

Boianovsky, Mauro

Working Paper

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CHOPE Working Paper, No. 2017-18

Provided in Cooperation with:

Center for the History of Political Economy at Duke University

Suggested Citation: Boianovsky, Mauro (2017) : Macroeconomics the Latin American way: Sunkel and the quest for a structuralist model, CHOPE Working Paper, No. 2017-18, Duke University, Center for the History of Political Economy (CHOPE), Durham, NC

This Version is available at:

<https://hdl.handle.net/10419/172310>

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MACROECONOMICS THE LATIN AMERICAN WAY:
SUNKEL AND THE QUEST FOR A STRUCTURALIST MODEL

by

MAURO BOIANOVSKY

CHOPE WORKING PAPER NO. 2017-18

OCTOBER 2017



Macroeconomics the Latin American way: Sunkel and the quest for a structuralist model

Mauro Boianovsky (Universidade de Brasilia)

mboianovsky@gmail.com

A Spanish version of this paper will appear in *Oswaldo Sunkel del estructuralismo ao neoestructuralismo: la travesía intelectual de un desarrollista*, ed. by M. Torres, Santiago, CEPAL, 2018.

Abstract. The paper provides a narrative of the effort to develop a structuralist macroeconomic model in Latin America, as seen through the eyes of Chilean economist Oswaldo Sunkel (b. 1929). Sunkel faced the problem of how to model structuralism, an indigenous Latin American contribution to economics and to stabilization and development policies, put forward in the 1950s-1960s. It is shown how Sunkel deployed Schumpeter's 1954 distinction between "vision" and "scientific models", and how he took the Keynesian multiplier and Domar's growth equations as starting-points for his own formulations, instead of Lewis's 1954 model of a dual economy. Sunkel regretted the difficulties in formalizing the concept of "structure" and "structural" changes. Eventually, Sunkel became a co-founder of Latin American neo-structuralism in the 1990s, which is now regarded part of international heterodox economics in general.

Key words. Sunkel, structuralism, models, Latin America, development macroeconomics

JEL classification. B22, B31, B50

1. Schemes and models of explanation

The controversy between “structuralists” and “monetarists” that took place in Latin America in the 1950s and 1960s was the most important debate in the history of Latin American economics. It happened before the 1960s/1970s macroeconomic argument involving monetarists and Keynesians in the northern hemisphere. Indeed, Campos (1961) and others introduced the terms “monetarist” and “monetarism” in Latin America before they became widespread in the US and the UK. Unlike the later Anglo-Saxon controversy – and the 1950s demand-pull vs. cost-push inflation discussion – the Latin American debate was not about the specification of the aggregate demand side, but about changes and composition of aggregate supply and the relation between economic development and inflation. Hence, the identification of Latin American structuralism of the 1950s with Anglo-Saxon Keynesianism is a simplification.

That controversy grew out of the International Monetary Fund’s unsuccessful stabilization plans in the region, which led to the formulation of the monetary approach to the balance of payments by that institution. Latin American structuralism asserted that any attempt to bring inflation down, for a given economic structure, was bound to cause a permanent reduction in the rate of economic growth. The structuralist position was based on the implicit assumption of a non-vertical long-run Phillips curve – in which the relevant tradeoff was between inflation and growth, instead of unemployment. The monetarists, on the other hand, believed on a long-run vertical curve and sometimes even on a negative relation between inflation and economic development (see Boianovsky 2012). The controversy reached its apex with the 1963 international conference held in Rio (Baer and Kerstenetzky 1964), which

gathered economists from the region and elsewhere, such as Arthur Lewis, Gustav Ranis, Arnold Harberger, Roy Harrod, Albert Hirschman and Nicholas Kaldor.

The original formulation of the structuralist approach to inflation was due to Juan Noyola (1956a), Osvaldo Sunkel (1958, [1958] 1960) and Celso Furtado (1954, [1961] 1964), born in Mexico, Chile and Brazil respectively, all members of CEPAL (United Nations Economic Commission for Latin America). However, structural inflation was not incorporated as part of CEPAL's "official" doctrine, since it conflicted with Secretary Raul Prebisch's more conventional views along demand-pull/cost-push lines. Noyola, Sunkel and Furtado were followed by Argentine economist Julio Olivera (1960, 1964) and Dudley Seers (1962), a British economist who worked at CEPAL's Santiago headquarters for a while.

Sunkel's elaboration of the structural inflation hypothesis was the first stage in his thinking about Latin American economic development. From mid 1960s to 1970s, Osvaldo Sunkel (born in 1929) shifted his interests to dependency theory, and from the 1980s he contributed to the founding of Latin American neo-structuralism (Sunkel 1970; 1993). Sunkel (1958) interpreted chronic (but non-accelerating) inflation in Chile, Brazil, Argentina and some other Latin American countries as the outcome of unbalanced growth accompanied by changes in the structure of demand in open developing economies with inelastic supply functions and downward rigidity of money prices. "Propagation mechanisms" in the system – in the sense of the ability of economic agents, including the government through fiscal deficits, to keep or increase their shares in output – turned shocks to relative prices into inflationary movements of the price level.

The structuralist-monetarist controversy was not fought over formal mathematical models. Sunkel (1958, p. 572) provided what he described as an

“analytical scheme” [“esquema analítico” in Spanish] of structural inflation. Likewise, he deployed the term “general scheme” [“esquema geral”] in the title of Sunkel (1957b), a preliminary version of his 1958 article. Dudley Seers prompted Sunkel to have his 1958 piece translated and published in *International Economic Papers*. In fact, he helped Sunkel translating it (Sunkel 2016a). This may explain why the phrase “esquema analítico” is translated as “analytical model” in Sunkel ([1958] 1960, pp. 108-09). Sunkel (1956a, 1957a) did use the term “modelo” [“model”] at the time, especially in association with E. Domar’s growth equations and the Keynesian multiplier mechanism. However, he never referred to a “structuralist model” of inflation.

Sunkel’s methodological stance was influenced by the well-known distinction between “vision” and “scientific models” put forward in Schumpeter’s (1954, pp. 41-43) *History*, which he called “the Bible” as far as economic method was concerned (Sunkel 1999, p. 35). He was first exposed to Schumpeter’s views on method during his 1953-55 period as a graduate student at the London School of Economics (LSE) on a UN scholarship. Schumpeter famously claimed that analytic effort is necessarily “preceded by a pre-analytic cognitive act that supplies [its] raw material”, called “Vision”. The first task of analytic effort is to “*verbalize* the vision or conceptualize it in a such a way that its elements take their places, with names attached to them that facilitate recognition and manipulation, in a more or less orderly *schema* or picture”. Finally, factual and theoretical work, together with the surviving elements of the original vision, will eventually produce “scientific models” (ibid; italics added). The whole passage was translated and quoted by Sunkel (1970, p. 84), who adopted

Schumpeter's distinction between schemes (as verbalization of the vision) and formalized models.¹

By the mid 1950s, when Schumpeter's *History* came out and Sunkel embarked on his long career as a development economist, economics had moved from a verbal to a model-based science (Morgan 2012, p. 2). The introduction of models – in the sense of artifacts or “small mathematical, statistical, graphical, diagrammatic, and even physical objects that can be manipulated in various different ways” – as a new kind of scientific objects involved a new form of reasoning in economics (ibid). From that perspective, as Sunkel (1958) was aware, he conveyed a verbally expressed schema, not a full fledged model. In fact, the elusive quest for a structuralist macroeconomic model, particularly in the period 1956-70, came high in Sunkel's research agenda.

Sunkel was not the only structuralist economist shy of claiming the status of models for his analytical pieces, although reasons for that varied. CEPAL's original framework is usually associated to Prebisch's influential discussion of structural differences between the “center” and the “periphery” in the world economy, and its implications for import substitution policy (see e.g. Boianovsky 2016). In correspondence of 16 July 1964 (when he had already left CEPAL for UNCTAD) with Benjamin Hopenhayn, director of ILPES (Latin American Institute for Economic and Social Planning), Prebisch stated:

It seems to me that you exaggerate a bit when you talk about a “model” elaborated by CEPAL 15 years ago. I don't believe we reached the construction of a “model”, for this would have required a more complete

¹ “Scheme” and “schema” are used interchangeably here, although there are occasional differences in their meaning in the English language. Both are translated as “esquema” in Spanish, as Sunkel (1970, p. 84) did it, in the sense of a plan or outline.

examination of several determined factors. It is just some loose ideas, and it seems worth examining them again. You talk about an import substitution model, with no consideration of socio-political variables. It is precisely the lack of such variables that prevents us from talking of such “model”. (Prebisch 1964)²

The difficulties involved in the introduction of institutional variables and their historical dimension – apart from formalization issues – are also behind Sunkel’s approach to modeling, as discussed in the rest of this paper.

2. The limits of Keynesian macroeconomics

The 1950s were the highpoint of the supremacy of Keynesian economics in macroeconomic theory and policy. That was also true of development and growth economics, largely dominated by the so-called Harrod-Domar model, of Keynesian origin. Hence, it was natural that Sunkel’s (1956, 1957a) quest for a macro model should start with the Keynesian multiplier and Domar’s deceptively simple approach to growth.

Sunkel’s (1957a) title-question is: “What is the practical use of multiplier theory?” Not much in developing countries beset by chronic inflation, he answered.

² “Me parece que usted exagera un poco al hablar de ‘modelo’ elaborado por la CEPAL hace 15 años. No creo que se haya llegado a la constitución de un ‘modelo’ pues ello hubiera requerido un examen más completo de los factores determinados. Se trata simplemente de algunas ideas sueltas y me parece muy bien volverlas a examinar. Habla usted de un modelo de substitución de importaciones sin consideración de variables socio-políticas. Precisamente es la falta de estas variables lo que no permite hablar de tal ‘modelo’”.

The “Keynesian model” was originally elaborated in the institutional and political British context of the 1930s, which cannot be easily transferred to 1950s Latin America. Whereas R. Kahn (1931) made clear the restrictive premises and limits of the application of employment multiplier to concrete cases, Keynes (1936) turned it into an analytical tool for the determination of the income level in general. Apart from some general conceptual problems, the application of Keynes’s multiplier to underdeveloped countries was problematic. Sunkel (1957a, p. 269) criticized the argument that, since the saving ratio is lower in such economies, shifts in investment have less impact on the income level, which would render them more stable than industrial economies.

Such claim, Sunkel objected, illustrated “the indiscriminate deployment by some economists of certain models, appropriated to specific circumstances, to radically distinct conditions” (*ibid*). The main source of autonomous demand in Latin American countries was exports, not fixed capital investment. The role of the external sector in the determination of aggregate demand in such economies made them highly unstable. Moreover, from the perspective of aggregate supply, the restricting factor is capital (including imported capital goods), not labor as in industrial economies. The sort of unemployment relevant for developing countries is not the Keynesian involuntary kind, but “disguised” (or “structural”) unemployment corresponding to zero or near zero marginal productivity of labor for a given capital stock, Sunkel claimed.

Hence, “in underdeveloped countries the terms of Keynesian analysis and of the multiplier are generally inverted, since in such countries the limiting factor is capital, and it is its full utilization – not labor’s – that determines the advent of the dichotomy between nominal and real income” (Sunkel 1957a, p. 271). The low

elasticity of the supply of agricultural goods (particularly in Chile) – together with the overall inflexibility of the production structure – means that the typical aggregate supply function of developing economies turns highly inelastic not just before reaching full employment of labor, but before the point of full capacity of capital. The main (interconnected) problems faced by Latin American economies were low capital accumulation and high “propensity to inflation”. Capital accumulation – discussed along the lines of Domar’s model, as documented below – was deemed essential to the productive absorption of labor supply, the main goal of economic policy (ibid, p. 275).

Sunkel’s critical account of the Keynesian multiplier model was a starting-point for his structural approach to inflation and growth in developing countries. M. Kalecki ([1954] 1976) had pointed out the limits of that model when applied to economies with reduced supply elasticity, especially in the production of food (see FitzGerald 1990). Sunkel ([1958] 1960, p. 100, n. 5) referred to Kalecki’s article, originally published in Spanish in *El Trimestre Económico*. So did Noyola (1956a, p. 604), who introduced the distinction between “basic inflationary pressures” (resulting from unbalanced growth) and “propagation mechanisms”. Unlike Sunkel, Noyola (p. 605) described his framework as a very simple “model”. He did not distinguish between “schema” and “model”, as it is clear from his survey of the history of economics since 1930, where both terms are deployed interchangeably to portray Leontief’s input-output system, Keynes’s *General Theory*, Harrod’s and Domar’s growth equations, and Lewis’s development economics (Noyola 1956b).

Noyola (1956b, p. 306) referred to Tinbergen’s (1952a) influential *Theory of economic policy*, widely read by Latin American planners at the time. Tinbergen (1952b, pp. 27-30) defined structure as the set of “known” constants of a certain object

of economic study. He came to “*identify the notion of structure with the minimum demanded information*” to estimate statistically the parameters of the model (ibid). In his survey of the various usages of “structure” in the 1950s, Machlup ([1958] 1963, pp. 78-79) argued that its only precise meaning was related to the transformation of irregular impulses into regular swings, which is accounted for by the reaction coefficients, as originally proposed by Frisch (1933) and further elaborated by Tinbergen. The invariant background against which “certain processes of change are seen on the stage provided by the analytical model is regarded as its structure” (Machlup, ibid).

Noyola’s and Sunkel’s distinction between inflationary pressures and propagation mechanisms is clearly reminiscent of Frisch’s impulse/propagation concepts. The first version of Frisch’s model was a diagrammatic schema of economic activity as a circular flow, followed by a mathematical manipulable model (Morgan 2012, p. 28). Sunkel met Frisch and Tinbergen during his 1953-55 stay in Europe, when he informed them of CEPAL’s approach to planning (Sunkel 2016b). Sunkel went to the LSE in 1953 to do research on economic development, but Lionel Robbins’s (LSE director) lack of interest made him shift to the study of inflation. When Sunkel told Robbins of his plans to investigate development, the latter reacted by saying: “What is that? If you are interested on those things you must study demography” (Sunkel 1999, p. 13). Robbins’s reaction fit into then fashionable Neo-Malthusianism. Sunkel instead started reading “everything written about inflation”, and formed a seminar about the topic with students from Latin America, India and the US. That was how “many ideas that would take final shape in my work with Juan Noyola and others at CEPAL” first made their appearance (ibid). Their hallmark was that visible propagation mechanisms should not conceal the deep (“basic”) causes of

inflation in Latin American countries, as determined by their socio-economic structures perceived as the invariant background against which processes of change were interpreted. Hence, Sunkel (1963) claimed, stabilization policy involved not just traditional monetary and fiscal policies, but changes of their productive structures as well, if the pace of economic development should not be jeopardized.

3. Lewis and the route not taken

As the structural approach to inflation provided an interpretation of the links between growth and inflation in semi-industrialised economies, the quest for a structuralist model naturally started with the attempt to analyze the economic development process. The 1950s were the period of “high development theory”, when development economics began as a new field. Unlike their contemporary growth economists (Harrod, Domar, Solow, Swan, Kaldor, von Neumann, etc.), development economists did not make use of models to convey their ideas, partly because they addressed more complex issues not confined to the boundaries of steady states. As pointed out by Krugman (1993), Lewis’s (1954) model of development with unlimited supply of labor was a partial exception to the dearth of formalization among development economists at the time (see also Boianovsky 2018).

The publication of Lewis’s 1954 article sparked strong, if mixed, reactions among CEPAL economists. In correspondence of 22 February 1955 with Noyola, Furtado regarded it “the best single piece ever written about the theory of development. He follows exactly the same approach adopted by us in our preliminary studies for planning techniques ... If we had not been discouraged to

‘theorize’ at that stage, we would have been able to present two years ago the basic elements of a theory of development along the lines of ... Lewis.” (quoted from Boianovsky 2010, p. 252). Lewis’s (1954, part II) model of unequal exchange seemed to support CEPAL’s framework, but at the same time frustrated Prebisch, as it gave Lewis priority in modeling a key aspect of what Prebisch called the dual “center-periphery” system (Dosman, p. 322).

During his 1953-55 stay in England, Sunkel visited Lewis in Manchester. It was a “very frustrating” meeting. As recalled by Sunkel (2016b), Lewis “essentially told me that he had just finished his book on *Economic Growth* [Lewis 1955] and that it contained everything I should know about the subject. And he was very derogatory about Prebisch’s ideas”. Lewis (1955, p. 283) did not refer to Prebisch or CEPAL, but he probably had the Argentine economist in mind when he criticized those who neglected agriculture and production for exports, and embraced “nationalist dogmas, according to which the road to economic progress lies through concentrating upon industrialization” – not a balanced view of Prebisch’s development strategy. Invited to deliver the “Closing remarks” at the 1963 Rio conference, Lewis (1964, p. 27) showed no appreciation for Latin American structuralist approach to inflation either. The proposition – that food will put a brake on growth if its supply does not match growing demand, unless one imports more food – was deemed “familiar territory”. Indeed, “so familiar that it is puzzling to learn that this proposition now forms the basis of a new school of structural economics”. Other economies had faced and solved that problem throughout history; then, “why do we hear such pessimistic cries from those Latin American countries which now face the same problem?” asked Lewis (*ibid*). It would take Lewis some time to come to terms with Latin American

structuralism and welcome Prebisch's center/periphery dichotomy together with the notion of balance of payments constraint (Lewis 1978, p. 16).

After Furtado's initial enthusiasm, CEPAL economists started to show reservations concerning Lewis's 1954 model of growth in a dual economy. Noyola (1956b, pp. 315-17) criticized Lewis's strict Ricardian outlook and his disregard for the effects of stationary real wages on aggregate demand à la Malthus and Marx. Moreover, unlike Lewis's model, the Chilean economy featured shift of labor from a high productivity economy (copper exports) to others of lower productivity, which was a main factor behind the inflationary process. In an anonymous article about inflation acceleration in Chile between 1953 and 1955 (written by Sunkel, as disclosed to this author in correspondence of 2009), Sunkel (1956b) showed how the decline in the international demand for copper was accompanied by an increase in the real production cost, as productivity declined faster than real wages. Moreover, the fall of the international price of copper had perverse effects on Chilean fiscal situation.

In his later assessment of development theories, Sunkel (1970, pp. 32-33) criticized Lewis's (1954) model for presenting underdevelopment – and its main feature, generalized excess supply of labor – as a development stage. From that perspective, Lewis shared with other development economists an inductive method of identification of the empirical characteristics of each stage. However, Lewis's and other “explanations of the ‘succession of stages’ sort – where in each one of them a particular feature of the phenomenon prevails – are descriptive and with no analytical capacity to account for the passing of one development stage to another, that is, the process of structural change” (Sunkel 1970, p. 34). In that same year, Sunkel's colleague Aníbal Pinto (1970) argued that Latin American backwardness featured

“structural heterogeneity”, in the sense that economic processes of massively distinct productivities could be found in the same economy. Again, that differed from Lewis’s economic dualism and from its implications about the tendency of modern sectors to absorb activities of lower productivity (see Love 2018). However, modeling structural heterogeneity and its transformations proved to be a difficult, if not unreachable, task.

4. Growth and history

The economic model that best captured Sunkel’s imagination was Domar’s (1956, 1947) growth model. In fact, Sunkel (1956a) wrote the first comprehensive account – from both methodological and theoretical standpoints – of Domar’s growth equations, in any language (Boianovsky 2017). He stressed the novelty of Domar’s concept of dynamic equilibrium and the groundbreaking notion that capitalist economies can only be in equilibrium when they grow. Moreover, Sunkel criticized the widespread use of the term “Harrod-Domar model”, since there were important causal differences between Harrod’s accelerator and Domar’s capital coefficient. He found Domar’s approach particularly useful for development planning, a major concern and area of research at CEPAL. Indeed, Domar’s equations are conspicuous in CEPAL’s and official documents about the economic planning of Latin American countries in the 1950s and 1960s (see Sunkel 1970, p. 246). Another influential model Latin American structuralist planners deployed extensively – and further elaborated for open economies – at the time was Leontief’s (1941) input-output system, which, unlike Domar’s model, featured disaggregated economic relations (see Di Filippo 2009, p. 185). Domar was fond of Leontief’s linear matrix approach, and even

entertained the notion that it could provide a foundation for the study of technical progress (Boianovsky, *ibid*). Leontief's system may be seen as the culmination of what Morgan (2012, p. 3) has described as the first ever economic model: Quesnay's 1767 *Tableau Économique*.

Part III of Sunkel's (1970) *Latin American Underdevelopment and the Theory of Development* was a long critical investigation of the theory of economic development, comprising more than a half of his 380pp book. In his opinion, there was a "Latin American vision [in Schumpeter's sense] of the development of the region, which requires to be instrumented, formalized and enriched; for that it is necessary to use, among other things, the existing theoretical tools" available in the economic literature (Sunkel 1970, p. 97). Latin American structuralism had a vision but lacked a model to implement it and turn it into a theory. Sunkel's study of old and recent contributions to the theory of economic growth examined their formal aspects, including formal restatement of ideas by the classical economists, Marx and Marshall. The "modern" chapters dealt with Domar's and Harrod's Keynesian approaches to growth and J. Meade's version of the neoclassical growth model. In order to fully grasp such models and assess their applicability to a different historical reality, one should not just investigate their internal logic coherence, but "contrast such formal aspect with the reality that originated them and that they tried to explain", Sunkel (*ibid*) claimed. Harrod's discussion of "secular stagnation" was a case in point. It did not apply to Latin American economies, where chronic inflation co-existed with (structural) unemployment of capital and labor (p. 268).

The last and fourth part of Sunkel (1970) provided an interpretative historical essay of Latin American economic development since colonial times. His typology of Latin American economies through time was not accompanied by formalization of the

different types of economic systems in distinct periods, to his frustration. Sunkel (2016c) had never attempted modeling structural inflation, but he did try to elaborate models of Latin American economic history, without much success.

It is worth noting that, throughout the investigation, efforts were made to elaborate models to explain the underdevelopment of different historical periods, but they did not bear fruits ... It seems that the way to accomplish a proper formalization of Latin American underdevelopment consists in, firstly, getting a typology that enables us to specify particular working patterns for each kind of economy, and, immediately after, have that translated in a formal model for each concrete socio-economic system. Despite such insufficiency in the elaboration of formal models, it seems opportune to publish the results obtained in the present state of investigation (Sunkel 1970, p. 12).

A few years later, Peruvian economist Carlos Boloña Behr (1975) produced a suggested mathematical and diagrammatic formalization of Sunkel's (1970) historical narrative, carried out as part of his master at Iowa State University. However, it did not prompt any reactions from Sunkel or other structuralists, possibly because it was never published and remained relatively unknown.

The poor economic performance and persistence of poverty in many Latin American economies, despite the implementation of the import-substituting industrialization strategy supported by CEPAL since the 1950s, led to the formulation of "dependency theory" as the rebellious offspring of structuralism, with focus on an integrated world-system in which centre and periphery are interconnected. Sunkel (1970, p. 36) described how a "self-critical position inside the structuralist school" was developed at the time at both methodological and ideological levels. "It became

clear that structuralism did not examine Latin American reality as a totality that explains itself as a product of its historical evolution". The proposed new method should approach reality from a "structural, historical and totalizing" point of view, based on the notions of "process, structure and system". Sunkel called it "historical-structural method", an attempt to combine the notions of continuity (associated to structures) and change (linked to historical processes).

What constitutes the essence of the historical-structural method is that such previous hypothesis should be totalizing. For, if history must be understood, apprehended as a process through some theory, this must capture it as a totality, in the sense that the facts that form it are explained in relation to each other in their interrelations and in their succession (ibid).

The goal of the historical-structural method, as put forward by Sunkel (p. 95), was not to capture static or synchronic facts, but reality as a totalization that "objectively reproduces itself in a permanent way". Such approach should take into account only the "essential" elements of totality, given the intrinsic complexity of social phenomena. It is significant that Sunkel explained his notion of totality by referring to J.-P. Sartre's existentialist concept of dialectical totalization. In the immediate post-war period existentialism was French dominant intellectual movement. C. Lévi-Strauss' classic structuralism rose to prominence in the 1960s in the wake of existentialism. This focused on the construction of reality and meaning, and assumed that individuals are agents who consciously intend their actions. Structuralism, on the other hand, focused on structures of meanings as predetermined, and assumed that actions are dominated by the deeper structures of mind that lie beneath the individual's conscious behaviour. It was only gradually that classic

structuralism penetrated Latin American intellectual community, as illustrated by Furtado (1970), who tried to blend it with F. Braudel's historicism in his methodological treatment of models in economics (see Boianovsky 2015). However, modelling development as the result of structural change remained a challenge for Sunkel and other Latin American structuralists.

5. Theory and Policy

A main feature of Schumpeter's (1954, pp. 41-43) distinction between "vision" and "scientific models" was to argue that the ideology factor, dominant in the first stages of the scientific process (when the vision is formed), recedes more and more into the background as the scientific "rules of procedures" are deployed and models exposed to testing and discussion. Sunkel, however, doubted the ideological element could be gradually minimized in the way Schumpeter depicted it. Even more, Sunkel was skeptical about the distinction between positive and normative economics, since policy goals are present and motivate every stage of the economic discourse. That was particularly true of Latin American structuralism, which aimed at transforming the region's underdevelopment condition.

It must be explicitly recognized that our thought also contains a vision that makes us perceive Latin American reality in a certain way and comprehend that it is necessary to transform it in determined ways and forms. Now, recognition of historical and ideological influences does not imply that it is impossible to achieve an objective or scientific knowledge of Latin American reality; on the contrary, explicit recognition of such influences is the scientific

guarantee of elaboration of objective and relevant knowledge. (Sunkel 1970, p. 86)

Structuralism was not restricted to Latin American economists, although it did start in the region. Hollis Chenery visited CEPAL headquarters often in the late 1950s, to teach and interact with the staff. Indeed, he would support structuralist development economics and claim that it was not restricted to Latin American economics (Chenery 1975). Chenery's well-known two-gap model of growth with balance of payments constraint reflected his exposition to similar (but not formalized) ideas by Prebisch and Furtado during his Santiago periods (see Boianovsky and Solís 2014). He recollected that Sunkel and other CEPAL economists were critical of the way he had excluded socio-political variables from mathematical-econometric modeling. Chenery served as Prebisch's advisor, during a time when the battle lines between structuralism and orthodox economics had been drawn not just in the field of economic theory, "but also in the politics of North and South".³ In particular, "a leftist school of structuralism was quite prominent at ECLA [CEPAL] and created a degree of animosity in relation with the United States. In the opinion of many more politically aware structuralists, such as Osvaldo Sunkel or Celso Furtado, my approach was too quantitative and empirical to be considered truly structuralist" (Chenery 1992, pp. 384-85).

Pinto and Sunkel (1966, pp. 82-83) questioned the import of analytical methods from North American economics – and the export of Latin American economic students to the US. They praised the use of mathematical methods for attesting that the analysis is "logical and consistent", but warned that not all economic

³ Chenery encouraged Prebisch to present a more rigorous formulation of his terms of trade hypothesis, which he did in Prebisch 1959 (see Bielschowsky, 2000, p. 28, n. 8).

problems can be treated mathematically. Moreover, they claimed, those who can are not necessarily the most relevant, and the use of mathematical methods is not the only way to “achieve scientific rigor”. Interestingly enough, Milton Friedman would shortly deliver his hugely successful 1967 presidential address to the American Economic Association, which launched the natural rate of unemployment hypothesis. Friedman’s (1968) argument was entirely verbal, with no use of mathematics, diagrams or a model of any sort. Instead, it was based upon the application of general principles of neoclassical economics (Hoover 1987, p. 24). Surely, many would soon model that hypothesis, even independently so, as witnessed by E. Phelps parallel articles.

Nevertheless, the lack of formal modeling of Latin American structuralism continued to bother Sunkel, who complained that “there has not been much formalization of the concept” of structure, in the sense of the “institutions, behavior, culture, technology, the more permanent elements” (Sunkel 1999, p. 17). He “felt that there was much similarity with Douglass North’s neo-institutionalism” (*ibid*), which has not been, for the most part, formalized either. In fact, there are significant parallels between structuralism and what formed North’s research agenda, despite the latter’s criticism of CEPAL (see Boianovsky 2009). Sunkel (1989) also found some common themes between structuralism and traditional institutionalism. In that same piece, Sunkel (1989, p. 151) welcomed Lance Taylor’s (1979, 1983) attempts to give structuralism a more “formal and mathematical expression”. Nevertheless, Taylor and his students, in Sunkel’s view, tended to focus too much on “short-term equilibrium and adjustment problems rather than on questions of economic development” (*ibid*), reflecting the acute macroeconomic instability of Latin America at the time.

Taylor had been Chenery's graduate student at Harvard in the mid 1960s, when he probably learned about structuralism. In the 1970s and 1980s, Taylor established close connections with Edmar Bacha and other Brazilian structuralists, and since the 2000s with Colombian economist José A. Ocampo, former secretary-general of CEPAL. In fact, Brazilian economist Eliana Cardoso (1981), Taylor's graduate student at MIT, put forward one of the first structuralist models of inflation (see also Olivera 1967 for an earlier effort at formalization). By the 1990s, neo-structuralism started to replace traditional structuralism in Latin American and CEPAL economics. Latin American neo-structuralism was born at CEPAL as a reaction to the macroeconomic crisis that beset the region throughout the 1980s, accompanied by negative economic growth rates. It represented a shift in CEPAL's analytical framework, which had stressed in the 1950s and 1960s the role of demand dynamics in economic development. As put by Sunkel, one of the members of the 1950s generation and one of the formulators of neo-structuralism 30 years after,

It is not demand and markets that are critical. The heart of development lies on the supply side: quality, flexibility, the efficient combination and utilization of productive resources, the adoption of technological developments, an innovative spirit, creativity ... public and private austerity, an emphasis on saving, and the development of skills to compete internationally – in short, independent efforts undertaken *from within* to achieve self-sustained development. (Sunkel 1993, p. 8)

After the 1970s, distinct national and regional schools of economic thought became more and more integrated into broader international research programs. Unlike Latin American structuralism of the 1950s and 1960s, neo-structuralism is part of

international heterodox economics, as witnessed by the book organized by Alicia Bárcena and Antonio Prado (2015). Although it reflects its Latin American background, neo-structuralism has deployed the same modelling techniques of heterodox currents in general, especially in its neo-Schumpeterian and post-Keynesian versions. In that sense, Sunkel's long quest for a structural macroeconomic modelling strategy has come to an end.

Acknowledgements

I would like to thank Michael Assous, Goulven Rubin, Joaquim Andrade, Mary Morgan and (other) participants at the workshop on “The history of modeling practices in macroeconomics”, Université de Lille, 13 October 2016, for helpful discussion of some points of the paper. Research funding from CNPq is gratefully acknowledged.

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