

**THEORY**  
**of**  
**ECONOMIC CALCULATION**

$$w = mq^2$$

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# THEORY of ECONOMIC CALCULATION

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## INTRODUCTION

*If you want to destroy capitalism,  
destroy the economic calculation,  
you will achieve it by destroying its currency.*

Accord the evolution of my economic investigations, shown in all the works published in [www.carlosbondone.com](http://www.carlosbondone.com), I believe that the time has come to summarize, update and improve the theory of economic calculation, especially since it has been the central theme of my doctoral thesis.

In this work, it will be appreciated that calculation was present from the very beginning of economic analysis, which could not be otherwise, since it refers to the essence of the elements that make up all science — without calculation that corroborates theories its scientific rigor It is not the same.

Starting from the general framework of calculation in scientific knowledge, we will develop the characteristics that economic calculation has, and the serious consequences that the error in its foundations had on all economic theory, with a strong impact on current economic institutions.

Thus, the objective of this work is to demonstrate that:

- The economy meets all the requirements of scientific calculation.
- That the theory of economic calculation has been inconsistent, precisely because it has not adequately complied with the requirements of scientific calculation. Task that would be completed at the beginning of the 21th century by means of the *Subjective and Solidarity Economic Theory* (SSET - 4th Edition), as we will see here.
- That the theory of economic calculation should explain both barter and monetary calculation. This implies that a good economic theory does not need a “special ad hoc theory of currency” to explain the calculation with money prices, since it would be different from the calculation in units of economic goods.  
Having demonstrated that there is a single theory of economic calculation, the inconsistency of all the economic theories of currency that have been concerned with presenting a special theory for it <sup>1</sup> in order to explain the differences between calculation of currency and barter (currency and real world).
- The economic calculation allows to establishing the interdependence between currency and capital in *the capitalist currency economic evolution*, known as the “industrial revolution”.

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<sup>1</sup> Incomprehensible attempt that could only lead to inconsistent reasoning such as that: currency is alternatively wealth or it is not (which would require a theory of currency outside the law of wealth); that the economic unit of measurement is neutral or not; that there is a theory of interest outside the law of wealth; that the distribution of wealth is explained by the equality between the marginal utilities of each wealth over its monetary price ( $U_a / P_a$ ; ...;  $U_n / P_n$ ), which implies ignoring that prices are originated by the validity of the law of wealth and exchange; the IS / LM curves; that the State must intervene to balance the currency world and the real “non-currency” world; etc.

This interdependence confirms that the *currency is a capital good*, while the SSET understands as such any tool that multiplies the result of work.

- I have incorporated what I called the *equation of economic relativity* ( $w = mq^2$ ), which acts as a synthesis of the derivations of the *general equation of wealth*. An equation that allows us to express the evolution of wealth with an equation similar to that of physics:  $e = mc^2$ , which is far from being a coincidence and confirms the universal character of the epistemology arising from the deductive logical nature of human rationality.

Thus, this work consists of a first part destined to define the requirements of a calculation with scientific rigor, and then to apply them to the economy, where the pre-existing failure will be appreciated, and the solution presented by the SSET.

Finally, I would like to thank Manuel Polavieja and Victor Rioseco Ventura for their collaboration, who, by exchanging opinions derived from reading my writings, have contributed to enriching the didactic aspect of the work, without it implying compromise to them in its content.

### **Very special dedication**

Go this work in memory of Carl Menger, on the occasion of the 150th anniversary of his monumental work *Principles of political economy* (1871). Book to which I had to arrive, in my retrospective research work, to find firm economic theory from which to elaborate my own.

**Note:** the critical paragraphs on current economic theory have the didactic purpose of reference to what is already known, with which we are familiar.

## I - SCIENTIFIC CALCULATION

We begin by defining the concept of *calculus*: *Computation of something with mathematical operations.*

It is appreciated that the calculation is carried out through **mathematics**,<sup>2, 3</sup> which is the case since it is a science that is composed of **abstract entities**, then:

- It allows it to be applied to *non-abstract elements* that belong to the different disciplines of knowledge, without affecting their calculations — its abstract nature means that “the use of mathematics is not contaminating to the calculation”.<sup>4</sup>
- *It is a necessary condition to define precisely* each **non-abstract element**<sup>5</sup> of the discipline of knowledge in which it is desired to calculate.
- *It is necessary to define precisely* the **dimension**<sup>6</sup> of each element to be calculated (distance, volume, weight, etc.).
- *It is a necessary condition to define precisely* the **unit of measure** of the dimension from which the measurements of the elements that participate in the dimension to be measured (meter, yard, etc.) will be made. This issue has particular relevance in economic calculation, to the point that Menger referred to its complexity as the **squaring of the economic circle**, which would be resolved at the beginning of the 21st century by the SSET.
- *It is a necessary condition to define with scientific rigor the laws of nature that determine the behavior in time of the non-abstract element of science.*

The expressions “*it is a necessary condition to define precisely*” arise from the requirement of rigor in scientific knowledge.

The order that we have given to the entities ***element* → *dimension* → *unit of measure* → *laws***, has not been capricious, but obeys a deductive logical order: each one depends on the existence of the predecessor: without *non-abstract element* there is no *dimension*, without *dimension* there is no *unit of measure*, and without knowledge of *natural laws* the fundamentals of the behavior of non-abstract elements of science are not known — typical case of epistemological positivism whose interpretation of the data has no scientific rigor.

Starting from the logical deductive structure of scientific calculus, we now turn specifically to economic calculus.

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<sup>2</sup> It is a science that adds a lot of scientific rigor by to configure an integrated logical-deductive system of axioms, theorems, corollaries, correlations, rules, etc.

<sup>3</sup> Mathematics can be misused or well used; in science one must judge whether or not it contributes to explaining reality. As the SSET has shown, mathematics is a first-rate tool for judging theories with scientific rigor, whether to corroborate or discard them, as here we will have the opportunity to appreciate.

<sup>4</sup> The ***Popper's Observed Observer***, who demands to isolate contamination from his presence in the laboratory.

<sup>5</sup> If the element were abstract we would continue in the field of mathematics, as we advance in the economic calculation we will see its relevance.

<sup>6</sup> Dimension: each of the magnitudes used to measure a non-abstract element.

## II – THE ECONOMIC CALCULATION

Guided by scientific calculation, we proceed to determine the necessary conditions that govern economic calculation, which by definition must incorporate mathematics.

### Components of the economic calculation

Let us see each of the conditions necessary for the economic calculation:

#### *Definition of the non-abstract element of the economy*

According to the deductive logical order of economic calculus, we must *precisely* define the *non-abstract element of the economy*.

J. S. Mill emphasized with total precision what was the element of the economy, although the failed resolution<sup>7</sup> of it conditioned all the current economic calculation. Let us see two of his quotes where his success and failure are summarized, rescued from Jevons (1998):

“Almost all speculation regarding the economic interests of a society thus constituted involves some **theory of value**: the slightest error on this subject inoculates a corresponding error in all our remaining conclusions, and any vagueness or nebulosity in our conception of it creates confusion and uncertainty in everything else.” (P: 119-120) *Own bold on original text translated.*

It is evident that from the beginning of the quote, Mill refers to value as something pertinent to the economic interests of a society. The fact that it does not refer to the interests of the individuals that make up a society is an advance that it *confuses value with price*. Mill's theoretical scheme does not differ from Keynes, both theorize macroeconomics (society-prices) without noticing that it is a simple aggregate of microeconomics (individual-values), in this way for Mill, Robinson Crusoe does not value. This reflection is essential, because here lies the germ of the error of confusing value with price, without noticing that: value is a subjective individual entity, from which exchange with its neighbor can arise or not, while price is a mere coefficient between quantities of economic goods exchanged. From this fatal error, the entire economic theory of the 20th century was assembled, where prices would arise from supply and demand.<sup>8</sup>

With the necessary exception of the previous paragraph, what follows from the quote is in line with the SSET (4th edition) *definition of economic science*:

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<sup>7</sup> It is validated by Jevons' epistemological “fateful wit”.

<sup>8</sup> A few quotes from Mises (1980) are enough to corroborate it: “The economic calculation includes how much money can be acquired” (P: 329), “Everything that cannot be bought or sold for money is excluded from the economic calculation” (P : 333), and “The objective of economic science is to analyze the prices of goods” (P: 362): It follows that it is not feasible to calculate the wealth that is not exchanged because prices are not generated, and since they considered To the subjective non-measurable value, the economic calculation is confined to the emergence of prices. This footnote is very relevant, since it reveals the inconsistency of the current economic calculation theory, from which the economic institutions that manipulate our lives through prices arise.

## Economy

Science that studies value<sup>9 10</sup>

BUT, J. S. Mill goes on like this, in the words of Jevons (1998):

“Fortunately, there is nothing left to clarify in the laws of value, neither for current writers, nor for those of the future: the theory is complete.” (P: 120).

Quote with which the SSET (4th e.) totally disagrees because: not only that the theory of value was not finished, but, even more importantly, that adopted was inconsistent. The mistake was that the issue of value was terminated by consider that with the prices were enough.

The failure of the “value-price” theory of J.S. Mill is appreciated by noting that: *prices refer to the dimension, and the value to the element*. Then, the issue of *the precision of the value element could not be resolved from the dimension*, all of this as a consequence of not having a precise definition of the components of the scientific calculation and their deductive logical order (*element → dimension*).

We could locate the failure of economic theory in one of these foundations:

- *Abstract subjective value*: this flawed theoretical framework implies considering subjective value as an abstract, non-measurable entity, therefore we could not consider it as a *non-abstract element*.
- *Calculation by means of prices*: this flawed theoretical framework (in tune with Mill's flawed judgment) implies that price is the non-abstract economic element.

We could summarize the current state of economic theory by saying that: although it is accepted that value is subjective, considering it an abstract entity implies that it is not measurable, then, by considering prices, the issue of economic calculation was solved and there was no more to worry about.

This is the position *implicit* in Jevons' “relation of exchange”, from which he derives his “epistemological ingenuity” (in Marx Blaug's terms), and he is content to confine economic calculations to changes in prices. Failed to which he adds conforming to static calculation, because he does not know, or considers it impossible, how to explain the temporal dynamics of the economy. That is, Jevons' “theory” claimed that prices arise from utility (like Menger), but his

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<sup>9</sup> It is considering value as a set of two ordered elements, utility and scarcity.

<sup>10</sup> Our definition of economic science differs completely with the sentence of Mises (1980) that - in harmony with Mill's theoretical framework where *with prices the issue of value is resolved* — he said: “*The objective of economic science consists in analyzing the prices of goods as, in fact, they are demanded and paid in the market*” (P: 362). Sentence with which Mises ignores the origin of prices in utility (Menger), at the same time he forgets the human being that he subjectively values and from this determines whether or not he proceeds to exchange, if he does so, prices just arise. That is, Mises also does not explain the economic life of Robinson Crusoe. As can be seen, Mises also does not leave the **limited** macroeconomic framework of exchanges, from which the Walrasian “equilibrium” arises (a topic that I have dealt with in *SSET 4th edition* in greater depth).



epistemology could not prove it, which is why he settled for the simple use of prices for economic calculation.<sup>11</sup>

Subsequently, based on the “Jevonian ingenuity”, it was enough to state that prices originate from Marshallian supply and demand, and the economic calculation was complete, which implies explaining the entire economy in terms of prices: distribution, currency, interest, unemployment, cycles, etc. — remember Mill's first date.

The important thing is to note that behind the “Jevonian ingenuity”, and its derived supply and demand curves as the origin of prices, there is not the subjective value theory as Mill and Jevons presumed, but the objective value theory.<sup>12</sup>

The SSET has shown *that prices do not adequately measure wealth*, which can only be seen through a *prior and consistent subjective value theory without epistemological errors in its demonstration — as happened with Jevons*. In order to correct the current state of economic theory described, in the SSET we return to the path started by Menger at the end of the 19th century, where **the element of the economy is wealth, defined as the subjective value that the human being assigns to the economic goods**, which is measurable (not abstract), a requirement for the existence of an economic dimension and unit of measure to which mathematics can be applied to give scientific rigor to economic calculation.

In other words, *we are going to show that prices, being abstract entities, do not configure the element of the economy, and that, on the contrary, the non-abstract element of the economy is subjective value, which implies its measurability*. It is a task that entails a considerable challenge of demonstration, since it refutes the current state of economic theory.

#### ***On the dimension of the non-abstract element of the economy***

Having defined the non-abstract element of the economy (wealth), we turn to the second necessary condition for economic calculation with scientific rigor: the aspects referring to the dimension of the non-abstract element *wealth*. For this we resort to the deductive logical causal chain of the theory of value and prices immersed in the SSET (4th e.).

#### *Economic good*

They are *useful* and *scarce* things to the human being. Then, for a thing to be considered an economic good, it must simultaneously meet two conditions: *utility* and *scarcity*.

#### *Value*

The human being assigns (subjective) value to economic goods, according to the level of needs that satisfy them.<sup>13</sup>

#### Wealth

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<sup>11</sup> There is an extensive development of the topic in Annex VIII - Neoclassical Jevons in SSET 4<sup>a</sup> e.).

<sup>12</sup> There is no difference between considering the value of the weighted average work of Ricardo and Marx, as a unit of value, with the quantitative theory of the currency that does it with the average price of the currency, like the so-called “modern” monetary theory — all of this implies quantivism that forgets quality (utility) as a precedent to quantity (price). In other words, we can say that quantivists-monetarists could only reject “modern” monetary theory on technical issues, since its foundation does not differ.

<sup>13</sup> Unlike the failed theory of objective value, where it is assumed that economic goods have value per se, without the presence of the human being.

The SSET defines wealth as: *the subjective value that the human being assigns to a certain amount of economic goods*. From there it follows that ***the element of the economy is the wealth***.

### *Dimension*

The *dimension of wealth* is **utility**<sup>14</sup> (that allows compare the magnitudes (measurability) of different manifestations of wealth-value-utility, as well as of each unit belonging to the same wealth, since the units that compose it do not have the same dimension — the latter is a product of the characteristic of science economic, as we will see.

### *Economic unit of measure*

The homogeneity imposed by the definition of the utility dimension requires the determination of its unit of measurement, which in economics is subject to the characteristics of this science, resulting from the natural laws that govern it.

It is worth anticipating that this singularity is that the economic unit of measure is determined in each calculation, it is not predetermined before measuring, like the physical meter. This is what SSET calls *inverse causality of the economic unit of measure*. It is important to clarify that: reverse causality does not alter the magnitude of the measured thing, respecting the same criteria of physics, where the use of the meter does not alter the measured magnitudes. In this way, as we will see, the unit of measurement of a manifestation of wealth is the marginal utility of the last unit,<sup>15</sup> from which it follows that there is a unit of measurement for each measured wealth, unlike the physical unit of measurement (metro) which is the same for all measurements.

### *Exchange*

*Fallible man* copes with the *shortage* of economic goods through the surpluses generated by specialized work, because they are *different*, with the help of capital.<sup>16</sup> The *exchange* of these surpluses is the natural mechanism to realize the benefit of said specialization. It is appreciated that: without a dimension, and unit of measure<sup>17</sup> thereof that allows the comparison of the values of the different manifestations and units of wealth, their exchange would be archaic.

### *Price*

It is the technical coefficient between quantities of economic goods exchanged.

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<sup>14</sup> That when referring to wealth, scarce is assumed, meaning of the term throughout the text.

<sup>15</sup> Not with this precision, both Menger and Jevons alluded to the importance of the last unit that determined the exchange. Here it is important to note that we are referring to the marginal utility of the last unit, of a wealth stock, as a unit of measurement of all the units that compose it, not as the value of all of them, which are different from each to another.

<sup>16</sup> It is a tool that enhances the result of the work.

<sup>17</sup> Just thinking about ordinality to compare always implies a reference point of comparison, whose dimension becomes the unit of measurement of the dimension of the other thing, referenced to it: if A is greater than B it means that the point of the reference dimension of A is that of B. Thus, since the sense-direction of utility is marginally decreasing, its measurability and the determination of a reference unit of measurement are feasible.

Thus, the SSET solves the deductive logical chain of the scientific calculation that we describe where subjective value, as an element of the economy, implies the necessary presence of the human being — a central difference with the theory of objective value by maintaining that things have value *per se*, and it is not assigned by the human being. Then, *economics* is the *humanistic science* par excellence, as long as it is based on the *theory of subjective value*.<sup>18</sup>

In turn, we have solved the dilemma of economic theory about whether it is feasible to measure value. To this end, it will only suffice to refer to Carl Menger (1985), this time to amend his misinterpretation of his own correct sentence:

“... because although it is true that value is a magnitude that can be measured, the measure does not belong to its essence, nor does the circumstance that it can be measured is part of the essence of time or space” (P: 103).

If we interpret Menger's condition that only that which has essence can be measured, the SSET tells us that: if the definition of subjective value is the utility assigned to economic goods — without utility, value cannot be defined, does not exist — it is evident that utility is part of the essence of value, together with quantity. Unlike space or time, scarce utility is a relationship with a good created by the subject that values it cannot exist without a subject assigning value to it. Therefore, if Menger accepted this qualification that the SSET makes — interpreting his own theory of subjective value — he would say that in the case of value, its measure and its essence are inseparable (if they are not the same thing).

In this way, the SSET demonstrates with scientific rigor that the value is measurable, within the requirement that Menger himself imposed for this to occur. In other words, if we define value in terms of utility, utility is the essence of value.<sup>19</sup>

### **Development of economic calculation**

Knowing that the economy meets the necessary conditions for scientific calculation, we proceed to develop the economic calculation.

From the definition of the element of the economy, we know that wealth is a set of two elements, *quality* and *quantity*:

*Quality (U)*: refers to the need that satisfies the economic good, which we identify as *utility*, which defines its *condition* as a *utility* thing.

*Quantity (q)*: it is the one that defines the necessary *magnitude (quantity)* of the economic good to satisfy the present need in its utility, which defines its *condition of scarcity*.

Thus wealth (*W*) is a function of *U* and *q*:  $W = f(U, q)$ .

This logical-deductive analysis of the elements that the SSET presents us seems to be perceived with the naked eye just by knowing that: of the same bread, 1kg is not the same as 2kgs, no 100kgs.

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<sup>18</sup> The interference of religion, politics, morals, ethics, etc., in economic matters is the consequence of relying on theories that are based on *objective value*, which goes against the laws of nature developed by the SSET (of wealth and human action or exchange).

<sup>19</sup> In order to demonstrate that measurability and the use of an economic unit of measure were present in Menger, we present Annex A.

BUT, since economics tries to explain what the combined set of quality and quantity ( $x$  kgs. of bread) means, let us see what it means to consider  $U$  and  $q$  together:

- The same amount of the same bread is not the same for Mary as it is for Peter.
- The same amount of the same bread is not the same for Maria all the time.
- Of the same bread does not mean that each unit has the same value for Peter. This given that its usefulness depends not only on the quality of the bread, but also on its ordinal quantity (1st, 2nd, ...  $n$ ) —exceeding a certain quantity will cease to be an economic good, it will no longer be scarce and will cease to be wealth: sand in the desert.

These simple practical descriptions (the apple falling from the tree) lead us to present the **fundamental law of economics** (the law of gravity).

### *Law of wealth*

Let us see how much wealth each apple out of a total of 10 that he has represents for Pedro. For this we resort to the *law of decreasing marginal utility: in a specific space-time environment, each unit of an economic good that is incorporated adds less value than the previous one*. In other words, the unit  $n-1$  (before) has a greater value than the unit  $n$  (after), which is to say that the later unit has a lower value than the previous one:  $v_n < v_{n-1}$ .

Let us observe **EVERYTHING**<sup>20</sup> that is deduced from this **FUNDAMENTAL LAW OF ECONOMY**, *momentarily* referring to a manifestation of wealth ( $q$ : apple):<sup>21</sup>

- The value of each unit of wealth is different, according to an ordinal criterion.
- The value of each unit of wealth is decreasing until the last unit is considered — as we will see, science was misled by not noticing this supposed banality.<sup>22, 23</sup>
- The value of the last unit of wealth is the smallest of all the unit values, therefore it is included in the value of all the units, which allows it to be a *unit of measure* for the economic calculation of all of them. Thus, if unit 4 is worth 1.75, it implies that it is worth 1.75 times the utility-value ( $U$ ) of the last unit (here it is that of the 7th unit):  $U_{4(7)} = 1,75v_7$  — its development in SSET (4th e.), *Chapter IX - The economic unit of measure*.

<sup>20</sup> As we proceed we will appreciate all that economic theory failed to notice, that was contained in Menger's subjective marginalism —or warned, misinterpreted.

<sup>21</sup> That in the SSET we call the **LAW OF WEALTH** or *law of value*, as it is applicable to all manifestations of wealth (bread, apples, pears, etc.), which is feasible as they all participate in its universal *utility*.

<sup>22</sup> The decreasing character of the value ( $v$ ) indicates the relevance of its **ordinal aspect: each unit acquires a different value according to its place in the total:  $v_1 > v_2 > \dots > v_n = 1$ .**

<sup>23</sup> The double dependence of the value of each unit of wealth is appreciated: both on the total number of units considered ( $q_i$ ) and on the order they occupy ( $q_i$ ). That is, the unit value is a variable dependent on the total quantity and its ordinal location. Circumstances whose relevance are essential to develop theory of value, as emerges from the SSET — shown in its **general equation of wealth**.

- It can be seen that: in order to obtain the subjective value of each unit of wealth we must previously know (or estimate) the total stock of the units whose unit values we wish to know, which is in line with the fact that if we don't know the quantity we don't know if something useful is scarce.<sup>24</sup>
- The total value of the stock of wealth considered is the sum of the value of all the wealth units that compose it — it cannot be otherwise, since each unit has a different value.<sup>25</sup>
- Both the unit and the accumulated utility are positive: axiom of the positivity of the SSET utilities:  $U_i > 0$  and  $U_a > 0$ .
- If we subdivide a total of economic goods, components of wealth, into two parts ( $10q = 4q + 6q$ ), it means that we will have two different manifestations of wealth, one made up of  $4q$  and the other made up of  $6q$ .<sup>26, 27</sup> In each of these manifestations of wealth, the same procedure must be carried out to determine the value of each unit and, in each case that of the last unit will act as the unit of measure for each of them ( $4q$  and  $6q$ ).  
 YES: *the value of the unit of measurement* in  $4q$  is achieved with the fourth apple on the other hand in  $6q$  it is achieved with the sixth apple, then, by the law of wealth, the 1 of  $4q$  is not the same as the 1 of  $6q$ :  $1q_4 \neq 1q_6 \neq 1q_{10}$ . This small “banality” referred to the unit economic of measure, developed by the SSET, is the key to solving the problem of economic calculation (“squaring the economic circle”), as we will see.  
 In economics, as in physics, the total is the same as the sum of the parts, but  $4q + 6q$  is not the same as  $10q$  — we will exemplify this in a next section.
- The presence of **time** underlies the *law of wealth*, as it speaks of the value of each unit as we add (remove) units, which is only feasible with the presence of time<sup>28</sup> —epicenter of economic time theory, and interest, of the SSET, which in my first work on economics I called: *Theory of economic relativity*, which exempts the development of a theory of interest, which is already covered with financial and actuarial math.<sup>29</sup>
- We have so many manifestations of wealth according to quality (utility) and/or quantity:

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<sup>24</sup> As the estimate of the harvest varies, the current value-price of the cereal varies, as well as according to the monetary expansion the depreciation of the value of the currency is estimated.

<sup>25</sup> **We will refer to the error of considering that the value of the last unit is the value of all units. The last unit "determines the value of wealth" inasmuch as it is the one that limits the scope of the thing as an economic good, but does not determine its value, which arises by adding the value of all units of wealth, which are different by the law of wealth (decreasing ordinal).**

<sup>26</sup> Here it is confirmed that wealth is a set of two elements: quality and quantity, which is why two different quantities of the same quality are two different wealth.

<sup>27</sup> It is a task that retailers do.

<sup>28</sup> This is a situation that Böhm-Bawerk did not notice otherwise he would not have postulated the failed theory of time preference.

<sup>29</sup> Without foundation with scientific rigor, Fischer was "correct" when he referred to the interest that had to be calculated, it was not necessary to define it. The SSET has shown that it was defined in the law of wealth, with which, conversely, Fisher's positivism corroborates that a special theory of interest was not necessary. In other words, the calculation of interest is the calculation of economic time, that of variations in wealth, then the law of wealth is the theoretical foundation of interest — which we will refer to at the end of this work.

*Different riches for **quality**: apples and pears.*<sup>30</sup>

*Different wealth by **quantity**: 5 apples is a wealth and 10 apples is another wealth.*

- *Different owners:*<sup>31</sup> since we have so many manifestations of wealth according to their quality and quantity, it appears that we have so many different wealth according to their proprietary distribution: Maria has  $3m$  (apples) and  $5p$  (pears), and Pedro  $1m$ ,  $6p$  and  $3d$  (peaches).<sup>32</sup>

Which puts us at the crossroads of measuring the value of each unit and the total of each wealth: the  $3m$  and  $5p$  of Maria, and the  $1m$ ,  $6p$  and  $3d$  of Pedro; the value of the total wealth of Maria and Pedro, that of both, and that of each manifestation of wealth:  $4m$ ,  $11p$  and  $3d$ .

Economic theory has not considered, with the appropriate logical-deductive scientific rigor, ALL the content of the chain of causalities present in the entities of economic calculation that we have highlighted.<sup>33</sup> This motivated that: 1) it was always assumed that the subjective value is not measurable, since it is not possible to speak of the constancy of the unit of measurement, such as the meter —SSET has solved this *squaring of the economic circle with its theory of the economic unit of measure*;<sup>34</sup> 2) it had not been realized that a theory of the economic unit of measurement was needed, with scientific rigor, independent of the theory of currency; 3) the presence of the inverse causality of the economic unit of measurement had not been noticed, for which its treatment (non-constancy) is different from that of the physical one (constancy);<sup>35</sup> and 4) it had not been noticed that it was not necessary: a theory of interest, insofar as time is already present in the law of wealth; nor a special theory of currency (insofar as it is wealth, it is subject to the law of wealth); nor a theory of business cycles (explained by price control); nor unemployment;... nor many other *ad hoc* theories, highlighted in SSET (4th e.).

Knowing the challenge of having an adequate economic calculation theory, let us continue with its development, hand in hand with the SSET (4th e.).

## **General equation of wealth**

It is evident that the infinity of combinations between quality and quantity of different wealth, distributed in immensity of owners unequally, makes it imperative to locate a universal wealth equation, and from there derive a unit of measure of common use according to its inconstancy in the

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<sup>30</sup> In turn, an apple is a wealth as direct consumption, and another as part of a cake.

<sup>31</sup> It is according to the *wealth-owner axiom* of the SSET: *there is no wealth without an owner or an owner without wealth.*

<sup>32</sup> Even if Pedro and Maria have the same amount of the same economic goods, the value they will assign to it is not the same.

<sup>33</sup> Value was assimilated to utility, as well as value to price, without adequately noting the deductive logical causal chain: *economic good* → *value* → *utility* → *unit of measure* → *laws*.

<sup>34</sup> If the value of each unit, within the same manifestation of wealth, is different, therefore there can be no constancy in any unit of measure to measure different manifestations of wealth. Difficulty that Menger considered "*the squaring of the economic circle*", and left his resolution to posterity — a task that SSET assumed.

<sup>35</sup> The scientific requirement on the economic unit of measurement is that it does not alter the dimension of the thing measured, not its constancy. On the contrary, in the economy, in order not to alter this condition of the unit of measurement, it must be non-constant, which does not imply the factual need for stability, which is the reason for the different proposals for this purpose (constant currency expansion, basket of goods), etc.

calculation, which we must do following the scientific guidelines to calculate, which in turn addresses the reality of the simple daily calculation through the use of money prices.

Before beginning the presentation of the general equation of wealth of SSET, it is worth this quote from Menger (2006) to the effect:

“The objective of the theoretical sciences is to understand, beyond mere immediate experience, and to dominate the world of reality. We understand phenomena by means of theories, insofar as these show us each concrete case simply as an exemplification of a general regularity. We obtain knowledge that transcends immediate experience insofar as, in the concrete case and based on the laws of coexistence and the succession of phenomena, from observed facts we deduce other facts not directly observed; finally, we dominate the real world inasmuch as, based on our theoretical knowledge, we put — whenever it is in our power — the necessary conditions to cause a certain phenomenon to occur.” P: 124.

The procedure will consist of going from the simplest to the most complex cases, which is why we begin with the calculation of a manifestation of wealth of an owner, and then move on to the most complicated combinations of calculations.

In accordance with all the requirements that we have seen for economic calculation, and the existence of the *law of wealth*, to which the non-abstract element of the economy (subjective value) is subjected, the SSET has proposed this **GENERAL EQUATION OF WEALTH** [ $U_{m(i)}$ ], for any of its manifestations (apples  $q$ ):

$$U_{m(i)} = q_t / q_i$$

Where  $q_t$  is the total units of  $q$  and  $q_i$  is the variable unit ( $i$ ) whose marginal utility [ $U_{m(i)}$ ] is to be calculated.<sup>36</sup>

It can be seen that the **general equation of wealth** includes all the aspects that we have expressed: total quantities ( $q_t$ ), decreasing value (as the unit considered — independent variable  $q_i$  — its value  $U_m$  is lower), the marginal value of the last unit is  $1 = q_t / q_t$ , etc.

Let us apply the equation to a practical case where we have a richness of 10 apples (10 $q$ )

**Decreasing marginal utility of wealth:  $q_t = 10$**

<i>Manzanas</i>		
$q_i$	$U_i$	$U_t$
1 <sup>a</sup>	10,000	10,000
2 <sup>a</sup>	5,000	15,000
3 <sup>a</sup>	3,333	18,333
4 <sup>a</sup>	2,500	20,833
5 <sup>a</sup>	2,000	22,833
6 <sup>a</sup>	1,667	24,500
7 <sup>a</sup>	1,429	25,929
8 <sup>a</sup>	1,250	27,179
9 <sup>a</sup>	1,111	28,290
10 <sup>a</sup>	1,000	29,290

<sup>36</sup> Its integral (continuous) is equivalent to the harmonic series (discontinuous), which explains the dilution of the sound of a stringed instrument in space. It is no coincidence that it has to do with the harmony of natural economic evolution, and the number  $e$  present in financial mathematics.

- $q$  indicates the quality of apple wealth.
- $q_t$  indicates the total units of apples ( $q$ ).
- $q_i$  indicates the order of each unit within the total.
- $U_i$  indicates the value (marginal utility) of each unit of apples  $q_i$ .<sup>37</sup>
- $U_{it}$  indicates the value (marginal utility) that accumulates as a unit of apple is incorporated.
- **Unit of measure:** the value (marginal utility) of the last unit of apple is 1, therefore it acts as the **unit of measure** for all other units of apples. In this way the  $4^{\text{a}}q$  unit is worth  $2.50u_{q10}$ .

Having learned that the value of each unit of apple (wealth), belonging to a total, is different from one another, and is determined according to the number of total units and the order that each one occupies in the total, we can move on to the one that links different manifestations of wealth.

### The double relativity of wealth

According to the SSET, we continue to advance in the analysis that is derived from our simple *wealth equation*, and thus we come to notice the presence of two types of values: *intrinsic value* and *extrinsic value*:

**Intrinsic value:** it is the marginal value of wealth (unit  $U_i$  or accumulated  $U_{it}$ ) that arises from a stock of economic goods that make up a manifestation of wealth (units of the same quality that belong to a certain quantity: 10 apples). We classify it as *intrinsic value* based on the fact that its unit values depend exclusively on the total number of units of apples ( $q_t$ ), and in their order in the total ( $q_i$ ).

From this we can deduce the **theory of the intrinsic imputation of wealth**, as the value of each unit of a manifestation of wealth is imputed to determine the value of accumulated wealth: the  $U_i$  of each unit is imputed to the total utility  $U_t$  of 28,490 from our table. In this way, *intrinsic imputation arises from the law of wealth*.

We deduce that the wealth of an owner, if we consider the diversity of manifestations of wealth that compose it, measured according to a universal unit of measure (dollar), is valued according to the **theory of the intrinsic imputation of wealth**, expresada en esa unidad de medida.

Now we go on to relate the different manifestations of wealth, which we do by linking the intrinsic values of each of them, which gives rise to the appearance of the **extrinsic value of wealth**.

**Extrinsic value:** the SSET tells us that *extrinsic values are the intrinsic values that activate human actions (generate-save-destroy-exchange wealth)*.<sup>38</sup> In other words, human actions on wealth are activated at certain levels of intrinsic values of wealth: consumption stops at the marginal utility level of the 2nd unit; it is exchanged at the marginal utility level of the 5th unit; it is destined to the production of other wealth at the level of the 3rd unit; you start saving (future) at the 11th unit level; the value of wealth is calculated up to unit  $x$ , which would become the last unit

<sup>37</sup> It is according to the general equation of wealth of SSET.

<sup>38</sup> Which in our case refers to the action of calculating wealth.



measured; **the value of wealth is calculated up to unit x, which would become the last unit measured** <sup>39</sup> — thus we have that the marginal utility of the 11th unit is the *extrinsic value of saving*.

Economic theory has only made reference to the *extrinsic value of the exchange* between different manifestations of wealth, between different owners: that is, *the extrinsic value of exchange of a wealth is the intrinsic value at the level of the unit of wealth that is delivered*. Thus, the SSET has extended the scope of the extrinsic value of wealth to explain all human actions on wealth. With which the SSET has made Menger's postulate a reality, economics must be explained in terms of utility, knowing that explaining economics implies explaining human economic behavior. <sup>40</sup>

**Double relativity of wealth:** the SSET highlights the presence of intrinsic and extrinsic value as *double relativity of wealth*. Thus, we can well speak of *intrinsic relativity* (when we refer to intrinsic value, which arises from the *law of wealth*) and *extrinsic relativity* (when we refer to extrinsic value, which arises from the law of *human action, or exchange*, that which we will see below).

Having understood that the economic calculation differs as we refer to that of the units comprised within a wealth and the one that relates different wealth, we proceed to make a brief state of affairs of what has been developed so far:

- We know what the *intrinsic value* of each unit of a manifestation of wealth means, and its consequent *intrinsic imputation in the accumulated value*.
- We know that among the intrinsic unitary values of a manifestation of wealth is the one that will activate human action (to generate, save, destroy, calculate exchange wealth), which we will identify as the *extrinsic wealth value of the human action that it activates*. Traditionally, what we define here as the *extrinsic value of exchange* was discussed, while it had not been realized that it is extrinsic to all human actions, a universality that incorporates the SSET and becomes the cornerstone to understand the distribution of wealth with adequate scientific rigor. <sup>41, 42</sup>

Then, to identify the extrinsic values, from among the intrinsic ones, we must enter into the treatment of *human action*.

## The human actions

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<sup>39</sup> It is in total harmony with a quote that we will make from Mark Blaug about the end of this work.

<sup>40</sup> Mises (1980) rightly said: “*The economy is concerned with action, that is, with man's conscious effort to alleviate, as far as possible, his discomforts.*” (P. 366) But, in the same chapter Scope and methodology of catallactics, in his work Human Action, he specifically refers to exchange: “*The objective of economic science is to analyze the prices of goods, as, indeed, in the market they are demanded and paid.*” (P: 362) The SSET defines *economics as the science that studies value*, which goes to the root of economic phenomena, among which is exchange, from which prices arise — on the contrary, Mises explains in terms of prices, supply and demand, as all economic theories do.

<sup>41</sup> Unlike the traditionally known one — derived from relation of exchange of Jevons — that depends on combining marginal utility and price ( $U_a/P_a = \dots = U_n/P_n = U_s/P_s$ ), inconsistent insofar as  $P$  is a variable dependent on  $U$ , a situation that the current theories do not they had been able to see the objective value underlying them, which had not been noticed.

<sup>42</sup> This is a compelling sign that economic theory had settled with price theory to explain the entire economy.

The SSET, in line with Menger, shows that ALL HUMAN ACTIONS are guided by utility, determined by the dimension of the intrinsic values of wealth that move human action.<sup>43</sup> We will then see how we identify the *intrinsic values* that act as *extrinsic values*, which identify the moment of human actions.

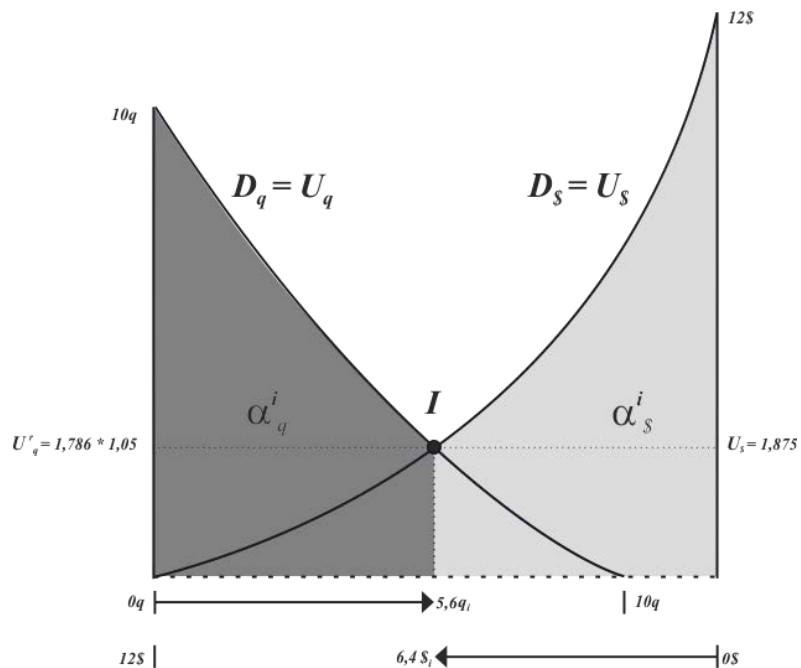
To achieve the aforementioned task,<sup>44</sup> the SSET had to go much further, and thus be able to demonstrate how each of the human actions (generate, save, exchange, destroy and calculate wealth) is guided, according to the *law of wealth*, which is reflected in the:

**Axiom of the efficient, equitable and solidarity distribution of wealth**

**Wealth is distributed** according to the marginal utilities (*intrinsic values*) of the human actions that determine it: *in decreasing order to generate and conserve, and increasing to exchange and destroy*<sup>45</sup>

We present the graphical and numerical exposition of the double relativity of wealth.

**Double relativity of wealth**<sup>46</sup>



<sup>43</sup> Subjective value theory that completely disqualifies objective value theories, according to which things have value per se, independent of the presence of the human being. This disqualification has greater scientific rigor than comparing the greater value of a diamond over other riches, whose obtaining requires greater effort.

<sup>44</sup> To identify the extrinsic values that activate each human action, from among the intrinsic values that make up a manifestation of wealth.

<sup>45</sup> As we will see in this work, in a very elementary way Böhm-Bawerk had this axiom in mind.

<sup>46</sup> For scientific rigor, this graph should perhaps start with the ordinate axes at 1q and 1\$ instead of 0q and 0\$, as I highlighted in previous work.

Let us see graphically how, based on the *intrinsic value* of each manifestation of wealth (quality and quantity), we can see the moment when a human action will be activated on it, **showing which of these intrinsic values will express the extrinsic value of that human action**. To this end, we bring the graph 5 of the SSET (4th e.),<sup>47</sup> where we compare 10 $q$  with 12\$, which we do by facing up the marginal utility curves of each manifestation of wealth, that of  $q$  with a traditional reading from left to right ( $D_q = U_q$ ) and that of \$ with inverse reading from right to left ( $D_\$ = U_\$$ ). In other words, we face two utility curves of different manifestations of wealth, with which we are in line with Menger insofar as we explain economics in function exclusively of utility — which the SSET corroborated insofar as it warned that it is the dimension of its non-abstract element. Let us see graphically how, based on the intrinsic value of each manifestation of wealth (quality and quantity), we can see the moment when a human action will be activated on it, showing which of these intrinsic values will express the extrinsic value of that human action. To this end, we bring the graph 5 of the SSET (4th e.), where we compare 10 $q$  with 12\$, which we do by facing up the marginal utility curves of each manifestation of wealth, that of  $q$  with a traditional reading from left to right ( $D_q = U_q$ ) and that of \$ with inverse reading from right to left ( $D_\$ = U_\$$ ).<sup>48</sup> In other words, we face two utility curves of different manifestations of wealth, with which we are in line with Menger insofar as we explain economics in function exclusively of utility — which the SSET corroborated insofar as it warned that it is the dimension of its non-abstract element.

And now we present its corresponding table 4 (from SSET 4th e.):

$$v_{\$(q)} = 1,050 \text{ and } v_{q(\$)} = 0,952 \text{ }^{49}$$

Decreasing utility of $q$					Decreasing utility of \$				
$q_t = 10$				$U^r_{max}$	$\$, = 12$			$U^r_{m\$\$}$	
$q_x$	$U_{max}$	$U_{tax}$	$U_{Max}$	$U_{max} * v_{\$(q)}$	$\$_x$	$U_{m\$\$}$	$U_{t\$\$}$	$U_{M\$\$}$	$U_{m\$\$} * v_{q(\$)}$
1	10,000	10,000	10,000	10,500	1	12,000	12,000	12,000	11,424
2	5,000	15,000	7,500	5,250	2	6,000	18,000	9,000	5,712
3	3,333	18,333	6,111	3,500	3	4,000	22,000	7,333	3,808
4	2,500	20,833	5,208	2,625	4	3,000	25,000	6,250	2,856
5	2,000	22,833	4,567	2,100	5	2,400	27,400	5,480	2,285
<b>5,60</b>	<b>1,786</b>	24,619	4,396	<b>1,875</b>	6	2,000	29,400	4,900	1,904
6	1,667	24,500	4,083	1,750	7	1,714	31,114	4,445	1,632
7	1,429	25,929	3,704	1,500	8	1,500	32,614	4,077	1,428
8	1,250	27,179	3,397	1,313	9	1,333	33,948	3,772	1,269
9	1,111	28,290	3,147	1,167	10	1,200	35,148	3,515	1,142
10	1,000	29,290	2,929	1,050	11	1,091	36,239	3,294	1,039
					12	1,000	37,239	3,103	0,952

On the left we have the table of decreasing marginal utility of each 10 $q$  unit (it would be the discontinuous  $D_q = U_q$  of the graph) and on the right of each 12\$ unit ( $D_\$ = U_\$$ ).

Although the exercise was intended to explain the human action of exchanging wealth, with the same structure —referring to a wealth relative to itself— the SSET explains the four human actions,

<sup>47</sup> That I called Menger's "scissors" (with its two utility compound blades, as Schumpeter said correctly), as opposed to Marshall's "scissors" (supply and demand curves), but these refer to the same economic good, unlike our curves that refer to different economic goods, a situation that Schumpeter did not notice.

<sup>48</sup> In this way each curve is marginally decreasing.

<sup>49</sup> As we will see later, these values arise as coefficients of the marginal utilities where the exchange takes place.

according to the intrinsic value that arises from the marginal curves: decreasing for show the behavior of generating and saving wealth and growing to show the actions of exchanging and destroying wealth.

Thus, to understand the concept of extrinsic value, I have to identify which of the intrinsic values represents them, let us continue with the human action of exchange referred to in the graph and its table.

### Law of exchange

From the SSET it appears that the action of exchanging 5,6q for 6,4\$ is the consequence of what we have called the

### Law of exchange

*The exchange occurs when the relative marginal utility of one economic good  $[U^r_{q(\$)}]$  equals the marginal utility of the other  $[U_{\$(q)}]$ <sup>50</sup>*

In the example it appears that:

- $[U^r_{q(\$)}]$ :<sup>51</sup> the *relative* marginal utility ( $U^r$ ) of  $q$  with respect to  $\$$  activates the exchange when it reaches **1,875**, where it is equal to the marginal utility level of  $\$$  (**1,875**), which occurs with the marginal utility of the unit 6,4\$.
- $[U^r_{\$(q)}]$ :<sup>52</sup> the *relative* marginal utility ( $U^r$ ) of  $\$$  with respect to  $q$  activates the exchange when it reaches **1,786**, where it is equal to the marginal utility level of  $q$  (**1,786**), which occurs with the marginal utility of the unit 5,6q.

This is where we appreciate which of the different marginal utilities, of each of the units that make up the stock of  $q$  and  $\$$ , is the *intrinsic value* of  $q$  and  $\$$ , which in turn represent their *extrinsic values referred to exchange*, which allowed the action of exchange. So:

*Extrinsic value of  $q$ , in the exchange with  $\$$ , is 1,786*, which corresponds to the marginal utility of 5,6q with respect to the total of 10q.

*Extrinsic value of  $\$$ , in the exchange with  $q$ , is 1,875*, which corresponds to the marginal utility of 6,4\$ with respect to the total of 12\$.

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50 This equation refutes the theories based on the idea that exchange occurs when marginal utilities are equalized, with which there would be no exchange because it is economically sterile.

<sup>51</sup> According to the SSET, it arises from multiplying the  $U_{q(\$)} * v_{\$(q)}$ , as can be seen in the table, where the relative value of  $\$$  with respect to  $q$  is determined by:  $v_{\$(q)} = U_{\$/U_q}$ . In this way we can express the exchange equation like this:  $U^r_{q(\$)} * v_{\$(q)} = U_{\$}$ .

<sup>52</sup>  $U^r_{\$(q)} * v_{q(\$)} = U_q$ .

We have shown how the *intrinsic value* of a manifestation of wealth is what moves human action, here referred to exchange (relative to another manifestation of wealth),<sup>53</sup> and reveals which of them represents its *extrinsic value* with respect to that human action.

In this way, the SSET perfects the analysis initiated by Menger: although the extrinsic value is not a known fact before the exchange — which is what Menger show to discredit the theory of prices, supported by supply and demand curves — it is demonstrated that it was not only pre-existing to the act to exchange, and belonged to the set of intrinsic unitary values of each manifestation of wealth. That is, prior to the action of the exchange, **it is not known which of the intrinsic values, of both riches, would be chosen as extrinsic values** to trigger the human action of the exchange. Which confirms that the exchange is between wealth, manifested by its intrinsic unitary values, what are different within the same wealth set.<sup>54</sup>

Thus, the SSET broadens and gives greater precision to Mises's concept of Human Action, while opening the way to the measurement of subjective value.

Then the SSET corroborates that, in the economic calculation:

- Intrinsic value precedes extrinsic value.
- Extrinsic value comes from intrinsic value.

These appraisals coincide with those referred to by the SSET regarding the fact that the origin of prices are values, not supply and demand; and that there is only exchange between present riches — there is no exchange of what is not present wealth —,<sup>55</sup> for this reason it is inconceivable to think of monetary exchange with abstract, virtual currency or currency that arises out of nowhere.

Given that we have expressed the *Law of exchange* as a function of the marginal utilities of the exchanged wealth, we then develop the *relative values* of one wealth with respect to the other [ $v_{q(\$)}$  and  $v_{\$(q)}$ ], which determine the action of exchanging, which we appreciate through the *equation of exchange*:  $U^r_{q(\$)} = U_{q(\$)} * v_{\$(q)} = U_q$ .

## Relative values

According to the SSET, the *relative value* of one manifestation of wealth with respect to another [ $v_{q(\$)}$  y  $v_{\$(q)}$ ], is the ratio of the intrinsic values of the manifestations of wealth that activate their exchange. In this way, the relative values emerge as the quotients between the marginal utilities of the wealth that are exchanged or compared:

$$v_{\$(q)} = U_{\$} / U_q$$

$$v_{q(\$)} = U_q / U_{\$}$$

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<sup>53</sup> Precisely, since economic theory only considered value in reference to price, it is only referring to the extrinsic value of the action of exchanging. As can be seen, the theory of subjective value had greater explanatory power than that of the sole action of exchanging: all human action is explained in terms of utility, with which the SSET demonstrated the central hypothesis of the marginal subjective value theory of Menger: *the economy is explained by means of utility* — distinctive that Schumpeter identified very well.

<sup>54</sup> Once again Menger demonstrates his enormous aprioristic deductive logical capacity for analysis.

<sup>55</sup> In this regard, the SSET emphasizes that when there is an exchange on credit, by which present goods are delivered in exchange for future goods, we are in the presence of present wealth, while the value of the present asset is its **present value** and that of the credit is its **current value**.

By virtue of the positivity of the marginal utility, it is evident that the relative values are positive by definition, which corroborates that the exchanges are made because the intervening parties benefit.

Given that human actions are guided according to a decreasing or increasing order of the marginal utilities of wealth, we will refer to the way of calculating the relative values according to one or another procedure, and the inverse relationships between them.

*Relative values with decreasing marginal utility order* [ $v_{q(\$)}$  y  $v_{\$(q)}$ ] since it is the one that we have presented in the preceding graph and table, we simply refer to their values:

$$v_{q(\$)} = U_{qi} / U_{\$i} = 1,786 / 1,875 = \mathbf{0,952} v_{\$}$$

In the example, wealth  $q$  is valued at  $0,952v_{\$}$  of wealth  $\$$ , and vice versa, wealth  $\$$  is valued at  $1.050v_q$  of wealth  $q$ .

*Relative values with increasing marginal utility order* [ $v^{\bullet}_{q(\$)}$  and  $v^{\bullet}_{\$(q)}$ ]: here we begin by presenting the table where the marginal utilities of each unit of both wealth ( $q$  and  $\$$ ) appear in an increasing sense:

$$v^{\bullet}_{\$(q)} = 0,952 \text{ and } v^{\bullet}_{q(\$)} = 1,050$$

Increasing utility of $q$				Increasing utility of $\$$			
$q_t = 10$			$U^r_{max}$	$\$_t = 12$			$U^r_{m\$,x}$
$q_x$	$U_{max}$	$U_{tax}$	$U_{max}v_{\$(q)}$	$\$_x$	$U_{m\$,x}$	$U_{\$,x}$	$U_{m\$,x}v_{q(\$)}$
1	0,100	0,100	0,095	1	0,083	0,083	0,088
2	0,200	0,300	0,190	2	0,167	0,250	0,175
3	0,300	0,600	0,286	3	0,250	0,500	0,263
4	0,400	1,000	0,381	4	0,333	0,833	0,350
5	0,500	1,500	0,476	5	0,417	1,250	0,438
<b>5,60</b>	<b>0,560</b>	2,060	<b>0,533</b>	6	0,500	1,750	0,525
6	0,600	2,100	0,571	7	0,583	2,333	0,613
7	0,700	2,800	0,666	8	0,667	3,000	0,700
8	0,800	3,600	0,762	9	0,750	3,750	0,788
9	0,900	4,500	0,857	10	0,833	4,583	0,875
10	1,000	5,500	0,952	11	0,917	5,500	0,963
				12	1,000	6,500	1,050

This table was constructed in the same way as the previous one, except that the marginal utility of each wealth is considered in an increasing way, with which the actions of exchanging and destroying wealth are also appreciated.

As expected, when ordering in increasing order the data in the previous table, which were ordered in descending order, the relative values have been inverted: <sup>56</sup>

$$v_{\$(q)} = v^{\bullet}_{q(\$)} = 1,050$$

$$v_{q(\$)} = v^{\bullet}_{\$(q)} = 0,952$$

<sup>56</sup> Consequence that  $U^{\bullet}_q = q_i / q_t$ , inverse of  $U_q = q_t / q_i$ .

Due to this circumstance, the equivalence between  $U_q = 0.560$  with  $U_\$ = 0.533$  is now appreciated, as opposed to 1.786 and 1.875 when we calculated based on an increasing marginal order.

The important thing is to appreciate that considering any of the relative values, those that arise according to a decreasing or increasing order of the marginal utility of each unit, the exchange occurs exactly between the same quantities 5,6q and 6,4\$.<sup>57</sup>

We have carried out the two calculations of the relative values in order to:

- *Ordering with decreasing marginal utility*: through which we understand the human actions of generating and saving wealth.
- *Ordering with increasing marginal utility*: through which we understand human actions to destroy and exchange wealth.

The important thing is to note that: whatever the criterion of relative values ( $v$  or  $v^\bullet$ ), with  $v_{q(\$)}$  we are valuing wealth  $q$  (according to its total and exchanged stocks) as a function of wealth  $\$$  (according to its total and exchanged stocks). Which is to say that we are also considering the unit of measurement of wealth  $\$$  (the marginal utility of its last unit:  $u_\$$ ) as the unit of measurement of wealth  $q$ . In this way we know that the 5,6q have one value based on the unit of measurement of  $q$ :  $u_q$ , or based on the universal unit of measurement  $u_\$$ :

$$5,6q = 1,786 u_q = 1,875 u_\$$$

From where we obtain the relative values of both manifestations of wealth:

$$v_{\$(q)} = 1,875 / 1,786 = 1,050 v^\bullet_{\$(q)}$$

$$v_{q(\$)} = 1,786 / 1,85 = 0,952 v^\bullet_{q(\$)}$$

In short, relative values are the tools that allow us to relate the valuations that individuals in a society make of the wealth  $q$  and  $\$$ , according to what each of them possesses. Relative values explain how individuals are economically related according to their possessions and those of their neighbors, in accordance with human nature (laws of wealth and exchange).<sup>58</sup>

The theory of relative values of the SSET shows the need to have a universal unit of measure of wealth, a task that consists *simply* in selecting the manifestation of wealth whose unit relative value will be considered the unit of measurement of all wealth.<sup>59</sup>

Well, the *time* has come to place prices in economic theory.

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<sup>57</sup> With which the preceding axiom of the distribution of wealth is corroborated, inasmuch as it makes it compatible to use the two expressions of wealth (increasing and decreasing) in the same graph (read the same calculation).

<sup>58</sup> Here we ratify the observation of the SSET on the epistemological failure of Jevons, when trying to explain economic phenomena based on macroeconomic data — with its consequences on current economic theories and institutions.

<sup>59</sup> It is a forceful expression that corroborates Menger when he affirmed that any manifestation of wealth could be selected as a unit of measurement, highlighting the advantages of being a currency of universal use. The essential thing is to note that the SSET was already present in Menger, here in terms of the separation of the theory of the unit of measurement from the theory of currency.

## Prices

Considering that the price is a simple technical coefficient, between exchanged quantities of different economic goods, arising from the relative values, in our exercise we observe the *unit price (average)* of  $q$  as a function of  $\$$ , and its inverse:

$$P_{q(\$)} = 6,4\$/5,60q = \mathbf{1,142} \text{ \$/}q$$

$$P_{\$(q)} = 5,6q/6,40q = \mathbf{0,875} \text{ } q/\$$$

From the concept of price, it appears that the  $5,6q$  have the same price of  $1,142\$$  each, which makes a total of exchanged currency wealth of  $q$  of  $6,40\$$ . This simple reflection is necessary and sufficient to warn that

**Prices do not explain reality**

This given that all units have the same price, *the theory of prices does not express the law of wealth*, according to which the value of each unit is different given to a decreasing marginal ordinal behavior.

In a very simple way, we have demonstrated the inconsistency of the sentence of J. S. Mill: “*with prices the issue of value is resolved*”, the basis of all economic theories.

### Relationship between values and prices

The SSET establishes these relationships between both economic entities:

- Relative values (utility) determine exchanges.
- Prices arise from exchanges, as simple average coefficients of quantities exchanged.
- The price arises as an act of a consummated fact (human action). Then, there can be as many prices as events occur.
- Each exchanged unit of  $q$  has the same price, but we know that the intrinsic value of each unit of wealth that makes up  $q_i$  ( $5,6q$ ) has a different value; which in turn are different from the intrinsic values they had when they made up the wealth of  $10q$ .
- Relative values differ from prices:

$$v_{q(\$)} = \mathbf{0,952} \neq P_{q(\$)} = \mathbf{1,142}$$

$$v_{\$(q)} = \mathbf{1,050} \neq P_{\$(q)} = \mathbf{0,875}$$



- Using the general wealth equation, the SSET has shown that the observed prices allow the relative values to be calculated. A topic that we deepen here and we give greater scientific and explanatory rigor.
- The *correlation between changes in relative values and prices is positive*: the rise (fall) of the relative value implies the rise (fall) of the price:  $\uparrow v_{q(\$)} \rightarrow \uparrow P_{q(\$)}$ . Situation that arises from the *law of exchange*, from which it follows that: as the relative value of one wealth increases with respect to another [ $\uparrow v_{\$(q)}$ ], the amount of economic goods received from it increases ( $q_i$ ), respect to the same amount delivered of the first ( $\$_i$ ).
- The correlations between values and prices, and the feasibility of measuring values as a function of prices, are an obvious sign that prices are more than signals of the consequences of human actions they are rigorously reliable data,<sup>60</sup> since they arise from values, and allow their calculation.

We have confirmed that it is the *double relativity of wealth* that explains the origin of prices, not the supply and demand curves. It is evident that here we are appreciating how the SSET explains the *highly complicated phenomena* that give rise to prices, to which Menger refers — see quote we make from Menger's *Note 18* below.

For the purposes of exercising everything that has been corroborated, suppose that there has been an increase in the intrinsic value of the units of the economic good  $q$  of the order of 20%, maintaining that of the units of the economic good  $\$$ .

As a consequence of this, we have this situation table:

$$v'_{q(\$)} = 1,20 \quad v_{q(\$)} = 1,20 * 0,952 = \mathbf{1,142}$$

By the inverse of the relative SSET, we have:

$$v'_{\$(q)} = 1 / 1,142 = \mathbf{0,875}$$

Given that the intrinsic values of each unit of the  $12\$$  (the  $U_\$$ ) did not change, it is worth assuming (it does not necessarily have to be the case) that they still want to exchange 6,4 for  $q$ . Now it is possible to determine how many units of  $q$  (which are now worth more) will be delivered for 6,40\$, which is determined by the formulas developed in table 6 of SSET (4th e.). For this we use the equation of exchange: the exchange occurs when the *relative* marginal utility [ $U^r_{\$(q)}$ ] of a manifestation of wealth is equal to that of the marginal utility of the other wealth ( $U_q$ ). Thus, knowing that the intrinsic marginal utility of  $\$$  for which the 6,4\$ exchange will be made is 1,875, we deduce the intrinsic value of  $q$  that will allow the equation to be fulfilled

$$U^r_{\$(q)} = U_\$ * v'_{q(\$)} = 1,875 * 1,142 = \mathbf{2,141} U_q$$

Knowing the intrinsic value of  $q$ , which will act as its extrinsic value that will activate the exchange, we only have to calculate the amount of  $q$  that will be exchanged:

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<sup>60</sup> It is without forgetting the institutional alterations that they could suffer. Theme developed in *Ch. XIX, in SSET – (4th e)*.

$$q'_i = q_t / U^r_{\$(q)} = 10q / 2,141 = 4,67q$$

Then we deduct the prices of both manifestations of wealth:

$$P'_{q(\$)} = 6,40 / 4,67 = 1,37$$

$$P'_{\$(q)} = 4,67 / 6,40 = 0,73$$

The following variations are appreciated:

- The relative value and price of  $q$  increased:  $q$ :  $v'_{q(\$)} > v_{q(\$)}$  and  $P'_{q(\$)} > P_{q(\$)}$ . The inverse happened with  $v'_{\$(q)}$  and  $P'_{\$(q)}$ .
- The new relative values are still different from the relative prices:  $1,142 \neq 1.37$ .
- Variations in relative values were not proportionally the same as those in relative prices:

$v'_{q(\$)}$  and  $P'_{q(\$)}$  are 20% higher than  $v_{q(\$)}$  and  $P_{q(\$)}$ .

$v'_{\$(q)}$  y  $P'_{\$(q)}$  are 17% lower than  $v_{\$(q)}$  and  $P_{\$(q)}$ .

$q'_i$  is 17% lower than  $q_i$ , but  $\$i$  remains the same (for expository simplification).

It is important to note that: while the relative value and the price of  $q$ , with respect to  $\$$ , varied by 20%, the exchanged quantities of  $q$  decreased by 17% — it is a clear demonstration of how the *double relativity of wealth* alters one relativity respect to another in different form. A theme that will reveal to all theorists, including Menger, as shown by the repeated citations that we make of him in SSET (4th e.), regarding the relation intrinsic and extrinsic value.<sup>61</sup>

## The economic unit of measure<sup>62</sup>

Let us see the enormous relevance of what we have seen so far, since it introduces us directly into the economic calculation of the universality of manifestations of wealth, for which we must necessarily resort to the analysis of the economic measurement unit, homogeneous for all wealth — which SSET corroborates with the homogeneity and monotony<sup>63</sup> of the general wealth equation.

We know that the intrinsic value of any unit that makes up a wealth is expressed as a function of the intrinsic value of the last unit of that wealth ( $u_q, \$$ ). In our example, the marginal utility of 6,4\$ [ $U_{6,4(12\$)}$ ] is **1,875** $u_{\$}$ . This is given that the marginal utility of the last unit of wealth 12\$ is 1: [ $U_{12(12\$)}$ ] = 12 / 12 = 1.

<sup>61</sup> This conclusion is extremely relevant to appreciate how “currency policies”, which alter the price of the currency [ $P_{\$(q)}$ ], do not affect all manifestations of wealth equally — a situation highlighted by the Austrian School, and the SSET corroborates with scientific rigor, without the need for a special theory of economic cycles with currency origin.

<sup>62</sup> The theoretical development of the economic measurement unit can be seen in *Annex XI of SSET 4th edition*, which is expanded in this work.

<sup>63</sup> It is a **necessary condition** to explain the world of proportionalities that arises from the use of money prices.

Then, knowing the unit of measure of a manifestation of wealth ( $u$ ), it appears that the *relative marginal utility* of one wealth with respect to another [ $U'_{q(\$)}$ ], expresses its marginal utility as a function of the unit of measure of the second wealth, to which it is relative ( $U_{\$}$ ). In our example we saw that [ $U'_{q(\$)} = 1,875u_{\$}$ ] is equivalent to  $U_{5,6(10q)} = 1,786u_q$ , that is, the unit 5.6q has a utility of  $1.875u_{\$}$ , measured by considering the unit of measure of wealth \$ ( $u_{\$}$ ) as a unit of measure of all wealth.

It is important to appreciate how the value of each unit, of each manifestation of wealth, arises according to its order in the total quantity of which it is a part.<sup>64</sup> Then, given that in every manifestation of wealth we use the same epistemological procedure, the possibility arises of homogenizing the calculation with the simple expedient of selecting a manifestation of wealth from which to measure all the others. Thus, ***the epistemological homogeneity of economic calculation, arising from the general equation of wealth*** of the SSET (4th e.) has responded to the homogeneity that Menger claimed and could not find,<sup>65</sup> leaving his resolution as a legacy. Which SSET (4th e.) provides us through an adequate epistemology with scientific rigor, for responding to the requirements of calculation in science.

The epistemological homogeneity of the economic calculation of SSET (4th e.) is a consequence of respecting the intrinsic values of each manifestation of wealth that is measured, both the measured one and those of which it acts as a unit of measurement. It is another corroboration of:

- The neutrality of the economic measurement unit (its use does not alter the measurement).
- The economic unit of measure is wealth it is not an abstract entity, which is evidenced in that it is the marginal utility of a wealth (of its unit latter); therefore, currency as a unit of measurement is wealth, it is not an abstract entity in economic calculation.
- The inverse causality of the economic unit of measurement determines that its dimension arises from each measurement, therefore its neutrality (not altering the observed-measured) arises from its condition that it is not constant, as the meter is in physics. That is the homogeneity that Menger claimed and did not notice, which led him to express this as “*the fundamental problem of economic theory*” that he called: ***the squaring of the economic circle***. Problem that prevented noticing the measurability of subjective value, without which any theory of economic calculation is inconsistent, given that it is the non-abstract entity of the economy, whose resolution was left to posterity, a task that the SSET collected.<sup>66</sup>

With the dual purpose of:

- To corroborate the consistency of the above, we are going to present the economic calculation referring to two simple cases of daily life from which the scope of the theory presented here will be fully understood.

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<sup>64</sup> How could it be otherwise, economics had to explain with scientific rigor the value of the information that arises from reality.

<sup>65</sup> The homogeneity that Menger was looking for, which he did not find because he did not overcome the issue of constancy, which theorists also unsuccessfully sought in the economic unit of measurement, a guide to regressive “currency policies”.

<sup>66</sup> Scientific problem that which Mises (1980) also did not overcome, which made it impossible for him to notice that subjective value is measurable: “*Measurement is based on the immutability of the managed unit. The unit of length is ultimately the foundation of measurement. The corresponding measurement is considered invariable*” (P: 325).

- Appreciate how a consistent theory, based on the laws of nature, explains the real world, where we see prices and not subjective values.
- Corroborate that the daily economic calculation, through the use of monetary prices, fully respects the laws of nature. That is, we are going to show that the daily economic calculation, through the use of money prices, is totally rational.<sup>67</sup>

The basis of the examples revolves around corroborating how money prices are a good guide to accept them as tools that arise from relative values. With which we are saying that they originate from the validity of the laws of wealth (subjective marginal utility) and exchange, and that the economic calculation of all manifestations of wealth is valid through the use of a neutral universal unit of measure — precisely by be carried out respecting the aforementioned laws.<sup>68</sup>

To demonstrate the above, we must only corroborate that the economic calculations that arise by applying the wealth law to quantities of a stock of economic goods, do not differ from the one that arises by applying them to wealth calculated as a function of currency prices.<sup>69</sup> Once this is achieved, we are in a position to adequately interpret the cases that we will present:

- 1) Economic calculation of the same quantity of the same economic good, with different prices.
- 2) Economic calculation of two different economic goods and the same good in different quantities.

In order to show that economic calculations at currency prices do not differ from non-currency ones,<sup>70</sup> we present the following table:

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<sup>67</sup> It is giving up those who discredit the economic theories that are based on an economically rational human being. The SSET shows that — in line with the fact that the human being who stands out from the rest of the living beings due to his rationality— the economy must explain the behavior of rational beings. But, which does not imply accepting that all the theories that have tried it are adequate.

<sup>68</sup> In other words, we are giving scientific rigor to Menger's (1985) suggestion: "... the analysis of the nature and function of currency teaches us that the different valuations we have been talking about... are usually more accurate and reasonable when they are expressed in money" (P: 244/5).

<sup>69</sup> In other words, economic theory must explain both a barter economy and a monetary one based on the laws of nature, without ad hoc theories — which culminate in the failed attempts to consider two worlds to balance: "real" and "currency", as if the currency is not real.

<sup>70</sup> With which we corroborate that the currency calculations of the observable world (prices) are reliable to understand the subjective unobservable world (subjective value) that gives rise to it. That is, through currency prices we observe the real world, which we understand based on the theories that explain what is observed (prices). On the contrary, the positivism of data without theories that allow us to understand them lacks scientific rigor (monetarism, "modern monetary theory, etc.), it is as if they made me interpret an X-ray or a laboratory analysis; the same happens with an official who takes measures based on prices, from a misguided theory about their meaning, that is why the consequences of state interventionism in the economic world (they can be seen in *Chapter XIX - Affected Capitalism in SSET 4th edition*).

<i>Apples</i>				
$q_i$	$U_q$	$P_{q(\$)}$	$q_{i(\$)}$	$U_{\$}$
1 <sup>a</sup>	4,00	3	3	4,00
2 <sup>a</sup>	2,00	3	6	2,00
3 <sup>a</sup>	1,33	3	9	1,33
4 <sup>a</sup>	1,00	3	12	1,00
	8,33			8,33

The table shows that we refer to a stock of 4 apples ( $4q$ ) valued at a unit price of 3\$.

- $q_i$ : indicates the order of the four apples ( $q$ ).
- $U_q$ : is the “physical” *marginal utility* of each apple, *expressed in apples* (hence the “physical” utility). Its values arise from applying the *general equation of wealth to the quantities of economic goods*:  $U_q = q_t / q_i$ .
- $P_{q(\$)}$ : is the unit price of each apple. It is repeated in the four blocks for exhibition purposes.
- $q_{i(\$)}$ : indicates the accumulated money price up to the  $q_i$  apple, which is obtained by the simple multiple of the figures in the columns  $q_i * P_{q(\$)}$ . Here it is important to appreciate that, for the purpose of applying the general equation of wealth when we use currency prices, 12\$ is conceptually equivalent — for the purposes of calculation based on the law of wealth — to the physical stock of 4 apples ( $q_t$ ), expressed in dollars. That is, in order to apply the law of wealth in physical units of apples, or currency units of prices, we can alternatively consider  $q_t = 4q$  and / or  $\$t = 12\$$ .
- $U_{\$}$ : is the currency marginal utility of each apple ( $q$ ), *expressed at currency prices* (hence the “monetary” utility), as we have applied the *general equation of wealth considering currency prices*:  $U_{\$} = \$t / q_{i(\$)}$ .

It is very important to appreciate what the underlined terms “physical” and currency mean, as the former refer to physical units ( $U_q = q_t / q_i$ ), and the latter to monetary units [ $U_{\$} = \$t / q_{i(\$)}$ ]. BUT, both corroborate the existence of the laws of wealth and exchange,<sup>71</sup> which implies rationality of the human being by guiding his actions based on money prices. That is, *prices are more than mere symbols of subjective value they are concrete data that make it measurable*.

The equivalence between  $U_q = U_{\$}$  corroborates the SSET, and it does so with forcefulness by observing that:

The subjective value is measurable in both physical and monetary units. Which is relevant based on:

- *Physical units* of an economic good:  $U_q$ .

<sup>71</sup> This shows the absurdity of doing economic theory based on the fact that the real world (without the presence of currency) is different from the currency world. This led to developing theories that try to explain the currency world without the existence of currency, absurd from the same formulation.

- *Currency units*, by using a unit of measure  $U_{\$}$ .

In this way, it is corroborated that currency manipulation (whether via quantity or price) is explained by the simple theory of the consequences of price control, no *ad hoc* theories of currency cycles are necessary, as the SSET has shown.

- The “*physical*” and “*currency*” measurability of subjective value implies two essential things that greatly distracted the theorists: 1) being able to measure the utility of a single manifestation of wealth (be it physically or monetarily), implies that the value of use (intrinsic) is pre-existent to exchange value (extrinsic) and determines it when a human action takes place; and 2) that the value of a single manifestation of wealth does not differ whether we calculate it in physical units or by using a unit of measure — Robinson measures subjective value on the island and in the city.
- In both cases (physical and currency) the total value of wealth  $4q$  is 8.33 times that of the unit of measurement represented by the marginal utility of the last unit of wealth considered (physically and monetarily). Which, by the law of wealth, is the lowest of all and therefore applies as a unit of measure (not to the value of all units), unlike considering prices, because the price of the last unit is equal to all the others (3\$).  
In other words, from the uniform unit prices (assigning the same price to all units of wealth) we have been able to calculate the existence of the different unit values (as their marginal value is ordinally decreasing) that make up wealth. *We have shown that the ordinal does not prevent the cardinal, or that the cardinal is compatible with the ordinal, which enables economic calculation, which involves measuring subjective value, physically and monetarily.*
- If we calculate the relative value of apples ( $q$ ) with respect to wealth considered as a unit of measure (\$), that is,  $v_{q(\$)}$  we have:<sup>72</sup>

$$v_{q(\$)} = 3 * 4 / 12 = 1$$

According to the SSET, the result of  $v_{q(\$)} = 1$  is only relevant in two situations, when it refers to a wealth relative to itself, which is not the case, and the one referred to the marginal utility of the last unit of wealth, which in our case is alternatively represented by  $4q / 4q$  or  $12\$ / 12\$$ . That is to say, we corroborate once again the correctness of the use of the **general equation of wealth** insofar as it is a faithful representative of the validity of the laws of wealth and exchange.

It is important to note the meaning of  $v_{q(\$)} = 3 * 4 / 12 = 1$ , as it refers to the **total units of \$** referred to the measurement of the **total units of apples**, it means that **both  $4q$  and  $12\$$  play as  $q_t$  in the total wealth equation, the essence of the feasibility of applying the general wealth equation, both in physical and monetary units, which gives more scientific rigor to the currency economic calculation. It is a sentence that corroborates the presence of rationality in the daily economic calculation.**

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<sup>72</sup> This is according to the formula in Table 6 of *SSET 4th edition*:  $v_{q(\$)} = P_{q(\$)} * q_t / \$_t$   $v_{q(\$)} = P_{q(\$)} * q_t / \$_t$ .

- **The validity of the *general equation of wealth*** of SSET, as it is the equation that allows economic calculation, within the framework of the laws of wealth and exchange, through observable prices. This is due to the fact that the origin of the *constant multiplier* of prices (over all calculated units) is in tune with the *monotony* of the general equation of wealth. By the inverse reasoning it follows that: *depending on the economic calculation through prices, the equation of value that explains its origin must be monotonous.*
- The possibility of carrying out the economic calculation based on money prices or relative values —exposed here—, had already been demonstrated in SSET (4th.e.) in its *chapter X - The economic calculation.*

It is worth making a synthesis, reiteration and extension, of what the simple practical exercise tells us, of real life. To the effect we see:

- That wealth is measurable, with which we are confirming that subjective value, insofar as it is wealth, is measurable.
- That there is an economic unit of measure neutral to the economic calculation, otherwise we would not have arrived at the equivalences between the columns  $U_q = U_{\$}$ . We have been able to calculate *one manifestation of wealth* as a function of another, used as a unit of measurement, and the calculations obtained did not alter the consequences of the presence of the Law of wealth — whether we measure as a function of (q) or of another wealth considered as a reference unit of measurement (\$), therefore  $U_q = U_{\$}$ .  
*I believe that this is the most important conclusion in the theory of economic calculation based on a reference unit of measure, which should end with two very expensive issues in economic theory: the “neutrality of the currency”, and assume that a proper economic theory explains both a barter and a currency economy.* This excludes any theory of the economic equilibrium of the “two worlds”, the real and currency, which give rise to the institutions that enable “public officials” to intervene in the economy to “balance the imbalances between both worlds”.
- The simple example of everyday reality explains that prices:

*They are not tools to do economic theory*, but must be explained by economic theory, as the SSET does.

*They are tools to guide daily life*, as they arise from the validity of the law of wealth. They are not mere symbols or signs of value.

- It is worth noting that one should not fall into the confusion of saying: if  $U_q = U_{\$}$  then prices are enough, and Mill was correct when he said that with them the issue of value was overcome.  
ON THE CONTRARY, we have shown that prices are a tool to discover the **different** unit values that gave rise to them. That is, from money prices we can calculate the marginal utility of each unit of wealth, although we do not need that calculation in daily life. This is given that we have demonstrated the reliability of prices to explain the rational behavior of the human

being — the SSET scientifically demonstrates the rationality of daily human economic behavior, it is how one lives with the law of gravity (SSET) without knowing about it. In other words, we have measured the marginal utility of each unit of economic goods, according to the *Law of wealth* (in order of decreasing marginal utility) through *uniform* currency prices, obtaining the same results as if we had applied the **general equation of wealth** to the physical units  $q_t$  and  $q_i$  — the “real” world of barter is explained with the same laws of the “currency world”, no ad hoc theories are needed (currency, interest, prices, equilibrium of two worlds: IS / LM, etc. ).

Well, from the enormous epistemological-academic step that we have taken to understand the foundations of the SSET, and to be able to explain the invisible world of natural laws from the visible world of money prices (the most difficult of the scientific task, in Einstein's words), let us continue to understand the world we observe every day. For this we present the two cases mentioned.

### **Economic calculation of the same quantity of the same economic good, with different prices**

73

Here we will scientifically explain what the senses show us in daily life. In this case we will show the “greater” utility obtained by a person who buys the “same” economic good in the market at lower prices — with which we demonstrate that the “same” economic good at different prices is not the same wealth, since that economics is about values, not economic goods.<sup>74</sup>

Taking advantage of the case already exposed, we now suppose that another person acquires the 4 apples ( $4q$ ), but at a price of 4\$ per apple instead of 3\$ as we saw before. Which we represent in this table, similar to the previous one:

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<sup>73</sup> Here we see different wealth as we refer to different prices of the same quantities of apples ( $q$ ).

<sup>74</sup> With which we are demonstrating the inconsistency of considering that all economic calculations imply universally equal prices, which is what underlies the idea that the market tends towards a price (including Marx), which circumscribes the economic calculation to the *hypothetical and non-existent case of perfectly informed markets in a framework of perfect competition*. On the contrary, the theory must explain the reality where the perfect knowledge of the man “who knows everything” is impossible, which attempts to explain based on the fallible condition of the human being, as well as the similarity of circumstances. In other words, we can say that the reality, which makes two people buy the “same” economic goods at different prices, is showing us that we are talking about two different wealth according to the spatial-temporal value circumstances. According to Mises, the “same coffee” in downtown New York is not worth the same as in a town in the interior, they are two different riches, the difference in price of which shows it. **If this is not understood in depth, we are in the theory of objective value, where assuming that two identical coffees have different prices is to assume that they are economically equal, which ignores the subjective valuation that gave rise to the different prices. The economy is measured according to value, the only way to explain the diversity of circumstances in which it is valued — the “same coffee” at a different price is not economically the same coffee. Here we corroborate that prices are adequate indicators to warn that the price difference of the “same coffee” tells us that this difference is supported by the subjective value theory: 1 $q$  to 3\$ is different from 1 $q$  to 4\$. In the popular saying: *the price makes the difference*.**



<i>Apples</i>				
$q_i$	$U_q$	$P_{q(\$)}$	$q_{i(\$)}$	$U_\$$
1 <sup>a</sup>	4,00	4	4	4,00
2 <sup>a</sup>	2,00	4	8	2,00
3 <sup>a</sup>	1,33	4	12	1,33
4 <sup>a</sup>	1,00	4	<b>16</b>	1,00
	8,33			8,33

As currency prices are faithful reflections of the laws of wealth and exchange, it is enough for us to refer to the highest price ( $P_{q4}$ ) as a function of the lowest price ( $P_{q3}$ ), since it acts as the unit of measurement because it is the lowest, and we have:<sup>75</sup>

$$P_{q(3/4)} = 4 / 3 = 1,33P_{q4}$$

Thus, the SSET corroborates that: common sense, which rationally guides our daily economic calculations, is totally correct: those who buy at 3\$ are “benefited” by 33% compared to those who buy at 4\$, this is so, while the 3\$, valued according to the price of 4\$ is 1.33 higher than this. Another way of expressing rational economic behavior, on a successful daily basis, is considering that someone with 16\$ can buy 4 $q$  at 12\$ and keep 4\$ in stock, which does not happen to those who buy from the same stock of currency 16\$. BUT, we know that 12\$\$ is a different wealth than 16\$, so the “benefit” should be considered as a popular expression of expressing the different valuation of the supposed same **wealth**.

In other words, we have corroborated that two supposed equal wealth of 4 $q$  are not equal when we express them in terms of their prices, given that 4 $q$  \* 3\$ = 12\$ is a different wealth from that of 4 $q$  \* 4\$ = 16\$, which is which indicates that the “same economic goods” at different prices imply the presence of different subjective valuations for both circumstances. In this way we warn that prices are reliable indicators to express the infinity of circumstances that determine subjective valuations, from which prices arise, with which we explain the economy of perfect, imperfect, monopolistic competition, wholesale prices, retail prices, etc. In other words, **the SSET explains the infinity of evaluative circumstances, which is why it can also explain the consequences of violations of the laws of nature, through state interference in prices.**<sup>76</sup>

Now we turn to the second case, which also corroborates how common sense rationally guides economic calculation.

***Economic calculation of two different economic goods<sup>77</sup> and the same good in different quantities<sup>78</sup>***

To explain this case, we compare the wealth represented by the 4 apples (4 $q$ ) at 3\$ per unit, with a wealth composed of 2 tables (2 $r$ ) at 100\$ per unit.

In order for the scope of the explanation to be greater, we are going to compare 2 units of each wealth (2 $q$  and 2 $r$ ), and then the total units of each of them (4 $q$  and 2 $r$ ).

<sup>75</sup> Given that we are talking about the same quantities, as a matter of proportionality, it is indistinct to refer to the currency price, as in this case, to do it with the total monetary wealth, which is the one that corresponds: 16/12 = 1.33.

<sup>76</sup> Chapter XIX - *Affected Capitalism*, from *SSET 4th edition*.

<sup>77</sup> Appels ( $q$ ) and tables ( $r$ ).

<sup>78</sup> 2 appels ( $q$ ), 2 tabes ( $r$ ), and 4 appels ( $q$ ).

We expose the table referring to the 2 tables ( $2r$ ) at 100\$ per unit, in order to compare it with the one that we already have of 4 apples at 3\$:

<i>Tables</i>				
$r_i$	$U_r$	$P_{r(\$)}$	$r_{i(\$)}$	$U_\$$
1 <sup>a</sup>	2,00	100	100	2,00
2 <sup>a</sup>	1,00	100	<b>200</b>	1,00
	3,00			3,00

Since we are in a different case from the previous one, here we must calculate based on the total currency wealth ( $W$ ) of both manifestations of wealth, and thus we have

$$W_{r(2)} = 2q * 100\$ = \mathbf{200 \$}$$

$$W_{q(4)} = 4q * 3\$ = \mathbf{12 \$}$$

It is clearly appreciated that prices are faithful demonstrations of the subjective valuation from which they derive, good  $2r$  at 100\$ per unit is valued at 16.67 times good  $4q$  at 3\$ per unit.

Now we are going to compare both economic goods, varying only the quantity of one of them, for which we incorporate the manifestation of wealth of 2 apples ( $2q$ ), maintaining its unit price of 3\$ of the first case:

<i>Apples</i>				
$q_i$	$U_q$	$P_{q(\$)}$	$q_{i(\$)}$	$U_\$$
1 <sup>a</sup>	2,00	3	3	1,00
2 <sup>a</sup>	1,00	3	<b>6</b>	2,00
	3,00			3,00

Comparing the three different manifestations of wealth, we appreciate that:

$$W_{r(2)} = 2q * 100\$ = \mathbf{200 \$}$$

$$W_{q(4)} = 4q * 3\$ = \mathbf{12 \$}$$

$$W_{q(2)} = 2q * 3\$ = \mathbf{6 \$}$$

Relating each of the three manifestations of wealth, at monetary prices, we have:

$$W_{r(2)(q4)} = 200\$ / 12\$ = \mathbf{16,67}$$

$$W_{r(2)(q2)} = 200\$ / 6\$ = \mathbf{33,33}$$

$$W_{q(4)(q2)} = 12\$ / 6\$ = \mathbf{2}$$

Again, common sense tells us that  $2r$  has a greater relative value to  $2q$  than to  $4q$  ( $33.33 > 16.67$ ); and that  $4q$  has a greater value than  $2q$ : which is to say that two tables are valued more than 4 apples and 2 apples, and that 4 apples are worth more than 2 apples.

In short, we have corroborated that the SSET explains in a very simple way that *the daily economic behavior of human beings is totally rational*, which implies accepting the theories that they explain in terms of optimization or efficiency. *The SSET shows that the economy tries to maximize, which is done in terms of efficiency.*

It is evident that the rationality present in common sense that guides our daily economic actions continues to surprise. The only thing missing was a correct theory that would give scientific rigor to the *satisfaction of simplicity*. In other words, economic theory does not need further development than that presented by the SSET, stripped of any *ad hoc* wild card. Once again, common sense demanded a response with scientific rigor, which arises from the appropriate theories.

We have corroborated that prices are consistent guides to express subjective values, which, because they are subject to the law of wealth, are decreasing marginal and determine the exchanges from which prices arise, visible entities. That is, the prices we see, which rationally guide our economic decisions, have full scientific support in the theory of diminishing marginal subjective value (this explains *everything that underlies the phenomenon of prices*, a task that Menger entrusted to the later generations to develop of the theorists).

In other words, just as the human being does not need to know the law of gravity, it is enough for him to see its consequences (he will move from the path of a piano that is moving in free fall towards him), the same happens with the economy, the being Human is guided by prices, he does not need to know the law of wealth that gives rise to them. It follows that any compulsive interference in prices (direct by fixing them, or indirect on quantities) will be punished by the natural economic order imposed by the laws of wealth and exchange, in the way shown by the SSET.

We have shown what perhaps Böhm-Bawerk (1998) meant when referring to the traditional structure, or old formula, of the law of supply and demand:

*“In my opinion the problem is solved if we introduce into the traditional structure the simple idea that price is entirely a product of men's subjective valuations ... Everything that was true and correct in the old formula finds, in this way , explanation and confirmation” (P: 283)*

Personally, I believe that this brief quote expresses the rejection that Menger expressed to Schumpeter about the Böhm-Bawerk theory, which posterity would take care of amending.

If we accept that Böhm-Bawerk argued that subjective valuations determined human actions, including exchanges, and that prices arise from there (with a bargaining process prior to exchange), it is evident that his prose was not adequate a reason that I think it would inflame Menger, while in it:

- It does not reject the generally accepted interpretation that supply and demand determine prices — which it does with the expression *“Everything that was true and correct”*. It seems that what Böhm-Bawerk tries to say is that behind supply and demand are subjective valuations, an inconsistent, imprecise and unnecessary detour, for Menger and SSET: *the reality is that subjective valuations determine exchanges, from where prices arise.*
- It is the same flawed interpretation that led Schumpeter to say that: for Menger the two blades of Marshall's “scissors” (supply and demand) were built only for utility. He did not notice that

Menger's "scissors" referred to two utility sheets of two different manifestations of wealth, unlike Marshall's that refers to the price of a single economic good in which their own curves face: demand (utility) and "your costs". The very clear example is that the two curves of Menger's "scissors" are curves of marginal profits of the goods whose exchange will determine the prices, there is no price, neither as ordered nor abscissa — Jevons was in the middle, crossed two curves of the same economic good for two different uses, which was "very close" to Menger's "scissors".

The curious thing about the confusion of Böhm-Bawerk is that he begins the treatment of the section, of which the quote is part, saying that he has reached there (P: 381), being able to explain economics without having referred to prices. It is a procedure that we have also used here and in SSET (4th edition), where prices appear as a data of human actions, which arise from the rational behavior of the human being according to the laws of wealth (subjective value) and exchange.

I believe that in this section the topic has been unraveled: prices are *very useful and necessary tools* for daily human action,<sup>79</sup> but their origin is not in the supply and demand curves, but in subjective valuations, which operate according to the laws of wealth and exchange.

We conclude the section by saying that the SSET has scientifically corroborated the subjective marginalism of Menger, and dispelled the existing doubts in Böhm-Bawerk regarding the origin and determination of prices.<sup>80</sup> We can also say that we have given a framework of scientific rigor to the spirit present in Mises's catalactics, insofar as we consider money prices as manifestations of our actions — which SSET corroborates by showing that behind them lie the natural economic laws of wealth and exchange,<sup>81 82</sup> which shows that rationalism is what drives human actions.<sup>83</sup>

Let us then see how the shortcomings of the economic calculation traditionally used (prices) are evidenced, as a consequence of having deviated from the postulates of subjective marginalism developed in the SSET (values).

### The failure of post-Menger economic theory

In economics, *the total is equal to the sum of the parts*, contrary to what is traditionally said: that the total is greater than the sum of the parts, assigning an additional "systemic" value to the addition function. BUT, in economics the parts and the totals differ depending on whether we calculate in values or in prices and that, as we have shown, the value of totals must be explained and understood, which are composed of units whose values are different (ordinally decreasing).

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<sup>79</sup> They are more than just signs, as the Austrian School describes them. That is why **profaning prices should be condemned with the same constitutional rank as the lack of freedom of expression — the linear relationship between price freedom and democracy is not by chance, and its inverse, lack of free prices implies the presence of authoritarianism**. In other words, price control alters the peaceful and natural order of human cooperation.

<sup>80</sup> Just as Hayek's doubt has cleared by trying to give temporary to the prices: *Annex X - Interest and price variation of SSET 4th edition*.

<sup>81</sup> They are also explained by decreasing subjective marginalism, not by supply and demand curves.

<sup>82</sup> The SSET specifies with scientific rigor and extends the concept of the impossibility of calculation in Mises's socialism — which SSET explains simply this way: without private property there is no exchange, without these there are no prices, which makes economic calculation impossible — to the **difficulties and consequences of the calculation with any intervention on prices**. The SSET demonstrated that with the use of a measurement unit, subjective valuation is preserved, which is achieved using the proportionality of currency prices. They are also explained by decreasing subjective marginalism, not by supply and demand curves.

<sup>83</sup> Interpreting as rationalism: acting according to natural laws (corroborated theories).

So let us look at the *theory of economic calculation* according to values (Menger's utility) and prices (Mill-Marshall's supply and demand).

### ***Economic calculation according to values***

Warned that intrinsic and extrinsic values can be expressed both in physical units ( $q$ ) and in monetary prices (\$), since both expressions arise from the natural laws that give rise to them, we continue the discussion considering that we can alternatively resort to physical expressions [barter ( $q$ ) or currency (currency prices  $P_{q(\$)}$ ), which arise from exchanges for currency].

To simplify, suppose that we refer to 3 different wealth that refer to the same economic good apple  $q$ ,<sup>84</sup> which happens considering different amounts. Suppose we have three totals of apple ( $q$ ),  $10q$ ,  $4q$ , and  $6q$ . The mathematical abstract tells us that  $4 + 6 = 10$ , let us see what economics tells us by considering units of apple ( $q$ ) instead of the abstract numbers of mathematics.<sup>85</sup>

According to our ***wealth equation*** we have made the following table, of decreasing marginal profits, for *each manifestation of wealth*, of the same economic good apple ( $q$ ), but different amounts (10, 4 and 6):

$q_t = 10$			$q_t = 4$			$q_t = 6$				
<i>Apples</i>										
10	$U_m$	$U_a$		4	$U_m$	$U_a$		6	$U_m$	$U_a$
1 <sup>a</sup>	10,000	10,000		1 <sup>a</sup>	4,000	4,000		1 <sup>a</sup>	6,000	6,000
2 <sup>a</sup>	5,000	15,000		2 <sup>a</sup>	2,000	6,000		2 <sup>a</sup>	3,000	9,000
3 <sup>a</sup>	3,333	18,333		3 <sup>a</sup>	1,333	7,333		3 <sup>a</sup>	2,000	11,000
4 <sup>a</sup>	2,500	20,833		4 <sup>a</sup>	1,000	<b>8,333</b>		4 <sup>a</sup>	1,500	12,500
5 <sup>a</sup>	2,000	22,833						5 <sup>a</sup>	1,200	13,700
6 <sup>a</sup>	1,667	24,500						6 <sup>a</sup>	1,000	<b>14,700</b>
7 <sup>a</sup>	1,429	25,929								
8 <sup>a</sup>	1,250	27,179								
9 <sup>a</sup>	1,111	28,290								
10 <sup>a</sup>	1,000	<b>29,290</b>								

It is clearly appreciated that the sum of the total accumulated values ( $U_a$ ) of the  $4q$  and  $6q$  do not coincide with that of the accumulated total of  $10q$ :

$$U_{a_{q(10)}} = 29,290 \neq U_{a_{q(4+6)}} = 23,033 = 8,333 + 14,700$$

Then, according to the values, we can say that the sum of  $4q$  and  $6q$  is not equal to the total  $10q$ . And this is so because in economics  $4q$ ,  $6q$ , and  $10q$  are not equal economic entities, each one is a different manifestation of wealth that is why the addition does not apply: it is as if they were apples

<sup>84</sup> With a universal unit of measure, this restriction is lifted, as we refer to infinity of manifestations of wealth.

<sup>85</sup> Perhaps this simple reasoning assumes that mathematics is not applicable to economics. On the contrary, the value of mathematics resides in that, because it is abstract, it adapts to the non-abstract entities of each science, as is the case of subjective value in economics.

and pears. *Mathematics has solved the problem of economic calculation for us, at the same time that it has confirmed that its subjective value element is not abstract, therefore, it is measurable.*<sup>86</sup>

BUT, in addition to appreciating that  $29,290 U_{a_{q(10)}} \neq 23,033 U_{a_{q(4+6)}}$ , the differences in values are also appreciated at the same level of quantity of the same economic good ( $q$ ), between the different manifestations of wealth:  $10q$ ,  $4q$  and  $6q$ . This can be seen considering that the unit 4 of  $10q$  is worth  $2,500 u_{10q}$  while the unit 4 of  $4q$  is worth  $1,000 u_{4q}$ , and the unit of  $6q$  is worth  $1,500 u_{6q}$ . This simple example confirms that the units of measurement for each of the three manifestations of wealth are different:  $1u_{10q} \neq 1u_{4q} \neq 1u_{6q}$ .

We can see what:

- As the quantity of economic goods increases, the value of the same unit **would increase** [ $v_{4(10)} = 2,500 > v_{4(6)} = 1,500 > v_{4(4)} = 1$ ]. This arises as a consequence of the fact that the unit of measurement of the  $4q$ , the 1 of the  $4q$ , has a higher value than the 1 of the  $6q$  and  $10q$  respectively.
- We also observe what: as economic goods increase, the greater the value of total accumulated wealth. fall of the economic unit of measure

Two circumstances that occur simultaneously without contradicting the law of wealth: the more wealth, the lower the value of the economic unit of measure, but the higher the value of the total wealth.<sup>87</sup>

Thus, in order to consider the full validity of the wealth law — fall of the economic unit of measure as the quantity of economic goods ( $q_t$ ) increases — we must compare the accumulated marginal utility of the last 4 units (because it is the lowest quantity of stock of units of the three cases considered) of each manifestation of wealth:<sup>88</sup>

$q_t = 10$			$q_t = 4$			$q_t = 6$		
<b>10</b>	$U_m$	$U_a$	<b>4</b>	$U_m$	$U_a$	<b>6</b>	$U_m$	$U_a$
7 <sup>a</sup>	1,429	1,429	1 <sup>a</sup>	4,000	4,000	3 <sup>a</sup>	2,000	2,000
8 <sup>a</sup>	1,250	2,679	2 <sup>a</sup>	2,000	6,000	4 <sup>a</sup>	1,500	3,500
9 <sup>a</sup>	1,111	3,790	3 <sup>a</sup>	1,333	7,333	5 <sup>a</sup>	1,200	4,700
10 <sup>a</sup>	1,000	<b>4,790</b>	4 <sup>a</sup>	1,000	<b>8,333</b>	6 <sup>a</sup>	1,000	<b>5,700</b>

The table clearly shows that, according to this criterion, the 4 units in the stock of  $10q$  and  $6q$  have a lower value than in the stock of  $4q$  ( $4,790 < 5,700 < 8,333$ ), which corroborates the validity of the **law of wealth**, and from our equation  $W = f(U, q)$ .

<sup>86</sup> Strong proof that wealth-value ( $W$ ) is an ordered set of utility and quantity:  $W = f(U, q)$ , and that mathematics applies to economics, insofar as it explains despite the fact that  $4 + 6 = 10$  and  $4q + 6q \neq 10q$ .

<sup>87</sup> In *SSET (4th e)* the subject is dealt with in *Chapter XVII Capitalism - Work and capital*.

<sup>88</sup> This is as wealth is exchanged or destroyed according to an order of increasing marginal utility (SSET), which is in line with Böhm-Bawerk (1998): “A good that you already have is valued for what is lost, this means that its value is determined by what it values the last or lowest need that the good satisfies.” (P: 263). It is a sentence with which Böhm-Bawerk ratifies the correctness of our axiom of the *distribution of wealth*.

### ***Economic calculation according to prices***

If we use the price of  $q$  from the previous exercise of 1,14\$ (the market one) per unit of  $q$ , we have these wealth values:

$$10q_{(\$)} = 10 * 1,14\$ = \mathbf{11,40 \$}$$

$$4q_{(\$)} = 4 * 1,14\$ = \mathbf{4,56 \$}$$

$$6q_{(\$)} = 6 * 1,14\$ = \mathbf{6,84 \$}$$

It is confirmed that the total is equal to the sum of the parts:  $4,56\$ + 6,84\$ = 11,40\$$ . And this is so insofar as with prices it is assumed that  $4q$  and  $6q$  belong to the total of  $10q$ , that is, with prices the economy would be explained in terms of the abstracts (prices).<sup>89</sup> By reverse reasoning we deduce that, against everything we have been taught: ***in economics prices are abstract entities (unit average of exchanged quantities), not the subjective values that give them origin, which make up the non-abstract element of the economy: the wealth.***

### ***Summary of the section***

In both calculations, the total is equal to the sum of the parts, but the parts, and therefore the total to which they belong, are different according to one or another theory of value that we adopt:

*With values:*<sup>90</sup>

- The ***total of each manifestation of wealth*** is the sum of its component parts:  $U_a = \sum U_i$ .
- Total different amounts of the same economic good — ignoring who values and the spatial-temporal moments for analytical simplicity — yield different unit values for each manifestation of wealth:  $1v_{x(a)} \neq 1v_{x(n)}$ .

*With prices:*

- The ***total of each manifestation of wealth*** is the sum of its component parts:  $q_t * P_{q(\$)}$ .<sup>91</sup>
- Total different amounts of the same economic good — ignoring who values and the time-space moments for analytical simplicity — are measured considering the same unit price for each manifestation of wealth, in flagrant violation of the *law of wealth*.

*Value versus prices conclusion:*

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<sup>89</sup> Which confirms that prices are abstract entities; that is why they belong to the field of observation. This confirms that data without prior theory have no scientific explanation, and that prices do not explain economics, just as telescopic observations do not explain physics — corroborate theories.

<sup>90</sup> We incorporate *Annex B* with the aim of clearing up a flawed interpretation, within the same authors who uphold subjective marginalism, by valuing wealth according to the marginal utility of the last unit considered, with which the invalidity of the Law of wealth.

<sup>91</sup> We replace the sum by the multiplication because all the units have the same price.

The economic calculation differs depending on whether we adopt one or another economic entity:

$$q * P_{q(\$)} \neq \sum_l^n v_{q(\$)}$$

It is worth closing this section by quoting Menger (2007):

“Note 18: ... Also the theory of supply and demand (that is, the theory of «effective» supply and of «effective» demand) is completely worthless as regards the theoretical understanding of the price phenomena, until that the highly complicated elements from which they arise, are not derived and limited to their elementary constitutive factors, and to the play of individual interests.”

It is appreciated that the SSET, by expanding and deepening the theory that Menger left us, has shown that: supply and demand lack scientific rigor to explain prices, their origin is in *highly complicated phenomena* that exceed supply and demand (unraveled by the SSET). Reflection that does not contradict the use of money prices in economic calculation, as we have shown.

We can conclude by saying that economic calculation implies solving the central issue of the economy, which is achieved by noting that: ***subjective value is the non-abstract element of the economy*** (instead of the abstract prices). Hence the enormous importance of having a consistent theory of the unit of measurement, in order to solve the problem of economic measurability with scientific rigor, within its peculiarity with respect to the other sciences: *variable economic unit of measure and its reverse causality, which lead to the double relativity of wealth*.

All this allows us to notice in a simple way the origin of the inconsistency of the current economic theory, which is why it does not configure a body of knowledge with scientific rigor so that it does not leave space for institutions that violate the laws of nature.<sup>92</sup>

BUT, we reiterate that: given the discrepancies, or diversity of criteria, within the thinkers of the Austrian School — between them and the internal doubts of each one of them —, regarding whether the economic calculation should consider as the value of all units to the marginal utility of the last unit, or considering the cumulative total of the marginal utilities, is that I incorporate *Annex B*.

### **Economic calculation with values and prices**

The SSET has shown that currency economic calculation can be carried out through the use of currency prices, or the relative values of each manifestation of wealth with respect to the currency.<sup>93</sup> Here we have reiterated how the value of the economic measurement unit is determined based on the wealth that is measured with it, the currency.

The time has come to summarize everything that the SSET leaves us about the calculation

$$W = q * P_{q(\$)}$$

$$W = \$_t * \sum v_{q(\$)}$$

<sup>92</sup> Among the issues of enormous relevance that the SSET resolved, related to what is discussed here, is the impossibility that the monetary interest ( $i_s$ : of the financial market) is equal to or less than the wealth interest ( $i_w$ : of the scope of all wealth) — Keynes's underlying idea to “expand the economy and employment” (“currency policies”), which Hayek failed to refute with scientific forcefulness.

<sup>93</sup> See *Chapter X - The economic calculation - How to measure wealth in SSET 4th e.*



We could synthesize expressing this equality of monetary wealth (**W**):

$$W = f(U, q) = f[P_{q(\$)} * q]$$

BUT, the fact that wealth can be calculated monetarily as a function of the sum of its values relative to the currency [ $\sum v_{q(\$)}$ ], and its total stock of \$ ( $S_t$ ), does not mean that this is the value of the wealth.<sup>94</sup> This is due to the fact that the extrinsic value of each unit of a manifestation of wealth, considered in the sum, is not equal to that of the other units of wealth from which they arise — by the law of wealth, the previous ones have greater value, and lower the later ones.

This is how the relationship between the intrinsic and extrinsic values of all wealth and especially that of currency is understood. Without the rigorous analysis in the definitions of the components of the economic calculation, and its strict deductive logical order arising from the economic laws of wealth and exchange, it is impossible to understand the economic calculation. It is a situation in which the current theories are found, where the institutions and currency policies come from. Now it is understood why currency crises are necessary and recurring, to detoxify to the economy from “currency policies”.<sup>95</sup>

Let us see the consistency of the economic calculation that we have developed, from the *SSET 4th e.*, for which nothing better than to submit it to *explain the economic evolution*.<sup>96</sup>

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<sup>94</sup> On the other hand, the SSET has shown that general price indices do not consider the variations in wealth that occur as a result of variations in the value of the currency.

<sup>95</sup> To which Hayek alluded, without scientific rigor, with his expression the *fatal arrogance*.

<sup>96</sup> Task that can be carried out after having developed the economic calculation presented here.

### III – THE MACROECONOMIC CALCULATION

In *Subjective Macroeconomics* (Bondone 2021- b) we have presented the following definition of macroeconomics:

**Macroeconomics studies data of aggregate magnitudes of individual economic entities that share the same dimension.**

In this way we see completely paved the way to do macroeconomic calculus theory, because the task consists of extending the microeconomic calculus theory that we have previously developed.

#### **Wealth law in macroeconomics**

How could it be otherwise, macroeconomics is also explained by the law of wealth. For this, nothing is more appropriate than to apply the **general equation of wealth** of the SSET, since its term **YES** has the character of general,<sup>97</sup> unlike the one claimed by Keynes with his “**general**” **theory**.<sup>98</sup>

#### **The general equation for macroeconomic wealth**

From the **general equation of wealth**, which we defined as follows:

$$U_{qi} = q_t / q_i$$

we define the general equation of macroeconomic wealth knowing that we have wealth whose unit of measurement operates as the unit for calculating all wealth ( $u_{\$}$ ).

Thus we have this general equation of macroeconomic wealth, based on a unit of economic measurement arising from the use of currency as such ( $\$$ ):

$$U_{\$i} = \$_t / \$_i$$

Given that  $\$_i$  includes all exchanges made through the currency, we know that  $\$_i$  is equivalent to the exchanges of the currency world, which we call  $W_i$ ,<sup>99</sup> which arises from valuing all exchanged wealth in currency prices, that is, we refer to a real and currency world:

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<sup>97</sup> It as arises from the summation of all its parts.

<sup>98</sup> While Keynes tried to explain from the general to the particular, it is evident that he is in the field of the theory of objective value (data has value per se of the society entity), versus our theory that considers the sum of subjective events as general arising from individual human acts that give rise to individual microeconomic human actions. In other words, the failure of Keynesian macroeconomics is to consider the proportionality of prices without noticing that they arise from the subjective relative value not proportional, but decreasing, a circumstance that places it as an exponent of the failed theory of objective value.

<sup>99</sup> In our example of exchanging 5.6q for \$ 6.4 we have  $\$_i = W_i = \$ 6.4$ .

$$U_{\$i} = \$_t / W_i$$

Since we are in the world of currency exchanges, we must enter into the macroeconomic analysis of exchange.

### ***Currency interest ( $i_{\$}$ )***

At this point, we must make a revelation of extreme importance in economic theory, provided by the SSET: since marginal utility is the dimension of the variation in wealth contributed by each unit of wealth (in this case the currency), this is equivalent to the concept of ***currency interest ( $i_{\$}$ )***<sup>100</sup> of the SSET, as it defines it as the value-price of economic time, which is represented (materializes) in the changes in wealth (currency), it appears that:

$$U_{\$i} = i_{\$}$$

Then we have:

$$i_{\$} = \$_t / W_i$$

Equation with which the SSET tells us:

- A theory of interest is not necessary, because it is understood by the law of wealth.
- Currency interest ( $i_{\$}$ ) is defined in the world of exchanges ( $W_i$ ) the world of finance, insofar as it is the one that is in need of liquidity.<sup>101</sup> Thus, in a very simple way we know the behavior of the financial world just by knowing the amount of currency and the exchanges that are made with it ( $W_i$ ), which is relevant to all wealth: knowing the total and exchanged stocks of wealth ( $q_t$  and  $q_i$ ).
- Precisely, by facilitating exchanges, the currency is distinguished by what the SSET called the *quantitative characteristic of the currency: its exchanges are higher than its stock*, that is, its rotation speed is very high as long as the same currency serves for infinity of exchanges ( $\$_i > \$_j$ ) — scientific precision to what Menger called increased marketability of the currency.

The same deductive logical analysis with which we have developed and understood the ***financial world of currency exchanges*** allows us to understand the ***world of all currency wealth (W)***, not just that exchanged ( $W_i$ ).

### ***Wealth interest ( $i_w$ ) or economic unit of measure (u)***

Since currency is also a unit of measurement of unchanged currency wealth, that is, of ***total currency wealth (W)***, we have:

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<sup>100</sup> Since currency is used as an economic unit of measurement.

<sup>101</sup> This is an appreciation that is in tune with the origin of the currency wealth as a universal means of exchange, which makes it highly probable that its unit value is considered a universal unit of measure.

$$U_{\$W} = \$_t / W$$

With which we can define the *wealth interest* ( $i_w$ ):

$$i_w = U_{\$w}$$

$$i_w = \$_t / W$$

BUT, as **we are referring to the calculation of total wealth** — we are considering currency as the unit of measurement for calculating all wealth ( $u_{\$}$ ) — it is no longer an act of exchanging currency for wealth, **which is why it is not the cross-correlation of the exchange that does apply with  $i_{\$}$  is applied**, a crucial circumstance in economic analysis, as we will see.

Then we have:

$$i_w = u$$

Now we turn to the analysis of the correlations between  $i_{\$}$  and  $i_w = u$ , with wealth ( $W$ ),<sup>102</sup> which so complicated the economics theorists, without consistent results.

### *Correlation between currency interest and wealth interest or unit of measure*

Then we have two manifestations of universal dimension, that of *currency interest* ( $i_{\$}$ ) and that of *wealth interest* ( $i_w$ ), which by definition always presents this relationship:

$$i_{\$} > i_w$$

This is due to the fact that  $W_i < W$ , with the same numerator  $\$_t$  in both equations.<sup>103</sup>

We see in a very simple way how the SSET uncovers the theories that promote the institutions to manipulate the monetary interest in order to “favor” the general welfare (greater occupation and generation of wealth). What is known as currency policy, based on Keynes's general theory (the claim to achieve that  $i_{\$} \leq i_w$ ).<sup>104</sup>

We have demonstrated the **general** character of our general wealth equation (which we may call **general microeconomic theory**), just as we have discredited Keynes's “*general macroeconomic theory*”.

Let us see below how macroeconomic calculation, which arises from *general* microeconomic theory, explains the simultaneously real and currency macroeconomic world,<sup>105</sup> for this we relate currency interest ( $i_{\$}$ ) and wealth interest ( $i_w$ ) with wealth ( $W$ ).

<sup>102</sup> The SSET has incorporated work, salary and wealth distribution into the economic correlations.

<sup>103</sup> This correlation explains in a simple way the consequences of altering the quantity of currency ( $\$$ ) on the world, the currency world and that of total wealth (unemployment, etc.).

<sup>104</sup> That is, the SSET with its simple expression  $i_{\$} > i_w$  completely invalidates Keynesianism.

<sup>105</sup> Unlike the two worlds (real and monetary) that give rise to inconsistent equilibrium theories that point to both being synchronized ( $IS / LM$ ,  $S = I$ , etc.). Which “unfailingly requires the *currency gods*”, members of the legal entities that enable them to such arrogance, which in turn are supported by failed economic theories, which are revealed here.

## Correlation between currency interest, unit of measure and wealth

To understand what lies behind monetary economic calculation, we must explain how monetary interest ( $i_s$ ) and wealth interest ( $i_w$ ) or universal economic unit of measure ( $u$ ) are correlated with wealth ( $W$ ).

### *Correlation of wealth with currency interest*

*Currency interest* ( $i_s$ ): the currency of exchange is included in the positive **cross correlation of the exchange** (SSET). Thus, the increase in its value relative to non-currency wealth [ $v_{s(q)} = i_s$ ] implies the increase in non-monetary wealth exchanged for it ( $q_i$ ):<sup>106 107</sup>

$$\uparrow v_{s(q)} = \uparrow i_s \leftrightarrow \uparrow q_i$$

In turn, the *Adam Smith Simple Correlation* (SSET) states that:<sup>108</sup>

$$\uparrow q_t \leftrightarrow \uparrow q_i$$

Thus we have:

$$\uparrow i_s \leftrightarrow \uparrow q_i \leftrightarrow \uparrow q_t$$

Based on the fact that the economic unit of measurement ( $u$ ) is a neutral entity to economic calculation, we extend the Adam Smith correlation to the world of currency wealth ( $W$ ):

$$\uparrow i_s \leftrightarrow \uparrow q_i \leftrightarrow \uparrow q_t \leftrightarrow \uparrow W$$

From where the correlation between **currency interest** ( $i_s$ ) and **wealth** ( $W$ ) arises:

### **Correlation of wealth and currency interest**<sup>109</sup>

$$\uparrow i_s \leftrightarrow \uparrow W$$

The relevant practical consequence of this correlation of the SSET, *the increase in wealth has a positive correlation with the increase in currency interest*, is shown by condemning all “*currency policy*”.<sup>110</sup>

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<sup>106</sup> It is a scope of the classical quantitative theory of currency, circumscribed to the market of monetary exchanges ( $W_i$ ) — developed here and in *Ch. 15* of *Theory of Economic Relativity* (TER).

<sup>107</sup> **Currency or financial interest** is defined in the liquidity market, the financial world of currency exchanges  $W_i$ .

<sup>108</sup> That arises as a consequence of the correlation between the increase in surplus wealth — achieved with specialized work enhanced by the help of capital — with the exchanges they generate.

<sup>109</sup> It is a simple expression of the shortage of currency “intuited” by Hayek.

### ***Correlation of wealth with wealth interest***

Here we are not facing a human action to exchange, but rather before the calculation of all manifestations of wealth. Reason why we are not facing the cross correlation of the exchange that we saw in  $i_s$ , we only stick to the simple interpretation of the equation of  $i_w = S_t / W$ , from which the following arises:

#### **Correlation of wealth and wealth interest**

$$\uparrow W \leftrightarrow \downarrow i_w$$

### ***Correlation between wealth, currency interest and the economic unit of measure***

We conclude with the correlation between the theoretical entities on which the economic calculation is based:

#### **Correlation between wealth, currency interest and the economic unit of measure**

$$\uparrow W \leftrightarrow \uparrow i_s \leftrightarrow \downarrow i_w$$

$$\uparrow W \leftrightarrow \uparrow i_s \leftrightarrow \downarrow u$$

Through this simple correlation, the SSET has shown that the simple foundations of Menger's<sup>111</sup> subjective marginal utility theory are necessary and sufficient to understand the relationship between wealth, currency, interest and the unit of measurement, knowing that prices are a simple visible manifestation of the entire economic world that originates human actions. In other words, we have demonstrated in a very simple way everything that economic theory has revealed, and it has been the origin of the inconsistent institutions that govern our economic and social life.

In the field of subjecting the *Theory of Economic Calculation* here exposed to severe corroboration, let us see how it explains the economic evolution of humanity.

### **Theory of economic evolution**

**Currency** is *wealth that satisfies liquidity*. The *discovery* of the currency allowed humanity to get out of the obsolete state of barter, which promoted the generation of surplus wealth destined to

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<sup>110</sup> In turn, the SSET has demonstrated the correlation between wealth and work (L), through the broad correlation of Adam Smith, then we have this correlation:  $\uparrow i_s \leftrightarrow \uparrow q_i \leftrightarrow \uparrow q_t \leftrightarrow \uparrow W \leftrightarrow \uparrow L$ , with which also derails the idea of generating work by inducing a decline in  $i_s$ .

<sup>111</sup> That the SSET summarizes in total and exchanged quantities of economic goods ( $q_t$  and  $q_i$ ) subject to the laws of wealth and human or exchange action, which are made visible through currency prices.

exchange, which was achieved through specialized work from which the invention-discovery of capital arises — a tool that allowed to multiply the result of the work, which is why currency is capital.

The prose of the *productive revolution through specialized work*, empowered by the tools that multiply its results (**capital**), called “industrial revolution”, is synthesized in the correlation of the natural economic evolution of the SSET: <sup>112</sup>

$$\uparrow H_L \leftrightarrow \uparrow k \leftrightarrow \uparrow W \leftrightarrow \uparrow q_t \leftrightarrow \uparrow q_i \leftrightarrow \uparrow i_s \leftrightarrow \downarrow u \leftrightarrow \downarrow P_{q(\$)} \leftrightarrow \uparrow H_s$$

### *The capitalist currency revolution*

In this way it is more appropriate to refer to the enormous expansion of wealth in recent centuries as:

$$\text{Capitalist currency revolution}$$

Then we deduce the positive correlation between currency and capitalism: <sup>113</sup>

$$\uparrow \text{Currency} \leftrightarrow \uparrow \text{Capitalism}$$

Expression where the double meaning indicates the reciprocal incidence of the evolutions of the currency and capital, **with which any attempt to pretend evolve by promoting the degradation of the currency, or hindering work and capital is derailed.**

*The function of the currency is to satisfy liquidity*, that is, to facilitate the exchange of surpluses arising from specialized work with the help of capital. This single function is sufficient to define the currency, which implies that many manifestations of wealth can exercise their function. A situation that completely lost economic theory, <sup>114</sup> as a consequence of not realizing that:

- Everything that is currency does not imply affirming that they are equal currencies (M1, M2, crypto currencies, gold, etc.), treating them as such is like assimilating all varieties of apples.
- The economic unit of measurement may not be the value of the currency, BUT the fact that the value of a currency is considered as the unit of economic measurement highlights the enormous importance of the **currency taxonomy** (money versus currency-regular credit or

<sup>112</sup> In here  $H_L$  is labor,  $k$  capital and  $H_s$  salary. In SSET 4th edition we can see the incorporation of higher variables that explain the economic evolution. As can be seen, natural economic evolution has nothing to do with the institutions that alter the natural order (currency institutions, price control, compulsive unionization, etc.).

<sup>113</sup> Understanding by capitalism the social economic system where the laws of wealth and exchange prevail, that drive-motivate the appearance of capital. Which allow the free manifestation of natural individual differences, being equal before the law.

<sup>114</sup> Especially not having treated with adequate scientific rigor the case in which credit occupies the function of currency, and its differentiation between regular and irregular credit (SSET taxonomy).

irregular). The value of a currency can be poorly assimilated because it is an “alternative currency substitute for exchange”.<sup>115</sup>

On the other hand, we have seen that the economic calculation needs to have a universal unit of measurement, then what better than the value of the currency that is of universal use.

It is clearly appreciated that the currency as a unit of measurement arises from the practicality for the calculation. In other words, that the relative value of a unit of currency is selected as the unit of calculation, it is a function that is assigned to the currency for satisfying the economic calculation, not for satisfying liquidity. Then, by satisfying liquidity, it acquires universal relevance in human relations, hence its usefulness as a unit of measurement.

From the foregoing it is very important to note that: the currency fulfills two completely different functions, and as such they represent different wealth. A matter that economic theory did not take with adequate relevance, it simply limited itself to studying the issue of the economic unit of measure from the theory of currency, which in turn was complicated by the lack of an adequate taxonomy, as we have indicated — at the beginning of the XXI century the TER and SSET would settle these circumstances.

The SSET perfected the economic analysis starting precisely from separating the *liquidity currency* from the *unit currency of economic measure*.<sup>116</sup> As a consequence of this, the price value of both manifestations of currency wealth is discovered, which it does through the entities *currency interest* ( $i_s$ ) and *wealth interest* ( $i_w$ ) or *economic unit of measure* ( $u_s$ ), having arrived at this correlation<sup>117</sup>

***Wealth has a positive correlation with the currency and negative with the unit of measurement***<sup>118</sup>

Thus, we appreciate that:

- The *liquidity currency* is the one that enhances the economic evolution currency ↔ capitalism by facilitating the exchange:

$$\uparrow i_s \leftrightarrow \uparrow W$$

The *liquidity currency* is worth more as the exchanged wealth increases (***law of exchange***).

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<sup>115</sup> A public or private title (debt or property) may well be a means of liquidity easily convertible into the currency whose value acts as an economic unit of measure, for which it must be nominated-quoted in it. In other words, a very liquid security will be denominated, or will be convertible in dollars but it is not a dollars.

<sup>116</sup> Added to the currency taxonomy of the SSET, which separates it between money and credit currency, and the latter is regular and irregular.

<sup>117</sup> You can see the complete development in *Chapter XIV - The economic time (the interest) of SSET 4<sup>a</sup> e.*

<sup>118</sup> If you want to destroy capitalism, destroy the economic calculation, which you achieve by destroying its currency. From this we deduce that a country where there is no "stable" currency prevents economic calculation, which, according to Mises, places it as a socialist country. From this we deduce that a country where there is no “stable” currency prevents economic calculation, which, according to Mises, places it as a socialist country.



- The *economic unit of measurement currency* is the one that calculates the economic evolution:

$$\uparrow W \leftrightarrow \downarrow u$$

The *unit of measure currency* is worth less as the wealth it serves for its calculation increases, and where its value comes from (*law of wealth*). We can derive that the decrease in the unit of measurement implies an increase in the ability to calculate — the law of large numbers — which has a positive effect on wealth.

Both manifestations of currency wealth, through the laws of wealth and exchange, explain with total clarity the impossibility of the constancy of the economic unit of measure, as well as how far-fetched and damaging its search implies (currency policies).

The simplicity with which the SSET demonstrates the economic evolution according to the correlation between the currency (\$) and the wealth (W) is appreciated, as well as solving the “*quadrature of the economic circle*” by Menger.<sup>119</sup>

Finally, we highlight the importance of noting the simplicity with which the SSET disqualifies the foundations of Keynesian,<sup>120</sup> Ricardian, Marxist, quantitative, etc. and everything that comes from the theory of objective value, support of the “currency policies”.

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<sup>119</sup> It is not difficult to explain the Argentine economic failure, which went from the podium of the developed world (beginning of the 20th century) to being equated with the marginal countries (beginning of the 21st century), without having been involved in the catastrophic world wars of the 20th century.

<sup>120</sup> The objective is to manipulate  $i_{\$}$  so that it equals, or is less than  $u_{\$}$  (“currency policies”).

## ANNEX A

### THE MEASURABLE VALUE IN MENGER

We have already referred to a quote from Menger, where he told us that “...*although it is true that value is a magnitude that can be measured, the measure does not belong to its essence*”, and we have saved the limitation of the essence, by realizing that the utility is the essence of value (together with quantity when it is scarce), since it is defined in terms of it. Here we are going to show how Menger implicitly expressed the certainty of our claim, which we do by showing that in his work he not only measured wealth but also used a unit of measure of utility to compare different manifestations of it.

To this end, we present the Menger table (1985 - P: 113), where it represents the importance of the different manifestations of satisfaction of needs, that is, wealth (I to X), and based on this, it assigns utility to the units that make up each of them:<sup>121</sup>

I	II	III	IV	V	VI	VII	VIII	IX	X
10	9	8	7	6	5	4	3	2	1
9	8	7	6	5	4	3	2	1	0
8	7	6	5	4	3	2	1	0	
7	6	5	4	3	2	1	0		
6	5	4	3	2	1	0			
5	4	3	2	1	0				
4	3	2	1	0					
3	2	1	0						
2	1	0							
1	0								
0									

Now we simply proceed to expose the same table, only that we present the utilities — which Menger assigns to the different manifestations of wealth<sup>122</sup> —, based on ordering them (in descending order) by equal value assigned to the first of them until the last, in each case (according to the law of wealth):

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<sup>121</sup> MENGER (1985) says: “We will mark with a 10 the importance of satisfying those needs on which our life depends and then, in decreasing numbers, with a 9, an 8, a 6 and so on, the following needs” P: 113. It is a sentence with which Menger measures all manifestations of wealth, and does so by means of a common unit of measure of utility.

<sup>122</sup> It is worth reiterating that our term wealth is equivalent to Menger's significance: “Suppose that scale I expresses the significance of the satisfaction of the need for food...” (P: 113).

I	II	III	IV	V	VI	VII	VIII	IX	X
10									
9	9								
8	8	8							
7	7	7	7						
6	6	6	6	6					
5	5	5	5	5	5				
4	4	4	4	4	4	4			
3	3	3	3	3	3	3	3		
2	2	2	2	2	2	2	2	2	
1	1	1	1	1	1	1	1	1	1
0	0	0	0	0	0	0	0	0	0

It is appreciated that at utility level 6, a unit of V is preferable over unit 6 of I, which provides 5 of utility to satisfy needs.

If we consider the graph as a coordinate system, where the column that rises from 0 to 10 is the ordinate, and the last row of zeros is the abscissa, it is evident that the descending line of shaded boxes, which indicate the utilities assigned to the first unit of each manifestation of wealth, we obtain our decreasing marginal utility curve of wealth ( $U_m$ ).

With the simple graphical presentation that we have carried out, we corroborate the anticipations regarding these essential questions about the measurement of the underlying value in Menger:

- *The subjective value is measurable.*
- *There is an economic unit of measurement, which is represented by the value of the last unit of wealth whose marginal utility is considered a unit of measurement. In Menger's example, wealth whose unit of measurement is universal to be compared with all the others is that relevant to wealth I with 10 units.*

We conclude that the analytical structure of the economic calculation presented here, which we have derived from the SSET (4th. Edition), responds to Menger's foundations, expanding and / or amending their own interpretations of them.

BUT, it would not be appropriate to terminate this annex without making a deserved reference to the foundations on which Böhm-Bawerk 1998 supported the measurability of subjective value, which he does in *Chapter X - Section II - The gradation of value and emotion* (P : 329-337).<sup>123</sup>

We can well summarize as a conclusion of the exposed economic calculation theory that:

**The economic calculation is feasible because the subjective value is measurable.**<sup>124</sup>

<sup>123</sup> It seems that the non-measurability of subjective value is represented by the “Austrians” after Menger and Böhm-Bawerk.

<sup>124</sup> This is a consequence of the presence of the law of wealth.

## ANNEX B

### TIMELINE OF THEORY OF ECONOMIC CALCULATION

Attentive to the relevance of economic calculation, the epicenter of economic science, it is essential to have a chronological overview of how its theoretical development was. Let us see:

- Economic theory went from the concept of *objective value* (goods have value *per se*) to the theory of *subjective value* (human beings assign value to economic goods).
- The subjective value theory adopted the law of marginal utility of a stock of a given economic good  $q$ : unit  $n$  of  $q$  contributes less marginal utility than unit  $n-1$ .<sup>125</sup> This task recognizes different instances, according to Hayek:

*Gossen*: its three laws place satisfaction (utility), which provides one thing to human needs, which is limited by quantity (physical or spatial scarcity). Although it is said that in Gossen the temporal aspect was not present, as a limitation of the valuation, this is not the case since every calculation implies determining with precision both the spatial and temporal scope to calculate: otherwise we could not affirm that it is they can eat two apples on an empty stomach, because once the first one is consumed, they are no longer fasting to consume the second, which makes it necessary to define a time for breakfast, which allows considering the second apple as well — that is, if breakfast it includes only the time to consume an apple, it does not include the second as pertaining to ending the fast.

*Menger* adds the temporary limitation of utility (satisfaction), and does so by referring to the production process, in time, of an economic good, establishing that its value determines that of all intermediate goods that intervene in its production. Thus it destroys: a) the objective theory of value, which was limited to the history-origin of the good that of the work incorporated to obtain it, with which the greater value of something that demanded less work could not be explained, and b) it upsets the entire theory of the distribution of wealth, between labor, land and capital.

- In this way, the value was referred to the utility that the economic good provides to the human being. Later, the SSET would specify the relationship between value and utility, assigning to this the function of being a value dimension; which it does by defining value as the utility that human beings assign to economic goods.
- The SSET, by defining wealth as the subjective value assigned to economic goods, is implying that wealth has magnitude. Thus, he generalizes the concept of subjective value to all manifestations of wealth, not only to that of a single economic good.
- **LAW OF WEALTH**: the SSET extends the law of marginal utility of an economic good to all manifestations of wealth: unit  $n$  of wealth provides greater utility than unit  $n-1$ .

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<sup>125</sup> We again emphasize utility as an essential part (required by Menger for its measurability) component of value, which is complemented by quantity (scarcity).

- For the purposes of applying the law of wealth, it is essential to identify a unit of measure of wealth, that is, a utility that serves as a measure of all utilities. Task that should be carried out within the framework of the LAW OF WEALTH: each unit of wealth has a different value from the others that compose it (whether of the same economic good, or of several once a unit of measurement is obtained homogeneous utility of all types of wealth), which is ordinal decreasing to the lowest of all, that of the last unit considered in the act of measuring. It follows that SSET considers subjective measurable value, as there is a dimension that defines wealth (subjective value), a very contradictory situation among theorists, and even within each one of them. This is based on the fact that it is considered that the human being can order preferences (ordinally) but not quantify (cardinally). The SSET shows that the use of prices (by all accepted for economic calculation) are numbers, which have an origin in the ordinal subjective value, which are what determine the exchanges, from where prices arise, otherwise they would not exist. That is to say, prices cannot arise out of nowhere, there must be a way to explain the underlying causes in the origin of prices (as Menger well postulated), since it is the general equation of wealth of the SSET.
- BUT, the SSET would solve another essential issue, which is to explain the economic calculation within the framework of the LAW OF WEALTH, **which is not feasible if we consider any of these alternatives as a unit of measure, of the economic calculation:**

*Prices:* as we have shown in this work, it violates the law of wealth.

*The marginal utility of the last unit of wealth:* although we know that all the authors of the Austrian School validate the Law of wealth, when it is time to define what is the marginal utility that must be considered to measure a stock of economic benefits, if the last is the unit, the accumulated unit values, or the value what activates the exchange (extrinsic value), we can appreciate discrepancies between them and each own confusion. Yes, while upholding the law of wealth they commit the epistemological error of assigning to a stock of economic goods the value of the marginal utility of a given unit of wealth (be it the latter or the extrinsic value — it being feasible that this coincides by be of the last unit). Thus no different from the error economical to calculate with prices, while all units that are part of a (total or partial) set of wealth are valued equally useful, which contradicts the LAW OF WEALTH.

In other words, the SSET reveals the error in the theory of economic calculation, either within the theory of objective value (prices), or within the theory of subjective value when the epistemological error of valuing all units in function of the marginal utility of a unit of wealth, be it the value of the latter unit, or that of the extrinsic value that activates a human action (for example, exchange) defined in this work. That is, one procedure (prices) fails by theory and the other by epistemology (this case is similar to Jevons' epistemological failure, denounced by the SSET).

### **The economic calculation in the SSET**

We can summarize how the SSET clears the confusion regarding the marginal utility function of the last unit of a wealth stock (be it a total or any of its partials). For SSET, the marginal utility of the last unit of wealth is the unit of measure of all the marginal utilities of the units that make up

that (partial) total, which does not mean that all the units have the same value, since this implies to forget the Law of wealth.

In other words, the SSET resolves the confusion regarding the importance of the value of the marginal utility of the last unit of wealth: it is the unit of measurement of all the previous ones, which are different, and greater according to the order they occupy, by law of wealth.<sup>126</sup>

We bring part of our traditional graph of decreasing marginal utility of the economic good  $q$ , where we indicate the quantity that gives rise to its exchange ( $5,6q$ ), and the level of its marginal utilities: from the unit  $5,6 u_{q10}$  it is  $1,786 u_{q10}$  and the accumulated until it is  $24,619 u_{q10}$ :

$q_x$	$U_m$	$U_a$
1	10,000	10,000
2	5,000	15,000
3	3,333	18,333
4	2,500	20,833
5	2,000	22,833
<b>5,60</b>	<b>1,786</b>	<b>24,619</b>
6	1,667	24,500
7	1,429	25,929
8	1,250	27,179
9	1,111	28,290
10	1,000	29,290

We are going to value the total stock of  $10q$  as we use prices, the marginal utility of the last unit, or the accumulated value of the marginal utilities of each of the  $10q$ .

*To measure wealth based on prices:* in the exercise the price was 1,142 \$, which implies measuring the 10 units of  $q$  at 11,42 \$. Which, depending on the relative value of  $q$  with respect to \$, implies valuing the 10 units of  $q$ , as a function of  $q$ , like this:  $11,42 * 0,952 = 10,97q_{q10}$ .

*To measure wealth based on the value of the marginal utility of the unit that determines the exchange (that of the unit  $5,6q$ ):* being the same  $1,786q$  it implies that the  $10q$  have a value of  **$17,86q_{q10}$** .

*To measure wealth as a function of the marginal utility value of the last unit of the stock of  $q$ :* since it is 1 it implies that the 10 units of  $q$  are worth  **$10q_{q10}$** .

*To measure wealth as a function of the accumulated marginal value of the 10 units of  $q$ :* it comes from column  $U_a$ , where the  $10q$  are worth  **$29,290u_{q10}$** .

It is clearly appreciated that the law of wealth determines how to measure, from a wealth stock, the accumulated marginal value up to the unit to be measured, the last unit being the unit of measurement of all the preceding units. This is the way to measure considering the LAW OF WEALTH; the other proposed forms directly violate the definition of the referred law.

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<sup>126</sup> Böhm-Bawerk was correct when he corrected the mistake of Wieser (who in this regard followed Menger's ruling), which valued all units with the marginal utility value of the last unit. Although he did not realize that it was a unit of measurement for all units, that later will made the SSET.

We can say that the doubts of the subjective economic calculation theory were in considering that all units of wealth should be valued taking the value of the last unit, instead of warning (as does the SSET) that this is only a unit of measurement of all units, where the others have greater value according to the order they occupy. Doubts that arise from confusing that the value of the last unit of measurement is the limit that triggers human actions — among them that of assigning the quality of an economic good to a quantity, which once exceeded indicates that it is no longer scarce —,<sup>127</sup> with the assigning the same value to all units. It is a situation that the SSET will finish solving.

That is, while the subjectivists were aware that the *value of the last unit* is very relevant in economic theory, they did not clearly notice that it serves to measure all wealth in terms of being the unit of measurement of all units, not to be the value of all units. This given that according to the law of wealth (decreasing value) it is the one of lesser value then it is contained in all the others. BUT this is not the value that should be considered to value all the units, and simply proceed to multiply them by the number of units to be calculated — an act of multiplication that is done using prices. On the contrary, economic calculation is an act of adding unit values that are different from each other, which are measured considering that of the last unit as the unit of measurement.

The SSET has correlated the act of multiplication of everyday economic calculation using money prices, with the act of subjective value addition that determines prices, as a result of which it has been able to demonstrate — through the general wealth equation applied alternately to quantities and currency prices of economic goods— that currency prices arise from relative values (not from supply and demand), therefore they are explained in terms of the natural economic laws of wealth and exchange. In other words, the SSET has demonstrated the validity of natural economic laws, whether we calculate in terms of units of economic goods (barter) or money prices (the so-called “indirect exchange” through currency) — this task was carried out in accordance with the observation of *the correlation between the proportionality of prices with the monotony of the general equation of wealth*.

The important thing is to note that the confusion about the aforementioned subjectivist economic calculation, especially in relation to the economic unit of measurement, is the origin of all the unnecessary developments of currency theory, especially those of the 20th century, as they tried to explain the economic calculation currency based on a special theory of currency, different from the economic theory that explains barter.

In order to measure the enormous importance of what we have shown in this work, it is worth highlighting a quote from Mark Blaug (2001) that presents a very adequate synthesis of the confusing chronological framework in which the theory of economic calculation was found:

“... But, the marginal utility is not, strictly speaking, the derivative of the utility with respect to the quantity, but the differential increase of the utility...<sup>128</sup> The modern textbooks still speak, sometimes, of the marginal utility as the utility of the last unit. This can lead to an error; the marginal utility of the last unit is the utility of each unit because any unit can be the last;<sup>129</sup> saying that marginal utility is the utility of the marginal unit implies that we can obtain the total utility by multiplying the marginal utility by the number of units consumed, which is incorrect...” (P: 337).

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<sup>127</sup> Subject on which there seems to be no disagreement as everyone adheres to that concept (Menger, Jevons, Böhm-Bawerk,...).

<sup>128</sup> As our *General equation of wealth* defines it, as it directly expresses the utility that each unit incorporates, it does not arise from the derivation of the total, but on the contrary, it will contribute to shaping it.

<sup>129</sup> Here our extrinsic value is implicit as an intrinsic value that manifests itself to activate a human action.

Without the rigor of the entities of intrinsic and extrinsic value exposed here, as well as some textual objection that can well be made, it is evident that Mark Blaug was in line with what we have exposed in this work — a statement of great scientific rigor inasmuch as it arises from someone who denied the fundamentals of the Austrian School, although it is said that at the end of his life he would end up accepting them.

### **Economic calculation and interest**

The SSET shows that the LAW of WEALTH makes a theory of interest dispensable, since this is the price of economic time, which leads the SSET to show that interest is equivalent to the concept of marginal utility (variation of wealth in time):

$$U_m = i$$

$U_m$  that the SSET defines as a function of the utility dimension ( $U$ ) and the quantity of economic goods ( $q_t$  and  $q_i$ ),<sup>130</sup> which we have corroborated in the currency world with the use of currency as a unit of measurement, through money prices:

$$U_m = i = f(U, q) = q_t / q_i$$

SSET demonstration that ends with the conflict over what determines the incidence of time in the economy, if prices (unfortunate, by the way) or value, confusion still present in **Hayek** — whose own recognition in this regard makes clear his **enormous honesty intellectual**.<sup>131</sup> This is a consequence of the inconsistency on the scope of the subjective value theory in economic calculation, that is, in all economic theory, as demonstrated by the SSET.

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<sup>130</sup> According to Böhm-Bawerk (1998): “*Utility and scarcity are the ultimate determinants of value*” P: 268.

<sup>131</sup> A broad treatment referring to Hayek's confusion of assigning temporality to prices can be seen in *Annex X of Subjective and Solidarity Economic Theory (SSET - 4th. Edition)*.



## ANNEX C

### ECONOMIC CALCULATION FROM UTILITY

This annex is dedicated to corroborating that the economy is explained only in terms of utility, which is demonstrated by making the economic calculation based on it, without resorting to costs or prices (supply and demand).

The aforementioned demonstration arises by virtue of the essential tools for economic calculation that the SSET discovered, referring to: the proportionality that underlies the use of money prices in economic calculation, which makes the general equation of wealth will be applicable to economic calculation currency, insofar as the unit of measure that arises from them is neutral to it; as well as having discovered that the marginal utility of every manifestation of wealth is the inverse of its rotation.

For its demonstration, we present another way <sup>132</sup> of calculating monetary wealth without knowing money prices, which we do considering that the marginal utility of wealth is the inverse of its turnover, as determined by the SSET. BUT, in this case we will use the rotation of wealth as a function of the amount of currency exchanged from the stocks of goods ( $\$_i$ ), in relation to the stock of currency ( $\$_t$ ) — we do not use the physical rotation of economic goods, but rather the rotation of the monetary quantum of the exchanges of each manifestation of wealth, with respect to the stock of currency — a task that we can do since we have demonstrated the proportionality of the economic calculation when it is done by means of prices, which preserves the neutrality of the currency economic unit of measure in the calculation, which in economics means not to alter the validity of the law of wealth when calculating.

Thus, from these data, without knowing the prices or quantities of economic goods exchanged — only the quantity of currency for which the economic goods were exchanged (total sales-purchases) —, <sup>133</sup> we calculate the marginal utility of the currency destined to exchange for a certain amount of economic goods ( $U_{\$i}$ ), and from it we calculate its rotation and from there we make the currency economic calculation.

To this end, we bring the data, which interest us, from Table 15 of SSET (4th edition), where we considered the market for 4 economic goods exchanged for currency:

$U_{\$i}$	$\$_t$	$\$_i$	$q_t$	$q_i$	$r_{\$}$	$P_{q(\$)}$	$W_i$
1,481	10	6,76	6	3,25	0,675	2,08	6,76
1,835	10	5,46	7	4,55	0,545	1,20	5,46
1,786	10	5,59	8	4,40	0,560	1,27	5,59
1,942	10	5,13	14	9,33	0,515	0,55	5,13
		<b>22,95</b>			<b>2,295</b>		<b>22,95</b>

<sup>132</sup> Different from the one already presented by means of the relative values in SSET 4th edition, and of the rotation of the stocks of economic goods.

<sup>133</sup> The SSET has already shown us the difference with the quantity theory of currency. Relevant clarification insofar as we refer to sales-purchases, which involve transactions.

In the first row we observe that 6.76\$ (columns  $\$i = W_i$ ) destined to exchange for 3.25 $q_1$ , determine a  $p_{q_1(\$)}$  of 2.08\$ for each  $q_1$  [column  $P_{q_1(\$)}$ ], with a stock total coin of 10\$ (column  $\$t$ ), which implies that  $U_{\$i(q_1)} = 10 / 6.75 = 1.481$  (column  $U_{\$i}$ ). Knowing from the SSET that the rotation ( $r$ ) of  $q_1$  is the inverse of its marginal utility, we have that  $r_{\$1} = 1 / U_{\$i} = 0.675$  (column  $r_{\$}$ ).

Based on the traditional formula of economic calculation, we obtain the monetary wealth exchanged — which we do by multiplying the quantities of economic goods exchanged by their respective monetary prices (column  $W_i$ ) — we observe a total currency exchange (purchases-sales) of  $W_i = 22,95\$$ .

BUT, we also arrive at this figure if we consider the accumulated rotations of all the manifestations of wealth valued monetarily (2,295) and we multiply it by the stock of currency 10\$:  $W_i = 22,95\$$ .

Let us see the reason for the result obtained, for which we derive formulas based on the general equation of the wealth of the SSET:

$$U_{\$} = \$t / \$i$$

$$r_{\$} = \$i / \$t$$

$$\$i = \$t * r_{\$}$$

By the sum of all currency exchanges (purchases-sales  $\$i$ ), we have:

$$W_i = \$t * r_{\$(a)} + \$t * r_{\$(b)} + \dots + \$t * r_{\$(n)}$$

$$W_i = \$t [r_{\$(a)} + r_{\$(b)} + \dots + r_{\$(n)}]$$

They are an equation and exercise that corroborate the advantage of the proportionality of prices and the monotony of the general equation of wealth for economic calculation.

This corroboration implies highlighting the enormous relevance that variations in the amount of currency ( $\$i$ ) have for the economic calculation. Its influence on the economy is of central importance, hence the zeal that must be put in the event that it is imposed by “currency authorities” instead of those required by the economy (the market). The greater or lesser predictability of the variations in the amount of currency is extremely relevant, so it is essential to identify the amount of currency that the economy needs, and that which arises for reasons beyond its control, read politics.

All this as a consequence of the fact that the usefulness of the currency emerges from the valuation that individuals make of it considering the political orientation of the government in power, which has an impact on the rotation of wealth, while a lower valuation of the currency implies a drop in trade in economic goods:  $\downarrow U_{\$} \rightarrow \downarrow q_i \rightarrow \downarrow q_t \rightarrow \downarrow W_i$ .

This is how the SSET explains in a very simple way the part of the variations in monetary wealth attributable to the currency (its valuation-utility) and to economic goods (its valuation-utility-rotation). This explanation is obtained by applying the laws of wealth and exchange to the currency, without the need for a special theory for it. That is, the chain of correlations of the natural economic evolution of the SSET is the direct transmission mechanism with which the SSET explains the correlation between the currency and the other manifestations of wealth to which it lends its usefulness as a means of exchange and unit of measurement, without the need for the so-called “indirect transmission mechanism” referred to by other economic theories, which did not

warn that a currency world should be explained from the same laws of a non-currency world — *ad hoc* theories of the currency and interest.

It is important to note that economic calculations based on rotations, whether of economic goods or currency, highlight the origin function of the currency, which is to act as a means that facilitates exchanges (origin of rotations).

## EQUATION OF ECONOMIC RELATIVITY

$$w = mq^2$$

$$(e = mc^2)$$

I have always given great importance to the epistemological aspect of scientific research, because I consider it a key tool to corroborate theories. <sup>135</sup>

On the other hand, I have always maintained that the point of contact between the epistemology of the different sciences was the deductive logic of human rationalism, so we should be prepared to find more similarities than differences between the scientific method of the different sciences. We can conclude that human reasoning allowed a body of knowledge that is the component of World 3 of Popper's ideas, as objective as the material world, which today we could well define as the world of knowledge.

This section will refer to what we call the *equation of economic relativity*, applied to three economic calculations, that of a stock of economic goods ( $q$ ), that of a stock of different currency manifestations of wealth ( $W_a, W_b, \dots, W_n$ ), and that of an exchange ( $q_i$  and  $\$i$ ).

**Economic relativity in units of economic goods**

Let us see the surprise that the relationship between economic and physical calculations brings us, for which we start from our simple table of calculating wealth composed of 10 units of the economic good  $q$ :

$q_x$	$Uq_x$	$Uq_{x(a)}$	$1/q_x$	$\sum 1/q_x$	$n/\sum 1/q_x$
1 <sup>a</sup>	10,000	10,000	1,000	1,000	1,000
2 <sup>a</sup>	5,000	15,000	0,500	1,500	1,333
3 <sup>a</sup>	3,333	18,333	0,333	1,833	1,636
4 <sup>a</sup>	2,500	20,833	0,250	2,083	1,920
5 <sup>a</sup>	2,000	22,833	0,200	2,283	2,190
6 <sup>a</sup>	1,667	24,500	0,167	2,450	2,449
7 <sup>a</sup>	1,429	25,929	0,143	2,593	2,700
8 <sup>a</sup>	1,250	27,179	0,125	2,718	2,943
9 <sup>a</sup>	1,111	28,290	0,111	2,829	3,181
10 <sup>a</sup>	1,000	<b>29,290</b>	0,100	<b>2,929</b>	<b>3,414</b>
	<b>29,290</b>		<b>2,929</b>		

<sup>134</sup> I am grateful to Victor Rioseco Ventura, for his guidance regarding the greater expository rigor of the mathematical aspects exposed in this annex.

<sup>135</sup> In the SSET I have demonstrated the failure in Jevons' epistemology applied to a correct theory, which ended up turning his epistemological development into an expression of objective value, against the theoretical subjectivism that he declaimed. Jevons believed that his epistemological "ingenuity" (explaining through the variation of prices) kept him within subjectivism, a situation on which all the theory developed later was based. Topic covered in *Annex VIII - Neoclassical Jevons of SSET 4th edition*.

$q_x$ : in the first column we indicate the 10 units according to their order, from the 1st to the 10th.

$Uq_x$ : is the marginal utility that each unit incorporates according to the general equation of wealth ( $Uq_x = q_t / q_x$ ).

$Uq_{x(a)}$ : is the accumulated marginal utility at the level of  $q_x$ . It arises from the sum of the preceding column.

$1/q_x$ : is the **unit harmonic value** incorporated by each unit  $x$  of  $q$ . This is a consequence of the fact that the integral of the general equation of wealth decants in the harmonic series, as expressed in *SSET 4th edition*.

$\sum 1/q_x$ : is the sum of the unit harmonic values, from unit **1** to  $n$ .

$n / \sum 1/q_x$ : is the quotient between each unit of wealth over each of the values in the preceding column that corresponds to it:  $4 / 2,083 = 1,920$ .

According to the definition of the **harmonic mean** ( $H$ ),<sup>136</sup> in our example we have that for the last unit of wealth

$$H = 10 / 2,929 = 3,414$$

In turn we have the inverse of the harmonic mean, which is the **arithmetic mean**<sup>137</sup> of the inverses of the values of the variable, which we call  $m$ :<sup>138</sup>

$$m = 1 / H$$

Thus, in our case we have:

$$m = 1 / 3,414 = 0,2929$$

Then we are in a position to define the:

General equation of economic relativity

$$w_q = mnq$$

We deduce that, when  $n$  is the last unit of wealth we have  $n = q$ , then:

$$w_q = m * q^2$$

<sup>136</sup> Given  $n$  numbers of  $x_1, \dots, x_n$ , the harmonic mean is  $H = n / \sum_{i=1}^n 1/x_i$ .

<sup>137</sup> Given  $n$  numbers of  $x_1, \dots, x_n$ , the arithmetic mean is  $m = (\sum_{i=1}^n 1/x_i) / n$ .

<sup>138</sup> Instead of  $m\theta$  as it is usually used.

It which can be seen in our example:

$$w_q = m * q^2 = 0,2929 * 100 = \mathbf{29,290}$$

In this way we ratify the calculation of total wealth ( $w_q$ ) — composed of a certain amount  $n$  of economic goods ( $q$ ) —, which in line with the **intrinsic imputation of wealth** <sup>139</sup> allows us to state the:

*Special equation of economic relativity* <sup>140</sup>

$$w_q = mq^2$$

### **Economic relativity of a set of manifestations of currency wealth**

Continuing with the general equation of economic relativity, we now consider all kinds of wealth situations where  $n \neq q$ , which will allow us to calculate a wealth ( $W$ ) composed of subsets of wealth ( $W_x$ ), that is:  $W = W_1 + W_2 + \dots + W_n$ . Where each one of the subset addends  $W_x$  is an element of the total of  $n$  that make up  $W$ , which implies referring to the world composed of diversity of wealth, which we can measure by the existence of a neutral unit of measurement (the value-price of the currency).

Then, from the general equation of economic relativity we can define the:

**Equation of currency economic relativity**

$$w_\$ = mn\$$$

Where  $w_\$$  is the total monetary wealth, of a subset of  $n$  elements of monetary wealth  $m$ , <sup>141</sup> measured as a function of the stock of currency  $\$$ .

Let us see a practical example to corroborate that the equation of economic relativity also explains the currency world. <sup>142</sup> With which we will have corroborated, once again, the microeconomic origin of macroeconomics — this being aggregates of those.

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<sup>139</sup> Implicit in the summation of the valuations of all the units measured.

<sup>140</sup> Any similarity with  $e = mc^2$  is not by chance, with the exception that  $q$  is not constant, unlike physical  $c$ , which further accentuates the concept of relativity in economics. BUT  $m$  does have a connotation of physical mass, because it refers to the composition of the value of wealth.

<sup>141</sup> Here the economic equivalent of the corporeality of mass in physics, with the corporeality of values in economics, is appreciated with scientific rigor, which confirms that subjective values are measurable, that is why the non-abstract element of the economy (to which mathematics can be applied as we do here) is wealth.

For the purpose of its demonstration and understanding, we bring here the data that interest us from *table 21 of SSET 4th edition*, of currency wealth composed of 5 elements, each of which is a manifestation of currency wealth:

### Currency wealth from relative values

$n$	$U_s$	$\$t$	$\$i$	$q_t$	$q_i$	$U_q$	$v_{\$(q)}$	$v_{q(\$)}$
1	1,481	10	6,75	6	3,25	1,846	0,803	1,246
2	1,835	10	5,45	7	4,55	1,538	1,193	0,838
3	1,786	10	5,60	8	4,40	1,818	0,982	1,018
4	1,942	10	5,15	14	9,33	1,500	1,294	0,773
5	2,000	10	18,00	1	0,00	3,600	0,555	1,800
<b>Summation <math>v_{q(\\$)}</math></b>								<b>5,675</b>

We already know from the SSET that non-currency wealth, at currency prices of the set of the 5 wealth elements considered, is \$ 56.75, which arises from our total wealth equation as a function of the **values** of each physics wealth manifestation **relative** to currency [ $v_{q(\$)}$ ]: <sup>143</sup>

$$R^T_{(\$)} = \$t * [v_{a(\$)} + v_{b(\$)} \dots + v_{n(\$)}] = 10 * 5,675 = \mathbf{56,75 \$}$$

Result that we corroborate from the *equation of currency economic relativity*:

$$\$t = 10$$

$$n = 5$$

$$m = 5,675 / 5 = 1,135$$

Then we have:

$$W = 1,135 * 5 * 10\$ = \mathbf{56,75 \$}$$

Which confirms the application of the *general equation of wealth* as soon as it converges in the harmonic series, this is a consequence of the fact that each term  $v_{q(\$)}$  within the summation is equivalent to its inverse when we express it in currency terms:  $v_{q(\$)} = 1 / v_{\$(q)}$ .

Another very simple way of calculating that we have carried out here is by using the rotation of the currency ( $r_\$$ ). To do this we simply multiply the coin stock (10\$) by the number of times its unit has rotated ( $56,75 / 10 = 5,675$ ): <sup>144</sup>

$$W_\$ = 10\$ * 5,675 = \mathbf{56,75 \$}$$

<sup>142</sup> Let us see a practical example to corroborate that the equation of economic relativity also explains the monetary world. With which we will have corroborated, once again, the microeconomic origin of macroeconomics - this being aggregates of those.

<sup>143</sup> Without considering the currency stock, which is obtained by adding 1 to the addition between brackets.

<sup>144</sup> Equation that arises (*SSET 4th edition*) simply by multiplying and dividing the wealth stock ( $W_\$$ ) by the currency stock ( $\$t$ ):  $W_\$ = W_\$ * (\$t / \$t)$ , where  $W_\$ / \$t = r_\$$ .

## Economic relativity in the exchange

Let us see how the equation of economic relativity explains an exchange, which is determined by two sets composed of a single element each: the quantities of economic goods exchanged ( $q_i$  and  $\$i$ ), in relation to the stock of currency ( $\$t$ ). For this, we only have to refer to its application in the exercise where we had  $10q$  and  $12\$$  whose exchange occurred at  $5,6q$  and  $6,4\$$ . There we have:  $5,6q$  with a marginal utility in currency terms of  $U_{\$i} = 1,875$ ,  $n = 6,4$ , and  $\$ = 12\$t$ . Then we deduct  $m = (1/1,875)/6,40 = 0,0833$ ,<sup>145 146</sup> with which we can determine the currency wealth exchanged:

$$W_{\$(i)} = 0,0833 * 6,40 * 12 = \mathbf{6,40\$}$$

## The economic relativity

We have confirmed, once again, that macroeconomic currency figures originate in the microeconomic world governed by the natural laws of wealth and exchange (where currency prices are determined). Then, transpolating physical quantities from the world of economic goods (“real world”) to the macroeconomic world of currency quantities (“currency world”) does not alter the natural order imposed by those laws.

We have shown that the **general equation of wealth** ( $U = q_t / q_x$ ), which decants in the harmonic series, is as useful a tool for economic analysis ( $w = mq^2$ ) as it is for physics ( $e = mc^2$ ).

The **equation of economic relativity** makes me see, from a distance, that it was not a mistake to have called my first book on economics *Theory of Economic Relativity* (TER), as it summarized the study of economic science on the behavior of wealth in time, then, **the study of variations in wealth implies understanding the relativity of economic time**. For this, nothing is more appropriate than using the **harmonic mean**, which is recommended for averaging speeds.

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<sup>145</sup> For the application of the equation of economic relativity in currency exchange, we must consider the amount of currency exchanged and the extrinsic value of the exchange expressed in currency units (1,875), where the sum of the inverse of the harmonic series is composed of the inverse of that single element (1/1,875).

<sup>146</sup> It can be deduced algebraically that  $m * \$t = 1$ .



## ANNEX E

### THE RELATIVITY OF MACROECONOMICS

In order to corroborate, once again, that macroeconomics is a simple summation of microeconomic data, and that extrinsic values have their origin in pre-existing intrinsic values, I present this section to relate the relative values of all manifestations of wealth with respect to the considered unit of economic measure, the currency [ $v_{q(\$)}$ ]. For this we will make a compendium of everything that the SSET (4th edition) has taught us and what is expressed in this work.

In this annex we are going to expand the way of expressing the transposition of subjective marginalism, arising from the quantities of economic goods (the microeconomic world), to the calculation made through the use of a universal measurement unit (the macroeconomic world), considering as such to the value-price of a currency unit.

According to the equation of total non-currency wealth presented by the SSET (4th edition),<sup>147</sup> we have this equation based on considering the relative values of each unit of an economic good ( $q$ ), with respect to the currency ( $\$$ ):

$$W = \$_t [v_{a(\$)} + v_{b(\$)} + \dots + v_{n(\$)}]$$

$$W = \$_t * v_{a(\$)} + \$_t * v_{b(\$)} + \dots + \$_t * v_{n(\$)}$$

Knowing that

$$v_{a(\$)} = U_a / U_{\$(a)} = (q_t / q_x) / U_{\$(a)}$$

But, if we consider that when calculating the unit  $x$  of  $q$ , we are referring to the last unit of calculation for that manifestation of wealth<sup>148</sup> we have that for each unit of economic goods calculated ( $a$ ), we are presented with  $q_x = q_t$ , then, for each unit considered we have its expression in currency terms:

$$v_{a(\$)} = 1 / U_{\$(a)}$$

In this way we can calculate the monetary values of each manifestation of wealth that we wish to carry out ( $W_x$ ), simply appealing to the multiple of the inverse of the marginal utility of the last unit [ $1 / U_{\$(n)}$ ]<sup>149</sup> by the stock of currency ( $\$_t$ ):

$$W_x = \$_t * 1 / U_{\$(x)}$$

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<sup>147</sup> To include wealth in the equation to that represented by the currency, we only have to add the addend 1 within the second term.

<sup>148</sup> In this sense as Marx Blaug said, in tune with the distribution of wealth of the SSET: for each human action any unit can be the last one, that is, it as long as any intrinsic value can activate a human action. It is here precisely where the SSET identifies the emergence of a subset, where  $q_n$  becomes  $q_t$ , and a new wealth is generated and economic unit of measure and economic unit of measure.

<sup>149</sup> Which we know is its rotation.

It is a currency expression of any manifestation of wealth that allows us to demonstrate how it is distributed according to the extrinsic monetary values that activate human actions, as well as its proprietary distribution.

For a simple demonstration, we will use the exercise in Table 20 of the SSET (4th edition), where we had a stock of 10\$ and five different manifestations of wealth:

$\$x$	$U_{\$}$	$1 / U_{\$}$	$W_{\$(x)}$	$W_i$	$W_{st}$
1,00	10,00	0,100	1,00		
2,00	5,00	0,200	2,00		
2,58	3,88	<b>0,258</b>	2,58		<b>2,58</b>
2,93	3,41	<b>0,293</b>	2,93		<b>2,93</b>
4,00	2,50	0,400	4,00		
4,58	2,18	0,458	4,58		
5,00	2,00	0,500	5,00		
5,15	1,94	0,515	5,15	<b>5,15</b>	
5,45	1,83	0,545	5,45	<b>5,45</b>	
5,60	1,79	0,560	5,60	<b>5,60</b>	
5,71	1,75	<b>0,571</b>	5,71		<b>5,71</b>
6,00	1,67	0,600	6,00		
6,75	1,48	0,675	6,75	<b>6,75</b>	
7,00	1,43	0,700	7,00		
8,00	1,25	0,800	8,00		
9,00	1,11	0,900	9,00		
10,00	1,00	1,000	10,00		
18,00	0,56	<b>1,800</b>	18,00		<b>18,00</b>
22,95	0,44	2,295	22,95		
33,81	0,30	3,381	33,81		
56,76	0,18	5,676	<b>56,76</b>		
66,76	0,15	6,676	<b>66,76</b>		
			<b>Totals</b>	<b>22,95</b>	<b>33,80</b>

In the first column ( $\$x$ ) we have indicated the quantities of monetary units, interleaving those that gave rise to some human action considered in the exercise: to exchange ( $W_i$ ) or not to exchange ( $W_{st}$ ).

Column  $U_{\$}$  represents the marginal utility, according to the *general equation of wealth* of the SSET ( $\$/\$x$ ), at each level of column  $\$x$ . In the next column its inverse, equivalent to the coefficient of rotation ( $r$ ) of  $\$x$  in relation to  $\$t$ .

Column  $W_{\$(x)}$  arises from applying the aforementioned equation of  $W_x$ , that is why it is the multiple of the figures in column  $1 / U_{\$}$  times the stock of currency of 10\$. Obviously it is similar to  $\$x$ , which was what it was intended to demonstrate. In this way we calculate, at currency values, each of the manifestations of wealth that we wish to make, for example the one that activates the exchange of 6,75\$ for 3,25q:

$$W_{3,25q} = \$t * 1 / U_{\$,3,25q} = 10\$ * 1/1,48 = 10\$ * 0,675 = 6,75 \$$$

We have highlighted in shading the extrinsic values (expressed in units of monetary measurement) that gave rise to the exchange activities ( $W_i$ ), and in bold those that gave rise to the actions of conserving (saving) wealth ( $W_{st}$ ). From this result, we obtain the monetary wealth

exchanged (22,95) and that kept in stock (33,80), which coincide with those of the exercise presented in SSET (4th edition).

We have shown that the general equation of wealth applies to the wealth exchanged and to that which remains in stock, as well as to that of an individual as a group of them. That is, we have shown that the ***general equation of wealth*** applies to the micro and macroeconomic world, which corroborates that the latter is a simple aggregate of the former.

In this annex we have rounded up the concept that economics deals with utilities, whether they are considered units of economic or currency goods, which are governed by natural laws, which implies that their violation violates human nature.

Personally, I am greatly gratified to have continued the foundations of Carl Menger (19th century) without which I would not have been able to reach the conclusions presented here, in TER and SSET. Relevant reflection when 150 years have passed since the appearance of his monumental work: **Principles of political economy**.

December 2021.

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