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Gorga, Carmine

The Somist Institute

30 May 2017

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Carmine Gorga
President, The Somist Institute
cgorga@jhu.edu

May 2017

Abstract

Concordian economic theory is composed of models that observe the economic system from the perspective of production, distribution, and consumption of wealth—as well as the system as a whole. These are specialized approaches that, studied separately, have tended to create separate schools of economic thought. Concordian economic theory does not only try to recover the core of wisdom that exists in every school of economic thought; it also lays the foundation for a commonality of language that will eventually allow for communication across the divide of the schools.

Concordian economic theory (Anon. 2002a, Anon. 2002b, Broski 2003, Gorga 2009, Gorga 2016a) is a framework of analysis that takes its lead from a fundamental change in the second equation of Keynes model of the economic system. The new equation, first formulated in 1965 and announced in Gorga (1982), separates saving from investment. From there, Concordian economic theory methodically studies the economic system from various perspectives. To achieve this aim, it distinguishes the real wealth of goods and service from financial instruments representing that wealth, stocks from flows, statics from dynamics and then, after interjecting into the system the monetary value of ownership rights over real as well as financial wealth, it organizes these elements into five models—or five sides—from which the system can be studied.

Alan Reynolds, M. L. Burstein, and Franco Modigliani have powerfully assisted in the development of this research framework for about thirty years.

This paper briefly reviews the methodology of Concordian economic theory and offers a schematic presentation of five models that study the economic system from five different perspectives. The paper also highlights how each model relates to various schools of economic thought. A few concluding comments point out that the new framework lays the foundation for a commonality of language that will eventually allow for communication across the schools.

In brief, while most economic theory today is focused on markets and trade, Concordian economics—not unlike classical economics—is a broad framework of analysis that encompasses trade as the resultant of forces that interact with each other in the fields of production of real wealth, distribution of the financial values of ownership rights over real and monetary wealth, and expenditure—or consumption—of monetary instruments. The economic system is more

than trade. The economic system, it is herewith assumed, is not a linear but a tridimensional object that can be studied from many points of view.

The Methodology of Concordian Economics

Concordian economic theory relies on standard mathematical procedures that are currently used by scientists and engineers (cf. Thompson, 1986). Rather than thinking in terms of points and planes (see Clower, 1960), it asks to think in terms of solids moving in space.

Concordian economics also relies on three ancient principles of logic: the principle of identity, which instructs us to give one meaning and one meaning only to each term of the discourse; the principle of non-contradiction, which instructs us to give one non-contradictory meaning to each term of the conversation, and the principle of equivalence, which allows us to escape the circularity of arguments inherent in only two terms of the conversation by extending the analysis to include a third term to which they both have to be equivalent (e.g., Suppes 1957 and esp. Allen 1970, p. 748).

These three principles are strictly applied in mathematics, in which the first principle is recognized as $A = A$; the second as $A \neq B$; and the third can be symbolized either as $A = B = C$ or $A \leftrightarrow B \leftrightarrow C$, with the latter formulation to be preferred where possible because its symbols clearly suggest the requirements of the relation of equivalence: the three terms have to be reflexive, namely, identical to themselves, symmetric, and transitive.

With this method of analysis, all terms are put in relation with each other; and, since each term has to pass each one of these tests for it to be an admissible element of the discussion, the entire chain of reasoning is placed on an objective and most reliable basis. The reasoning

eschews personal preferences and anyone can verify its validity. "Remorselessly" applying these principles (cf. Davidson 2003), Concordian economics obtains the following results.

Component Elements of Concordian Economic Theory

Friedrick A. Hayek (1994) said: "…one of the things I most regret is not having returned to a criticism of Keynes's treatise…." (p. 145); and in ([1968]1995) he more fully explained:

> When I look back to the early 1930s, they appear to me much the most exciting period in the development of economic theory during this century…. [T]he years about 1931,…. and say 1936 or 1937, seem to me to mark a high point and the end of one period in the history of economic theory and the beginning of a new and very different one. And I will add at once that I am not at all sure that the change in approach which took place at the end of that period was all a gain and that we may not some day have to take up where we left off then" (p. 49).

Gorga (2002, pp. 9-24) heeds this recommendation and makes three discoveries: First, that modern economics is mostly based, whether directly or indirectly, entirely or in part, on the system of thought presented by Keynes in the *General Theory*; second that, in turn, Keynes' system of thought is uniquely based on Adam Smith's definition of saving; and third that, contrary to common opinion, Keynes presented the inner core of that thought, not as a system of equations, but as a syllogism. This is, in fact, what Keynes (1936) ingeniously wrote: "Provided it is agreed that….

Income = value of output = consumption + investment.

Saving = income – consumption.

Therefore saving = investment" (p. 63).

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The recognition that this formulation is a syllogism, rather than a set of equations, fully explains Keynes' (1939) reaction toward econometrics and invites the application of principles of logic to verify the validity of his reasoning. This verification allows us to penetrate the "black box" of mainstream economics (e.g., Petrongolo and Pissarides 2001) and reveals that neither the definition of individual terms of this syllogism nor the relationships among them respect the basic principles of logic mentioned above. It is not the critical function of this analysis that is of interest here, but its constructive outcome. The key result of a logico-mathematical procedure, which is carried out in Gorga (2002, pp. 25-181) and can be replicated by any economist, is to unravel the term saving from its two-hundred-year-old constricting nexus to investment. Thus, freed of the saving/investment "quagmire," economic analysis can start anew.

Using primarily geometry, rather than mathematics or logic, both the critical and the constructive portion of this procedure can be rendered brief and direct. As is well known, microeconomic—as well as some macroeconomics—analysis is mostly enclosed in the demand and supply apparatus. Macroeconomic analysis is mostly enclosed in the flow of funds apparatus. These frameworks are diagrammed as follows:
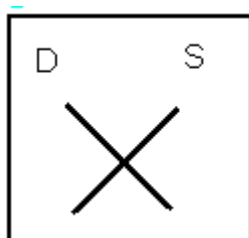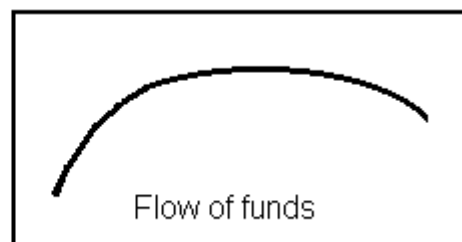

Figure 1. Microeconomics

Figure 2. Macroeconomics

If one starts the analysis from Figure 1, one needs to physically separate the two lines of demand and supply (of any item of wealth) from each other. If one starts the analysis from

Figure 2, one needs to cut the line into two segments in order to separate items of monetary wealth from items of real wealth. In either case, one obtains the following construction:

Figure 3. Two Segments

While these geometric transformations are simple, their economic implications are momentous. Since Figure 1 can be made to represent the analysis of saving and investment and Figure 2 can be made to represent the analysis of real goods and services as well as money, Figure 3 allows us to analyze saving separately from investment and real goods and services separately from money. And then economic theory can start anew.

Among all possible variations, Concordian economics chooses to frame the analysis through the lenses of investment, because this perspective eventually yields a new set of mathematical models through which every side of the economic system is gradually exposed to light. In Concordian economics there are two changes in the definition of terms. To respect the principle of identity and the principle of non-contradiction, saving—which in mainstream economics can literally assume 100,000 definitions (see, R. G. Goldsmith 1955-1956, p. 69n)—is _restricted_ to mean hoarding; and consumption—which in mainstream economics is arbitrarily (see Keynes 1936, p. 61) restricted to expenditure on consumer goods[1]—is _expanded_ to mean expenditure to buy any item of real or monetary wealth. Is not expenditure to purchase capital goods expenditure also?

Through these two adjustments, the language of economics is purified so that words in economics assume the same meaning as used by common mortals[2] and Figure 3 is restricted to represent real goods and services separately from money. Concordian economic theory then assigns to each type of wealth its own set of symbols. Thus, real wealth (RW) is identified as the

sum of consumer goods (CG), capital goods (KG), and goods hoarded (GH). M. L. Burstein, in conversation with the writer, defined goods hoarded as goods having zero use rate: They are goods that at the moment of observation, unless technological requirements demand otherwise, are used neither as consumer goods nor as capital goods.

Monetary wealth (MW) is identified as the sum of the following categories of thought: money supply to buy consumer goods (MS_c), money supply to buy capital goods (MS_k), and money supply to buy goods to be hoarded (MS_h) as well as money supply for short (MS_s), medium (MS_m), and long term (MS_l) monetary commitments and, finally, uncommitted funds (U), i.e., money hoarded.

In order to respect the principle of equivalence, wealth in general and each one of these categories of thought in particular are then observed also from the point of view of distribution of the value of ownership rights (DO). Whenever necessary, this point of view is represented by adding the symbol "O" in front of each category of thought.

These distinctions are the result of 27 years of relentless probing by Franco Modigliani in his office at MIT. Among his papers at David M. Rubenstein Library, Duke University, there are five folders that record our conversations and exchange of letters and papers.

Three pivotal categories of thought represent a series of essential perspectives through which the economic system can be observed: the perspective of production of real wealth; the perspective of distribution of ownership rights over real and monetary wealth; and the perspective of consumption—or expenditure—of monetary wealth. Then there is the perspective of the system as a whole. These perspectives can be respectively expressed in the following mathematical models.

Three Models: Production, Distribution, and Consumption

The first equation of the Model of Production is: $P = CG + KG + GH$. Clearly, neither consumer goods nor goods hoarded contribute to the next cycle of production in the market. Hence one isolates capital goods and writes the second equation as $KG = P - (CG + GH)$. Were there one sole producer in the economic system, this equation would repeat itself ad infinitum: During the next cycle, capital goods—in accordance with the laws of supply and demand—create consumer goods, goods to be hoarded, and additional capital goods. Yet, the economic system is a complex system. Some producers might eventually want to sell their capital goods to other producers. Then the right of ownership (O) has to be ascertained (by lawyers), before this key precondition for an exchange is established. In an ordered society, no exchange occurs without evidence of proof of ownership; the sales slip represents ownership of the chocolate bar at the store exit point. Thus, an intermingling of real goods and *legal* instruments occurs. In every day affairs, one asks, "Who owns this?" These decisions are represented as follows:

The Model of Production

$$P = CG + KG + GH$$

$$KG = P - (CG + GH)$$

$$KG = OKG.$$

Once the link between the real and the legal economy is established, it needs to be taken into account systematically: Ownership rights, in fact, blanket the entire economy, not capital goods alone. The ownership certification for each item of wealth is necessary because, while one might want to sell one's consumer goods only in exceptional circumstances, the readiness to sell capital goods and goods hoarded at the right price is assumed to be almost constantly in existence. (Were the description of the economic process in this paper to start with the narrative

of the exchange of money for goods, rather than goods for money, one would need to extend the analysis to include the ownership of all stocks of monetary instruments as well. This step is skipped in this paper.) Hence one writes the Model of Distribution (D), in which again the third equation asks for additional information. Here, as required by another major precondition for the exchange, it is the financial value of ownership rights that has to be determined (by accountants) before an exchange can occur. The value of ownership rights can then be exchanged for financial—i.e., monetary—values. In this fashion

<div align="center">

Model of Distribution

$D = OCG + OKG + OGH$

$OKG = D - (OCG + OGH)$

$OKG = I.$

</div>

Once again, monetary values are not confined to the value of capital goods—i.e., investment assets (I); rather, they blanket the entire economy. The need to obtain a model of the monetary economy is evident. The solution lies in the transformation of monetary stocks, namely $MW = MS_h + MS_k + MS_c + MS_s + MS_m + MS_l + U$, into the equation of monetary flows. Thus:

<div align="center">

$E = EMS_h + EMS_k + EMS_c + EMS_s + EMS_m + EMS_l + E_h,$

</div>

where E = Expenditure (or Consumption), EMS_h = Expenditure of the money supply to buy goods to be hoarded, EMS_k = Expenditure of the money supply to buy capital goods, EMS_c = Expenditure of the money supply to buy consumer goods, EMS_s = Expenditure of the money supply to buy short-term monetary instruments, EMS_m = Expenditure of the money supply to buy medium-term monetary instruments, EMS_l = Expenditure of the money supply to buy long-term monetary instruments, and E_h = uncommitted funds.

Simplifying, one obtains

The Model of Consumption

$$C = E_h + E$$

$$I = C - E_h$$

$$I = E.$$

These three models describe one cycle in the economic process from the act of production of real goods and services, the consequent automatic apportionment of (value of) ownership rights over these goods, to the exchange of the value of capital goods (or investment-assets, namely stocks or bonds) for monetary instruments (let us say, cash; or different stocks and bonds). Until consumer goods and goods to be hoarded are sold, they are part of a producer's capital assets. Thus, the analysis includes all—actual and potential—exchanges of capital goods, consumer goods, and goods hoarded for monetary instruments.

The three models describe how the three processes—complex entities in themselves—are related to each other to form the economic process as a whole (Gorga 2002, pp. 161-328). Again, while the logico-mathematical apparatus that allows for these transformations is rather long and complex, the geometry is simple and direct. From Figure 3, due to the requirements of the principle of equivalence, we pass to the analysis of the following construction:
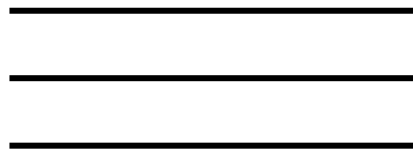

Figure 4. Three Segments

In order to see more clearly what happens within each line and then relate the content of each line to the content of the other lines, through a simple Smale transformation we enlarge

each line to obtain three rectangles—and then we put each rectangle in relation with each other.
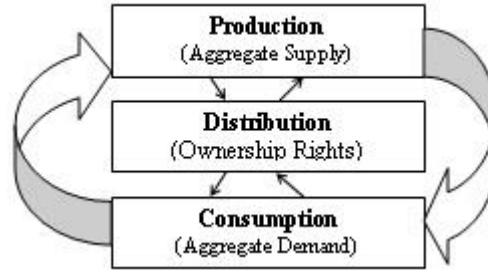
As follows:

Figure 5. The Economic Process

Figure 5 represents the economic process at the moment of the exchange. The unit of account can be the world economy, the national economy, the local economy, or the economy of an individual firm or individual person. Indeed, with the explicit addition of net transfers, it is also possible to use this framework to model the needs and the realities of government structures. Figure 5 reads as follows. When goods and services pass from producers to consumers, monetary instruments of a corresponding value pass from consumers to producers. For this transaction to occur, producers must have legal title to the wealth they produce and money must have already been distributed among consumers. Then, one cycle of the economic process is completed.

The description of how money is distributed among people, exciting and essential as the topic is, does not belong to economic theory but to economic policy.

The System as a Whole

If one links mentally the first equation given above to the last, one obtains a complete description of the economic system as a whole. One might even visualize the system as three huge aerial intertwined chutes, with many side entrances and exits, in which one drops a ball at

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one point, lets us say a ton of fluid chocolate, and follows it down to production of chocolate

bars; these bars have a certain economic value, which people might want to cash in (either by

sale or by getting a bank loan); this money is distributed among all those who produce the

chocolate bars—so they can go on transforming another ton of chocolate into umpteen chocolate

bars. A bit like the system that fuses chocolate, foil, and paper wrap to produce the chocolate

bar, the economic system produces at once real wealth, monetary wealth, and legal deeds.

Willy Wonka might be happy, but the description is cumbersome. And for it to

be transparent and accurate, one ought to keep three *separate* ledgers: one for the economic

value of the product; one for the monetary value of the product; and one for the apportionment

of the value of the product at each step of the way. (Actually, since monetary values are often

different from economic values, there is a need for four ledgers; this complication is passed

under silence at this stage of the conversation.) With a powerful assist from his wife, Joan, the

writer has lately solved this so far impossible task of keeping the three ledgers distinct and

separate from each other: they are now defined as p-values, d-values, and c-values (Gorga

2016b).

There are two mathematical models that describe the system as a whole and fuse the

three into one ledger: one model is synthetic and totally abstract; the other analytical. Let us give

a look at them.

Two Models of the System as a Whole

To see the process as a whole, one has to mentally rotate about each geometric center the

entire Figure 5 as well as each rectangle within that figure; one then obtains the image of four

overlapping circles; and what is a circle if not a two-dimensional image of a sphere? Real goods,

ownership rights, and money, in other words, operate as three concentric spheres—one into the other—in a non-Newtonian fashion, since both the value of money representing wealth and ownership rights are non-material entities that adhere to any item of real wealth all the time. Their integration forms the fourth sphere of the system as a whole.

The mathematics of the system as a whole follows models (cf. Thompson 1986, p.228) that are well understood by engineers and physicists. If the economic system ran completely free and smoothly, the three modules—namely, production, distribution, and consumption—would be represented by three interpenetrating spheres moving synchronously over time. In this case, the following model would suffice:

The General Synthetic Model

$$p^{\cdot} = fp(p,d,c)$$

$$d^{\cdot} = fd(p,d,c)$$

$$c^{\cdot} = fc(p,d,c),$$

where $p^{\cdot}$ = rate of change in value of total production, $d^{\cdot}$ = rate of change in the value of distribution of ownership rights, and $c^{\cdot}$ = rate of change in total expenditure.

But in economic reality the three modules are not completely free and completely smooth. To mention only one obvious interference, the tendency to economic inequality that exists in unruly markets is the most serious obstacle to a smooth performance of the economic system. (Issues of control are issues of economic policy.) As Mandelbrot (1983) was fond of saying, "Clouds are not spheres, mountains are not cones, coastlines are not circles, and bark is not smooth, nor does lightning travel in straight lines" (p. 1). Can economic systems be expected to be represented by perfect solids? It is necessary then to move on an understanding of the inner elements of the economic system. To this purpose, one can use the following

General Analytic Model

$$p \cdot = f(r,d,mec)$$

$$d \cdot = f(YL,rW,R)$$

$$c \cdot = f(w,d,m),$$

where r = the rate of interest, d = existing distribution of values of ownership rights, mec = marginal efficiency of capital, YL = labor income, rW = income from ownership of real and monetary wealth (capital income), R = rent from land and natural resources, w = value of real wealth, and m = value of monetary wealth.

Most of Franco Modigliani's contributions to the five perspectives outlined above were too fundamental, too continuous, and too subtle to be easily identified. However, the derivation of the distribution and consumption function in the present model from Modigliani's (1990) saving function is precisely documented in Gorga (1991).

On Econometrics

Functional relationships among the various elements of the economic system will come when the numbers are collected in accordance with the categories of thought of Concordian economics. That is a goal worth pursuing. In the meantime, considering the contributions of prevailing econometric models, there is not too much that will be missed during the wait. The world might be better guided by a sound understanding of the economic process than by wrong econometric models.

In the meantime, the writer has discovered a method to measure real wealth and to keep its measurement distinct and separate from monetary wealth (Gorga 2017).

This, of course, is the solution to a pesky problem that has beset mainstream econometrics since its inception. Recall the vain efforts by Keynes to measure real wealth in

"labor units." Recall the insistent resistance of Keynes to Tinbergen's "method" (e.g., Syll 2012).

Are These New Perspectives?

A deep historical analysis reveals that the perspectives isolated above are not new at all. *Mutatis mutandis*, and the necessary changes are mostly formal in nature, it is easy to isolate the major strands of thought and identify them through the major schools with which they are associated. Given these conditions, one can make the following statements.

The perspective of production is shared by Classical, neoclassical, Austrians, neo-neoclassical (especially those who are in search of the real business cycle), and—neglecting their policy positions—supply-side economists.

The perspective of distribution is shared by all schools of old and new Institutional economics, especially all those that are concerned with issues of economic justice. And in Institutionalism, as well, there are many strands: "law and economics" (e.g., Coase 1937), "choice theory" (e.g., Buchanan 2004), "behaviorism" (e.g., Rabin 2000), and "new comparative economics" (Djankov et al, 2003) cannot not be mentioned here.

The perspective of consumption—again, neglecting their respective policy positions as well as particular theoretical positions such as the different understanding of the function of interest rates—is shared by early monetarists (especially by economists like Antonio Serra [1613], the father of political economy in Italy, and Sir James Steuart [1767], the father of political economy in Britain) as well as modern monetarists, Keynesians, and post-Keynesians.

And, of course, most schools believe that they study the system as a whole.

If one keeps in the forefront of one's mind the economic system rather than the various schools of economic thought, one will find common language among the schools. Indeed, if one uses the above framework of analysis, one will be able to extract all the inner wisdom that exists in most schools. Then, one might attempt to truly understand the system as a whole.

Conclusions

This paper has offered a schematic presentation of five new tools of analysis—five models representing five perspectives—for the study of the economic system, as well as a brief historical excursus to show how each model relates to various schools of economic thought.

The hope of this paper is not only to recover the historical roots of the discipline as a whole, but especially to establish common language to facilitate communication across the schools.

With the recovery of their historical roots, economists will be more assured of where they came from and where they are going.

Certainly, passage to a new era can be more easily negotiated by revisiting what unites—and what separates—Keynes and Hayek (Gorga 2012).

Footnotes

[1] Houses are commonly considered an "investment" by most economists. Lena Novello, mother and daughter of Gloucester fishermen, knew that houses are consumer goods rather than capital goods, as generally assumed, because, as she famously used to say, "Boats build houses; houses do not build boats."

[2] Some implications of the unification of economic language and common language are explored in the Third Edition of *The Economic Process* (Gorga 2016a)

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