056 oz.
2)	50X plus 80Y	100 units	10.4 oz. /unit	1040 oz.
3)	60X plus 76Y	110 units	10.0 oz. /unit	1100 oz.

Here, it is true that as the supply increases from 96 to 100 units, the configuration of the demand curve and the market price is such that the revenue is lowered. However, the important consideration is that *the point of maximum output is also the point of maximum revenue*. Should Jones shift to another than the maximum combination in order to restrict the product, the higher price will not be sufficient to compensate for the loss of revenue. In both Case (b1) and Case (b2), the producer will choose the point of maximum output, which will also be the point of maximum revenue.

This data can be translated into terms of the *demand curve to the individual producer*. The individual producer, after all, is not concerned with what the market demand curve will turn out to be—he is concerned what the price will be for his particular product. He must ask himself the question: if I produce so many units, what will the selling price be; if I produce so many more units, what will be the effect on the selling price? In other words, he in effect is estimating what price the buyers will pay for different possible supplies of *his particular product. This analysis applies whether or not the producer is one of hundreds producing the same product, or whether he is the only one producing that good*. In any case, he must estimate at what price he will be able to sell his product to the buyers.

For Cases (b1) above, the *demand curve to the individual producer* can be constructed as follows:

Figure 1: Case (b1)

	SUPPLY OF PRODUCER	PRICE OF PRODUCT
1)	96 units	10.5 oz./unit
2)	100 units	10.4 oz./unit
3)	110 units	10.0 oz./unit
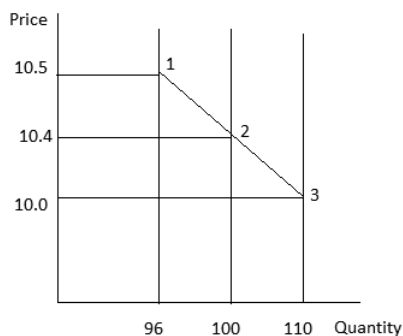
When the supply of Jones is 96, the market price will be 10.5—in other words, consumers will be prepared to demand 96 of Jones' units at a price of 10.5. This gives Jones one of the points, 1, on the *demand curve for Jones' product*. The price and supply at 10.4 and 100 respectively, and the various other items on the schedule, yield the other points on this demand curve (such as 2 and 3). These points are drawn together in one line for convenience. The schedule above also tells Jones how much of his product will be demanded at any particular price. Thus, it is clear that the producer knows that if he produces 96 units, they will be sold for 10.5, and 100 units will be sold for 10.4, etc. He *also* knows that, regardless of the size of his stock, if he sets the price for his product at 10.5 he will be able to sell only 96 units; if he sets the price at 10.4 he will be able to sell 100 units, etc. Thus, the supply and estimated market price yield him an estimate of a true *demand curve for his individual product*. Not only will he know that a supply of 110 units will provide him with the maximum revenue, he will also know that, once the 110 units are produced, *it will not pay for him to destroy or withhold some units in order to raise the price on the remainder*. Thus, with this type of demand curve for his own individual product, it is to his interest to produce his maximum physical product, and not to deliberately restrict or withhold his product to obtain a higher price. Even if he can obtain a higher price, restriction will not compensate him in revenue for the lesser quantity sold.

This property of the demand curve for the individual producer, determining whether decreased production will raise or lower revenue, is called its *elasticity*. We remember from Chapter II that a demand curve is termed "elastic" over any given range if the total outlay of the sale will be greater at a lower than at a higher price.[14] In the money economy, this means that a demand curve is *elastic* between a range of two prices *if the amount of money spent at the lower price is greater than the amount of money spent at the higher price*. In the case of the *demand curve to the individual producer*, the money outlay by the consumers constitutes his gross money revenue at that price. Thus, in Case (b1), the gross revenue obtained by the producer at a price of 10.5 and supply of 96 is 1008 oz.; at a price of 10.4 and supply of 100 units is 1040 oz., etc. What we are concerned with in this problem is the elasticity of the demand curve for the individual producer at and above the point of maximum output. We compare the revenue at that point with the revenue at possible lower outputs. In the case of (b1), the gross revenue at the point of maximum output—the price of 10.0—*is greater than* any revenue that could be obtained from restricting Jones' production to sell at a higher price. Thus, Jones will sell at a point of maximum output when the demand curve for his particular output is *elastic* at and above that point.

What of Case (b2)? Here, the demand curve for Jones' product is inelastic, if we compare the price of 10.4 and supply of 100, and the price of 11.0 and the supply of 96. *Between these two points on the curve, the demand is inelastic, and it would be more profitable for Jones to restrict his production from 100 to 96 in order to take advantage of the greater money revenue. However, this is irrelevant for Jones' action, because the demand curve is still elastic relative to the point of maximum output.* The point of maximum output yields the point of maximum revenue, and hence with respect to this point, the demand curve for Jones' product is elastic throughout its range. The choice will still be Combination 3, the supply of Jones will still be 110 units, and the market price will still be 10.0.

If Jones were in the situation of Case (a), the analysis would be even simpler. It is obvious that if the price were 10 regardless of Jones' product in the relevant range, the demand curve for his

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[14] *Editor's footnote*: See Rothbard (1962, pp. 126–130).

product is completely elastic, and it would always pay for him to be at his most productive, and produce the maximum physical output with a given monetary investment on factors. In this case, too, the producer strives for maximum physical productivity, and maximum output coincides with maximum revenue.

Another conceivable case is Case (c), where the demand curve for the individual producer is inelastic at the point of maximum output. Suppose, for example, that the following conditions obtained:

Table 7: Case (c)

	COMBINATIONS OF INPUT	RESULTING PRODUCT	PRICE OF PRODUCT	GROSS REVENUE
1)	40X plus 84Y	96 units	11.6 oz. /unit	1114 oz.
2)	50X plus 80Y	100 units	11.5 oz. /unit	1150 oz.
3)	60X plus 76Y	110 units	10.0 oz. /unit	1100 oz.

Or, diagramming this in the form of the individual demand curve:

Figure 2: Case (c)
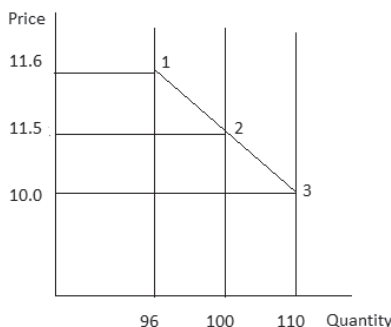
With this sort of demand curve facing him, it pays the producer best to supply to the market 100 units instead of the 110 units which he could supply. With a price of 11.5 per unit instead of 10.0, the result is a larger gross revenue of 1150, and a net revenue of 150 instead of 100.

Jones can restrict his production in either of two ways, and it does not matter which course he takes. He may either use the less productive combination of factors, Combination 2 instead of Combination 3, thus reducing his physical productivity; or, he

may produce the maximum amount (Combination 3) and destroy the difference (the 10 units). Economically, it doesn't matter which course he takes, since the result is to supply less for the market than he could have done with the purchased factors.

We see that when a demand curve confronting the individual producer is inelastic as in Case (c), there are two major points of differentiation from the Cases (a, b1, and b2), where this curve is elastic. First, in the other cases, physical productivity (output on a given investment in factors) is at a maximum, and all of this output is supplied on the market. In Case (c), there is a restriction of productivity by the producer to obtain greater revenue. Secondly, the final market price is always lower in the other cases, other things being equal. The effect of the action in Case (c) is *always to raise the price to the buyer*. The effect of the restrictive action is always to raise the price of the individual firm's product *higher* than it would have been at the point of maximum supply and output.

SECTION 2: COMPETITIVE PRICE AND MONOPOLY PRICE

When the market price of a firm's product is arrived at as in Cases (a) and (b) above, this is termed *the competitive price*; when it is arrived at as in Case (c), through the restriction of production and supply, the resulting price is termed *the monopoly price*.[15] The monopoly price can only be attained in the case of a demand curve inelastic to the producer, and is the result of a restrictive cut back from maximum productivity; it is always higher than the competitive price would have been. *How much* higher the monopoly price is, *how much* production is restricted, depends of course on the conditions of each particular case. Evidently, the more inelastic the demand curve for the individual producer, the higher, relatively, will be the monopoly price.[16,17]

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[15] On competitive price and monopoly price, see Fetter (1915, pp. 77–84, 381–385); Mises (1949, pp. 273–279, 354–376), Mises (1951 [1922], pp. 385–392), Menger (1950 [1871], pp. 207–225) and Wieser (1927 [1914], pp. 204, 211–212).

[16] See Brown (1908, pp. 626–629).

[17] *Editor's footnote*: Rothbard slightly modifies his definitions of monopoly and competitive price below (pp. 538–39).

Many writers have assumed that "competitive price" only refers to such conditions as Case (a), where the action of the individual producer has no effect on price. Such a rare condition is dubbed "perfect" or "pure" competition. More common situations like Case (b), where the action of the individual producer does affect the price, are termed, invidiously, "monopolistic" or "imperfect" competition, and it is assumed that this "monopolistic competitive" price is higher, and the quantity less, than would have obtained under "pure" competition.[18] We have seen that this contention is completely fallacious. If the demand curve for the individual producer is elastic at the competitive price, so that this point yields maximum revenue, the product will sell at the competitive price regardless of the fact that the action of the individual producer may have a strong influence on the market price. Thus, we see that there is *not* a large range of possible prices with the competitive price at the bottom, and monopoly price at the top, and a variety of "monopolistically competitive" prices that could be set in between. *There is only, the competitive price and the monopoly price.*

Whichever price is set, whether competitive or monopoly price, the determination of the price takes place in the way we have analyzed above-via the supply and demand schedules. The difference comes through the determination of the quantity of stock produced. Under competitive price the producer estimates what his selling price will be, or rather, what price he will be able to sell his stock for, and produces the maximum stock that he can from his investment. But if the demand curve to the producer is inelastic at that price, he can restrict his production somewhat, produce less stock, and increase his monetary revenue. The market price which will obtain as a result of such restriction is the monopoly price.

The extra revenue which the producer obtains from the monopoly price as compared to his revenue at the competitive price is a *monopoly gain*, and this concept, along with further details of the monopoly question, will be studied further in a later section.[19]

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[18] For example, see Chamberlain (1942). Recently, however, Professor Chamberlin has repudiated the implications drawn by his followers that the "pure competition" situation is the ideal; indeed, he implies quite the reverse. Chamberlin (1950, pp. 85–92).

[19] *Editor's footnote*: This later section, whether or not it was intended to be included in the current chapter or a later one, was not found by the editor in the Rothbard

It is most unfortunate that traditional terminology in economics makes it necessary to use such terms as "competitive price" and "monopoly price." The terms are highly misleading and can lead to serious errors in analysis, and they are highly charged emotionally-they are "loaded terms" to most people. "Competition" is usually regarded as fine and praiseworthy while "monopoly" as somehow sinister and tyrannical. There was good reason for the sinister attachments to the word "monopoly" in the public mind. The original meaning of monopoly was *a grant of special privilege by the State* to a person or group of persons to produce a good to the exclusion of other producers. As the great jurist Lord Coke defined monopoly:

> A monopoly is an institution or allowance by the king, by his grant, commission, or otherwise... to any person or persons, bodies politic or corporate, for the *sole* buying, selling, making, working, or using of anything, whereby any person or persons, bodies politic or corporate, are sought to be restrained of any freedom or liberty that they had before, or hindered in their lawful trade.[20]

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archives. See Rothbard (1962, pp. 677–680) for his mature theory of monopoly gains on the free market. It is important to note that here he no longer uses the competitive versus monopoly price distinction.

[20] See Ely (1917, pp. 190–191). The famous Blackstone gave almost the same definition, and called monopoly a "license or privilege allowed by the king."

The original meaning of monopoly therefore was a grant or exclusive trade in some area, conferred by the State to the hindering of the "lawful trade" of other would be traders, or "competitors," in the same field. Such monopoly grants were historically important in the Western world, and it is not surprising that, with the growth of the spirit of liberty and of the libertarian movement, monopolies became more and more odious.[21,22]

Many present day writers have changed the original meaning of the word "monopoly," and the result is an unwarranted transference of this acquired hostility toward entirely different conditions. Some define "monopoly" as any producer who is alone in the production and sale of any particular product, or "monopolistic" as the exertion of any perceptible influence over the market price. These conditions are far removed from privileged grants of monopoly. On such definitions, any individual producer of a good that the consumers regard as unique, and differentiate from other goods, is a "monopolist." Ford has a monopoly over the sale of Ford cars; John Williams, lawyer, has a monopoly over the sale of the legal services of John Williams, etc. In this interpretation, every seller of an individualized commodity is a "monopolist."

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[21] The battle of the equal-liberty movement against monopoly has had a long history in England. In 1603, the British courts decided, with respect to one of Queen Elizabeth's numerous grants of privilege: "That it is a monopoly and against the common law. All trades… are profitable for the Commonwealth, and therefore the grant to have the sole making of them is against the common law and the benefit and liberty of the subject." In 1624, Parliament declared that "all monopolies are altogether contrary to the laws of this realm and are and shall be void." In the American states, the Declaration of Rights of the Maryland Constitution asserted: "monopolies are odious, contrary to the spirit of a free government and the principles of commerce" Ely (1917, pp. 191–192). See Walker (1911, pp. 483–484).

[22] *Editor's footnote*: In this footnote Rothbard refers the reader to later chapters on the hampered market on various monopoly grants. Rothbard originally wrote multiple chapters on the hampered market before the publisher required that he cut the length of the book down and remove controversial parts of the manuscript. Rothbard then had to write a summary chapter of his analysis (Rothbard, 1962, pp. 875–1041). Rothbard's multiple chapters on government intervention were eventually published as Rothbard (2009 [1970]). See Rothbard (1970, pp. 1089–1144) for his analysis of various grants of monopolistic privilege. Rothbard also mentioned in this footnote that copyrights and patents would be discussed below, see Rothbard (1962, pp. 745–754) for his analysis on patents and copyrights.

Labels for concepts are basically immaterial, the main requirement being that the original meaning continue in force to avoid confusion and error. In view of its historic origins, and emotional connotations, such a use of the term "monopolist" is highly inexpedient, and should be rejected. Similarly, to classify *trademarks* and *brand names* for individual products as grants of monopoly is an illegitimate use of the term. For the government to protect any individual in the use of his own trademark is identical with protection against Jack Smith calling himself "John Williams" and selling his own legal services in the guise of forgery. In other words, it is equivalent to the governmental function of defending an individual's freely obtained property against violence and fraudulent theft.[23] Each individual, in a free economy, has the right to his own self, to *his own name*, and to the exclusive use of his own property. He is no more a "monopolist" over his own name, than he is over his own will or his own property. The governmental function of defense of person and property, so vital to the existence of a free economy and a voluntary society, necessarily involves the defense of each person's particular name or trademark against the fraud of forgery. It is absurd to use the term "monopoly" or "monopolistic" with respect to the consumers' differentiation of various individual's products and services. If the consumers consider Williams' and Smith's legal services as different in quality and therefore as different goods, then they are different goods. To allow Smith to pass himself off as Williams, because of the latter's greater reputation for quality, is to permit violation of each person's ownership over his name and product.

To define "monopolist" as the exclusive seller of any given product is thus highly inexpedient. We shall employ the original definition of monopoly as a grant of special privilege by the State, confining a field of trade of produce to one individual or group, to the exclusion of others who would be eligible to enter such production in a purely free economy.[24] We shall define that

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[23] *Editor's footnote*: See Rothbard (1962, pp. 162–169, 176–185).

[24] That such was the original definition of monopoly in economics as well as law is demonstrated by the definition of the economist Arthur Latham Perry: "A monopoly, as the derivation of the word implies, is a restriction imposed by a government upon the sale of certain services" (Perry, 1892, p. 190). Still earlier, Adam Smith discussed monopoly in similar terms, and pointed out how

voluntary society where there are no grants of monopoly privilege as a society of *free competition*, i.e., one where anyone may enter any field of production that he desired (so long as he does not usurp the name of another individual). His *ability* to do so in any case depends of course on the capital he can invest or borrow, and on his entrepreneurial ability in forecasting future conditions, but this of course is his *own* responsibility. He is *free* to compete, not only when he has the ability to do so, but generally when there are no coercive restrictions preventing him from doing so.

It should be clear by this time that there is a great distinction between the concept of "monopoly" and of "monopoly price," and hence the misfortune of the same word applying to different concepts. The two are entirely different. The monopolist, in our sense, may or may not be able to achieve a monopoly price. The demand curve for his product may be elastic, or there may not be even any consumer demand for his product at all, in which case he could make no net return in producing the good. Thus, the State may grant Hiram Jones an exclusive monopoly privilege for the manufacture of kerosene lamps, but if so few people wish to buy these lamps as to make the production unprofitable, the monopolist is not able to achieve a monopoly price or a monopoly gain. On the other hand, the production may be profitable, but the demand curve elastic, so that the monopolist does not restrict production and sells at what would have been the competitive price. Similarly, the "monopolist" in the faulty sense of a single seller of any product, may not be able to achieve a monopoly price for his sale. A lawyer will probably not be able to gain more revenue by restricting his hours of legal service in order to raise the market price; a producer of a particular brand of breakfast cereal may not be able to make gains by restricting his production in order to raise the price and earn a monopoly gain.

Thus it is perfectly possible for a "monopolist," either in the sense of a privileged seller or as the sole seller of an individualized commodity, not to be in the position of charging a monopoly price for his product. The result depends on the demand curve for his

monopolists may use the government privileges to restrict sales and raise selling prices; "Such enhancements of the market price may last as long as the regulations of police which give occasion to them" (Smith, 1937 [1776], p. 62).

individual product. On the other hand, it is possible to be able to charge a monopoly price without being a "monopolist" in either of the two senses. Thus, let us suppose that there are several sellers of the same product, and that therefore there is no monopoly. For each of the producers, the demand curve for his individual product is elastic at the competitive price, and therefore there is no way to achieve an extra monopoly gain by restricting production and raising price. On the other hand, the demand curve for the product as a whole, the total market demand curve, might be decidedly inelastic at the market price. In such a case, there might well be a tendency for the various producers to get together and decide production and price policy as if they were one firm only. If they could make such an agreement, they could act as one firm, and the market demand curve would then be identical with the demand curve for that "firm," and the inelasticity would permit a general restriction of production and a rise to a monopoly price. Such an agreement by many producers to act as one firm in the market is known as a *cartel*. A cartel arrangement can permit numerous firms to act as "monopolists" in the sense of sellers of an individualized commodity.

There are many stumbling blocks in the paths of firms attempting to form such a cartel, however. Although the demand for the whole product may be inelastic, the demand for each firm will be elastic. Therefore, each firm will agree that the total product and sale should be restricted in order to raise the price, but each producer will be reluctant to restrict *his own* product and sales. For if the other firms restrict their sales, each firm can gain considerably by expanding his own and taking advantage of the higher price. Hence, it is necessary for each cartel member to agree on a certain quota of the aggregate product and sales, and restrict himself to that quota. It is quite clear that the difficulties to the establishment, and the maintenance, of such a cartel are well-nigh insuperable. In the first place, there is likely to be a great deal of bickering about the assignment of quotas since each firm will try to acquire a larger quota. Whichever basis quotas are assigned are arbitrary, and will always be subject to challenge. As Professor Benham states:

> Firms which have produced a relatively large share of output in the past will demand the same share in the future. Firms which are expanding— owing, for example, to an unusually efficient management—will demand a larger share than they obtained in the past. Firms with a greater

"capacity" for producing, as measured by the size of their… plant will demand a correspondingly greater share" (Benham, 1941, p. 232).

Particularly likely to be restive under a cartel system are the more efficient producers, those who are making larger profits, and who are eager to expand their business. These firms will be eager to take advantage of the elastic demand curve to their own sales, and to test their own mettle against the less efficient firms protected by the assured cartel's quota. It is obvious that the cartel, increasingly as it persists, tends to protect the sales and earnings of the *inefficient* as compared to the more efficient competitors.

As Benham puts it:

> The successful maintenance of a combination, once it is formed, is threatened both from within and without. Conditions will change as time goes on, and will make it difficult for the combination to retain the adherence or "loyalty" of some of its members. Some firms will find that consumers demand more of their particular products than before and will resent having to pass on orders (in excess of their quota) to be executed by other members of the combination. Again, some firms will outstrip others in taking advantage of the progress of technical knowledge, and will conclude that they have more to gain by expanding their sales at lower prices than by continuing their membership of the combination. If the demand for the products of the industry falls considerably, the proportion of "unused capacity" will increase, and this will strengthen the desire of some firms to break away and make fuller use of their plants, thus increasing their receipts, by selling at lower prices.[25]

The ever present temptation to each producer, particularly a venturesome and efficient one, is to defy the cartel, either secretly or openly, and expand his own sales. The great instability of the cartel stems from the fact that once the firm steps out of line, the others must do so as well. For with A, B, C, etc. restricting their output to maintain the monopoly price, if competitor D expands his output, and cuts the price slightly, he tends to take a great deal of business away from the other producers. Even if price is not affected a great deal, D's expansion earns revenues while the

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[25] Benham (1941, p. 233). On the rapid breakup of even a relatively successful cartel, see Fairchild et al. (1926, pp. 54–55). Also see Molinari (1904, pp. 192–195), Fay (1923, p. 41) and Fay (1912).

others must limit theirs.[26] The result is a speedy breakup of the cartel and a return to competitive pricing and output conditions.

Just as great a menace to the existence of a cartel is the threat of outside competition from newcomers. As a matter of fact, the greater the success of the cartel in maintaining its internal cohesion, and earning monopoly gains which are apportioned to the members, the greater will be the temptation for new firms to enter the field. These new firms, unhampered by cartel agreements, can expand their production and sales to take business away from the cartel, and may cut the price of the product as well. This factor is a powerful one in causing the dissolution of the cartel agreements. As a result of these factors, it is not an exaggeration to state that almost no cartel agreement, unaided by special privileges from governments, has been able to survive more than a very short period of time.[27] The type of State privilege is varied, and will be dealt with in the chapters on State intervention and the Hampered Market.[28] One such measure in compulsory cartelization, another is the imposition of artificial restrictions in the freedom of entry of potential competitors into the field.

Another important factor tending to prevent the rise of cartels is that, in a free economy, an agreement to form a cartel *is not enforceable* in the courts. In other words, if Jones signs an agreement to join a cartel and only process 10% of the output of certain other firms, he may violate the agreement at any time without suffering governmental penalties, such as payment of damages of compulsion to abide by the contract. This is due to the particular scope which governmental enforcement of contracts has in a free economy. It was seen in Chapter II that the governmental agency, in a voluntary society, enforces contracts, not simply because they are contracts or promises *per se*, but because they represent *unfinished exchanges of property*.

Suppose, however, that a monopoly price has been established on the free market, either by an individual firm or by a remarkably

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[26] Menger (1950, pp. 222–225).

[27] In many cases, fear of possible outside competition prevents any formation of a cartel, even when other conditions seem favorable. This is known as the influence of *potential competition* on would be cartelists.

[28] *Editor's footnote*: See footnote 22.

stable cartel. Are the consequences necessarily sinister, as has often been assumed? In the first place, it must be realized again that the term "monopoly price," used in contrast to "competitive price" is really a misnomer, although the terms must be used for traditional reasons. The monopoly seller or sellers are not immune from, or beyond the pale, of competition. Quite the contrary. The terminology is the result of an old neoclassical preoccupation with single "industries." Every monopoly seller competes with every other seller for the money of the consumer. Every consumer allocates his money expenditure among all the available uses, and therefore this fundamental competition obtains between all sellers of all the goods and services. Producers compete for wide groups of laborers of various types, of lands and capital goods. Thus, Ford does not only compete with General Motors; it competes with the sellers of washing machines, of television sets, of houses, of caviar, of concert music, etc. Everyone on the free market is a mutual competitor. Thus the monopoly seller who obtains a monopoly price is not beyond competition. He does not dictate to the consumer or anyone else.

But even if the monopoly seller is subject to competition, isn't the consumer worse off when a monopoly price and restricted production obtains? Can we not say that there is a loss of consumer welfare in a monopoly price situation? Isn't this an important exception of the harmony of interests that prevails on the voluntary market? To answer these questions, let us recall the exchange situations detailed in Chapter II.[29] Jackson and Smith are in isolated exchange, the former has a horse and the latter has fish, and they bargain to make an exchange. Let's say the agreed upon terms of exchange are 90 barrels of fish for the horse. Now, critics could charge that Jackson is worse off than he would have been if the price had been set at 95 or higher, while Smith is worse off than he would have been if the agreed price were less than 90. Such charges however miss the point of the analysis. The point is that both voluntarily agreed on the price, that both believed that there were no better alternatives available. The same is true for every price in every exchange, regardless of the number of exchanges. The purchase or the sale

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[29] *Editor's footnote*: See Rothbard (1962, pp. 79–94).

of the unit of the good at the agreed upon price is considered the best possible alternative action by each party. Thus each is the best off, has the highest welfare, that he can obtain, consistent with the maximum welfare of everyone else. Smith could force Jackson at the point of a weapon to make the exchange for 80 or 70 or 60 or no fish at all. But in that case it is obvious that the use of coercion has made Jackson worse off, and that Jackson is being exploited by Smith. Furthermore, this action brings up all the problems of violence and an exploitative society, which have been mentioned previously and will be discussed fully in later parts of this book.[30] Within the framework of a voluntary society, the market price is the best price that either the seller or the buyer can get, and therefore comparing the welfare of either one with some impossible ideal is vain. In the same way, buyers and sellers on the market are "included" or "excluded" from exchange by their own voluntary action in accordance with their value scales.

But what of the case of a monopoly price? When it is set in the framework of the free market, again all parties to the exchange benefit. A coerced lower price or greater product could only exploit the sellers for the immediate benefit of the buyers. Monopoly pricing, on the other hand, is not the exploitation of the consumers, because the payment is voluntary. This conclusion is confirmed by a closer look at the inelastic demand curve, which must obtain in all cases of monopoly price. Thus, suppose that a firm's maximum productivity would yield a product of 100 units at the competitive price of 10 ounces. Its inelastic demand curve is such that a stock of 50 units raises the market price to 30 ounces, the monopoly price. In the former case, the firm's revenue is 1000 ounces from its investment; in the latter case, it is 1500 ounces. This means that consumers have *voluntarily* paid more money for the product in the monopoly price situation. How can it be deduced from this that the consumers are worse off under a monopoly price? After all, the inelasticity of the demand curve is not fixed in Heaven; it is the result of the voluntary action of the consumers in paying more money for the product at a monopoly price. If the consumers really felt that they were worse off than they could be because of the monopoly price, they

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[30] *Editor's footnote*: See footnote 22.

could, individually or jointly, *boycott* the product and refuse to buy at the higher price. Such action, would, of course, render the demand curve for the good elastic, and force the firm or the cartel to increase its output and lower the price to the competitive one. The money withheld in the boycott could either be added to cash balances, spent on the products of competitors, or used to invest in a competitor to a cartel. There is therefore never any need to worry about the situation of the consumers in a free market. The shape of their demand curve, and therefore the final market price, is purely the result of their own voluntary action.

It should be clear from the above discussion that there is nothing particularly reprehensible, or frustrating of consumer freedom, in the establishment of a "monopoly price" or in a cartel action. A cartel action, if it is a voluntary one, cannot injure freedom of competition or, if is profitable, cannot injure consumers. On the contrary, they are, as are all other actions on the free market, perfectly consonant with a free society, with individual self-sovereignty, and the earning of money through serving consumers.

As Benjamin R. Tucker brilliantly concluded in dealing with the problem of cartels and competition:

> That the right to cooperate is as unquestionable as the right to compete; the right to compete involves the right to refrain from competition; cooperation is often a method of competition, and competition is always, in the larger view, a method of cooperation… each is a legitimate, orderly, non-invasive exercise of the individual will under the social law of equal liberty….

> Viewed in the light of these irrefutable propositions, the trust, then, like every other industrial combination endeavoring to do collectively nothing but what each member of the combination might fully endeavor to do individually, is, *per se*, an unimpeachable institution. To assail or control or deny this form of cooperation on the ground that it is itself a denial of competition is an absurdity. It is an absurdity, because it proves too much. *The trust is a denial of competition in no other sense than that in which competition itself is a denial of competition.* (Italics ours.) The trust denies competition only by producing and selling more cheaply than those outside of the trust can produce and sell; but in that sense every successful individual competitor also denies competition.... The fact is that there is one denial of competition which is the right of all, and that there is another denial of competition which is the right of none. All of us, whether out of a trust or in it, have a right to deny competition by

competing, but none of us, whether in a trust or out of it, have a right to deny competition by arbitrary decree, by interference with voluntary effort, by forcible suppression of initiative.[31]

This is not to say, of course, that joint co-operation or combination is necessarily "better than" competition among firms. We simply conclude that the relative extent of areas within or between firms on the free market will be precisely that proportion most conducive to the well-being of consumers and producers alike. This is the same as saying that the size of a firm will tend to be established at the level most serviceable to the consumers.[32]

SECTION 3: THE PRODUCT AND OUTLAY SCHEDULES OF THE FIRM

Let us now return to the activity of the firm and its *production function*. We will assume now that the firm is competitive, and produces for a competitive price, so that its situation either fits Cases (a) or (b) above. In the production schedule drawn up for Jones shown in Table 3, the ratios between the quantities of the factors differ for the various technical alternatives available. Thus, 50X combined with 80Y produces 100 units of product, and 60X combined with 76Y produces 110 units. The ratios between the quantities of factors: 50/80, 60/76, etc. may vary considerably. The list of technological alternatives varies according to the specific "engineering" data of the product in question. In very rare cases, there might be cases where only one ratio, or one set of "production coefficients," is permissible. In such cases, for example, the product could only be produced with a combination of 5X to 8Y, in that ratio. In almost all

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[31] See Tucker (1926, pp. 248–257). For a defense of voluntary combinations from a juristic point of view, see Cooley (1878, pp. 270–271). Also see Flint (1902) and Croly (1909, pp. 359–365) for the economic defenses.

[32] Does our discussion imply, as Dorfman (1949, p. 247) has charged, that "whatever is, is right"? We cannot enter into a discussion of the relation of economics to ethics at this point, but we can state briefly that our answer, pertaining to the free market, is a qualified Yes. Specifically, our statement would be: Given the ends on the value scales of individuals, as revealed by their real actions, the maximum satisfaction of those ends for every person is achieved only on the free market. Whether individuals have the "proper" ends or not is another question entirely and cannot be decided by economics.

cases, however, it is possible to vary the ratios of the factors. Thus, some might assume that the factor ratios in a firm producing, say, chemical dyes are inalterably fixed by the chemical formula of the dyes. This is a complete misconception of the problem, however. The point is that the variations can take place among the number of workers, the number of vats, the amount of land, management, etc., that will be used. The greater the development of the economy, the advance of technological knowledge, and the amount and variety of factors, the greater the opportunity for variability of factor ratios. It is doubtful, indeed, if there are any instances of production where the factor ratios are absolutely fixed.[33]

In Jones' case, given the factor prices, and the production functions available, it is clear that he will choose the combination 60X plus 76Y in order to attain the maximum output, and hence maximum revenue, from the original investment. In order to analyze more fully the problem of production combinations, the firms' production, and factor prices, we will assume a far greater range of production alternatives by extending Table 3. Suppose, for example, that with the price of Factor X at 4 oz. per unit, and the price of Factor Y at 10 oz. per unit, 1000 oz. will purchase the following alternative combinations of factors yielding the listed quantities of product:

Table 8

Price of X equal 4 oz. per unit	Price of Y equal 10 oz. per unit
1000 ounces worth of alternative combinations	Units of Product
40X plus 84Y	96
45X plus 82Y	97
50X plus 80Y	100
55X plus 78Y	105
60X plus 76Y	110
65X plus 74Y	107
70X plus 72Y	105
75X plus 70Y	100
80X plus 68Y	96

These are the technological alternatives that can be accomplished with 1000 ounces' worth of factors. The maximum productivity is still at 60X plus 76Y, and this will still be chosen.

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[33] See Stigler (1946, pp. 111–112) and Weiler (1952, p. 147ff).

Now, simply from the given factor prices, we can deduce the *rate of outlay substitution*, i.e., the rate at which one factor must be subtracted to compensate for the addition of another factor, so as to have a *constant outlay* (in this case, 1000 ounces). In the present case, 2 less units of Y have to be compensated by 5 additional units of X in order to arrive at the "constant outlay combination" of 1000 ounces. For example, starting from the first line, we know that 40 times 4 equals 160; 84 times 100 equals 840, and the sum equals 1000. If we add 5 units of X and subtract 2 units of Y to move to the second line, we know that 45 times 4 equals 180, 82 units of Y times 10 will give 820, to sum to 1000. It will be seen below algebraically below that the *rate of outlay substitution of one factor for another is equal to the ratio of the prices of the two factors*. Therefore, the rate of substitution of factor X for factor Y is 2/5, while the ratio of the money price of Y to the money price of Y is 4/10, or 2/5. This ratio of 2/5 obtains regardless of what constant outlay is in view; whether it is 500 ounces or 700 or 1800 ounces.

As yet, we have not progressed far beyond the conclusion that Jones will produce at the (60X, 76Y) combination. However, this line of approach permits further insight into the activity of the firm, and the interplay of technological and financial factors. Let us now shift the focus of attention, and consider this type of question: assuming for the moment that Jones wishes to produce say, 105 units, what are the alternative combinations of factors which can produce them? The answer is a purely technological one, and in accordance with the technological knowledge available, Jones can draw up a list of alternative physical combinations that would yield this result. *So far*, in this sort of problem, no financial or monetary considerations have yet entered. We already know that 105 units can be produced by the combinations: (55X and 78Y), and (70X and 72Y). Let us say that the following are the combinations of the two factors that will yield 105 units of product:

Table 9

COMBINATIONS OF PRODUCING 105 UNITS OF PRODUCT	CHANGES IN FACTORS	
	PLUS X	MINUS Y
40X plus 100Y	-	-
45X plus 90Y	5	10
50X plus 84Y	5	6
55X plus 78Y	5	6
60X plus 75Y	5	3
65X plus 73Y	5	2
70X plus 72Y	5	1
75X plus 71Y	5	1

It is obvious, that in investigating any *constant product* combinations, an addition in the amount of one factor must be offset by a decrease in the quantity of the other, for the final product to be the same.[34] This can be deduced from the mere fact of these factors as instruments of production. It is *also* deducible from the very fact of the existence of factors. As more and more of one factor is added, and another factor is diminished, the added quantities must compensate less and less for losses in the other factor. Conversely, the more a factor is diminished, the greater will be the need to compensate by adding to another factor, to produce the same product. This is called the *imperfect substitutability of factors*. This imperfect substitutability is deducible from the very existence of human action. The very fact that consumer goods are scarce implies that factors of production are scarce, and the very fact that there *are* factors implies that there is more than one factor, since if there were only one factor it would be a consumer good and not a producers' good. The very fact that there is more

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[34] It is obvious that, for each of these combinations, more of both factors will produce at least as much as, and probably more than, the particular product. Thus, if (40X; 100Y) can produce 105 units of product, so can (45X; 105Y). This follows from the nature of scarce goods and scarce factors. The use of the latter combination to produce 105 units, however, would clearly be senseless. The latter, obviously more expensive combination, would either produce more and the surplus thrown away—which would be a ridiculous procedure; or else would produce just as much, in which case the factors would still be wasted and needless money expended. In describing constant outlay combinations, therefore, we assume that those combinations which are obviously more expensive for each product—using *more of both factors*—will be discarded at once. The only question then comes from the partial substitutability of one factor for another.

than one factor, in turn, implies that the different factors are *not* perfectly substitutable for each other; otherwise, they would not be separate factors at all. The common example of such imperfect substitutability is that if labor were perfectly substitutable for land on a farm, constant production could be insured with a constantly diminishing area simply by adding to the number of workers, so that 100,000 workers in the space of a thimbleful of land could produce as much wheat as 100 workers on a hundred acres of land. The imperfect substitutability, however, applies to *all* factors of production in all cases, and not just to labor and land.

We may define the *marginal rate of production substitution* of one factor for another as the ratio of the amount of the second factor that can be diminished as a result of an increase in the first factor in order to yield a constant product. It is clear that the marginal rate is *diminishing* as the factor continues to be added. When the combinations change from (40X; 100Y) to (45X; 90Y), the marginal rate of substitution of X for Y is 10/5, equal to 2; but later on in the proceedings, when the combination changes from (65X; 73Y) to (70X; 72Y) the marginal rate of substitution is 1/5. What the actual rates are depend on the specific technological data, but economics does tell us that the *marginal rates of product substitution diminish*.

Suppose that Jones decided to produce 105 units of product; he could affect the production in each of the above different ways. Which alternative would he choose? Obviously he could choose that alternative that involved the least expense in money, and that would depend on the prices of the factors. *Technologically*, he would have no way to choose between the various combinations, because technologically all of them are equally effective. It is only the existence of factor money prices that permits the producer to choose among these combinations. With the original factor prices of 4 ounces of gold per unit for X, and 10 ounces for Y, the necessary money expenses he would incur for the production of 105 units of product would be as follows:

Table 10

COMBINATIONS PRODUCING 105 UNITS OF PRODUCT	
PRICE OF X EQUAL 4 OZ. PER UNIT	PRICE OF Y EQUAL 10 OZ. PER UNIT
COMBINATIONS	MONEY OUTLAY NECESSARY
40X plus 100Y	1160 ounces
45X plus 90Y	1080
50X plus 84Y	1040
55X plus 78Y	1000
60X plus 75Y	990
65X plus 73Y	990
70X plus 73Y	1000
75X plus 71Y	1010

In this particular example, Jones will choose either (60X, 75Y) or (65X, 73Y) either of which minimizes his required money outlay at 990 ounces. Given the amount of production at 105 units, the *minimum outlay combination of factors* will be the one chosen.

Some writers discuss the activity of the firm as if this were the most appropriate manner of analysis, as if a quantity of product is arbitrarily set, and the producer looks for the minimum outlay combination of factors to produce it. In reality, however, it is clear that the beginning point is the decision to invest a certain amount of money in factors, and the attempt to choose a combination so as to maximize the productivity of the factors, as we have seen above. The present analysis is subsidiary and supplementary to the previous one, but it is useful to revealing the relationship between technological and monetary elements.

Reverting back to the 1000 ounces' worth of combinations depicted in Table 8 we saw that Jones chose that combination which maximized production for 1000 ounces, at 110 units of product (60X and 76Y). We shall now demonstrate that this combination is also the minimum outlay combination of all the factor combinations that could produce 110 units of product. The demonstration of this truth is simple. In the first place, we may rule out those combinations which require less of *each* factor, such as (55X; 74Y). We have seen above that obviously wasteful combinations are discarded immediately; therefore, if (60X; 76Y) are *required* to produce 110 units, there could not be another constant product combination with less of each factor that could also produce 110 units. This follows from the very nature of scarce goods and scarce

factors. Therefore, the possible combination which might be able to produce 110 units for less outlay would have to be a constant product combination schedule such as listed above in Table 10 for 105 units, with more of one factor compensating for the subtraction of another. Now suppose that this supposed minimum outlay combination for 110 units has a quantity of X of more than 60, and a quantity of X of less than 76. But to be cheaper, the combination would have to have less of one factor—given the other—than the combination on the 1000-ounce constant outlay schedule. But for each addition of X (X is assumed for convenience to only change in blocks of 5 units, but this does not alter the fundamental result), the constant outlay combination produces *less* units of product: 107, 105, 100, etc. In order to be cheaper for any given X, the units of Y would have to be even less; and it is manifestly impossible for such a combination to produce as much as these amounts, let alone 110 units. Symmetrically, the same is true for combinations with less X and more Y. For constant outlay, each of the possible alternative combinations produces less than 110 units; to be cheaper than each of these, any other combination could only produce still less, and could not produce 110 units.

It is therefore universally true that the maximum product combination for any given outlay of money is also the minimum outlay combination for that particular physical product.

Thus, we see that, on the free market, each firm, in maximizing the product that can be produced from any given outlay, is also engaged in reducing the money outlay required for each product. Given the prices of the factors, there is only one way to increase his money income from the investment: to find a factor combination that will be the most productive of physical product, and that, in consequence, will be the cheapest method of producing that amount. This analysis enables us to see clearly the different roles played in production by technological and by economic considerations. Technological considerations yield knowledge of the various series of constant product schedules that would be available. At any given product that could possibly be considered, the prospective producer could command a series of tabulations that would yield him the production functions and combinations that could produce it. This would be the contribution of technology. But this knowledge by itself would tell the entrepreneur next to nothing about the crucial

questions in the whole problem of producers' activity: should he enter the business at all? How much should he invest? Which of the alternative constant product combinations should he choose? The answers to these vital questions can only be provided by *economic*, by *financial*, as opposed to *technologic*, considerations. Specifically, it is the establishment of money on the market which enables the businessman to make these decisions in a rational and intelligible manner. The prospective producer will invest in that line of business, in that particular firm, which will maximize his expected money income, over any period of time that he chooses. This rule, as we have explained before, is modified when psychic nonmonetary matters intervene, thus obeying the general, universal rule that in *all* action the actor maximizes his expected psychic income. Setting aside cases of conflict between money and psychic income, which have already been noted, investors drive to maximize their money income. They will enter that line of business which promises the greatest return on their investment, they will invest in accordance with their expected return balanced by their time preference, and they will produce that combination which requires the least monetary expenditure for the particular product. And to accomplish this they will sell their products for as much as they can—which we have seen will quickly tend to be the competitive market price; will try to buy their factors for as little as they can—which we will see below will be the competitive price; and will try to increase the physical productivity which can be obtained from any given set of factors, i.e., increase their *productive efficiency* to the utmost. But it is clear that none of these decisions could be made if the investor did not have the various price data and estimates to guide him in his choices. And it is only because the money commodity has become the general medium of exchange that such markets, and such price and income comparisons and estimates, are possible.[35] And these

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[35] The absurdity of the "technocratic fallacy" here becomes obvious. The technocratic charge is that business conducts "production for profit" instead of "production for use," and that the latter would prevail if engineers were granted dictatorial control over the productive system. It is clear from the discussion that technology cannot solve the production problem, and that therefore "production for (money) profit" *is the only possible method of production* beyond the very primitive level. Technology by itself could neither provide a guide to "maximizing production" nor to determining *what* should be produced. And it is also evident that business on the market takes account of the technological factor as much as is necessarily

price and income calculations and estimates are most emphatically *money* estimates; they can in no way be reduced to, or considered equivalent to, barter.

We have already demonstrated that the maximum product combination for any given outlay of money is also the minimum outlay combination for that particular physical product. It is therefore also true that every minimum outlay combination is the maximum product for that outlay. Let us then take the case of an investor with 990 ounces of gold to invest. His maximum product combination will produce 105 units, at either the combination (65X; 73Y) or (70X; 72Y), which are also the minimum outlay combinations for 105 units. We may see above the behavior of the rate of product substitution as the number of units of factors change; the rate of product substitution of X for Y changes from 2, to 6/5, to 3/5, etc. We notice that the minimum outlay combination is reached at the approximate point where the rate of product substitution is equal to 2/5; i.e. is equal to the rate of outlay substitution, which, given the prices, is constant throughout at 2/5. If the rate of product substitution is appreciably less than or more than the rate of outlay substitution, it will pay for the producer to shift to other alternatives until the two rates are approximately equal.

Thus, there is a tendency for the firm to produce at such a rate and such a way that the *rate of product substitution between factors is equal to the rate of outlay substitution between them*. And, since as we have seen, the rate of outlay substitution always equals the ratio of the prices of the factors, the firm will always tend to produce *so that the rate of product substitution between the factors equals the ratio of their money prices*.[36]

In the particular case of Jones, he will tend to produce in such a way that the rate of substitution between the two factors is 2/5.

Actually, this analysis does not help us in the specific determination of the productive combination that will be chosen: this will

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possible. It should also be clear that production for profit is necessarily production for "use." There is no reason to produce any good except to supply the demand for its use by consumers, whether the consumer is other persons or the producer himself (in the more primitive production situations). All production is for use.

[36] *Editor's footnote*: See below (pp. 535–37) for Rothbard's analysis when more than 2 factors are involved.

always be given by the requirement of maximum product per outlay (which will be the minimum outlay for that product). On the contrary, the two ratios will not by means always be equal, because the range of production alternatives available may not be sufficient. If there are only a few production alternatives, then there cannot be the small steps which are necessary to allow equality of rates, or meaningful discussion of such rates. Thus, if only two combinations can produce 105 units of product: namely, (45X; 90Y), and (65X; 73Y), Jones will choose the minimum outlay combination, but the "rate of product substitution" between such distant combinations will be 17/20. However, the rate will still be the nearest approach possible to 2/5, and in that sense we may still say that the tendency will be to approach that rate. The value of the concepts of rate of substitution will fully emerge as essential to an analysis of the prices of factors of production, and, specifically, the demand schedules for the producers for these factors.

The Product and Outlay Schedules of the Firm-Mathematical Analysis

At this point it is now time to turn to an algebraic and geometric presentation of the above analysis for two factors.

The definition of a constant outlay schedule is that the total sum of money expended be constant, whatever that sum may be. In other words, for two factors, the sum of the amount of money spent on factor X plus the sum of the amount spent on factor Y is always equal. The amount of money spent on each factor, in turn, is always equal to the price of that factor times the total quantity of the factor that is purchased. Thus, if the price is 10 ounces per unit, and 5 units are bought, the total sum of money expended is 50 ounces. Therefore, for a constant outlay schedule, if p_x is the money-price of factor X; p_y is the money-price of factor Y, a is the number of units of X bought at any given point; b is the number of units of Y bought at any given point; and k is any constant sum of money outlay; then:

(1) $ap_x + bp_y = k$

This equation defines any given point on any constant outlay curve for two factors. Now, suppose that we wish to move from

this point to any other point on the constant outlay curve. The amount of X then becomes $a+m$, while the amount of Y, which diminishes in compensation, becomes $b-n$. At this point then:

(2) $(a+m)\,p_x+(b-n)p_y=k$

Now, we may multiply out in equation *(2)*, and substitute from equation *(1)*. Then:

$ap_x+mp_x+bp_y-np_y=k$

$ap_x+mp_x+bp_y-np_y=ap_x+bp_y$

$mp_x-np_y=0$

$mp_x=np_y$

(3) $n/m=p_x/p_y$

This gives us proof of the statement in the text that the *rate of outlay substitution between two factors is equal to the ratio of the prices of the factors*. As X increases, the ratio of the decline in Y due to the increase in X needed to maintain the same total cost is equal to the ratio of the prices of X to Y.

Returning to equation *(1)*, let us solve for b, the quantity of Y at any given point:

$bp_y=k-ap_x$

$b=(k-ap_x)/p_y$

(4) $b=k/p_y-a(p_x/p_y)$

Now, let us solve equation *(1)* for those points where a is equal to zero, i.e., there are zero quantities of X. Then:

$0+bp_y=k$

(5) $b=k/p_y$

This value of b, at the point where a equals zero, may be termed b_0.

Now, we may substitute *(5)* into *(4)*, and the equation becomes:

(6) $b=b_0-a(p_x/p_y)$

Now, we can see that equation *(6)* is directly applicable to the case of Jones' 1000 ounces. b refers to the values of Y at each point, and therefore may be written as Y. Similarly, a refers to the values of X and can be written as X. The ratio of p_x/p_y is equal to 4/10 or 2/5. b_0 is the value of Y when X is zero; it is equal to the constant outlay (1000) divided by the price of Y (10)—this equals 100.

Therefore, for Jones' condition of 1000 ounces and the given prices of the factors:

(7) $Y=100-(2/5)X$

This is Jones' constant outlay curve for 1000 ounces.

All constant outlay curves for two factors have the shape of a straight line. The slope of the line is negative, and is the ratio of the prices of the two factors, which is also equal to the rate of outlay substitution between them. When X is zero (even though such a choice will never arise in practice), Y is equal to the constant outlay sum divided by the price of X; and when Y is zero, it is easily seen that the value of X is the constant outlay divided by the price of Y.

This algebraic analysis enables us to establish a whole series of constant outlay curves for different values of k for different constant outlays. Whatever the constant outlay, the curve can be determined: it again will be of the same slope as the other curves, while the difference will be in its position. Thus, say the constant outlay is 800 ounces of gold. In this equation, when X is zero, Y will be equal to 800/10, or 80. When Y is zero, X will be equal to 800/4, or 200. And the constant outlay curve for 800 will connect the two points.

In this way, we can establish a whole *family* of constant outlay curves. All that is needed is the knowledge of the prices of the two factors, which are assumed to be given; and then for each possible constant outlay, the combinations of the factors can be determined. Some of the members of the family of constant outlay curves in Jones' case are as follows:

Figure 3
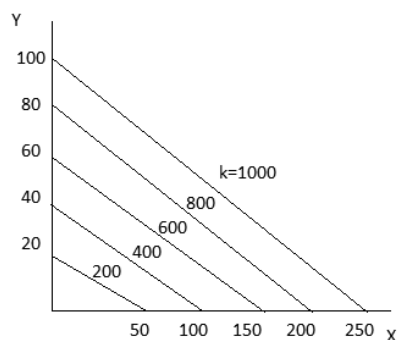
Now, it is important to realize that the prices of the factors are the sole determinants of the family of constant outlay curves. These prices are always approaching uniformity on the market. Therefore, the constant outlay curves are not only applicable to Jones; *the very same ones are applicable to all producers who use these two factors*. Thus, the given set of constant outlay curves and the given rates of outlay substitution are the same for all the firms producing with these factors, not just for one firm alone. At any one time, then, the family of constant outlay curves for any two factors is the same for all producers on the market. This family of constant outlay curves is a series of regular, similarly sloped lines, easily determined by anyone once the prices are given, and the same for all producers.

The *production function*, on the other hand, is *not* a given data to all producers. The production function is the estimate of the maximum quantity that could be produced from each combination of factors. Although this is technological rather than catallactic knowledge, it by no means follows that it is "given" to all prospective producers. This knowledge is not simply of engineering formulae; it involves numerous minute details of individual skills, correctness of estimates, judgment of materials and location, etc.[37] It is far more likely that each individual's production function differs than that it is the same, even with

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[37] On the vital importance of knowledge of "particular circumstances of time and place" see Hayek (1945, pp. 77–91).

the same product and the same factors. As we will see below, this likelihood is made a certainty when there are many more than 2 factors of production, and, when, as is almost always the case, some of these factors are unique (*specific*), in some ways to the individual firm. Production functions, therefore, are irregular, and differ from one producer to another. Furthermore, they are not "objectively" given; they are only estimates in men's minds.

What is the shape of the production function? Some might be of fixed proportions, i.e. only one combination of factors can produce each possible quantity of output. We have seen in the text that this is practically never the case, but if it were, a diagram would be as follows: the quantity of one factor on the horizontal axis (say X), and the quantity of the other factor on the vertical axis (say Y):

Figure 4
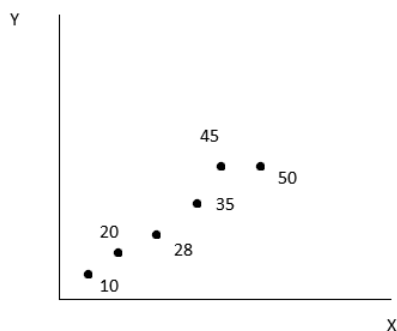
The numbers designate the quantity of output yielded at the various points. These quantities can be of any amount, but they must increase as the quantities of X and Y increase, by the nature of production.

With the existence of varying proportions of factors, so that there are alternative factor combinations for each quantity of product, we can draw up *constant product schedules*, and therefore *constant product curves*. If we assume that there are many possible combinations for each possible product, then we may ask the question: suppose for example that 1 unit of X and 10 units of Y combine to produce 10 units of product:

Figure 5

Y
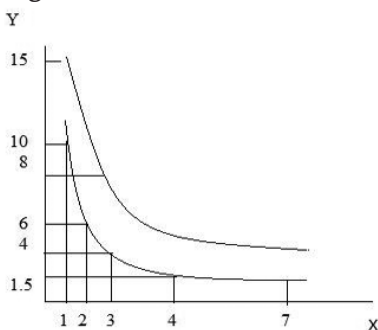
At this combination (1X; 10Y) there is very little of X and a great deal of Y. Now suppose that X is increased to 2; what will be the loss in Y to compensate and maintain production at 10 units? We cannot know the answer except for the concrete case, but it is clear that since the two factors are imperfect substitutes for each other by their very nature, where the quantity of X is low a slight addition of it will compensate for a big loss in Y to maintain constant production. Let us say that the constant production combination is (2X; 6Y). In the diagram we may connect the two points for the sake of convenience. Now, what if X is increased to 3 units? Since X has been increased and Y has diminished, it will now take a lesser loss of Y to compensate for an increase of X. Thus, the point (3X; 4Y) might be on the constant product curve. Between the first and second points, the loss of Y was 4 and the gain of X was 1 unit; the ratio of the two is 4/1, or 4. From the second to the third point, Y lost 2 and X gained 1; the ratio was 2. This ratio is the *marginal rate of product substitution* between the factors, or the rate of substitution of X for Y. It is evident that as X increases, this rate *diminishes*. As X increases and Y diminishes, more and more gain of X is needed to substitute for less and less loss of Y. Thus, the succeeding points on the constant product curve above may be (4X; 3Y), (7X; 1.5Y), with marginal rates of substitution at those points 1 and .5 respectively.

We have arrived at one constant product curve. At each constant product, it is evident that there will be a similar shape, in that the marginal rate of substitution diminishes throughout. However, it is obvious from the nature of production that the larger product calls

forth a larger quantity of both factors at each point. Thus, suppose that we are interested in a constant product curve at 20 units. Suppose X is 1 unit; it is obvious that Y will have to be more than 10 in order to produce these 20 units. What amount this will be we do not know; we only know it will be greater. Let us suppose that the point will be (1X; 15Y). We can now draw in a set of succeeding points, assuming only a diminishing marginal rate of substitution. It is clear that all these points will be above, or to the right of, the corresponding points on the lower constant product line.

Thus, we see that there is a *family* of curves for each constant product. The higher products are above (to the right of) the lower ones. The property of diminishing rates of marginal substitution make these curves tend to be convex to the origin. As the product gets lower and lower, the curves get closer to the origin, finally reaching that point itself at zero product; since zero quantities of factors yields zero product. On the other hand, the curves never cross the X or Y axes. Since both factors are assumed to be necessary ones for the production of the product, and hence the imperfect substitutability of the factors, no increase in the one factor, however great, can compensate for the loss of the whole supply of the other. A common classical example is the case of a wheat farm where no amount of labor, however great, can produce wheat when there is no land available; on the other hand, no amount of acreage can produce wheat without any labor. The point applies, however, to all types of production.

The point has come when this information can be consolidated. For any process of production using two factors, there are two families of curves: constant outlay curves, and constant product curves. Constant outlay curves hold for all producers who use the two factors, since they depend solely on the market prices of the factors. Constant product curves are estimates by the enterprising producers, and will differ from firm to firm. While the former are regular straight lines determined by the ratio of prices and total outlay in view, the latter are irregularly spaced, their only condition being the diminishing rate of substitution between the factors. The two families of curves will be somewhat as follows:

Figure 6
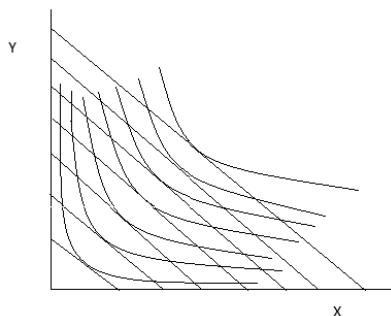
As we have seen in the text, at any given outlay, the actor will produce at the maximum product. What does this mean in graphic terms? Let us take, as in the figure below, a typical constant outlay line, and start at the top.

Figure 7
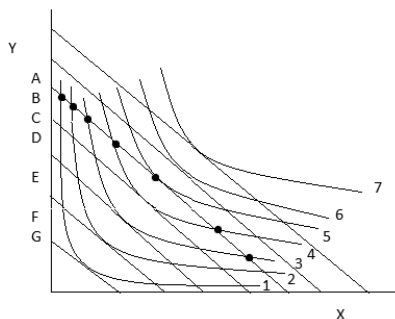
This diagram has seven constant product curves, marked 1 to 7, in ascending order of the size of the product. As the constant outlay curve begins at the top it intersects constant product curve 1 at point A. At point A, that combination of factors X and Y yield a total product of order 1. Proceeding further along the constant outlay line, (further in the sense of increasing X and decreasing Y), we intersect point B, at which point X the factors will produce products of size 2. So as we proceed along the constant outlay line, we arrive at higher and higher products—at curves further and

further to the right. Finally, we arrive at the point with the highest size product, and the point of production that will be chosen with this outlay. This is point E of size 5, the point of tangency between the constant outlay line and the highest constant product curve obtainable with that outlay. Beyond this point, the constant outlay line again intersects the lower-sized product curves.

For any constant outlay line then, the entrepreneur will strive to act so that his combination of factors will be at a point tangent to the constant product curve. Of course, the entrepreneur in practice does not need to know about such tangencies and curves; he is only concerned with maximizing his output for the given outlay. But we have seen that mathematically this is implied by such maximum output. It must be cautioned that in practice, the constant production curves are a series of dots, of discrete points, rather than continuous lines. A continuous curved line implies that the distance between the points of decision by the actor are infinitely small; actually, this can never be the case—human action of necessity deals with discrete objects and distances. However, in the realistic case, the choice of the maximum product is the closest approximation to such tangency that could be, or should be, achieved.

It is clear that this elaborate analysis of families of curves and tangencies is of no particular aid in this problem; however, it provides analytic tools that will be handy in later analyses of the pricing of factors of production.[38] For one thing, we know geometrically that the marginal rate of product substitution, which is always diminishing, is equal to the *slope* of the constant product curve, when the latter is a continuous curve. At a point such as E, of tangency with the constant outlay line, elementary geometry tells us that the slopes of the curve and the line are equal. The slope of the line equals the marginal rate of outlay substitution, which is constant throughout and equal to the ratio of the factor prices, and therefore, *at the point of tangency, the marginal rate of outlay substitution equals the marginal rate of production substitution*. Under real conditions, this is only an approximation rather than an actual fact, but this proves the assertion in the text that the producer sets

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[38] *Editor's footnote*: This analysis of factor pricing was planned to be in a later section, however it was never written because Rothbard changed his mind on the usefulness of using this approach. See Newman (2015) for more information.

his production so that these two marginal rates tend to be equal. And this means, furthermore that, for each producer's decision, *the marginal rate of product substitution between the two factors tends to equal the ratio of their prices*.

This equality is only an approximation, since for the universal case of more or less discrete points; the point of decision will only be the nearest approach to such equality. However, because of the divisibility of money, the constant outlay curve tends to be (although never will be) a *continuous* line, while the more advanced the production structure and the more complex the alternative combinations, the nearer will the constant production schedules approach being continuous curves. The more highly developed the market economy, therefore, the greater will be the tendency to approach equality between the ratio of the prices of factors and the marginal rates of product substitution between them.

At each possible constant outlay line, therefore, the producer will pick his preferred combination of factors at the point of maximum output, or approximate tangency to a constant product curve. The higher the amount of money to be spent, and therefore the higher the constant outlay line, the higher and the further to the right will be the constant product curve, and the various points of tangency. Thus, a typical family of constant product and outlay curves may have points of tangency as follows.

Figure 8
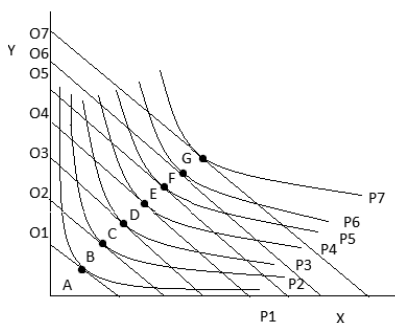
In this figure, we depict constant product curves, P1, P2, ….P7, and constant outlay lines, O1, O2, … O7. They have points of

tangency at A, B, C, D, E, F, and G. The zero point is also a point of tangency, at zero input of factors. The points of tangency enable to producer to determine his *maximum product outlay curve*. For at any given outlay, the tangency points will yield the size of the maximum constant product curve. Thus, O1 will be tangent to P1 at point A. The same is true to every other alternative. Thus, the decision points A, B, C, etc., reveal to the producer: 1) the maximum product for each outlay, and 2) the best combination of factors for this production.

SECTION 4: THE OUTPUT AND INVESTMENT DECISION OF THE PRODUCER

We must now return to Jones and his outlay of 1000 ounces. We have already seen that, given an investment of 1000 ounces, Jones will select one combination which will yield him a maximum product. Out of a group of alternative combinations, he will select the best combination. We could diagram this situation as follows:

Figure 9
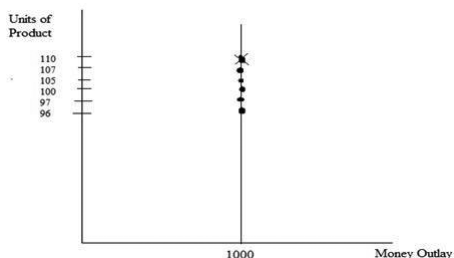
This diagram shows that, at an outlay of 1000 ounces of money, different alternative combinations could yield various amounts of product, namely 110, 107, 105, 100, 97, and 96, as listed in Table 8 above. The highest production, or the top dot on the line, will be the one that is chosen, and the combination of factors will be picked accordingly. This dot is crossed to represent the product of the combination that will be chosen. The same sort of process will be undertaken regardless of the amount that the producer has to invest. Thus, if he has 990 ounces to invest, he will choose the combination yielding him the maximum product, at 105 units.

At each possible investment of money outlay, the producer will choose that factor combination which yields him the maximum product. Thus, the diagram of such a situation will be as follows:

Figure 10
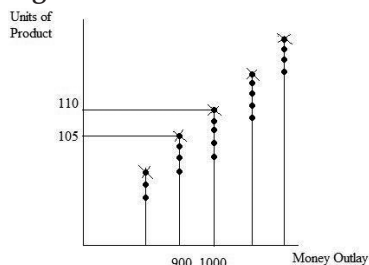
For each straight line, the top crossed dot will be selected. Thus, we see a series of possible vertical straight lines, representing the constant outlay, with units of product on the vertical axis, and money outlay on the horizontal axis. Each vertical straight line is a constant outlay line, and the crossed top dot is the maximum product that would be selected in each case. The crossed dots can be joined for convenience to give us a connected line of potential products for each money outlay:

Figure 11
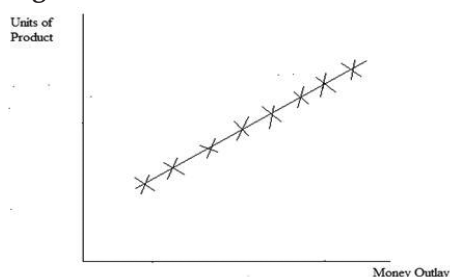
Each producer will try to determine the various points on this product outlay curve. As we have seen, he estimates the various alternative factor combinations for producing each particular quantity of product, and using these and the prices of the factors, the producer will be able to judge his constant outlay combinations,

and which combination will yield him the maximum product for each outlay. This will give him the series of crossed top dots for each outlay, and yield him the above diagram, which represents the *maximum product schedule* for each outlay.

What can economics say about the shape of this important curve? In the first place, it is obvious that a *greater outlay can never produce a lower maximum product*. We have seen above that the 1000 ounces will yield a maximum product of 110 units. A greater outlay, say 1050 ounces, cannot produce a maximum product of *less* than 110 units. This is obvious from the very nature of production and of factors. At the very least, the 110 units could be produced, even if the excess factors purchased with the other 50 ounces cannot be used. Thus, the maximum product schedule *always* slopes upward or remains horizontal when the money outlay increases. It never slopes downward.

Another characteristic of the maximum product outlay curve is an obvious one: it must pass through the zero point, since no expenditures will obviously result in no production. A typical product outlay curve might therefore look like this:

Figure 12
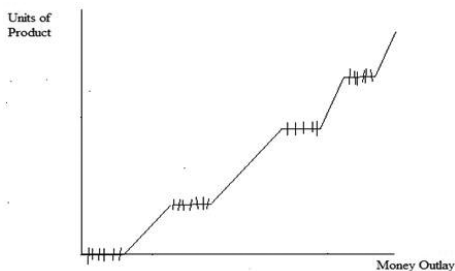
We notice that we may conveniently omit the crossed dots from the final connected line. From the line, we may read off the maximum product which would be yielded by the expenditure of any given outlay.

Without discussing at this moment when the curve is likely to be horizontal, it is obvious that no producer knowing the situation will pick any outlay along the horizontal except the cheapest: i.e., the point on the extreme left of each horizontal line. Thus, if 1000

ounces of outlay will produce 110 units maximum and 1050 ounces of outlay will also produce 110 units maximum, it is clear that there will be no hesitation in choosing the 1000 ounces, and not the more expensive outlays. Any other decision would be a pure waste of money by the producer. Therefore, without yet fully answering how much money will the producer decide to invest, we can immediately answer that he will never decide to invest that amount which lies along a horizontal line. Thus, if 1000 ounces will produce 110 units, and all greater expenditures up to 1100 ounces will only produce 110 units (with expenditures of over 1100 ounces yielding more units), we can be sure that Jones will not decide to invest a sum of between 1001 and 1100 ounces. He will either invest more or less. In Figure 12 above, we cross the horizontal lines with vertical marks to designate those sums that are ruled out from the producer's decision.

So far, from Figure 10 we know two definite points on Jones' maximum product outlay curve: 1000 ounces netting him 110 units of product and therefore 1100 ounces of money revenue; 990 ounces netting him 105 units of product and therefore 1050 units of revenue (selling prices are assumed to be 10 ounces per unit). In the former case, he makes a net money income of 100 ounces, equaling 10% of his outlay; in the latter case, he makes 60 ounces net, equaling about 6% of his outlay. Now, we must directly pursue the question of how much Jones, or any other producer, will decide to invest in any particular line of production, and how much he will decide to produce. It is clear that the determining influences are the expected net income, its amount and its percentage. Their exact nature, however, must wait on a more elaborate explanation of the relation between outlay, product, and revenue, in table and figure.

Before finally analyzing which point on the maximum product outlay curve will be chosen, it is necessary to extend the analysis to remove the restrictive assumption of 2 factors. What will be the situation with *n* number of factors? This is a vital consideration, since it is very rare to find an actual case where only two factors are used to produce any given product.

If there are *n* number of factors, with market prices assumes to be given, the producer's investment decision turns out to be almost identical with the case of two factors. The situation may not be diagrammed as in the case of two factors, but the greater mathematical difficulties in the description of the case of *n* factors does

not by any means signify difficulty for the producer. The producer is, again, confronted with a complex of technological alternatives, for producing various amounts of output. Now, the production functions will be combinations of various quantities of factors X, Y, Z, etc. Once again, a constant outlay will enable a certain set of factors to be chosen, in accordance with their market prices. The producer may draw up the list of alternative factor combinations and corresponding outputs, plus a list of factor combinations that can possibly be bought at each given outlay. And, once again, the producer will choose the maximum product combination for each outlay. The fact that there are now many factors does not change the desire of the producer to maximize his product for each possible outlay. The shape of the maximum product curve does not change; it is still true that a greater outlay cannot yield a lower product, and that those greater outlays which will not increase product will not be chosen. It is evident that the analysis based on the maximum product curve is not changed by permitting any number of factors.

What of the interrelationships between the factors and the factor combinations that will be chosen as points on the maximum product curve? Here, it is clear that the situation, with *n* factors, is more complicated. It is, however, essentially the same, and does not materially alter the analysis. It is still true that we can represent the producer as adjusting, and substituting, all of his factors for each other. Each factor is an imperfect substitute for each other factor, the degrees of imperfection varying with the data of each concrete case. There can be no perfect substitutes for different factors, and there are few or no cases of absolute fixed proportions between all factors, so that, within limits, more of one factor can be substituted for less of the others. The marginal rate of substitution *between any two factors* diminishes as one factor increases. The rate of outlay substitution *between any two factors* is equal to the ratio of their prices and the producer will still tend to approximately equalize the rate of outlay substitution and the rate of product substitution between any two factors. Even if ten factors are involved, if, *for any two factors*, for example, the rate of product substitution is greater than the rate of outlay substitution between them, it will pay the producer to keep substituting, say X for Z, until the rates are approximately equal. For this is equivalent to saying that substituting more X for less Z at constant outlay will yield a greater total

product. Conversely, if the rate of product substitution is less than the rate of outlay substitution, it will pay to use less of X and more of Z until the rates are equal.

Therefore, for a case of *n* factors, *the producer will always tend to produce at the point where the marginal rate of substitution for any two factors is equal to the ratio of their prices*. There is a simultaneous balancing and adjusting in order to find the maximum product for each outlay. It must be emphasized that there is still one maximum product for each outlay, that there is still an array of different products for the alternative combinations at each outlay. Out of this array, the producer selects the maximum product combination; the number of factors involved does not change this.

Now let us turn to the final production decision of the producer who has arrived at his maximum product schedule. How much does he decide to invest and to produce? For convenience, let us take the case of another producer, Smith, [who can invest in a different firm that produces Product P]. In addition to his maximum product outlay schedule, he estimates his future selling price, and this enables him to estimate his revenue outlay schedule. Thus, assume that his maximum product outlay schedule is as follows (assuming, for convenience, steps of 10 ounces of money outlay):

Table 11

SMITH—PRODUCT P	
TOTAL MONEY OUTLAY (GOLD OUNCES)	TOTAL MAXIMUM PRODUCT
0	0
10	0
20	10
30	18
40	28
50	40
60	50
70	55
80	55
90	65
100	70

This product outlay schedule is shown below in Figure 13.

Now Smith estimates the future selling price of his product. It is quite possible that, as Smith's prospective product decreases,

his selling price will rise. This estimate depends on his idea of the market demand schedule for his individual product.

At this point we must broaden slightly our application of the concept of monopoly and competitive price. A monopoly price situation will occur *not only* if less produced from a given money investment yields a greater profit, but also if a lower money outlay, and its lower product, yields a greater profit because of the higher selling price. It is clear, however, that this does not materially change our analysis of competitive and monopoly price. In the previous section we assumed a given investment and a lower than maximum product; here, a lower outlay can also yield the same goal of a lower product, and without the waste of the former. This, then, is the actual case. If the demand for the firm's product is inelastic, so that a lower product, thrown as stock on the market, will so raise the price that money revenue is increased, the firm acts as a "monopolist" to cut back production and outlay to the lower figure. Thus, suppose that at a money outlay of 60 ounces, and at a maximum product of 50 units, as in Table 11, the price of the product per unit is 2 ounces. The money revenue, then, will be 100 ounces, for a net income of 40 ounces. If the demand schedule for the firm's product is inelastic above this range, then, for example, a sale of 10 units will raise the price to 20 ounces, and a total revenue of 200 ounces. Now obviously, Smith will not invest 60 ounces, produce 50 units, and then throw 40 of these units away in order to acquire 200 ounces. We assumed this above, because we were dealing with the assumption that money outlay is fixed at a certain amount. Obviously, he will rather choose the minimum money outlay required to produce 10 units, i.e. 20 ounces. There will therefore be no need for him to throw away 40 units, and he will save 40 ounces which he would have needlessly expended.

There is therefore no change in our analysis of the demand curve for the firm, and its relation to the incidence of monopoly price. This curve depends only on the *quantity sold*, and bears no relation to how this quantity is produced. The change in our analysis of the monopolist is, that even *he* will choose the maximum product for the money outlay that he spends. Even the monopolist will choose a point on his maximum product outlay schedule, and therefore even he strives to gain further profits producing whatever units he makes as efficiently and as productively as possible. If his demand

curve is inelastic, he will simply reduce his money outlay from the amount that he would have invested under a competitive price. The reduction of his outlay will reduce his product to the most profitable amount.

On the other hand, there is no reason to restrict the definition of competitive price to a situation where the amount the firm produces has absolutely no effect on the price. It is clear that a change in the amount a firm produces always *does* change the market stock of the product, and therefore tends to affect the price. It may well be, of course, that, within the relevant range; the action of the firm is not large enough in relation to the product as a whole, to change the market price. There is no need, however, to restrict the discussion of competition to this limited case. The only criterion is that the demand curve is not such as to raise revenue for a restriction of output to a price above the competitive one.

The following is a tabulation of Smith's productive situation, [and the firm producing P that he can invest in], with the above total outlay and total product schedules, plus an *expected selling price* schedule for each quantity produced and sold of P. The selling price declines as the stock increases, but are not such as to yield a monopoly price situation (i.e. an increased total product for the firm does not lower its gross revenue). From these three columns we can deduce three others, which are also presented: *expected total money revenue* (which equals expected selling price times product); *net money income* (which equals money revenue minus money outlay); and *percentage net money income* (which equals net money income as a percentage of money outlay). These three schedules are derived from the primary three:

Table 12

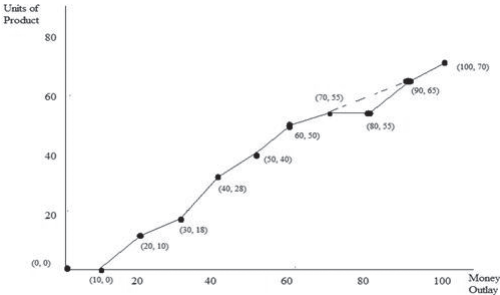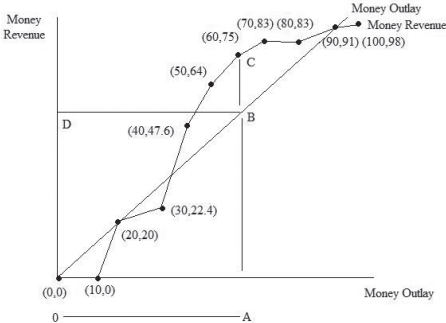| TOTAL OUTLAY	TOTAL PRODUCT	EXP. PRICE	EXP. REVENUE	EXP. NET INCOME	EXP. RATE OF NET INCOME %
(1)	(2)	(3)	(4)	(5)	(6)
			(=2*3)	(=4-1)	(=5/1)
0	0	--	0	0	0
10	0	--	0	-10	negative
20	10	2	20	0	0
30	18	1.8	22.4	-7.6	negative
40	28	1.7	47.6	7.6	19
50	40	1.6	64	14	28
60	50	1.5	75	15	25
70	55	1.5	83	13	18.5
80	55	1.5	83	3	3.75
90	65	1.4	91	1	1.1
100	70	1.4	98	-2	negative

Figure 13

Figure 14

Figures 13 and 14 illustrate Table 12. In Figure 13, total units of product are plotted on the vertical axis, as against corresponding money outlay on the horizontal axis. The figure reveals the amount of maximum total product that could and would be produced at different amounts of monetary outlay. The result is the product outlay curve, which is read vertically. There is a dotted line bypassing the point at the money outlay of 80, because here the product curve is horizontal, and no producer would consider such a waste of his resources as to produce at such a point.

In Figure 14, the product schedule is multiplied by the expected selling price at each quantity of product, to yield the expected total revenue for each point of outlay. This yields the total revenue schedule of Column 4. In this figure, money revenue is plotted on the vertical axis, and money outlay on the horizontal axis, the result yielding a *revenue outlay curve*, which expresses the expected revenues for each amount of invested money outlay.

It is clear that there is a direct resemblance between the shape of the revenue and product curves, since the former is derived from the latter. At a 45 degree angle between the two axes, there is a diagonal straight line. Since the units on each axis of Figure 14 are exactly the same (money in gold ounces), with the same distances, such a 45 degree line can also (vertically) represent *money outlay* on the diagram. Thus, let us take a money outlay of 60 ounces. This is given by the distance 0A on the horizontal axis. However, if we read vertically upwards from point A, we find that the distance between A and the intersection point B on the *money outlay line* is also precisely 60 ounces. Therefore, AB, and other such vertical distances, may be read as equaling money outlay on the chart.

This device makes figure reading a very easy task. At the outlay of 60 ounces, the money outlay equals AB. What is the money revenue? This can be read off from the revenue curve, and will equal AC, or 75 ounces. This permits a clear portrayal of *net income*, which will be the difference, or the vertical line BC.

Similarly, the expected net income can be read at any desired point. It becomes evident, for example, that there is a *negative* money income at such outlays as 10 ounces, 30 ounces, or 100 ounces.

Such a chart also permits the facile portrayal of the expected *percentage net income*, or *rate of net income*. This will equal the net

income divided by the money outlay. On the figure, for example, it will be the ratio of BC divided by AB, or alternatively, BC divided by DB.

Now, armed with this portrayal of the alternatives and their expected consequences, what amount [of P] will Smith decide to produce [in this firm]? It is obvious that this problem is a central one in the analysis of productive activity on the market. For the question is applicable to all producers, whatever the product or whoever the individual involved.

Smith has a list of alternative courses of action from an investment of 0 to 100 ounces. It is clear that he will not decide on 80 ounces, since this will be a wasteful act with 70 ounces able to produce the same number of units. It is also clear that he will not choose to invest: 10 ounces, 30 ounces, or 90 ounces, since he will suffer monetary loss from such investments. He will not invest 20 ounces, where there would be no income from his investment. Which alternative will he choose of the ones remaining?

Most writers on this important subject have gone astray in their answers to this question. They look at the schedules and simply assume that every producer is interested in "maximum money profits," or, in better terminology, "maximum net income." Almost invariably, they would conclude in Smith's case that Smith would choose a money outlay of 60, and the expected money revenue of 75, since this yields the highest expected net income, i.e. 15 ounces. This is greater than any of the other alternatives. At first sight, this assumption seems plausible. Further analysis, however, reveals the unsoundness of such a simple assumption. It is true that if Smith invests 60 ounces, he expects a return of 75, and a net income of 15. Yet compare this with the alternative of investing 50 ounces and obtaining a net income of 14. In the former case, his *percentage net income*, [or *rate of net income*], is 25%, while in the latter case it is greater, 28%. Isn't it plausible that Smith could invest 50 ounces at 28%, and then find a better and more rewarding way of investing the remaining 10 ounces? If we look at the *marginal* rate of net income, it becomes clear that, on the added 10 ounces of outlay, Smith is only making an extra 1 ounce in net income, a percentage net income of only 10% on these last 10 ounces. If, as seems plausible, Smith can find a greater *rate* of net income on these 10 ounces, it is clear that he will only invest 50 ounces in this product, and will invest the other 10 ounces elsewhere.

How many ounces [in this firm for Product P] then, will Smith invest? Will he invest 60 ounces to earn a net income of 15, and a rate of net income of 25%; or will he invest 50 ounces to earn a net income of 14, and a rate of 28%?

It is clear from out discussion that, in fact, *there is no precise theory of the determination of the investment in, and output of, the firm*. There is no theory of investment or output of *the firm*, because on firm cannot be considered in isolation from the other firms in the economy. Whether or not Smith will invest 50 ounces or 60 ounces in this firm depends, for example, on whether he will be able to invest the remaining 10 ounces elsewhere to yield more than 1 ounce of net income. The prospective investor considers, in various possible firms, the net returns that he will earn from various amounts of outlay in various possible firms. He must consider which alternative will be more remunerative: to invest 50 ounces here and 10 ounces elsewhere, or 60 ounces here. His marginal rate of return on the last 10 ounces is 10%; if he can earn 15% or 1.5 ounces elsewhere, he will invest them there, and invest only 50 ounces in this firm. Furthermore, the investor might invest *nothing at all* in this firm, for he might be able to earn a 30% return for 60 ounces in some other firm, producing some other product. It is impossible, therefore, to consider a firm in isolation, and attempt to determine how much will be invested in it, or how much it will produce.

Each investor, in a free economy, can range among a myriad of possible enterprises and invest in them. Indeed, by means of the device, to be examined more fully below, of parceling out parts of ownership of a firm's assets to different investors in various *shares*, each individual can invest a few ounces of money in one firm, a few in another, and several in a third, the investors hiring managers to supervise the actual production.[39] In all of his actions, psychic factors being equal, he will attempt to maximize the rate of net income from each unit of money that he invests, thereby maximizing his total net income from his entire investment in all branches. To pursue this approach will lead us to a theory of the savings and investment of the investor, rather than of the output of the firm, and thence to the theory of the savings and investment of all the investors, indeed all the individuals, in the economy. This

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[39] *Editor's footnote*: See Rothbard (1962, pp. 426–435).

will be inextricably connected with the problem of *time preference*, which we have already seen in Chapter I to play a determining role in the decision of the individual as to how much he will save and invest compared to the amount he will consume.[40] This will be discussed in a later chapter.[41]

It is evident that, in the pursuit of the maximum possible rates of net return, the investors will invest each sum of money, large of small, in that firm or in those firms where the rate of net return, for each size of money invested, will be at its maximum. Investors will spurn 2% return projects to invest in expected 20% return projects.

At this point we must make a crucial distinction in our analysis of investment and production—the distinction between the investor or investors considering investment in *new* firms, and those contemplating the extension or continuance of investment in *old* firms. New firms are those which are starting from the beginning. If Smith is a new investor, he will decide as follows: [with a given 60 ounces to invest], he will invest 50 ounces so as to produce 40 units [in this firm for Product P], and earn an expected 28% net income [and invest 10 ounces elsewhere to try to earn more than a 10% marginal rate of net income]. However, if he cannot earn [more than] 10%, or 1 ounce, on 10 ounces elsewhere [in another firm], he will invest 60 ounces to produce 50 units [of Product P], and earn 25% on the investment.

It is clear that there prevails on the market a tendency toward equalization of expected net income rates on *new* firm investments. Suppose that in one firm or product, the rate of net return is expected to be unusually high compared to other investments, say 28%. It is clear that the new investors will flock to invest in this firm, or in competing firms producing the same product. If the data on the market remain the same, then this flood of investments will tend to lower the price of the product, and raise the price of the factors, particularly those specific to that product, until the expected rate of return will be drastically lowered. Furthermore, in unusually unprofitable firms, such as those earning 2%, the *old* investors, given enough time, will allow their capital goods to wear

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[40] *Editor's footnote*: See Rothbard (1962, pp. 61–64, 68–70).

[41] *Editor's footnote*: See Rothbard (1962, pp. 367–451).

out, and shift their investments to the more profitable investments. Suppose we postulate, then, an *evenly rotating economy*, such that the data never change, i.e. on each day consumer demand, saving and investment, tastes and resources and technological knowledge, will be the same. *In this case, given enough time, the rate of net return will be equalized in every firm and every branch of production*. This will be an economy of certainty-since there will be no uncertainty of future price, demand, or supply. In this case, the *expected* rate of return will invariably be the realized rate of return, and this will be equalized for every firm and investment. This rate of return is called the *pure rate of interest*. What rate will it be, and how will it be determined, we must leave to further chapters.[42] In the evenly rotating economy, then, every firm will earn the same net return, say 5%. Since there is no uncertainty, every firm will be built and arranged to produce at its optimal level.

   [Returning to the individual investor, Smith, in the above example we assumed that he was going to invest 60 ounces in one or more firms. But how does Smith choose the amount of money that he is going to invest at all? We have shown above that we cannot simply concentrate on maximum net income on an investment, but must also pay attention to its rate of net income.] Can we then say that Smith will invest that sum which will yield him the largest percentage, or *rate of net income*? No, we cannot simply make such a plausible statement either. Suppose, for example, we consider the investment of 40 ounces, yielding a percentage net income of 19%. An additional investment of 10 ounces would yield an additional net income of 14 minus 7.6 ounces, which equals 6.4 ounces, [for a rate of net income of 28% on his 50 ounces]. This is a return of 6.4 ounces on an outlay of 10 ounces, a marginal rate of return, or marginal rate of net income, of 64%. Yet, circumstances are conceivable when Smith would not make the additional investment. We must never forget, as we pointed out in Chapter III above,[43] that every individual is always engaged in balancing his various consumption, and his various investment expenditures, and additions or subtractions from his cash balances. Suppose, now, that Smith has a money stock of 200 ounces, which he is in

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[42] *Editor's footnote*: See Rothbard (1962, pp. 367–451).

[43] *Editor's footnote*: See Rothbard (1962, p. 220).

the process of allocating. It is entirely possible that, while he may choose to invest 40 ounces in factors of production yielding him a 19% net income, even so high an additional return of 64% on the next 10 ounces will not induce him to restrict his consumption further. In such a case, Smith prefers present consumption spending with these 10 ounces to the 64% rate of income; therefore, his *marginal rate of time preference* for these 10 ounces is higher than 64%, and he does not make the investment. His investment in the product will then be 40 ounces and his level of output will be 28, producing an expected revenue of 47.6, a percentage of 19%.

In every case, therefore, the amount of money investment by the producer, and consequently the amount of product made, depends on the interrelationship between the *expected rate of net income* and the individual's *rate of time preference*.

This interrelationship, specifically, is most important in its *marginal* aspects. The reader is referred again to Chapter I, the basic foundation for the later analysis.[44] There we saw how man allocates his stock of goods in accordance with their marginal utility in the various uses.[45] We also saw how man allocates his labor in accordance with the marginal utility of the expected products in the various uses, and with the marginal disutility of the foregone leisure.[46] This is particularly relevant. We recall that each man allocates his labor in units, say hours, to that particular use which provides the greatest value of marginal product on his value scale.

This analysis, in its essence, is applicable to the present problem. Smith is choosing, not between the utility of labor and its product versus leisure forgone, but between the *utility of an expected future net money income*, and between the *disutility of present consumer goods forgone*, by investing in factors of production. Again, his decision in every case is *marginal*, i.e. he deals with divisible units of a good. In this case, he is dealing with units of a money commodity used to purchase factors. He knows, or believes that he knows, the various technological alternatives by means of

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[44] *Editor's footnote*: See Rothbard (1962, pp. 1-77).

[45] *Editor's footnote*: See Rothbard (1962, pp. 21-33).

[46] *Editor's footnote*: See Rothbard (1962, pp. 42-47).

which certain quantities of factors will yield him certain quantities of product, and from this he estimates the expected money revenue that will accrue from the sale.

Thus, let us consider an expansion of Smith's choices [for the firm producing Product P] as shown in Table 12 above:

Table 13

TOTAL OUTLAY	MARGINAL OUTLAY	EXP. NET INCOME	EXP. MARGINAL NET INCOME	EXP. RATE OF MARGINAL NET INCOME %
(1)	(8)	(5)	(7)	(9)
				(=7/8)
0		0		
10		-10		
20		0		
30		-7.6		
40	40	7.6	7.6	19
50	10	14	6.4	64
60	10	15	1	10
70	10	13	-2	negative
80	10	3	-10	negative
90	10	1	-2	negative
100	10	-2	-3	negative

Money outlay and *expected net money income* are taken from Table 12. The other columns require extended explanation. The purpose of the added columns is to better analyze Smith's final investment decision in production. Column 7 sets forth the *addition* in net money income which will be yielded by an addition to Smith's monetary investment in factors. This is the *marginal net income* expected from his various decisions. However, an investment of 10 ounces will immediately be rejected by Smith; the net income itself is negative. Similarly, an investment of 20 ounces, or 30 ounces, will be rejected for the same reasons. The first possible investment is that of 40 ounces; there is no choice for Smith between 0 and 40. Therefore, the space above that in Column 7 is left blank. Marginal decisions, and their features, refer only to actual choices confronting the actor. The differential in which we are interested in is the differential that is significant to the human actor, and not the convenience of algebraic manipulation. Therefore, for example, the marginal net income at an outlay of 40 ounces is *not* the difference between 7.6 and –7.6, equaling 15.2, since there is no possibility that Smith would ever consider an outlay of 30 ounces,

yielding a negative return. The *margin* is *not* between 0 and 10, 10 and 20, etc., but between 0 and 40 only. The marginal net income at 40 then, equals 7.6 minus 0, which equals 7.6. From then on, the margin occurs every 10 ounces, for that is the decision unit, so to speak. Smith estimates that the *next* 10 ounces of investment will increase his net income from 7.6 ounces to 14 ounces—giving him a marginal net income by these 10 ounces of 6.4. From 50 to 60, the 10 new ounces only increase the net income from 14 to 15 ounces, a marginal net income of 1 ounce. After this point, the net income declines; therefore, the marginal net income is *negative*. Thus, after 60 ounces, an additional 10 ounces will lower the net income to 13; thus its marginal net income is *minus 2 ounces*.

Immediately, we have learned something more about Smith's eventual investment production decision. It is obvious that *no one will knowingly invest additional money the marginal net income of which is negative*. Smith will not invest 10 more ounces in order to see his net income dwindle by 2. Therefore, in our example, all points above 60 are eliminated from Smith's final decision. This leaves us with three possible points of decision: 40, 50, and 60 ounces. Now, we may compute the *rate of marginal net income* for each of these amounts. This is equal to the *marginal net income* at each outlay divided by the *marginal outlay* listed in Column 8. The marginal outlay is the *additional* amount of money which each given amount of outlay represents in Smith's decisions. Thus, Smith may either invest nothing or 40 ounces, the next step. His *marginal outlay* for an investment of 40 ounces, is *40 ounces*. His marginal outlay at an outlay of 50 ounces is equal to *10 ounces*, or the differential between 50 and 40—the two successive points of decisions. The marginal outlay at 60 is also *10 ounces*. After that, there is no need to apply the concept, because these decisions have been ruled out. Column 9 lists the *rate of marginal net income*, and this gives the percentage of net income which each additional investment of units of money will earn. At 40, an addition of 40 ounces earns 7.6 ounces net; this is a percentage return of *19%*. At 50, an addition of 10 ounces earns 6.4 more ounces of revenue-a marginal percentage return of *64%*. At 60, the additional 10 ounces earns only one more ounce in revenue-a marginal rate of *10%*.[47]

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[47] In Smith's particular case, marginal net income is only negative in the early and later stages. In some cases, there may well be points where the marginal net

The alternatives that remain for Smith's consideration are condensed in Table 14 below taken from Tables 12 and 13:

Table 14

OUTLAY MARG.	MARGINAL OUTLAY	EXP. REVENUE	EXP. NET INCOME	EXP. MARG. INCOME	RATE OF NET INCOME %	RATE OF NET MARG. INCOME %
(1)	(8)	(4)	(5)	(7)	(6)	(9)
0	0	0	0	0	0	0
40	40	47.6	7.6	7.6	19	19
50	10	64	14	6.4	28	64
60	10	75	15	1	25	10

To summarize how we obtained these columns: from technological knowledge, Smith could calculate the maximum physical product that could be obtained from each combination of factors, and this with the prices of factors, which we have taken as given, determine the maximum total product schedule for each possible alternative outlay of money investment. Horizontal spaces in the schedule were eliminated, i.e. where the marginal product is zero for each increase in outlay (it can never be negative). For each possible product, Smith estimates the selling price for which he could sell the product, and this times the quantity produced yields him the revenue schedule for each outlay. The net income is then easily calculated, and points where this absolute net money income is expected to be zero or negative are immediately eliminated from consideration. The *rate of net income* is the percentage that the net income bears to the money outlay at each point. *Marginal Net Income*, then, can be calculated: at each step this is the additional net income earned from the additional dollars invested. *Marginal outlay* can usually be taken at equal steps for each alternative,

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income is negative *in between* points where it is positive. In such cases, the point of negative marginal income is skipped over, and marginal outlay is assumed to be the difference between the two nearest points of *positive* marginal outlay. Thus, Jones' schedule of outlay and expected net income may be as follows:

Outlay	Net Income	Marginal Net Income	Marginal Outlay
10	6	-	-
20	10	4	10
30	8		
40	14	4	20
50	19	5	10

but this must change when the net income turns out to be zero or negative in certain cases, in which cases the marginal outlay considered by the actor must be greater in order to skip these points. Those points where marginal net income is negative are then eliminated from consideration, since it would be obvious folly to invest additional funds where only losses would be earned. The two key concepts now are the *rate of net income* (which is equal to net income divided by outlay) and the *rate of marginal net income*, which equals marginal net income divided by marginal outlay. These are listed in Columns 6 and 9 respectively.

Before continuing to discuss the decision between the remaining alternatives, we might well consider the question: is there a fixed relationship between the *average rate of net income*, which shows us the percentage return from the total investment, and the *rate of marginal net income*, which gives us the percentage return on each successive dose of monetary investment? The answer is definitively yes; in fact, at any point, the *rate of net income is equal to the weighted average of the rates of marginal net income at that and preceding points*, the weights being the size of the marginal outlay at each point. Thus, at an outlay of 50, the rate of net income is 28. This is equal to the average of the rates of marginal net income at that and preceding points, namely 64 and 19. However, it is not simply 64 plus 19 divided by 2 ((64+19)/2=41.5). This would be an *unweighted average* of the two numbers. Each number is multiplied by the *marginal outlay* at that point, and the sums are divided by the sums of the marginal outlays, which is total outlay at the final point. Thus, 19 times 40 plus 64 times 10 is divided by 40 plus 10 (((19*40)+(64*10))/((40+10))=1400/50=28). Or, at the money outlay of 60, the rate of net income equals 40 times 19, plus 64 times 10, plus 10 times 10, divided by 40 plus 10 plus 10 ((40*19)+(64*10)+(10*10))/((40+10+10))=1500/60=25).

Furthermore, at the *first* feasible marginal step, whatever it may be (in this case it is from 0 to 40 ounces), the rate of net income equals the rate of marginal net income, the net income equals the marginal net income, and the total outlay equals the marginal outlay. This is because the starting point is always zero—no investment—and the total of something after the first step is the same as the difference between the step and zero.

Thus, we see that the average rate of return is the weighted average of the preceding marginal rates of return, and that at the

first step, the two rates of return are equal. This indicates another important truth: *that the average rate at any point is equal to the marginal rate, if the distance between that point and zero is taken as the unit.* Thus, if Smith is considering the investment of 60 ounces, his expected average rate of net income is equal to the marginal rate of net income, if the "margin" is taken as a unit of 60 ounces. Thus, the decision on an investment of sum of money is a "marginal" one in two senses: a) in the sense of the last small unit of money and its return, and b) in the sense of the return to a marginal unit taken as the size of the sum itself. Both sizes of marginal chunks are discrete steps, and both are taken into consideration by the actor.[48]

[Now we must return to the important concept of the rate of time preference and integrate our analysis of the rate of net income.] Any man, in deciding upon the allocating of any given sum of money between consumption and investment purposes, estimates the expected yield of net money income to be derived from his investment (modified where necessary by other psychic considerations) and compares it with his *minimum* required monetary return from that sum of money, taking into consideration his total stock, and his value scale. This minimum rate of return is his rate of time preference: any investment which he expects will yield him a lesser return will not be made. [Thus Smith and his investment decisions in the firm producing Product P, as shown in Table 14, are compared with his rate of time preference.] This rate of time preference is set by his relative valuations of present and future satisfaction; it is his "minimum supply price"—the lowest "price" at which he will part with his present money in order to invest in a prospect of a higher income at some time in the future. As an individual allocates more money to investment and less to consumption at any time, his marginal rate of time preference increases, until it finally becomes prohibitively high for

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[48] This statement will be surprising only to those who have been misled by the use of the differential calculus in economics. In calculus, the steps between points are treated as infinitely small, and therefore the marginal is thought to be the infinitesimal. In that case, "small" sized units will be recognized as approximations to some "ideal" marginal unit, but a "big" unit will not be thought of as marginal. Actually, the size of a marginal unit can be any amount, depending on the decision to be made. There is nothing ideal about infinitesimally small units, and they are not relevant to the real world of human action in any case, since action always deals with discrete steps.

any investment. This fact is set by man's necessity to consume in any given present, before making investments for the future. The entire schedule of a man's time preference rate, therefore, increases as the invested outlay increases, finally nearing verticality. [It can be calculated in marginal and averages form like net income.] If the rate of net income from the investment outlay is greater than the rate of time preference, he will make the investment; if not, he will abstain from the investment.

The investor Smith, in sum, does not simply try to maximize his expected net money income. He, like every actor in every situation and every choice, tries to *maximize his psychic revenue* and attain a *psychic profit*. He cannot only consider money income from the investment. He must weigh this against his psychic time preference rates. His maximization of psychic revenue, therefore, impels his investing so long as the rate of average and marginal net income exceeds his average and marginal rates of time pref- erence.[49] [Investment decisions in a firm, then, will always be where the average and marginal rates of net income are greater than or equal to the average and marginal rates of the investor's time preference. More precisely, Smith's investment decision in the firm producing P, will be at the last marginal outlay where this occurs. In general, then, investment in a firm will be pushed to the last marginal outlay where expected average and marginal rates of net income are greater than or equal to the average and marginal rates of time preference for the investor. We may call this the Law of Investment Decision.]

There is an important modification in this analysis of Smith that must be made, before our investigations into his output and investment decisions can be completed. In this example, we have assumed that the investor Smith faces only one alternative: either invest in the given line of production or don't invest at all. In actual life, as we know, the investor has open to him a choice in the investment of money in many lines of production or many firms. [As explained earlier, the production and investment of a firm

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[49] *Editor's footnote*: Strictly speaking, it must be greater than *or* equal to. An investor would still invest if the rate of return is equal to the rate of time preference, since his rate of time preference is the *minimum* he would need to earn in order to forgo the present money and invest. In the Evenly Rotating Economy, each investor only earns the interest rate, which is the societal rate of time preference.

cannot be considered in isolation.] Smith must not only choose whether to invest or to consume (or add to cash balance), he must decide between several alternative lines of production. How then must our law be changed to indicate the determination of his total investment, and of the investment in each line of production? In the first place, it is clear that Smith is primarily interested in maximizing his psychic revenue from the total of the investments in his portfolio. His interest is not in firm A or B or C, but in his income from all of these investments as a whole. Therefore, he weighs his average and marginal rates of time preference against the gross revenue that can be achieved from all of his investments at the given outlay. Thus, at any total outlay, say 120 ounces, he determines what distribution of money among the alternative investments will yield him the maximum total gross revenue, and hence the maximum net income, and maximum rate of net income for the given outlay. At each point of outlay he decided on the distribution that will accord him the maximum gross revenue, and therefore he is able to deduce the maximum average and marginal rates of net income for each outlay. He invests his money up till the largest amount at which the maximum average and marginal rates of net income are larger than his average and marginal rate of time preference, respectively. At this amount, he distributes his outlay among the various enterprises in accordance with the "maximum revenue distribution" at that outlay.

In the final form of the Law of Investment Decision, then, there is not the previous direct and complete link between investment outlay of the individual producer and the output of the individual product-as there is when the individual producer invests in only one line of production. It is still true that the actor invests in production—in general up to the last point that his expected average and marginal rates of net income exceed his average and marginal rates of time preference. Since this is true for each man, it is clear that the production *of all goods* in the society at any period is completely determined by these factors. It is *still* true for each individual product that the amount invested is such that the average and marginal net income rates at that point are greater than the time preference rates at that point. In this sense, the law still holds. However, no longer does the investor push his investment *in each particular firm* to the *last* point before his time preference

rates outstrip his income rates. He does not do so, because now he wishes to distribute his money outlays among several lines of production, in order to increase his revenue.

We must now return to our original question. How is the Smith, or in general, any investor's outlay in any given line of production, and therefore the output for that particular product, determined? To find the answer, we must look at a hypothetical illustration. Suppose now, that Smith has to consider, not only the product that we have explored in detail above, but also several other lines of production. Alongside the hypothetical money outlays, Smith lists, for each line of production, the expected *net income* from each outlay. Thus, let us say that he decided among firms producing products P, Q, and R, recalling that our illustration above consisted of product P. Then we might have the following schedules:

Table 15

NET INCOME			
MONEY OUTLAY	P	Q	R
10	-	2	-
20	-	7	8
30	-	13	7.5
40	7.6	16	9
50	14	18	15
60	15	20	14

These net income schedules reveal what net income Smith expects to enjoy when investing a certain outlay in any given line of production. But these schedules permit combination into *one maximum net income* schedule, which will determine the investment distribution that will yield the largest net revenue for each given outlay. Thus, suppose Smith is considering an outlay of 50 ounces. He might invest them all in the firm producing P, in which case his net income will be 14 ounces. If he invests them all in the firm producing Q, his net income will be 18 ounces; in the firm producing R, his net income would be 15 ounces. Clearly, if he can only invest in one firm or in the other, then he will choose firm producing Q. But, since he can distribute his investments, he also considers the various investment combinations adding up to 50 ounces which involve two or more firms. Thus 40 in producing P and 10 in producing Q will yield 7.6 plus 2, a net income of 9.6.

Mentally considering the various combinations, it becomes clear that prospectively the best is (30Q plus 20R) which yields a net income of 13 plus 8, or 21 net ounces. At each hypothetical outlay, the investor picks what appears to be that combination that will yield the highest net income. The following is Smith's *maximum net income* schedule with each money outlay, with the investment distribution in parentheses:

Table 16

MONEY OUTLAY	MAXIMUM NET INCOME	
10	2	(10 in Q)
20	8	(20 in R)
30	13	(30 in Q)
40	16	(40 in Q)
50	21	(30 in Q; 20 in R)
60	24	(40 in Q; 20 in R)

The best combination for any outlay is that one for which the *sum of the net incomes* from each line of production is the highest. An equivalent property of this condition is that the *weighted average of the rates of net income from each line of production be the highest* (where the weights are the money outlay in each line). Thus, take the problem of the best investment of 50 ounces. 50 ounces all in producing Q would yield 18 ounces income, or a 36% return. This is higher than an investment of 50 ounces producing P or R. But an investment of 30 ounces in B yields 13 ounces income, or 43%. An investment of 20 ounces in R yields a return of 8 ounces income, or 40%. A weighted average of these two yields by the respective outlays is: 30 times 43, plus 20 times 40, divided by 50. This equals 42%, the weighted average, which also equals the *rate of maximum net income* (amount of maximum net income divided by money outlay). Thus, the best distribution can be determined from schedules of rates of net income for each of the various outlays in the various lines of production. In this case, the distribution is not confined to producing just Q, even though producing Q is more profitable than either of the others at any given total investment.

From the maximum net income schedule, there can be deduced schedules of rates of maximum net income, marginal outlay, marginal maximum net income, rates of marginal maximum net income, etc. Thus:

Table 17

Outlay	Max. Net Income	Rate of Max. Net Income %	Marg. Outlay	Marg. Max. Net Income	Rate of Marg. Net Income %
(1)	(2)	(2/1)	(4)	(5)	(5/4)
10	2	20	10	2	20
20	8	40	10	6	60
30	13	43	10	5	50
40	16	40	10	3	30
50	21	42	10	5	50
60	24	40	10	3	30

Smith, or any investor, then proceeds analogously with the case of one product, investing money outlay (in the best distributions) up to the largest amount that his *rate of marginal maximum net income* is greater than [or equal to] his *marginal rate of time preference*, and his *average rate of maximum net income* is also greater than [or equal to] his *average rate of time preference*. Here again, average rate at any point is equivalent to the marginal rate (of maximum net income) at that point, with the size of the point itself considered as the unit.

We at last come to the end of the tortuous road of analysis of the determination of investor's decisions and of the amount of investment in any one productive firm. An investor will continue to invest rather than not so long as his expected average and marginal rates of return are greater than his average and marginal rates of time preference; and he will make his investment in that productive enterprise or combination of productive enterprises that will yield him the greatest possible net income, or rate of net income, for any hypothetical outlay. If we may eliminate the distinction between average and marginal by varying the size of the marginal chunk, then we may simply say that each unit of money outlay will be spent in the way that promises to yield the actor the greatest utility: in spending on consumer goods, if the rate of time preference for this amount is greater; or in spending on factors of production in that line or lines and in that firm or firm, where the rate of net return promises to be the greatest.

We have thus analyzed the principles according to which a man allocates his stock of money in accordance with expected greatest utility: the allocation of money units between investment in general and present consumption, and the decision between investment in various different firms and lines of production. The quest is for

psychic profit, and the course of action that will yield the greatest utility—in the usual case, this line of investment will be the one that is expected to yield the greatest net return from the outlay. Exceptions are cases where other psychic factors, such as particular like for, or dislike for, the production process or the product itself, alters the decision from a pure consideration of monetary return. Otherwise, a man invests in those enterprises which he expects will yield the highest rates of return.

We have thus seen what determines the amount of stock of any good that will be produced in any particular period—it will be the amount that the producer had invested in a previous period in order to aim at such production. The amount of previous investment depends on the producer's anticipated net monetary return. It is clear that an increase in anticipated rate of net income in any line of production will tend to increase the investor's outlay in that product, and that on the other hand a decrease in the anticipated return will tend to diminish his investment in that process. If we interpret the concept of "increase in rate of net income," as meaning an increase in the entire rate of net income schedule, so that at each outlay of product, net income is expected to increase, it is obvious that the rate of net income schedule will intersect the investor's time preference rate schedule at a further point, so that an increase in the expected net income schedule will increase the amount of investment outlay in that product, and contrary for the decrease. Furthermore, an increase in expected return for producing P will tend to shift more of the investment outlay to this firm from competing firms Q, R, etc., and the contrary will occur with a decrease in expected revenue.

As a matter of fact, changes in anticipated rate of net income are most likely to take place throughout the entire range of the schedule. The factors that can change the rate of return are: a) expected future selling price, b) the prices of the factors, and c) the producers' production function-the physical efficiency in converting quantities of factors into quantities of product. It is evident that, with factor prices here assumed to be given, and known, the producer's anticipations of future income are governed by his anticipations of selling price and of his production function. It is clear that a rise in expected selling price for any good, will *ceteris paribus*, increase the amount of investment outlay in its production; and that an increase in physical productivity for any good will *ceteris paribus*,

increase the amount of investment outlay. Conversely, decreases in expected selling price, and/or decreases in physical productivity will, *ceteris paribus*, diminish the investment in that product.

We have learned, therefore, that consumers' goods prices are determined by consumers demand schedule and by the stock produced and sold; that the sales of produced stock depend on anticipated future price; that the amount of stock produced depends on previous investment in production; that the previous investment in production depending on the net money income that the investor anticipated receiving, and the amount of investment will be up to the last amount at which the anticipated rate of return exceeds the rate of time preference; that the anticipated rate of return depends on: expected future selling price, and production technique (given factor prices). In the last analysis, then, consumers' goods prices depend on: consumers' demand schedules, and general time preferences, producers' anticipations of prices, and productive techniques.

Many questions remain to be answered. Among them is the discussion in Chapter IV on the final supply curve of the producers as compared to the stock on the market.[50] The "final supply curve" is the amount that will be called forth in supply in the future by certain prices. The discussion in Chapter IV implicitly assumed that the present ruling prices would be the ones that would be anticipated in the future. Thus, the figure below:

Figure 15[51]
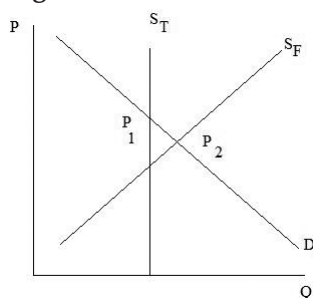
[50] *Editor's footnote*: See footnote 1.

[51] *Editor's footnote*: Although not discussed in terms of "final supply curve," a similar diagram can be found in Rothbard (2008 [1983], p. 27), which was not present in MES.

Implicitly assumes that the present prices of P_1 is assumed to be the future price, and will call for the equivalent amount on the S_F curve, which will tend to lower the final market price to P_2. However, we may alter this restriction, and make the necessary mental allowances for any anticipated change in price. The main point of the diagram still obtains—that the present market price is not necessarily the "final" one toward which the market forces are tending. The question then remains: what principles determine the "final" equilibrium market prices? Even though this price is never attained in practice, it is important because it is the point (though always shifting) toward which prices tend to move. And a final selling price, given the productive technique, and given factor prices tend to set net entrepreneurial income. On what basis does entrepreneurial net income, the driving force in the money economy, tend to be determined? This problem, along with a discussion of time preference, must be taken up in subsequent chapters.[52]

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[52] *Editor's footnote*: See Rothbard (1962, pp. 367–451, 509–555).

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BOOK REVIEW

DOING BAD BY DOING GOOD: WHY HUMANITARIAN ACTION FAILS

CHRIS COYNE
STANFORD: STANFORD ECONOMICS AND FINANCE, 2013, 272 PP.

JASON E. JEWELL

Historians know that Afghanistan is the graveyard of empire; would-be conquerors dating all the way back to Alexander the Great have seen their imperial dreams dashed in the region for a variety of reasons. Less well known is the fact that Afghanistan, especially the Helmand River Valley, is also the graveyard of humanitarian intervention. German, Japanese, and American governments have all tried and failed to bring prosperity to the region via technical expertise and infrastructure projects. For example, a U.S.-backed project to construct dams and irrigation canals in the 1940s and 1950s eventually increased (after several false starts) the available water supply for agriculture in the region,

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but local farmers did not know how to handle the influx of water, and agricultural output actually decreased as fields flooded. After many similar setbacks the project was abandoned in the 1960s, but after 2001 the U.S. government was back again with remarkably similar plans that met with remarkably similar failure.

The repeated failures of humanitarian projects in the Helmand River Valley are Exhibit A for Chris Coyne's case in *Doing Bad by Doing Good: Why Humanitarian Action Fails*. Over 204 pages, Coyne presents a devastating case against the dominant model of state-led humanitarian action worldwide. The implications of Coyne's analysis, which draws heavily on the tradition of Austrian economic thought and is bolstered by thorough empirical research, are that this model is irredeemable and needs to be completely overhauled.

Coyne's book is divided into three major sections. The first, "The Here and Now" contains two chapters that respectively describe the mentality and history of state-led humanitarian action. Borrowing language from Adam Smith, Coyne uses the phrase "man of the humanitarian system" to describe those with the mentality that "human suffering can be removed or prevented, that human welfare can be improved as desired, provided that the right people are in charge with the right level of resources and the right amount of will power." (p. 16) Such people are in abundant supply in government; Coyne produces a multitude of quotations from highly placed officials who wave away problems of knowledge and incentives by asserting that "will" is all that is needed to solve humanitarian crises. The significance of this vision that acknowledges few or no constraints on what can be achieved is heightened by the reality that, as Coyne explains in the section's second chapter, the state dominates humanitarian action today. Intergovernmental coordination and management of aid organizations is routine, and military peacekeeping has become increasingly common since the 1990s.

Coyne's second section, "The Realities of Humanitarian Action," consists of four chapters and is where the key economic analysis is found. Most importantly, Chapter Three provides an accessible layman's discussion of the socialist calculation and knowledge problems, which Coyne (presumably for simplicity's sake) combines and calls "the planner's problem." This discussion is relevant because, as Coyne points out, "even though humanitarian

action takes place in complex settings, humanitarians tend to rely on central planning as the way in which decisions regarding resource allocation are made." (p. 64) Humanitarians often operate on the facile assumption that markets are antithetical to humanitarian action, and they frequently lack the most basic understanding of how markets coordinate resources and activities. Moreover, because the state is bureaucratic by nature, its growing involvement in humanitarian action naturally leads to the employment of more bureaucratic methods. Finally, many areas receiving humanitarian aid lack the conditions necessary for the effective functioning of markets because of their predatory governments; of course, this is one reason these regions need aid in the first place.

The prevalence of central planning in humanitarian action means that aid agencies and the like lack the necessary feedback mechanisms to know whether they are actually improving the wellbeing of aid recipients. Coyne cites several reports where aid providers claim to have achieved "breathtaking successes" on the basis of metrics considered valuable by the providers themselves, e.g., the number of children enrolled in schools as a result of the aid. Absent from such self-congratulations is any awareness of whether real economic progress has taken place:

> Economic progress is the much more difficult task of increasing consumer welfare through fundamental changes that solve economic problems by helping individuals coordinate their scarce resources in more efficient ways. In other words, how do aid planners know that education, or healthcare, or infrastructure is the highest valued use of scarce resources from the standpoint of the members of the society in which they intervene? They cannot following the logic of the planner's problem. (p. 74)

Coyne cites the Soviet Union's economic history as the best example of how conflating output with economic progress led many observers to conclude that the USSR's economy was superior to the United States', despite the fact that the standard of living in the USSR was very low. A parallel situation exists today in Afghanistan, where official government estimates are that up to 97 percent of the GDP is a direct result of spending by military troops and international donors. Thus the GDP figures, which have increased rapidly since American intervention, are

disconnected from the stagnant standard of living of the average Afghan citizen. Coyne's conclusion at the end of this analysis is that the best humanitarian planners can hope to accomplish with their traditional approach is to expand output for immediate relief efforts in crises. Grand plans for long-term development on this model have no chance of success.

But the dominant aid model cannot guarantee success even in relief situations. The remaining chapters in the book's second section describe other related, intractable problems that accompany state-led humanitarian action. Two of these chapters "develop the political economy model of humanitarian action by considering how the incentives created by the political process contribute to the failure of state-led humanitarian action to deliver short-term relief to those in need." (p. 92) Specifically, political competition replaces market competition in the process of allocating resources, and the bureaucratic model of public humanitarian agencies encourages waste and mission creep. The section's final chapter discusses the problem of linear, technocratic thinking among humanitarian planners when the environments in which they provide aid are characterized by complex systems; the inevitable result is the unintended consequences of system effects, such as when the toppling of the Gaddafi regime in Libya led to destabilization in neighboring Mali as the Malian rebels Gaddafi had employed for years returned home to cause trouble for their own government. The cumulative impact of all this analysis? "Given the numerous past failures of state-led humanitarian efforts, the realities of political institutions that are at the center of humanitarian efforts, and the logic of negative system effects, the burden of proof necessary to justify humanitarian action, no doubt, should be extremely high." (p. 165)

The book's third and final section, "Implications for Humanitarian Action," is also its shortest. Coyne's central argument here is to call for the overturning of the "man-of-the-humanitarian-system" mentality and to replace it with Thomas Sowell's "constrained vision" for what human reason can comprehend and design. "Instead of starting from the assumption that something 'must be done' to help those in need, the constrained approach entails first asking, 'What can be done?' given the relative constraints." (p. 178) As already mentioned, this involves acknowledging short-term relief as the outer limit of what humanitarian aid can

accomplish. Development, by contrast, should be viewed "as an ongoing process of discovering new and improved allocation of scarce resources." (p. 179) Economic freedom thus becomes the preferred—indeed, the only—reliable method for bringing about sustained economic development.

Coyne stresses the importance of recognizing a society's endogenous rules of property ownership as opposed to attempts to design and impose property rights in a top-down manner. The constrained approach "recognizes that while some rules and organizational forms may be designed, they are grounded ultimately in a broader array of emergent rules and traditions that are not designed and are beyond the grasp of human reason. These traditions are the result of historical experiences and belief systems that vary over time and across people." (p. 183) These endogenous rules exist in all societies and help determine how communities respond to humanitarian crises. They also constrain efforts to design and implement what planners may consider "superior" formal rules. In this context Coyne examines the Millennium Development Goals promulgated by the United Nations and finds them wanting because they lack any focus on increasing economic freedom.

Coyne suggests that states, rather than trying to "fix" other countries, should focus on making internal reforms that can have the effect of helping the suffering in other parts of the world. His primary recommendation is to liberalize immigration laws to allow labor to flow to where it is most highly valued. He cites data indicating that remittances from immigrants to their home countries, such as those to Haiti in the aftermath of the devastating 2010 earthquake, are more effective than all the state-led humanitarian efforts in terms of their developmental impact. Given the emphasis on endogenous rules just a few pages earlier, here it would have been a good idea for Coyne, at least briefly, to answer the objection that the open immigration he favors could lead to an "importing" of endogenous rules at variance with those of the host society, leading to potential conflicts among people operating according to different norms but now sharing the same geographic space. Certainly this concern accounts for at least some of the opposition to immigration he attempts to refute later in this same chapter.

Although Coyne acknowledges that many vested interests, not least the United States military, benefit from the *status quo*

in humanitarian efforts and will oppose any efforts to overhaul them, he does see reasons for optimism in the long-term increase in economic freedom worldwide over the last fifty years and the corresponding long-term decrease in violence analyzed by Steven Pinker and others. Moreover, private remittances and the activities of for-profit businesses help constitute a flourishing non-state humanitarian "industry" that can be further developed. Finally, some voices sympathetic to the constrained vision are finally getting a hearing in policy circles.

Doing Bad by Doing Good is an accessible treatment of a major foreign-policy problem from a perspective solidly grounded in the tradition of Austrian economic thought. The research is thorough, as evidenced by the dozens of pages of sources. One hopes that this book will have a favorable impact on those in a position to alter the regime of state-led humanitarian action that dominates the policy landscape today.

BOOK REVIEW

EXPLORING CAPITALIST FICTION: BUSINESS THROUGH LITERATURE AND FILM

EDWARD W. YOUNKINS
LANHAM: LEXINGTON BOOKS, 2014, 346 PP.

SHAWN RITENOUR

Edward W. Younkins has made a very welcome contribution to business and economic education with his book *Exploring Capitalist Fiction*. In this book he documents how various ideas about business, commerce, and economics have been communicated through literature, plays, and cinema. In doing so, he has written a book that should prove very helpful to business and economics professors who should be aware of how various economic and business-related messages are crafted in literature and cinema and would like to draw upon such media to better teach others important truths.

The importance of economic messages in media has not been lost on Austrian economists. Ludwig von Mises, for example,

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had much to say throughout his career about the importance of novels and the media in shaping people's ideas about political economy. In one of his early main works, *Socialism*, he cites the nineteenth-century romantic and social-realist authors and poets as paving the way for socialism by inspiring their less talented and creative followers to propagandize against "the blood-sucking capitalist entrepreneur" and for "the noble proletariat" (Mises, [1922] 1981, p. 420). He further identifies Dickens' *Hard Times* as an attack on utilitarianism and economic liberalism. In his great work *Human Action*, Mises asserts that one of the challenges of economic education is the impact of mass media (Mises, [1949] 1998, pp. 873–874). Mises also saw the genre of the detective novel as a particularly pernicious manifestation of anti-capitalist literature (Mises, 1956, pp. 52–55). Additionally, he argued that what he termed "social novels" mislead because they leave the reader the impression that poverty is the result of capitalism instead of a *lack* of capitalism (Mises, 1956, pp. 66–72).

Twentieth century students of Mises also demonstrated through their work that they likewise understood the intellectual impact of literature and film. Mises's journalistic champion, Henry Hazlitt, was a literary critic by trade who turned to economics and economic journalism as a second career. His authoring the novel *The Great Idea* (republished as *Time Will Run Back*) testifies to his recognizing the power of literature to communicate economic ideas. Similarly, Murray Rothbard's regular film reviews under the moniker "Mr. First Nighter" reveals an awareness of the importance of political and economic messages in cinema. More recently, following in that tradition is the work edited by Paul A. Cantor and Stephen D. Cox, *Literature and the Economics of Liberty: Spontaneous Order in Culture*.

In the work before us, Younkins serves the reader with an outstanding survey of literature, drama, and film that focuses on various topics related to business and, by extension, economic ideas. The breadth of the book is very impressive. Sandwiched between an informative introductory survey of the book and its culminating thematic essay are extensive discussions of twenty-five books, plays, and movies.

By itself it provides a cultural education of how authors, play-wrights, and screenwriters conceive of the world of business, commerce and corporate culture. Younkins takes pains to include

works from across the spectrum, engaging works with both positive and negative perspectives of free markets and profit seeking enterprise. He examines, for example, works critical of commerce and a free economy such as Edward Bellamy's *Looking Backward* and Sinclair Lewis' *Babbitt* as well as those championing economic freedom and the life of the entrepreneur such as Ayn Rand's *Atlas Shrugged* and Hazlitt's *Time Will Run Back*.

Ultimately, *Exploring Capitalist Fiction* does what good books do: it makes the reader want to learn more. It encouraged me to pursue works with which I was unfamiliar such as *Glengarry Glen Ross* and *Cash McCall*. I was also motivated to revisit works I had read or seen before. Based on Younkins' commentary on books and films I do know fairly well, I vouch for his competence. He does an excellent job summarizing the main plot lines and motivations of principle characters.

As the reader makes his way through the book, it becomes clear that Younkins is a Randian. He puts *Atlas Shrugged* in a class by itself, because, he argues, there have been no other works of literature that have so successfully integrated and unified philosophy and business. He furthermore identifies Dagny Taggart as "perhaps the most heroic female protagonist in American fiction" (p. 169). It is no surprise, therefore, when Younkins uses *Atlas Shrugged* as the standard by which to judge novels. In the midst of much praise for Garet Garrett's *The Driver*, Younkins qualifies that "it is certainly not in the same class as *Atlas Shrugged*, but what is?" Similarly, in the final concluding essay summarizing the field, Younkins finds it noteworthy that *Calumet K* by Samuel Merwin and Henry Webster was Ayn Rand's favorite novel.

Exploring Capitalist Fiction is best suited for professors who would like to incorporate literary and cinematic works in their business and economics courses. I suggest it is not so useful as a text for classes that integrate literature and business and economics, simply because it would be best to expose the students to the primary sources and not chapters about the works. The bulk of the book comprises chapters summarizing the works considered. In that sense, the book is more like master plots and less like a literary analysis of the works under consideration. I would have liked more analysis in addition to the summaries. That is not to say that Younkins does not contribute some thematic and philosophical

analysis as he considered each work. He does. I just would have liked to see a little more.

That is a minor quibble, however, as this is an excellent work that achieves what it sets out to do. It points to various ways in which literature and film can communicate economic and business messages and how they can be interpreted. I am happy to recommend this volume to anyone interested in the intersection between literature, film, and the world of commerce.

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BOOK REVIEW

CONTENDING PERSPECTIVE IN ECONOMICS: A GUIDE TO CONTEMPORARY SCHOOLS OF THOUGHT

JOHN T. HARVEY
CHELTENHAM: EDWARD ELGAR, 2015, 168 PP.

MARK THORNTON

It is a shame that most economic students, whether at the under-graduate or graduate student level, are exposed to precious little about the different schools of economic thought. Most course work is based on the "Neoclassical synthesis" with mathematical models and econometric testing being the ultimate goal.

This situation could be the simple result of competition. Some economists argue that the status quo is the result of a competition between economists in the publication market, where economists compete for journal page space and citations to their publications. Neoclassical economics won that competition and absorbed

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everything of value from the other schools and it only makes sense to concentrate the student's time on the winner. In fact, most Neoclassical economists would argue that there is little in the manner of a fixed doctrine or dogma in the Neoclassical school. Just about everything is subject to questioning, change or evolution.

So far the World Economic Crisis since 2007 has done little to change the profession or to topple economists from their top spot in the social sciences. There was the French student protest against a lack of plurality in economic education in 2000 and there has clearly been a strong movement in support of Austrian economics since the housing bubble burst. However, there have been few signs of a grand refocusing within the profession similar to the widespread adoption of public choice theory.

This little book is an attempt to address the problem of a lack of plurality in economic education. It briefly reviews Neo-classical economics and six competing approaches, including Austrian economics, Feminist economics, Institutionalism, Marxism, New Institutionalism, and Post-Keynesian economics. The author tries very hard not to let his own views bias his presentations and critiques. The result is both refreshing and thought provoking.

Each school is given a basic description, its preferred methodology, its view of human nature, and its sense of justice. This is followed by the school's primary and secondary standards of behavior, i.e. what makes for good or bad economics. Each chapter concludes with a description of preferred professional activities, criticisms of the school, and a rejoinder from the school against its critics.

Before turning to the dominant Neoclassical school, the author employs arguments to explain how it came to dominate the profession. Part of the explanation is that it has been relatively good at being a "coldly rational institution, slowly stamping out ignorance and replacing it with the truth about the objective world around us" and eventually capturing the editorship of journals and control of graduate programs. This cemented its authority while permitting it to continue to adopt and evolve.

To this argument, the author adds the influence of two events that left Neoclassical economics as the dominant paradigm. The first event was WWII, when the fact that Neoclassical economics was the most operational form of economics, made it important

for addressing wartime allocation problems. Indeed, many Anglo economists trained in the 1930s found themselves fighting the war in some bureaucracy helping to build the Allied war effort. The second event was the Cold War. The fact that the enemy was Marxist communists and that any sympathy for collectivism would be viewed with suspicion, meant that Neoclassical economics was the least suspect type of economics compared to the other schools of economics. It was generally sympathetic with the free market, offered solutions for market imperfections, and did not object to the rise of the Warfare/Welfare State.

While the dominant status of Neoclassical economics seems assured, the author's discussion of the profession's structure and institutional incentives in Chapter 2 shows that there are clearly some troubling imbalances. One well-known issue is the increasing importance of math and statistics. For example, if a person has already earned a master's degree in mathematics the odds are very good that he could get his Ph.D. in economics and thrive at the higher levels of the profession even though he doesn't know the difference between the S&P 500, the Fortune 500, and even the Daytona 500. However, someone with extensive hands-on experience in commodity markets, futures markets and financial markets would be hard pressed to get a Ph.D. without the proper math skills.

The author describes the core of Neoclassical economics as consisting of marginalism, rationality, a-priorism, and general equilibrium theory. In the early days of Neoclassical economics, the Austrians were considered different, but similar to Neoclassicals from 1871 to the early 1930s. They were also considered important contributors, even though most did not adopt general equilibrium theory. Over time Neoclassical economics adopted mathematical modeling and positivism and many of the Austrian features have lost significance.

The author brings up one natural barrier to entry that works in favor of Neoclassical economics—the dominance of the American Economic Association Conference over the job market for academic economists:

> I mention all this to emphasize the critical importance of this conference. The overwhelming majority of universities hire new faculty via this

> process. In addition, universities have limited travel money. Therefore, an Austrian economist hoping to attend the Austrian Economics Research Conference might be forced to instead spend travel money to go to the American Economics Association meetings in order to participate in the interviewing. (p. 54)

According to the author, the number of sessions allotted to pluralistic economics at this conference has been declining in recent years.

Because the book is short and easy to read, I am going to skip the other schools of economics and review the section on Austrian economics. The author notes the importance Austrians place on methodology, but wrongly suggests that most Austrians "spend a considerable amount of time on this issue." (p. 77) Austrians do think methodology is critical, but few of them spend much time writing about it.

The author describes a methodological divide between two camps of Austrians. The first camp is led by Mises and his "strict" praxeological method. Here, using deduction, introspection, and reason it is possible to develop "foolproof axioms." The second camp is the weaker, more flexible methodology of subjectivism. For members of this camp, the fact that all valuation is done by individuals means that aggregate statistics are meaningless, that market economies are better allocators of resources, and that government planning leads to ad hoc and arbitrary allocation of resources.

I suspect the division of weak and strong is driven in part by the desire to avoid the moniker of the possibility of truth associated with Mises's "strict" methodology. Austrian-subjectivists are more mainstream on this issue of truth, as is the author of the book. The amusing thing is that traditionally if a graduate student were to tell his Neoclassical graduate advisor that he found empirical evidence refuting the law of demand or that minimum wage laws increase employment, the student would be told they were wrong and to start their empirical analysis over. At least that was true until recent years.

Even with these divisions, I believe that the number of what I call "Confusionists" is actually small. This grouping consists of economists that *do* spend a good deal of effort writing and preaching about methodology, often deny the existence of truth,

and try to *fuse* Austrian economics with any noteworthy economist who might have the slightest overlap with Austrian economics on a Venn diagram.[1]

A very short section on the "market process" does a good job summarizing the Austrian perspective. Austrians first try to explain how the world works using a realistic view of knowledge, uncertainty, and time. Real people have limited knowledge, face ongoing uncertainty, and their activities take place over time. As a result, markets are never perfect or in equilibrium, but they do produce prices and profit opportunities which help guide individual choices moving forward.

The short sections on the Austrian business cycle theory, Method, Views of human nature and justice, Standards, and Contemporary activities are all reasonably accurate given their brevity. The chapter on the Austrians is the second shortest with one more page than the chapter on the New Institutionalism.

The author has an interesting perspective on the interrelationships between the heterodox schools of economics. The author correctly portrays the Austrians as distinct. He notes that there is little interaction between the Austrians and the other heterodox schools, but there is some interaction between the Austrians and the Neoclassicals. On the dynamics between the heterodox schools he notes:

> Because they know that they are operating from a position of weakness within the discipline, most non-mainstream schools of thought avoid attacking each other. However, as suggested above, that courtesy is not always extended to the Austrians. (p. 85)

He describes Austrians as a threat to other heterodox schools. This threat is based on their jealousy of the ability of Austrians to interact with Neoclassicals and also the pro-free market orientation of most Austrian economists. "This means that Austrians come in for more than their fair share of criticism!" (p. 85)

The book is a good exercise in getting to know the broader economics profession, especially regarding the commonalities between the various schools of economic thought. The author

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[1] See Salerno (2007, 2009).

should be applauded for his effort at remaining impartial, because that is clearly a difficult task. Hopefully, it will contribute to a better understanding of and resolution of some differences among the various schools.

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BOOK REVIEW

FINANCE BEHIND THE VEIL OF MONEY: AN ESSAY ON THE ECONOMICS OF CAPITAL, INTEREST, AND THE FINANCIAL MARKET

EDUARD BRAUN
LIBERTY.ME, 2014, XXIV + 342 PP.

DAVID HOWDEN

Based on his doctoral thesis directed by Jörg Guido Hülsmann (who also wrote the foreword to the book), German economist Eduard Braun's *Finance Behind the Veil of Money* aims to show how money affects our financial decisions. The reader will notice that Braun approaches this goal from a different angle of most Austrian-school economists. Instead of looking at how money and credit affect interest rates and propagate an Austrian business cycle, Braun focuses on the "subsistence fund." Largely jettisoned from modern Austrian business cycle theory, in a way *Finance Behind the Veil of Money* picks up where Richard Strigl left off with his *Capital and Production* (1934).

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In expounding an updated theory of the definition and role of the subsistence fund, Braun rewards the reader for the time dedicated to reading the book. This time is not insubstantial. At 342 pages, the book is neither concise nor easy reading. It is heavy, dense, technical and littered with citations. The publisher's exclusive use of endnotes makes the going tougher yet, as the reader constantly finds himself flipping pages to find out to whom Braun is attributing a concept, to what era the idea belongs or, indeed, since Braun uncovers the changing thoughts of several authors over their lifetimes, to what specific work of an author he is referring.

Adding to the difficulties are several chapters with only tangential relevance to the subject at hand. Two sections of chapter 17 discuss, for example, monetary systems that separate money's pricing and exchange roles (pp. 170–177). Chapter 19, dealing with the role of the financial market, seems to not contribute anything to his book than to bring the level down from an otherwise high standard by stating, at length, the obvious: that financial markets intermediate savings through loan and equity investments. Chapter 22, dealing with the German financial crisis of 1873, seems an unlikely addition to an otherwise theory-laden book. (One interesting yet inadequately explained tidbit in this chapter is that dividend yields on German shares rose throughout the boom [p. 242], i.e., at the same time as credit expansion was relatively lowering interest rates. Since the rise in dividend payout ratios runs against common sense and experience, it would be nice if Braun could more thoroughly explain this paradox.)

Most readers will no doubt find many passages in the book to be either confusing at best, or wrong at worst. For example, Braun takes on the whole doctrine of opportunity cost analysis claiming that it "creates costs where they do not exist—in decisions—and neglects costs when they actually arise—in action" (p. 33).

I don't see much neglect by economists of the use of opportunity costs in action. The corollary is that such costs must also affect our decisions. Ask any first-year economics student what the cost of Braun writing his book was and he will surely say "the value he would give to the next-best alternative on which he could have spent the time." In other words, opportunity cost in action. For the sake of argument, let's assume Braun's next best use of his time was to practice playing piano. On what basis did he decide to

write the book and thus not practice piano? Opportunity cost, of course. Since the time commitment was the same and defined (let's assume) Braun's only two options, he pursued the one he valued more highly (or what is the same, had the lower opportunity cost).

Braun's chapters on the time-preference theory of interest will meet the most resistance. Indeed, they are the places where this reviewer found himself either lost or unable to agree with Braun's reasoning. Mostly the troubles crop up early as he lays the building blocks for his subsequent theory. Consider the following passage as a case in point.

> *Everything one does* must be called consumption because, apparently, one *wants* to do it. Someone who saves an apple for next month does not *save* at all. Instead, he *consumes*. He prefers the Apple in his fruit bowl to the enjoyment of eating it right now. Hence, the decision whether to eat the apple is not a decision between a present a good and a future good. It is rather a decision between a present good on the one hand—eating an apple—and a *combination* of a present good *and* a future good on the other. (p. 21)

In short, Braun does not believe that the "*value difference between present and future goods*" (p. 40) exists by necessity. For him, it is not a praxeological law. On the one hand, sure, if we want to start defining consumption as doing what one wants, then I have no quarrel with Braun's argument. On the other hand, there are good reasons to separate actions into productive and consumptive activities. Menger's imputation theory of value makes it clear that the value of higher-order (capital) goods can only derive from the value placed on the utility of lower-order, or consumers', goods (Menger, 1871, pp. 55–67). Braun makes much use of the value and general price level of consumers' goods later on, particularly in his look at the purchasing power of money in chapter 16. If every good is a consumer good, one wonders how these two chapters can be reconciled.

Braun states the traditional pure time-preference theory (PTPT) of interest as one comparing present goods with future goods. He criticizes Hulsmann's theory of interest on the same grounds, as "the term 'future good' [is] a synonym for the [term] 'means'" (p. 51). Yet, while early Austrian-school economists, e.g., Menger and Böhm-Bawerk, focused on the intertemporal value spread between

the same quality and quantity of goods, later generations had a more nuanced approach.

By the time the pure time preference theory (PTPT) of interest reached its full elaboration by Fetter (1914), a work which is absent from Braun's otherwise very comprehensive reference list, it was clearly based on a comparison of satisfactions equal in all but their timing. To be sure, some of the earlier Austrian authors and especially Böhm-Bawerk focus on the intertemporal value spread between present and future goods that Braun attacks.[1] It is true to say that Fetter considered that the rate of interest could only be embodied through one specific good, i.e., money, since any capitalization of expected future values could only be imputed to the present by means of a common denominator (Fetter, 1915, p. 116). But the origin of time preference is reckoned by the intertemporal value spread of wants expressed in money terms. Nor is it true that Fetter's PTPT of interest is rooted in psychological factors, as Braun (p. 17) suggests. Indeed, Fetter was critical of Böhm-Bawerk's reliance on both psychological reasoning and physical differences of goods, instead of value differences (Fetter, 1914, p. 127fn2).

Yet, for all its difficulties, the reader is duly rewarded for trudging on.

Braun puts forward the idea that the only "*difference between saving and investing lies in the time dimension*" (p. 55). In this Braun makes a very important point. Savings are always in money terms (or rather, income terms). Therefore, savings are always unconsumed income. Investing is the act of converting this unconsumed income to a claim to a future good (i.e., not consuming it). Thus, savings can only have one dimension: a value dimension as per the value of the unconsumed goods.

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[1] Böhm-Bawerk attributes the preference for present over future goods as a tendency brought about by three complementary causes (Herbener, 2011, pp. 31–34). First, since any present good can be enjoyed by the owner until some future time, the value in the present must necessarily be greater than that of the future (Böhm-Bawerk, 1889, p. 266). Second, that "we systemically undervalue our future wants and also the means which serve to satisfy them" (p. 268). Finally, that "as a general rule," present goods are technologically preferable to future goods as concerns their ability to satisfy wants, and as a result must warrant a "higher marginal utility" than future goods (p. 273).

Investment is bidimensional: the value of the unconsumed consumers' goods, and the duration of their tie-up.

The somewhat smallish early quibbles and marginal contributions aside, the book gets really interesting in chapter 16 on "The Role of the Purchasing Power of Money in the Business Sphere." In this chapter, he draws heavily from Friedrich Weiser and Arthur Marget to show that the purchasing power of money in terms of producers' goods is not relevant to human action. Ultimately, Braun's argument is just an extension of Menger's imputation theory of value. Since all value derives from that places on consumers' goods, so too must money's.

The reader should trudge his way through this book for two reasons. First is the aforementioned explanation for why the purchasing power of money must be defined in terms of consumers' goods prices, not capital goods. (Though this is an ironic conclusion for Braun to make given his doubts in the early part of the book as to whether it is even possible to speak of anything other than consumers' goods. Perhaps he should restate his theory so that the purchasing power of money is only defined in terms of *goods'* prices, though this reviewer thinks this would be a step backwards.)

Second, and more importantly, Braun resurrects the subsistence fund doctrine. There is no doubt in this reviewer's mind that he is the foremost authority on this bygone relic of Austrian business cycle theory. This is unfortunate, not because I don't think Braun is up to the task, but because it is such an integral aspect of business cycle theory and completely neglected by modern writers. Braun takes the reader through the historical development of the concept, and gives a good overview of the difficulties that third and fourth generation Austrian-school economists encountered when trying to "sell" this aspect of their business cycle theory. While most sympathetic economists emphasize Hayek's "loss" to Keynes and the ensuing death knell of broad acceptance of Austrian business cycle theory as due to ideological factors, after reading Braun's book an equally defensible explanation arises. Hayek was unable to provide a satisfying real resource constraint in his business cycle theory. In part this was because of the difficulties in updating the subsistence fund concept to the modern financial economy. Braun doesn't quite get there, but he's definitely taken many steps in the right direction.

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