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The « Toolbox » of Leontief's Input-Output Analysis

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Abstract

Largely overlooked due to the division of our discipline into micro- and macroeconomics, Wassily Leontief's input-output analysis is not only a formal theory but also a research strategy. As formal theory, it describes economic activity based on that of the different industries, thereby leading to the calculation of labour-value, price determination and GDP. As research strategy, it is applied to ecological and energy transitions leading to the calculation of pollution-value and energy-value.

Keywords: Leontief, input–output analysis, Leontief technology, technological matrix, Leontief inverse matrix, production possibility frontier, labor-value, pollution-value, energy-value, equilibrium prices, augmented Leontief matrix, profit margin and structural profit margin, input–output table, distribution of national income, Perron–Frobenius theorems, factor-price frontier, ecological transition, energy transition.

***JEL* classification**: A23. C67. D33. D57. E01. E17. E23. J21. L16. L23. L6-L9. O13. P18. P28. Q4. Q5

Introduction

The name of Wassily Leontief, Nobel Prize laureate in 1973, is associated with input-output analysis, of which he is the founder. This analysis describes economic activity based on the functioning of industries, and from there leads up to the calculation of GDP. Largely overlooked due to the division of our discipline into micro- and macroeconomics, this analysis is not only a *formal theory* but also a *research strategy* that has given rise to multiple developments.

In these times, when the planet is being profoundly affected by President Trump's decisions on automobiles, chemicals, textiles, perfumery, electronic components and other industries, input-output analysis proves directly applicable to examining the consequences of such decisions.

I have recently publishe*d An Introduction to Economics with Leontief. A Tool for Ecological and Energy Transition* (De Boeck Supérieur, September 2024. In French). The present article outlines the numerous « tools » of the formal theory and the application of specific research strategies to ecological and energy transitions.

What follows is an interview with the author by one of his colleagues. My warm thanks go to him, who has preferred to remain anonymous. I am also grateful to Ragip Ege and Moïse Sidiropoulos for their reading of this text, their comments and their encouragement.

Who Was Leontief ?

Born in Saint Petersburg in 1905 and passing away in New York in 1996, Wassily Leontief came from a wealthy family of textile industrialists. The family business specialized in producing chintz, a cotton fabric used for upholstery. Chintz was manufactured with cotton, dyes, machinery and labor. The machines were imported from England, and the finished products were sold domestically or even exported. Any resemblance to the very foundations of input-output analysis is perhaps not mere coincidence !

Leontief was admitted to university at a very young age in a Russia that had by then become the Soviet Union. A staunch defender of freedom of expression, he was imprisoned several times. Interrogations by the political police took place at night, during which he was threatened with lines such as : « You know we can kill you ! ». Censored in 1925 for an article on political philosophy, he came to the conclusion that the Soviet Union would not allow him the freedom necessary for genuine scientific work. He therefore decided to emigrate to Germany, where he stayed from 1925 to 1931.

Though his life there was extremely difficult, Leontief managed to defend his doctoral dissertation *Economy as Circulation* in 1928. He had been initially supervised by Werner Sombart (1863–1941), a member of the German « Young Historical School ». Since Sombart had no understanding of mathematics, Leontief's thesis was later entrusted to the Polish mathematician L. von Bortkiewicz (1868–1931). Bortkiewicz is best known for having « corrected » Marx's error in Volume III of *Das Capital* regarding the so-called « transformation of values into prices ». As we shall see, input-output analysis provides its own resolution of this problem.

In his dissertation, Leontief first emphasized the *primacy of technology*. He argued that technological and economic approaches are not « mutually exclusive : they share an intimate relationship, since *we must understand the objective technological framework before we can begin to construct a theory of the economic system* » (Leontief 1928 [1991, 182]. Italics mine).

Secondly, he described the functioning of the economy in terms of a *circular flow* — a « *material approach* » in which there exists « a variety of inputs which may be used in the production of a particular good, and each good in turn may be used in a variety of ways (…). This leads to *a system of economic interrelationships between economic processes* (…). Circular flow analysis takes into account only those relations that allow us to return to the starting point » (Leontief 1928 [1991, 182]). To « return to the starting point » is simply another way of saying that everything is interdependent, that everything depends on everything else, and vice versa.

Leontief initially expected to pursue his career in Germany. Publishing articles in German helped him build a certain reputation, and in 1931 he traveled to New York at the invitation of Simon Kuznets (1901–1985), who would later receive the Nobel Prize in 1971. The following year, he was appointed at Harvard University, where he remained until his retirement in 1975. He became a full professor in 1946 and in 1948 founded the Harvard Economic Research Project. He moved to New York in 1975, where he established and directed the Institute for Economic Analysis.

In 1973, he was awarded the Nobel Prize « for his work on input-output analysis ».

What Is Leontief's Research Project ?

In the autumn of 1921, at the age of 16, Leontief entered the University of Petrograd (the new name for Saint Petersburg). He read extensively in the library — in Russian, French and German — and undertook « a thorough reading of the most important works in political economy since the 18th century » (Leontief 1984, 77–78). From this he concluded that the founders of modern economic science — Adam Smith, Ricardo, Malthus and J. S. Mill — saw *the national economy « as a self-regulating system made up of a large number of different but interconnected and therefore interdependent activities* » (1984, 23. Italics mine). In 1984, Leontief also noted that he had read Quesnay, though at that time he « was not yet thinking about input-output » (1984, 89).

Leontief dated the first formulation of his research project to 1931. In 1984, he expressed it as follows : « In my view, the comprehensive, 'general equilibrium', approach is the only theoretical approach that makes it possible to understand the economic system in the classical tradition (…). With Walras, general analysis remains highly theoretical. I then thought that we should develop *a theoretical formulation that could be applied empirically by analyzing the flows of goods* » (italics in the original, 1984, 84).

After intense work carried out with the help of a single research assistant, Leontief published in 1936 an article where the terms *input* and *output* appeared for the very first time in the history of economics. From the opening sentence, the reference to Quesnay is explicit : « The *statistical study* presented in the following pages may best be defined as an attempt to construct, on the basis of available statistical materials, a *Tableau économique* (in French in the text) of the United States for the year 1919 » (Leontief 1936, 105).

This was followed in 1937 by a second article in which Leontief presented the *theoretical model* associated with these data. Together, the two articles fulfilled the project Leontief had set himself five years earlier.

How Did Leontief Apply His Research Project ?

Leontief broke down economic activity by industries. More precisely, *he began with production of industries and the technical conditions of that production*. This starting point of input-output analysis thus lies at the very heart of economics. Since the production of any output requires a number of inputs — which themselves require other inputs, and so on — Leontief's framework highlights, in its own way, the *interdependence* of all economic activities.

In his 1936 article, Leontief divided U.S. economic activity for 1919 into 44 industries and presented, in a chart measuring 51 cm by 66 cm, *the very first input-output table in the history of economics*. The 1937 article developed a simplified version based on a 10-industry table, as Leontief had meanwhile discovered the possibility of carrying out the necessary calculations with the help of a newly invented « simultaneous calculator ». This 10-industry table thus became *the first fully computable input-output table ever constructed*.

What Is the Fundamental Assumption of Input-Output Analysis, and What Are Its Consequences ?

The key assumption — *linearity* — implies that *the various inputs of a given industry are proportional to that industry's output*. Drawing very likely on his family's business experience, Leontief considered that « individual factors of production are assembled in *fixed proportions*, rather than in random quantities », and added : « For every production process there exist some *ideal proportions* in which all the factors of production involved in that process must be brought together » (Leontief 1927, 11).

This assumption essentially applies to small variations in production ; a doubling of output, for instance, would likely require a reorganization of production. Nonetheless, linearity entails three major consequences :

1. The matrix representation of the economy.
   If we analyze the production of a unit of output in a given industry — say, a car — and note all the inputs required, then repeat the exercise for all industries, we obtain a square table. Thanks to the linearity assumption, this table can be read as a matrix — *a square matrix with nonnegative coefficients*. Its properties can therefore be studied using the mathematical results established between 1907 and 1912 by O. Perron and G. Frobenius.

2. Independence from the number of industries.

The properties of such matrices do not depend on the number of rows and columns. This offers a major pedagogical advantage : the theoretical presentation of input-output analysis can be done with just two industries — say « agriculture » and « industry » — without altering the results. Empirical applications, however, may include any number of industries, depending on data availability and the desired level of aggregation.

3. Separation of physical and monetary analysis.
   Because proportional relationships between inputs and outputs remain constant under small changes in production, the technological coefficients and the technological matrix are unaffected. As these coefficients underpin monetary calculations, the determination of prices and other monetary aspects of input-output analysis is not altered.

This use of matrix algebra in input-output analysis represents, to my mind, a remarkable symbiosis between economics and mathematics, since, as we shall see, certain theorems of matrix theory yield unexpected results with striking interpretations in terms of input-output analysis.

What Are the Key Concepts of Input-Output Analysis That Make Up Its « Toolbox » ?

The key concepts of this « toolbox » fall into three specific groups.

The first group includes *labor-value, pollution-value* and *energy-value*. These three tools derive directly from the interdependence of industries. To produce a car, direct labor is required within the automobile manufacturer. But if we also take into account the labor needed to produce tires, glass, steel, and so forth, we obtain indirect labor ; the sum of the two defines the car's labor-value. The same principle applies to the other two measures. For example, the assembly of a car may itself be relatively non-polluting, but if tire production is highly polluting, then the car's pollution-value may turn out to be very high. The same applies to energy. By incorporating interdependence, input-output analysis highlights its importance as a tool for evaluating the multiple challenges of ecological and energy transitions.

Secondly, the input-output « toolbox » contains two diagrams known as *frontiers*. The first is the *production possibility frontier*. Knowing the total amount of labor available in the economy, this frontier shows the different quantities of final goods that can be produced. This frontier appears at the beginning of all introductory economics textbooks. Input-output analysis goes further, however, by deriving the construction of this frontier directly from the physical data of the production of various goods.

The second is the *factor-price frontier,* which relates to price determination. These prices are considered equilibrium prices insofar as they equate the price of each good with the sum of its production costs, which include a certain level of profit. Under these conditions, the factor-price frontier represents the variation in the real wage — monetary wage divided by a price index — as a function of the profit margin. Unlike the production possibility frontier, this frontier does not appear in economics textbooks, even though it clearly illustrates the conditions governing the distribution of national income.

The third major tool is the *input-output table* (*IOT*), or *Tableau des Entrées-Sorties (TES)*. Along with the *Integrated Economic Accounts (IEA)*, it is one of the two main synthesis tables of national accounting. Both are based on the same statistical data but organize them differently : the first groups them by industry, the second by institutional sectors. Both, of course, arrive at the same result regarding GDP, the Gross Domestic Product.

How Do Physical and Monetary Analyses Work ?

Matrix algebra reveals its full analytical power here. In traditional algebra, the variable x represents a single element, while in matrix algebra, the matrix X designates a set of n variables.

In the case of input-output analysis **in physical terms**, these n variables are the total quantities of the n goods produced in the economy and, by convention, X is a single-column matrix. The technological matrix of production conditions for the different goods is a square matrix A with non-negative coefficients, containing n rows and n columns. The rules of matrix multiplication are such that the product AX, also a single-column matrix, represents the total intermediate uses required to produce X.

Subtracting intermediate uses AX from total production X gives the single-column matrix Y, which represents the final demand for each good. This relationship can be written as :

$$Y = X - AX$$

This matrix equation makes it possible to determine final demand from the technological matrix A and the total production matrix X. The same equation can also be written as :

$$X = AX + Y$$

This is *the first fundamental equation of input-output analysis* : total production equals the sum of intermediate uses and final demand.

The real power of input-output analysis for economic policy, however, lies in solving the inverse problem : deriving total production X from final demand Y. By rearranging the equation $Y = X - AX$, we obtain *the second fundamental equation of input-output analysis* :

$$X = [\, I - A \,]^{-1}\, Y$$

Here, $[\, I - A \,]^{-1}$ is the *Leontief inverse matrix*, and I is the identity matrix of the same size as A.

The Perron–Frobenius theorems ensure that the coefficients of this inverse matrix are non-negative. Otherwise, it would be possible — through some choice of Y — to obtain negative outputs for certain goods, which is economically meaningless.

At this stage, let L be the single-row matrix of labor inputs (in man-years) required to produce one unit of each good.

Total employment t associated with production X is then written as :

$$t = LX$$

From forecasts of future final demand Y, we can deduce both industry-specific and total employment levels through the relation :

$$t = LX = L\,[\,I - A\,]^{-1}\,Y$$

Extracting $L\,[\,I - A\,]^{-1}$ gives us the *labor-value* of the goods produced in the economy. The row matrix L of labor inputs corresponds to direct labor inputs, while $L\,[\,I - A\,]^{-1}$ incorporates both *direct and indirect labor inputs* required for net unit production of each good. This is one of the key concepts of input-output analysis toolbox.

In the case of a two-good economy, the equation above describes a straight line : the *production possibility frontier,* which introductory economics textbooks use to represent scarcity — in this case, the scarcity of labor. If v_1 and v_2 are the labor-values of the two goods, and y_1 and y_2 their final demands, then the equation of this line is :

$$v_1 y_1 + v_2 y_2 = t$$

This frontier is thus directly linked to the production conditions of goods.

Now let us turn to **price determination**. Let P be the single-row matrix of the prices of goods. The value of intermediate inputs per unit of each good is PA. Let w be the money wage, then unit labor costs are wL. Thus, total unit production costs for each good are :

$$PA + wL$$

If λ is the profit margin levied on all these costs, profit per unit produced is :

$$\lambda\,(PA + wL)$$

(If the margin applies only to intermediate goods, i.e., λPA, the calculations are of the same type, though numerical results will differ.)

Equilibrium prices are defined as equal to unit production costs. For all goods, we thus have :

$$P = (PA + wL) + \lambda\,(PA + wL) = (1+ \lambda)\,(PA + wL)$$

Rearranging gives :

$$P = wL\,(1 + \lambda)\,[\,I - (1+ \lambda)\,A\,]^{-1}$$

This is *the third fundamental equation of input-output analysis*. Equilibrium prices therefore depend on the money wage w, the profit margin λ, and production conditions represented by the technological matrix A and the labor input matrix L. The matrix $(1+\lambda) A$ is called the *augmented Leontief matrix*, and similarly, $(1+\lambda) L$ is *the augmented labor input matrix*.

This formulation also shows that it is not possible to derive monetary prices P directly from labor-values $L [I - A]^{-1}$, as Marx attempted in the so-called « transformation problem ». Instead, one must go from the augmented labor input matrix $(1+\lambda) L$ to prices P, using the money wage w and the augmented Leontief matrix $(1+\lambda) A$.

For equilibrium prices to exist and be positive, the matrix $[I - (1+\lambda) A]$ must be invertible and its inverse must have non-negative coefficients. The Perron–Frobenius theorems confirm both conditions, as long as the profit margin λ lies between zero and a maximum value λ_m, which I call the *structural profit margin*. This value depends only on key characteristics of the technological matrix A, specifically its dominant eigenvalue. Thus, depending on the balance of power between workers and capitalists, the profit margin ranges between zero and this maximum, determined by physical production conditions.

Finally, let us consider the *factor-price frontier,* which shows the variation of the real wage as a function of the profit margin. In a two-good economy, take the price p_1 (for example, the price of the « agricultural good ») as the benchmark for living standards. The factor-price frontier is then a curve showing variations in the real wage w/p_1 as the profit margin λ changes. Its equation depends only on the elements of the technological matrix, labor inputs and the profit margin.

Once prices are determined, input-output analysis concludes with the last key concept of its toolbox : the *input-output table*. Returning to the full set of economic activity data in physical terms, we organize all intermediate and final uses into an *interindustry transactions table*. By multiplying the entries of the first row by the equilibrium price of the first product, those of the second row by the equilibrium price of the second product, and so on, we obtain *the input-output table in monetary terms*.

Applications for the Ecological Transition ?

As early as 1970 — two years before the publication of the Meadows Report *Limits to Growth* — Leontief published an article showing how to integrate pollution into input–output analysis (Leontief, 1970). The major contribution of this article was to account for pollution as a « negative good » : while it is released in the course of production, it does not increase the well-being of final consumers.

Leontief's article describes an economy with only two agents : households and firms. Firms produce two goods — « agricultural » and « industrial » — while each releases the same solid pollutant into the atmosphere. This pollutant is removed by the activity of a third industry, the *anti-pollution industry*. The pollutant thus appears as an intermediate product, while the purpose of the anti-pollution industry is to reduce its final use.

The same linearity assumption applies and, from this, a generalized technological matrix A^* is built for the case of pollution. From this, one can derive both the direct and indirect pollution per unit of final demand for each good — what Leontief called the *pollution-value* of each good.

Leontief resolved the main difficulty in accounting for pollution as a « *negative good* » by starting from the equilibrium conditions of physical quantities, generalized to include pollution.

$$X = [\, I - A^* \,]^{-1}\, Y$$

The third equation in this matrix system concerns pollution. It takes the form of the difference between the quantity of pollutant released into the atmosphere and the quantity eliminated by the anti-pollution industry : it represents the amount of pollutant not eliminated, i.e., *the tolerated level of pollution*, which is by definition positive. As this difference is written in algebraic terms as $-y_3$, in contrast to all the other variables in input-output analysis *the variable* y_3 *is therefore negative*. It has to be entered as such in the calculations : *Leontief thus treats pollution as a negative good*. Given the tolerated pollution level, one can then derive the interindustry transactions table recording all physical data for the economy : intermediate consumption, labor inputs, industry-specific pollution, final demand, etc.

In my own generalization of Leontief's model, I study *two tolerated levels of pollution* instead of the single level used by Leontief, which makes it possible to show the impact of anti-pollution policies on economic activity. To each level I associate *three financing scenarios* instead of Leontief's two : from complete financing by households to complete financing by firms, with an intermediate case where firms eliminate half of the pollution they generate. This threefold comparison highlights the socioeconomic stakes of environmental policy : whether pollution control is financed by households or by firms has very different implications for economic policy and for its acceptance.

The link between pollution control and employment is infinitely more complex than the linear relationship Leontief built into his model, and pollution goes far beyond solid emissions. Nonetheless, the ability to separate the determination of physical quantities from the determination of prices — thanks to Leontief's linearity assumption — makes it possible to identify how pollution-control standards and financing arrangements affect overall economic outcomes, including output, employment, prices and the structure of relative prices.

What Applications for the Energy Transition ?

Concerns over energy and its role in the economy emerged at the beginning of the 1970s, as with the environment, but for different reasons. Economic activity was becoming increasingly dependent on oil-based energy sources, and the first oil shock of 1973 accelerated awareness of this dependence among both policymakers and researchers.

Researchers sought to extend the basic input–output model by adding linear coefficients to calculate energy intensity — the *energy-value* of goods. This is the sum of the direct energy used in producing a good and the indirect energy used to produce its inputs. For example, the energy consumed on an automobile assembly line plus the energy needed to produce the tires, glass and steel.

In the rows and columns of the technological matrix, alongside the various goods appear the *different categories of energy* used to produce them. From this matrix, one can derive the Leontief inverse and then extract the sub-matrix of energy-values for different goods.

A key specificity of energy accounting is the distinction between *primary and secondary energy*. Primary energy sources (crude oil, coal, solar power) feed into production directly, while secondary energies (refined petroleum, electricity) are derived from primary ones. This raises the issue of energy conservation between a given primary energy and its secondary energies.

Numerically, *energy conservation* implies that in the column for a given good, the energy-value of the primary source (say, crude oil) equals the sum of the energy-values of the other energy goods (refined petroleum, electricity, etc.).

Since the late 1970s, another method has been developed to integrate energy into the input–output framework. This « *hybrid-units* » method expresses energy flows in energy units and non-energy flows in monetary terms. A common physical unit is the BTU (British Thermal Unit), which makes it possible to homogenize different energy sources. Proponents of this method do not see it as a replacement for the traditional approach. Instead, it facilitates empirical applications and has the advantage of adhering to « energy conservation laws » — something the traditional method guarantees « only if energy prices are uniform across all consuming industries » (Miller and Blair 2009, 401).

What conclusions do you draw from input-output analysis ?

The first conclusion is that *input-output analysis fully accomplishes the research project Leontief set for himself* : « to develop a theoretical formulation that could be applied empirically by analyzing the flows of goods ». The essential element of this formulation is that *it starts from production,* knowing that everything else derives from it through the productivity of the economy.

The second conclusion can be measured by the range of concepts of input-output analysis toolbox. In their physical form, they are : *technological coefficients, Leontief technology, technological matrix, Leontief inverse matrix, Leontief process, the interindustry transaction table, the production possibility frontier, labor-value, pollution-value, and energy-value*. To these must be added the monetary analysis concepts : *equilibrium prices, the augmented Leontief matrix, profit margin and structural profit margin, the input-output table, the distribution of national income between wages and profits, and the factor-price frontier*.

Despite its obvious scope, input-output analysis does not claim to be a universal principle of explanation. This is clear, first, in the analysis of production : the available quantity of labor is largely determined by *demographic factors*. The choice among final uses of different goods is *a societal choice,* involving not only households and firms but also the state. Next, the level of profit margin is determined by the *balance of power* between workers and capitalists. This margin remained relatively stable during the postwar boom years but, following the neoliberal turn under Margaret Thatcher in 1979 and Ronald Reagan in 1980, it shifted to a much higher level that now prevails internationally, notably through offshoring. Finally, decisions about tolerable levels of pollution, how to finance pollution control, and the use of energy are heavily conditioned by *state intervention* in the form of laws and regulations. Each of these areas of choice opens the door to *interdisciplinarity*.

What other developments has input-output analysis seen ?

Input-output analysis is not limited to what I have just described. Since Leontief's founding articles in 1936/1937, it has been developed in many directions. For Leontief, input-output was not only *a formal theory*, as outlined earlier, but also *a research strategy*, as we discussed in relation to ecological and energy transitions.

This strategy led to considerable developments. To start with Leontief's own work : as early as 1953, he turned to *structural change, dynamic and interregional analysis*. Studying U.S. international trade, he arrived that same year at empirical results that contradicted the claims of classical trade theory. Known as the *Leontief paradox,* these results sparked an extensive literature (Leontief 1953).

In 1977, with A. Carter and P. Petri, Leontief published for the United Nations a *multiregional model of the world economy*, later translated into French as *1999 : L'Expertise de Wassily Leontief* (Leontief, Carter & Petri, 1977). The study's ambitious goal was to « reduce by the year 2000 the gap between rich and poor countries by accelerating the development of the latter, while safeguarding the environment and natural balances » (back cover). Its conclusion : « Nothing is decided; it will be difficult, but it is possible — provided that social and political reforms are carried out in poor countries and that major changes occur in the international economic order, which presupposes a change of attitude by the rich countries ». This was written in 1977 ; we are now in 2025…

Leontief also continued to pursue his « primacy of technology », already posited in his 1928 doctoral thesis, by studying *technological unemployment* caused by machines replacing humans. Initially optimistic, he changed his mind in 1996, believing that future technologies would tend to reduce the role of human labor in production. For him, such a reduction implied the need for significant changes in the social system, notably through income transfers.

Other scholars also extended input-output work. Richard Stone, Nobel Prize 1984, developed *national accounting matrices* that broadened the input-output framework. Other developments included *computable general equilibrium models*, Clopper Almon's *INFORUM model* and *Statistical Decomposition Analysis*. Moreover, most major economic models contain substantial input-output submodels. In France, this was true of INSEE's *Modèle Dynamique Multisectoriel* (*DMS*) of 1987, whose very name referred to input-output analysis.

To conclude this survey, let me mention that in 1998, Kurz, Dietzenbacher and Lahr compiled 85 major articles from across the input-output field into a volume of nearly 1,500 pages (Kurz, Dietzenbacher & Lahr (eds.) 1998).

What, in your view, is the pinnacle of input-output analysis ?

For me, the pinnacle is *the existence of the structural profit margin*. Let us return to the factor-price frontier and start with a zero-profit-margin scenario. In this case, all value-added goes to workers, and one can compute equilibrium prices for goods. Now increase the profit margin : equilibrium prices rise, and national income is split between wages and profits, with the profit share increasing alongside the margin. The key question is whether there exists a maximum profit margin — at which point all income accrues to capitalists, and workers receive nothing. These are the two extremes of income distribution.

The pinnacle of input-output analysis is showing that the maximum profit margin — *the structural profit margin, a monetary variable — is in fact determined by the physical conditions of production*. Technically, it is calculated from the dominant eigenvalue of the technological matrix that reflects physical production in each industry.

I like to illustrate this with an analogy. A car engine has specific technical characteristics — power, acceleration, fuel consumption,… Based on these, engineers determine the maximum revolutions per minute the engine can safely reach ; beyond this, the engine physically explodes. In input-output analysis, the analogy is : beyond the structural profit margin, the economy « explodes », because it is no longer productive enough to meet capitalists' demands for profit margins.

Why were you drawn to input-output analysis ?

Unless one is forced into it, choosing a research field is akin to falling in love. As Montaigne said of La Boétie : « Because it was he, because it was I ». Justifications can be found afterward. In my case, I felt an early affinity with Leontief and his input-output analysis, which viewed the economy holistically and captured the interdependence of activities both theoretically and empirically. Looking back further, during my preparatory classes for the « Grandes écoles », I absorbed large doses of mathematics. The only chapter that stayed with me to the point of being able to write my book without reopening a math textbook was the one on matrix algebra ! My affinity with Leontief needed no further analysis : it was simply him and me. All I had to do was follow in the footsteps of this great man, whose Nobel Prize was richly deserved.

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