

# Richard Cantillon and the Discovery of Opportunity Cost<sup>1</sup>

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# Richard Cantillon and the Discovery of Opportunity Cost

Cantillon provided one of the clearest early explanations of market price. However, his notion of *intrinsic* value has quite possibly been a red herring in the history of economic analysis. There seemed little doubt in Cantillon's mind that market price depends on factors other than "real costs," some of which are subjective. – R. F. Hébert (1985, p. 270).

## Introduction

Opportunity cost is a central concept of economic science and Schumpeter (1954, p. 1044) considered it to be the great contribution of the early neoclassical period. Stigler (1941, p. 147) attributed the economist's conception of cost to the Austrian branch of the neoclassical period: "Menger lays the groundwork for a correct theory of productive organization—i.e., for the determination of the allocation of resources. The final development, however, the theory of alternative cost, is left for Wieser to formulate." Later, in an act of academic self-flagellation, Stigler (1955, p. 8) found that John Stuart Mill *understood* the concept of opportunity cost in 1848 in an example of the alternative uses of agricultural land where he made a "frank and clear recognition" that rent is derived from the existence of alternative uses for resources.

The claim here is that Richard Cantillon discovered the concept of opportunity cost one hundred and forty years earlier than its conventional dating. This finding is surprising given Cantillon's use of the term *intrinsic value* and his well-known search for a par value between land and labor. Even more shocking for modern readers of Cantillon

is that he used the phrase “intrinsic value” to designate opportunity cost. Not only did Cantillon have the “flavor” of opportunity cost, as some have suggested, he used it to construct key applications of economic analysis and integrated it into his theoretical understanding of cost and choice.

To sustain this claim, it will be shown that Cantillon used opportunity cost in three major applications in his *Essai sur la Nature du Commerce en Général* (hereafter, the *Essai*)<sup>2</sup> including one that corresponds to the classic textbook illustration of opportunity cost. In another application Cantillon incorporated opportunity cost into his demolition of the Mercantilists’ views on money and interest and his own defense of usury. The evidence shows that Cantillon had in fact used the term intrinsic value correctly (i.e. in accordance with its most commonly understood meaning, circa 1730) to signify opportunity cost. Furthermore, textual evidence demonstrates that his conception is consistent with all the tenets of our modern understanding of opportunity cost. Cantillon’s life was one of many mysteries and his economics has presented many puzzles, but one of the central theoretical puzzles is solved here—Cantillon was the first to discover the concept of opportunity cost.<sup>3</sup>

### **Cantillon’s use of Opportunity Cost**

If Cantillon were chained to a hopelessly incompetent understanding of economic cost, how could he have stumbled onto so many important advances in economic theory? This is a central puzzle of Cantillon’s economics. Buchanan (1969a, 1969b, p. 64) asserted

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<sup>2</sup> The first page number(s) will be to the original French edition (1995) as contained in Higgs edition of (1931), the second page number will be to the English translation by Higgs (1931), and the third number is to the Brewer edition (2001).

<sup>3</sup> Murphy (1986) provides an excellent and engaging discussion of all the puzzles surrounding Cantillon’s life and thought and provides a thorough analysis of the potential answers. Remaining mysteries include whether or not Cantillon staged his own murder. Current debates involve questions concerning his

that reliance on objective valuations causes “methodological chaos.” Hayek (1952, pp. 24, 31, 209-10) even believed that all major advances in economics were linked to the proper understanding of subjective value and opportunity costs. It would seem that if Cantillon had an intrinsic view of cost, even a sophisticated one, he would have been hard-pressed to have independently invented economic theory. And yet Higgs (1931, p. 386) described Cantillon as “the economist’s economist,” and Schumpeter (1954, p. 222) wrote that he was the starting point for price theory and the first “to give us a bird’s-eye view of economic life.”

Previous writers have noted that there is a *suggestion* of opportunity cost in the *Essai* and that readers could be misled by the term *intrinsic value*. The claim that Cantillon discovered opportunity cost begins with the insights of these eminent historians of economic thought. Schumpeter (1954, p. 219) recognized the potential for confusion from the term *intrinsic value* and he recommended “never mind the objectionable word, it is quite harmless.” Quite plausibly Schumpeter was referring to the fact that the meaning of the word *intrinsic* had changed over time, and that the generally accepted meaning of intrinsic value had changed in important respects after Cantillon wrote the *Essai*. Spengler (1954, II, p. 407) also alerted his readers to the role of opportunity cost in the *Essai*, and after describing the standard interpretation of Cantillon’s intrinsic value he noted that:

Cantillon shows how farmers and others, animated by self-interest, guided by the behavior of market prices and alert to the opportunity costs of particular courses of action, change their activities until they arrive at a combination which, under the circumstances, is satisfactory.

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influence on and relationship to subsequent schools of economic thought. Also see Blaug (1991) for a collection of important papers on Cantillon’s economics.

In more recent times Hébert (1985, p. 272) also noted that Cantillon's *Essai* contained implicit suggestions of the role of opportunity cost. He concluded that Cantillon's writing "is rich in suggestions of self-interest as a motive force, relative prices as signals to adjust resource use, and opportunity costs as a basis of economic decision making." Bordo (1983, p. 234) also made the connection between Cantillon and opportunity cost: "Finally, although it is not explicitly stated as such, the interest rate viewed as the price of money (as opposed to its exchange value) could be interpreted as an opportunity cost variable in the demand for money." These authors caution us not to be misled by Cantillon's term *intrinsic value* and point us in the direction of opportunity cost.

Not only did Cantillon use opportunity cost implicitly, he used it in a precise and detailed manner for several key illustrations involving land, labor, and capital. The classic textbook illustration of opportunity cost is the decision to attend college, where the decision to attend is affected by both the foregone income of four years and the explicit costs of college. Cantillon (23-24/19/12) gave us the 18<sup>th</sup> century equivalent of this illustration when he described a father's decision to send his son to an apprenticeship or keep him on the farm:

A laborer's son at seven or twelve years of age begins to help his father either in keeping the flocks, digging the ground, or in other sorts of country labor which require no art or skill. If his father puts him to a trade he loses his assistance during the time of his apprenticeship and is necessitated to cloath him and to pay the expenses of his apprenticeship for some years. The son is thus an expense to his father and his labor brings in no advantage till the end of some years.

The father loses the cost of the apprenticeship (tuition) as well as the foregone labor (wage income) for a period of seven years (four years). Cantillon went on to use

opportunity cost—“the time lost in learning the trade and the cost and risk incurred in becoming proficient”—to help explain the higher wage paid to artisans and craftsmen. Economists would be correct to object that the cost of clothing should not be included because children must be clothed whether they go to college or not. However, in Cantillon’s time children on the farm contributed much to their own upkeep, including the production of their clothing. They assisted in the production of wool and leather and undertook tasks such as weaving and sewing. Therefore, Cantillon included the need to clothe the apprentice in the father’s decision because children on the farm participated in the production and upkeep of their homespun clothing, while those in apprenticeships did not.<sup>4</sup> Therefore the father would have an additional expense for the provision of clothing for children sent to apprenticeships. What first appears as a typical freshman mistake turns out to be an even more impressive and complete construction of opportunity cost by Cantillon. This noteworthy illustration appears at the very beginning of a group of chapters that precedes his discussion of the price and intrinsic value of a good.

To further emphasize the importance of opportunity cost in decision making regarding apprenticeship, Cantillon (24/19/12) noted that wage rates must offset the foregone time working on the farm.

The working life of a man is estimated at ten to twelve years, and as several are lost in learning a trade, most of which in England require seven years of apprenticeship, a laborer would never be willing to have a trade taught to his son if the mechanics did not earn more than the laborers.

For Cantillon, an individual’s wage rate depends on supply and demand, but in general employers will have to pay high-skilled employees more than low-skilled employees: “their labor will necessarily be expensive in proportion to the time lost in learning the

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<sup>4</sup> See Braudel (1981, p. 315).

trade and the cost and risk incurred in becoming proficient.” Furthermore, the “crafts which require the most time in training or the most ingenuity and industry must naturally be the best paid.”<sup>5</sup> Cantillon established a framework where the decision maker must choose between farm production today and higher wages in the future, with the foregone time learning the trade as the key element.

In his chapter on intrinsic value, Cantillon noted that land and labor have different production possibilities and comparative advantages and that the proportion of land to labor in production is variable.<sup>6</sup> Then after defining intrinsic value and distinguishing it from market price, he (37/29/16) proceeded with the following example of alternative uses of the resources in building a garden; an example similar to the one Stigler would later point to in John Stuart Mill as an early formulation of the opportunity cost concept:

If a gentleman cuts canals and erects terraces in his garden, their intrinsic value will be proportionable to the land and labor; but the price in reality will not always follow this proportion. If he offers to sell the garden possibly no one will give him half the expense he has incurred. It is also possible that if several persons desire it he may be given double the intrinsic value, that is twice the value of the land and the expense he has incurred.

In this example, the intrinsic value is stipulated as possibly twice its market price, but if the garden is built it will be because he values the garden more than what could have been produced on the land, plus the expenses of building the garden. Cantillon described intrinsic value here in terms of the direct expenses and opportunities foregone, stating that the garden’s intrinsic value is “the value of the land and the expense he has incurred.” He included both the direct expenses of building the gardens as well as the opportunity cost of the land in farming—a masterful example of opportunity cost with

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<sup>5</sup> The word “expensive” is substituted for Higgs’s use of “dear” in translating *cher* (24/19/12) and the word “naturally” is substituted for Higgs use of “necessarily” in translating the word “naturellement” (26/21/13).

clear subjective elements that conforms to contemporary practice. It is even reminiscent of modern textbook examples that examine the opportunity cost of capital invested in a small business and the entrepreneur who accepts a lower income in order to become her own boss and the potential to reap large profits if the demand for her services is high. When you add the context of his discussion (62-3/49/23-4) of the entrepreneur-farmer who adjusts production levels across many possible agricultural and non-agricultural outputs, based on judgment, but without being able to exactly foresee market prices, you get more than the “flavor” of opportunity cost. You get the unmistakable context for identifying opportunity cost.

The third major example of Cantillon’s use of opportunity cost comes in the crucial chapters on the interest rate and usury. This is an especially important example because it may very well have been the issue that motivated Cantillon to write the *Essai*. As a key player in the Mississippi Bubble and a banker to several important investors in Mississippi Company shares, Cantillon was embroiled in numerous lawsuits and criminal charges for many years after the Bubble burst. Primary among the many charges against him was the violation of usury laws. Murphy (1986) has shown that crucial legal battles coincided with the writing of the *Essai* and that the legal arguments submitted by Cantillon’s lawyers closely paralleled sections of the *Essai*.

Cantillon wrote that the interest rate is the result of supply and demand, but that the rate of interest on a loan must be adjusted by the risk factor. He showed that interest rates will be affected by the size of the loan, the existence and type of collateral, and the type of business, credit history, overall credibility, and time preference of the borrower. He then went on to demonstrate that interest is related to the opportunity cost of capital.

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<sup>6</sup> For another example of his recognition of different production possibilities see (265-6/201/82).

Using logic and examples he showed that on the one hand, if an entrepreneur or farmer borrows capital for business operations his revenue must pay for his own upkeep and pay back the loan with interest. On the other hand, if that same entrepreneur or farmer had his own capital to employ, then his operations would pay for his upkeep, replenish the capital, and provide a considerable “profit or interest.” In short, for Cantillon (266-7/201/82-3) interest was a payment based on the opportunity cost of capital.

If the farmer has enough capital to carry on his enterprise...he will take for himself after paying all expenses a third of the produce of his farm. But if a competent laborer who lives from day to day on his wages and has no capital, can find someone willing to lend him land or money to buy some, he will be able to give the lender all the third rent...If by great economy and pinching himself somewhat of his necessities he can gradually accumulate some little capital, he will have every year less to borrow, and will at last arrive at keeping the whole of his third rent.

To defend the charging of high interest rates, he also showed that entrepreneurial borrowing at interest is essentially the same thing as buying capital on credit where the interest charges are reflected in the higher prices of capital goods purchased on credit. One of his examples was the case of a brewer who sold kegs of beer to alehouses on credit but charged a price high enough to cover an interest charge and the risk of default. “It is customary for the London brewers to lend a few barrels of beer to the keepers of alehouses, and when these pay for the first barrels to continue to lend them more.” He found this form of implicit loans to be pervasive between wholesalers and retailers. “All the merchants in a state are in the habit of lending merchandise or produce for a time to retailers, and proportion the rate of their profit or interest to that of their risk.” Cantillon (275-6/207-9/85) even found similar cases where financial intermediaries (expert

scriveners) financed the transactions between fishermen and retail sellers where loans were explicit and interest rates were extremely high on a per-annum basis.

The fishwives, who buy fish at Billingsgate in London to sell again in the other quarters of the city, generally pay under a contract made by an expert scrivener, one shilling per guinea, or twenty-one shillings, interest per week, which amounts to 260 percent per annum. The market-women at Paris, whose business is smaller, pay 5 sols for the week's interest on an ecu of 3 livres, which exceeds 430 percent per annum. And yet there are few lenders who make a fortune from such high interest.

Despite the very high implicit interest rate, Cantillon found that few lenders of this sort made large fortunes. In this manner he demonstrated that it was inconsistent and illogical to criminalize the charging of high rates of interest on money loans when it was perfectly legitimate and acceptable to sell capital goods on credit with exorbitant implicit or explicit interest rates. Indeed, Cantillon (276-7/209/85) found that this form of usury was useful, necessary, and benefited consumers.

These high rates of interest are not only permitted but are in a way useful and necessary in a state. Those who buy fish in the streets pay these high interest charges in the increased price. It suits them and they do not feel it. In like manner an artisan, who drinks a pot of beer and pays for it a price which enables the brewer to get his 500 percent profit, is satisfied with this convenience and does not feel the loss in so small a detail.

After constructing his positive case against usury laws based on the opportunity cost of capital, Cantillon mentioned the Casuists who were scholastic theologians who wrote on the topic of usury. Kaye (1998) showed that starting from a position of the "just price" where any interest was illegitimate and unjust, the scholastics gradually moved towards accepting the concept of interest, the charging of high rates of interest, and eventually to the position that any rate determined in the market and agreed to by both parties was a just price for a loan. Cantillon mentioned two concepts the Casuists

developed, *lucrum cessans* and *damnum emergens*, which supported the payment of interest against charges of usury. *Lucrum cessans* provided an exception whereby a lender could legitimately receive interest from a borrower equal to the same return he could have made from an alternative use of his money had he not lent it to the borrower. Similarly *damnum emergens* provided an exception whereby a lender could be compensated for any damages suffered because of the absence of money lent. Both concepts justified the charging of interest and recognized the existence of the opportunity cost of money.

It should be remembered that the scholastics were theologians and philosophers who dealt with the topic of usury in terms of morality and ethics. Likewise, mercantilists such as Malynes (1622)—who generally supported usury laws—introduced a *notion* of opportunity cost in order to make an argument for charging interest based on fairness. He felt that it was acceptable to charge high interest to wealthy merchants who could afford it, but not to the poor. In contrast, Cantillon used opportunity cost on the analytical level, in both the theoretical and applied sense. Therefore, despite the moral support that they provided him, Cantillon (277-80/209-11/85-86) made the difference between his analysis and their views by deriding the Casuists as “hardly suitable people to judge the nature of interest and of matters of trade” and that they were “wiseacres who were hardly acquainted with trade and always without effect.” It should also be noted that the scholastics’ and mercantilists’ recognition of opportunity cost is generally limited to the case of usury, whereas Cantillon used it analytically in at least three key areas (labor & wages, land and capital improvements, and money and interest).

These three illustrations of opportunity cost should not be seen as isolated haphazard occurrences, but as integral to his explanation of the nature of the economy which occurred in key sections of the *Essai* where he developed his theoretical structure. They also set the stage for his conception of intrinsic value—a cornerstone of his theoretical structure—which represents the core discovery of opportunity cost.

### **From Intrinsic Value to Opportunity Cost**

The standard interpretation of Cantillon is that he held to a land and labor theory of value. He is famous for deriving a par value between land and labor because his calculations were cited in Adam Smith's chapter on wages and plausibly provided some encouragement for Smith's labor theory of value. Cantillon's attempt to establish an exact relationship between land and labor also allows the cost of any good to be reduced to a quantity of land, and was plausibly a stimulant for the Physiocrats and their view that land and agriculture was the source of all wealth. The standard interpretation views Cantillon's concept of intrinsic value as a cost of production theory of value based on the quantity of land and labor. The claim made here is that the standard interpretation represents a fundamental misreading of Cantillon.

### **Problems with the Standard Interpretation**

Brewer (1992, pp. 61-70) claimed that Cantillon's intrinsic value was a long-run equilibrium or natural price that never changed and was based on the amount of land and labor used in production. Labor can be reduced to the land necessary to sustain and reproduce it, so he claimed that Cantillon produced a land theory of value.<sup>7</sup> He summarized this theory of value with the following quote from Cantillon:

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<sup>7</sup> Also see Brewer (1988).

In Part 1 an attempt was made to prove that the real value of everything used by man is proportionable to the quantity of land used for its production and for the upkeep of those who have fashioned it. (*Essai*, 115)

Brewer (1992, pp. 66-69) lamented that “the exact procedure is hard to disentangle from Cantillon’s verbal argument” and that the solution would be forthcoming if Cantillon had provided a “formal mathematical model” or if the statistical supplement had not been lost. Brewer produced an example where he could not calculate the intrinsic value of a barrel of wine solely in terms of land and blamed Cantillon for failing to distinguish between “net and gross output in the wage-good sector, and thus...his presentation of the land theory of value is faulty.”

Aspromourgos (1989, 1996) agreed with the basic tenets of the standard interpretation of Cantillon and concluded that his concept of intrinsic value faces the circularity charge in that costs cannot be known independently of prices. He also noted that profit is absent in the discussion of prices and that rent is given only a cursory treatment.<sup>8</sup> Like Brewer and others before him, Aspromourgos saw many puzzles and problems of presentation in the *Essai*, but perceptively mentioned some curious aspects about the land theory of value attributed to Cantillon, namely that the quantity of land and labor are only *measures* of intrinsic value, that money is the best measure of the par between land and labor, and that Cantillon’s pursuit of a par relation between land and labor was theoretically motivated, whereas Petty’s was empirically motivated.

Aspromourgos (p. 101) recognized that Cantillon was exploring the par between land and labor to investigate “more deeply the significance of his theory of production and value.” Despite all the flaws, puzzles, and shortcomings he found in the *Essai*, Aspromourgos (p.

84) found that the end product of Cantillon's analytical structure was an important insight in the history of economic thought:

Particularly remarkable is Cantillon's recognition that a distribution of the product, and a particular associated allocation of land, labour and commodities, may be conceived of as being brought about by decentralized market exchange at a definite set of prices.

Others have looked at the same material and have suggested that it is the standard interpretation, not Cantillon that is in error. For example, Grieve (1993, p. 46) noted Cantillon's emphasis on the heterogeneity of resources, and like Asproumorgos, claimed that land and labor resources were only measures of intrinsic value. In comparing the land theory of value to the general content of the *Essai*, he found that:

In the opinion of the present reviewer that interpretation (Brewer's) is open to question; it also, unfortunately, leaves the impression that Cantillon's theory is something rather peculiar—a unique excursion in an odd direction which can hardly be of more than antiquarian interest. The reader is given no inkling of the possibility that Cantillon offers an approach to the theory of value and distribution which not only escapes the problem of the labour theory but is also at the same time free of the circularity of the Marginalist treatment.

He suggested the following resolution: Cantillon's concept of intrinsic value is not based on physical inputs, nor should the land theory of value be ascribed to him. Hülsmann (2001) has also defended Cantillon, noting that intrinsic value was not conceptually detached from the market, but is a price not realized on the market. Cantillon did not pretend that market prices are determined by costs and thus he avoided the error of viewing value solely in terms of land and labor. He also observed that land and labor are merely a *measure* of intrinsic value and that Cantillon was driving toward entrepreneurial calculation in terms of money prices. Hülsmann attempted to close

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<sup>8</sup> Pendergast (1991) has argued (within a different framework) that Cantillon did have a theory of profit in

Rothbard's (1995) "big gap" in Cantillon and drew upon Cantillon's discussion of the gold mine to conclude that costs were ultimately grounded in survival, and that survival demands that the costs of production not exceed the value of the product. In subjecting the standard interpretation to serious and in-depth analysis Brewer, Aspromourgos, Brems, and others have set forth a series of puzzles, errors, and possible outright blunders in Cantillon. Looking at the same material, Grieve, Hülsmann, and others have been more sympathetic with Cantillon and have concluded that the standard interpretation must be wrong, but without providing a convincing alternative interpretation.

In addition to Brewer's own conclusions, other serious doubts must be raised against the standard interpretation. If we examine Brewer's quotation of Cantillon above, where he depicted Cantillon's view of cost, we find that Cantillon only claimed to have made "an attempt" to prove that intrinsic value was based on the land and labor involved in production. Actually, Cantillon analyzed many shortcomings and qualifications regarding this approach, all of which point in the direction of opportunity cost. In fact if we follow the passage quoted by Brewer we find a summary of many of the most important shortcomings analyzed in Part 1 of the *Essai*. Here Cantillon (152/115/49, emphasis added) clarified his position that intrinsic values could not be fixed along the lines suggested by the standard interpretation.

In this second part, after summing up the different degrees of fertility of the land in several countries and the different kinds of produce it can bring forth with greater abundance according to its *intrinsic quality*, and assuming the establishment of towns and their markets to facilitate the sale of these products, it will be shown by comparing exchanges which may be made, wine for cloth, corn for shoes, hats, etc. and by the difficulty which the transport of these different products or merchandises would involve, that *it was impossible to fix their respective intrinsic values*.

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which capital employed earned a proportional return.

## The Matter of Quality

For Cantillon's discovery of opportunity cost to make sense, it must be the case that Cantillon would have stipulated that it is not just the quantity of land and labor, but that the better the land and labor that goes into the production of a good, the greater the intrinsic value, and that this must, in turn, be related to prices. In the quotation above, he specifically refers to the different quality and fertility of land "and the different kinds of produce it can bring forth with greater abundance." He discussed differential productivity in several places in the *Essai* and did so at length when describing how population levels depended on the tastes of property owners. Where, for example, he (92/71/32) wrote: "land is often different in quality and fertility." His zeal to explore the differences in land is also illustrated in his role as an expert wine dealer where he allegedly would have his carriage stopped in order that he could actually taste the soil as he traveled across the various regions of Europe. In the *Essai* he also gave stunning examples (at least to his early readers) from China, the American Indians, Flanders, Naples, other parts of Europe, as well as historical reports from Sicily, Babylon, Africa and Rome regarding the land productivity in order to calculate the number of persons an area could sustain. Cantillon (36/29/16, emphasis added) also explicitly recognized that when gauging intrinsic value, that both the quantity and the quality of resources should be taken into account:

By these examples and inductions it will, I think, be understood that the price or intrinsic value of a thing is the measure of the quantity of land and of labour entering into its production, *having regard to the fertility or produce of the land and to the quality of the labour.*

It could be argued that Cantillon did not connect the fertility or productivity of the land to the price of land and thus missed a critical connection, but this again is not the case because while Cantillon did discuss the general price of land relative to the supply of money and interest rates, he also quite clearly recognized, in several places, that land rents are related to the productivity of the land. In his chapter on population Cantillon (98/75/34) reported that “farmers pay yearly a rent equal to about one third of the produce of [the proprietor’s] land” and elsewhere he noted (159-60/121/51) that land rent was usually one third of the produce of the land, although there were exceptions to this rule. When rent is based on a percentage of production, the greater the productivity of the land the greater the rents to landlords. Therefore, in addition to explaining the nature of rent as a payment for that which the owner could have produced, in Part 1 of the *Essai* a productivity-value connection of land rents is established in real terms. In Part 2 Cantillon described the influence of monetary factors on the general price of land in monetary terms, but most importantly, he provided the mechanism whereby he showed that an increase in the quantity of money drove up land prices because it increased consumption and therefore the prices of goods produced on the land.

Cantillon was also quite clear and explicit that intrinsic value depended on both the quantity and the quality of labor and that the rewards to labor were based on the quality of skills and the opportunity cost of labor. These issues are presented in the three short chapters before the chapter on intrinsic value. In Chapter 7 Cantillon gave his opportunity cost explanation for a father’s decision to apprentice his son. In Chapter 8 he briefly discussed why some “men earn more, others less.” In his explanation of the difference in income between the two tailors in a village he suggested that one might

have the higher income “whether from his mode of attracting business, or because he works better or more durably than the other, or follows the fashions better in the cut of the garments.” As a follow-up Cantillon posited that if one of the tailors were to die, the other would raise prices until “the villagers find it to their advantage to have their cloths made in another village, town, or city *losing the time spent in going and returning*”—an open recognition of the opportunity cost of time. This is then followed by his conclusion that it is not just the training time of an apprenticeship that sets higher wages, but also that those with the “most ingenuity and industry must necessarily be the best paid. A skillful cabinet maker must receive a higher price for his work than an ordinary carpenter.” It is important to note that Cantillon dropped heterogeneity for homogeneity of resources when, for example, he referred to land of average quality, in order to address the issue of measurement.

### **Opportunity Cost at the Core**

We can also see that opportunity cost is a pivotal component of Cantillon’s theoretical apparatus. After dispensing with his discussion of the par value between land and labor, he spent Chapters 12 and 13 of Part 1 demonstrating that property owners are independent and that everyone else is dependent on the property owners, concluding: “land owners alone are naturally independent in a State; that all other classes are dependent whether entrepreneurs or hired.” In Chapter 14 he presented a model of an isolated estate (“which I wish to consider here as if there were no other in the world”) that is an evenly rotating economy where production, income, distribution, and consumption are in equilibrium:

I do not consider here the variations in market prices which may arise from the good or bad harvest of the year, or the extraordinary consumption

which may occur from foreign troops or other accidents, so as not to complicate my subject, considering a state in its natural and uniform condition. (87/65/30)

Once the equilibrium conditions are established, Cantillon then has the owner of the estate experience a change in taste where he decides to spend his rental income on more horses and fewer servants. This results in higher hay prices and lower corn prices, which in turn will cause more land to be planted in grass and less in corn, (the role of profits and losses is treated elsewhere) with the end result being a decrease in population and more horses. His production and resource allocation model of a single landlord on an isolated estate *forces* an opportunity cost to be recognized for any economy-wide change in taste—more horses necessarily reduces the number of servants for the landlord. This explicit recognition of opportunity cost plays the pivotal role in Cantillon’s model of the economy.<sup>9</sup>

### **Problems of Changing Terminology**

Cantillon’s own term, “intrinsic value” is much to blame for the misunderstandings that enshroud his economics. However, the most generally accepted meaning of a word can change over time and the period between the writing of the *Essai* around 1730 and its publication in 1755 was clearly a period of revolution in the areas of economics, philosophy, and science. With this in mind, it is not surprising that the meaning of the word *intrinsic* has changed over time. The term now evokes notions of the fineness of gold, the caloric value of food, and the destructive capacity of the unleashed atom.

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<sup>9</sup> Opportunity cost also provides a basis of Cantillon’s population theory and occurs at the crucial juncture in the *Essai* between the real economy of Part 1 and the monetary economy of Part 2. Here Cantillon builds a scientific connection between the spending behavior of the Monarch and large land owners, and the deterioration of living conditions and population levels of ordinary people who he described as

However, as shown in the previous section, Cantillon used the term to describe the resources that had been sacrificed by placing them into the production of a particular chosen good. In other words, he used the term *intrinsic* not to refer to the objective properties of a good, like the malleability of gold, but to the alternative value of resources placed into the production of goods.

It is also important to remember that Cantillon was naming and describing a concept for which a term did not already exist. In French, the word *intrinsic* was originally a term of philosophy that meant something inside or interior, often referring to a thing's qualities or subjective properties, such as beauty and kindness.<sup>10</sup> Only later was it understood to mean something essential and proper to a thing, and the connection of weights of money with intrinsic value was added.<sup>11</sup> The more modern definition of *intrinsic* is that it *belonged to the thing in itself, or by its very nature*.<sup>12</sup> This meaning derives its popularity from its applications in the physical sciences, which developed largely after Cantillon's death, and this was the meaning with which Adam Smith ([1776] 1976, pp. 480-488) used the word—to refer to the properties of the good, usually money.

In English, the first two meanings of intrinsic value imply action and value that is individual and difficult to express, and these two meanings are almost the opposite of the third meaning which is used in the physical sciences to refer to physical properties and objective measurement.<sup>13</sup> Therefore, when Cantillon used the term *intrinsic value* (circa 1730) in all likelihood he meant that it was *value that has been relinquished in order to*

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“dependent.” In the next chapter he showed that reducing this dependent class was against the interest of the nation.

<sup>10</sup> Dictionnaire de L' Académie française, 1<sup>st</sup> Edition (1694, p. 605).

<sup>11</sup> Dictionnaire de L' Académie française, 4<sup>th</sup> Edition (1762, p. 948).

<sup>12</sup> Oxford English Dictionary, 2<sup>nd</sup> Ed., Vol. VIII (1989, p. 22).

<sup>13</sup> *Oxford English Dictionary Online*, Oxford University Press, 2003.

*produce a good or the value that is entered into production and that this value or price is of a private or secret nature and does not refer to the objective properties of the good itself.*

John Locke had used the term *intrinsic value* in its third meaning to refer to the purity of gold and silver money, an objective property of the object. Here, Cantillon (140/107/46) clearly recognized the difficulties with using the term *intrinsic value* and explicitly recognized the potential for confusion: “In this Essay I have always used the term intrinsic value to signify the amount of land and labour which enter into production, not having found any term more suitable to express my meaning. I mention this only to avoid misunderstanding.” In addition to explicitly warning readers about his meaning of *intrinsic value*, Cantillon tried to bring further clarification to his discovery by twice distancing himself from previous writers such as Locke and Petty. Therefore, it only makes sense that Cantillon was using the term according to its first two meanings, which is to be situated or placed within or internal to a thing, and in the sense of being secret, private, or difficult to convey.

Several commentators have recognized that intrinsic value was only designated as a *measure* of value or cost and there is no doubt that Cantillon was interested in objective measurement of cost as we find him dropping the heterogeneity of resources in order to seemingly measure cost. On the other hand, while modern economists are quick to think of measurement in terms of numbers and data, Cantillon use of the word “measure” could indicate that intrinsic value may not be measurable in the objective sense, with the possible exception being homogeneous land.

In his time the word measure often meant an *evaluation* rather than a counting exercise, such as to take the measure of a man, a woman's feelings, or the quality of artwork. With economic evaluations, we drop the "e" and perform *valuations* so that the intrinsic value of a thing becomes an evaluation of the land and labor that are entered into its production and such evaluations are likely of the opportunity cost sort. For example, Cantillon established that all land and labor are heterogeneous and could be put to many different uses. It was not possible to simply count the number of hours and acres except in an abstract way or in simple illustrations.<sup>14</sup> He also calculated (44/35/18) that the value of slave labor corresponded to twice the land needed to maintain him but that this "does not admit of exact calculation, and exactitude is not very necessary; it suffices to be near enough to the truth." Despite a keen interest in economic observation and data, Cantillon was consistent throughout the *Essai* that exact calculations and mathematical rules and formulas are not necessary to understand commerce or economics.<sup>15</sup> He overcame this hurdle by assuming homogeneous resources in order to proceed with objective measurement.

### **Cantillon and the Modern Concept**

Obviously Cantillon did not use the term *opportunity cost*.<sup>16</sup> His own term, intrinsic value, is misleading to modern readers and his construction could be considered

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<sup>14</sup> In fact, he noted at the very beginning of Part 2 of the *Essai* (152/115/49) that for specific goods in the real economy it is "impossible to fix their respective intrinsic value" because the valuation process was practically unique to each individual resource allocation decision.

<sup>15</sup> Although it would seem to me that a great deal of misunderstanding could have been avoided had the Supplement not been lost. It was Hayek ([1931] 1991, p. 263) who observed: "What is most significant about Cantillon's achievement in the field of value and price theory is his down-playing the quest for rules and formulae that might account for the 'normal' relationship between the value or price of various goods and concentrating instead on the forces and mechanisms that are consistently at work in restoring these normal relationships."

disjointed and therefore incomplete. His efforts to objectively measure cost and value also cloud the issue. However, a careful reading of Cantillon reveals that he painstakingly crafted the concept in all its essential elements and then employed it in his economic analysis. James Buchanan (1987) has provided a detailed description of the economic view of cost and Cantillon's *Essai* is consistent with all the basic tenets.

Buchanan's first tenet is that opportunity cost implies a decision maker. Cantillon's identification of the relevant economic decision maker has often been acclaimed as one of his primary accomplishments. No economist has placed greater importance on the role of the decision maker or greater emphasis on identifying the most important decision makers in society. The most important decision makers for Cantillon were the Prince and the property owner, who played a dominant role in the early 18<sup>th</sup> century economy. He who owned the land had the income necessary to make the bulk of consumption decisions and determine how resources will be used, whether they managed the land or rented it out. Writing on Cantillon in the original *Palgrave's*, Henry Higgs ([1894], 1926, pp. 214-217) concluded: "To consumption and demand he assigned an importance not generally recognized until much later." Schumpeter concluded that "Cantillon had a clear conception of the function of the entrepreneur" and that "nobody before Cantillon had formulated it so fully." Indeed Cantillon's entrepreneur lived on into the classical period through the works of Turgot and Say.<sup>17</sup> He also considered the decisions of ordinary citizens, farmers, craftsmen, merchants and entrepreneurs in terms of intrinsic value.

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<sup>16</sup> While Wieser is credited with coining the term opportunity cost (and marginal utility) his contribution to the concept over that of Carl Menger appears slight according to Streissler (1987). Actually, the English term, opportunity cost, was probably first coined by Green (1894) and popularized by Frank Knight.

<sup>17</sup> Schumpeter (1954, pp. 222 & 625) and Salerno (1985).

The second tenet of opportunity cost is that cost is an alternative in the decision maker's mind. In the *Essai* we find several situations in which Cantillon placed the reader inside the mind of the decision maker, such as when he enunciated the important considerations a father takes into account in placing one of his sons into apprenticeship. He also examined the landlord who would have to forego a number of servants in order to have more horses because land will be transferred from crop production that would have supported the servants into pasture to feed the horses. Cantillon also portrayed the choices of the farmer, such as what crop to grow, or whether to use free or slave labor, in terms of opportunity cost. By integrating transportation costs and population theory into his analysis, Cantillon was able to describe the opportunity cost of imported goods in terms of local production and population. If France wished to import fine lace then it would have to forgo a very large amount of wine produced and some population. By fully complying with Buchanan's first two tenets Cantillon demonstrated that his conception was private and individual.

The third tenet of opportunity cost is that cost is set at the moment of choice and cannot be realized thereafter. Cantillon formulated cost with choice. When production decisions are made the intrinsic value is set and the landlord-farmer-entrepreneur expects to benefit. Of course there are variations in the market price of crops, green peas, and other goods, which might result in losses or large profits. He even warns that a retailer might have to sell his products below the price he paid or face ruination and bankruptcy. Cantillon's (38/31/16) discussion of actual and hypothetical choices made clear that cost is incurred simultaneously with choice, and this solves the longstanding puzzle of how Cantillon could write that it is impossible to fix intrinsic values and that "there is never a

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variation in intrinsic values.” Once a choice has been made and resources are allocated, the opportunity cost related to that choice is fixed and does not change. It has been suggested that Cantillon made this claim because he had no concept of economic change, but this conclusion is difficult to accept about someone who was writing about the rise and fall of nations, the different states of economic development around the globe, and new technological goods such as the balance spring watch. The more obvious and consistent solution is that Cantillon thought it was impossible to fix intrinsic values in the sense of opportunity cost across nations, people, and time, but that once the individual’s choice had been made, no variation in opportunity cost occurred.

The fourth tenet of opportunity cost is that cost is subjective and not objectively measured. This issue is the source of much debate associated with Cantillon’s economics. He has long been considered an objective cost theorist, but it is also acknowledged that he clearly thought in subjectivist terms, especially when defining wealth in the opening paragraph of the *Essai* as “nothing but the maintenance, conveniences, and superfluities of life.” More directly, Cantillon wrote that consumption depends on the “humor and fashion of living of the Prince, the Lords, and the owner: if these are fond of drink, vines must be cultivated; if they are fond of silks, mulberry-trees must be planted and silkworms raised...if they delight in horses, pasture is needed, and so on.” Cantillon (7-8/7/7) demonstrated that choice is subjective, is made between alternative enjoyments, and that opportunity cost is a component of every choice. Indeed, Cantillon (60/47/23) wrote that everything in the State depends principally on the tastes and preference of property owners and described this as a main focus of the *Essai*. If the owner wants more horses, he must do without something, such as some of his house servants who would

supposedly die or be banished from the isolated estate. Cantillon's model wed the value of consumption to production decision and thereby provides subjective character to the production decision. His example of a gentleman who builds a garden at an opportunity cost possibly double the market value also smacks of the subjective valuation of resources. Cantillon (37/29/16) described intrinsic value here in terms of the opportunities foregone, stating that the garden's intrinsic value is "the value of the land and the expense he has incurred." Here Cantillon was not referring to a "real" cost approach, because he included both the direct expenses of building the gardens as well as the opportunity cost of the land. When it came to applying his theory to the real world and when he was faced with measuring cost, he resorted to objective measurement.

Finally, opportunity cost is choice influencing, not choice influenced. In contrast, the accountant works with *ex post* choice-influenced costs when the monthly bills are paid and balances are calculated. Cantillon's concept of intrinsic value is both forward looking and choice influencing because he was always examining what the individual must forego to pursue a course of action, and he examined the choices of the Prince in the same fashion. He conceived of choice in entrepreneurial terms where resources are entered into production for the pursuit of future production and profits. He examined the alternatives of decision makers and discussed possible changes in market conditions. Most importantly, Cantillon (56/43/22) used the words such as *couste* and *dépenses* when he referred to accounting costs and expenses which are determined by past choices in the sense of paying one's bills or expenses.

When intrinsic value is understood to mean opportunity cost, the mystery of Cantillon's supposed omission of profit disappears. Entrepreneurs calculate intrinsic

value and market price and engage in those activities where intrinsic value is less than or equal to expected market price. In stable markets, intrinsic value will likely be close to market price, and when prices fluctuate widely, large profits and losses are possible. The entrepreneur will also engage in projects such as a garden, when the intrinsic value exceeds the market value, if the entrepreneur values the garden higher than the intrinsic value of building the garden. Profits are not missing; rather Cantillon built them into his system as the driving force of all action and choice. Indeed, as a man who lived by his wits in volatile credit and securities markets, Cantillon was perhaps more attuned to profits and their role in economic activity than his contemporaries and even modern economists.

### **Summary and Conclusions**

It is generally accepted that Cantillon made many path-breaking discoveries of economic theory and method. Some have described him as having a rich understanding of cost and the principles of how an economy operates. Others have shown that he had a land theory of value that involves many puzzles, errors, and inconsistencies. This paper establishes the first sustained claim that Richard Cantillon was a pioneer in the discovery of the concept of opportunity cost.

Several major and minor examples of opportunity cost have been presented. The major examples include the decision to apprentice a son that conforms with the textbook illustration of the opportunity cost of going to college. A second important example involved the opportunity cost of capital. This was particularly important because it involved the probable motivation for writing the *Essai* and was a basis of his critique of the Mercantilists' view of interest. Two examples of production decisions are given. One

involving a gentleman who is contemplating building a garden where both the explicit expenses and the opportunity cost of the land involved are recognized. The other example involved Cantillon's model of the isolated estate where the owner foregoes some house servants in order to have more horses. Several minor examples of opportunity cost are noted, particularly those involving the opportunity cost of time and transport.

Rather than fluke occurrences, it has been argued that Cantillon used opportunity cost systematically and that his term intrinsic value should be read as opportunity cost, or a "measure" of opportunity cost. To demonstrate the connection between the two terms it has been shown that Cantillon considered not just the quantity of land and labor, but also the quality of resources into the determination of intrinsic value and that quality is linked with prices of both inputs and outputs. Most importantly, it has been shown that the words such as intrinsic had very different meanings when Cantillon wrote the *Essai* than it did for Adam Smith and modern readers. Rather than referring to the nature of a thing, the older meaning of the word *intrinsic* is completely compatible with our understanding of opportunity cost. It would seem that often-learned and often-forgotten warning about reading the ancients writers "in their own time" is as valuable as it is difficult to hold onto. Finally, it has been shown that Cantillon's usage measures up with the modern tenets of opportunity cost as described by Buchanan.

The recognition of his discovery of opportunity cost obviously increases our esteem for Cantillon and suggests that even more advances can be gleaned from his *Essai* than are currently recognized. Some readers may retain some doubts about the veracity of the claim that Cantillon discovered the concept of opportunity cost, or the quality of his construction. There certainly are some gray areas regarding how thoroughly and perfectly

he developed the concept and integrated it into his analysis and there is genuine uncertainty regarding the role of objective measurement of cost and value. However, what is beyond doubt is that Cantillon understood the concept of opportunity cost and made it the centerpiece of his economic models and analysis. Thus the standard interpretation of Cantillon regarding cost must be changed to recognize his discovery of opportunity cost.

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