

An ecological view of New Developmentalism: a proposal of integration*

*Uma visão ecológica do Novo Desenvolvimentismo:
uma proposta de integração*

GIULIO GUARINI**
JOSÉ LUIS OREIRO***

RESUMO: O artigo tem como objetivo integrar o Novo Desenvolvimentismo com a Visão Ecológica por meio dos conceitos de Mudança Estrutural Ecológica (ESC) e Coalizão de Classe Ecológica (EDCC). ESC significa aumentar a participação do setor manufatureiro verde no PIB e no emprego para aumentar a eficiência ambiental da economia. A sobrevalorização da taxa de câmbio causada pela doença holandesa e o crescimento com poupança externa podem prejudicar as indústrias manufatureiras verdes ainda mais do que as indústrias manufatureiras marrons. O ESC precisa da existência de um EDCC que pode ser dificultado se a sobrevalorização da taxa de câmbio não for removida por meio de impostos sobre as exportações de *commodities*, controles de capital e um mandato duplo para o Banco Central.

PALAVRAS-CHAVE: Novo Desenvolvimentismo; mudança estrutural ecológica; coalizão de classe ecodesenvolvimentista.

ABSTRACT: Article aims to integrate New Developmentalism with Ecological View by means of the concepts of Ecological Structural Change (ESC) and Eco-Developmental Class-Coalition (EDCC). ESC means to increase the share of green manufacturing sector in GDP and employment for increasing the environmental efficiency of the economy. Exchange rate overvaluation caused by Dutch disease and growth with foreign savings can harm green manufacturing industries even more than brown manufacturing industries. ESC needs the existence of an EDCC that can be made difficult to occur if exchange rate overvaluation is not removed through taxes over *commodities* exports, capital controls and a dual mandate for the Central Bank.

* The authors acknowledge the useful comments of Luiz Carlos Bresser-Pereira (FGV-SP), Daniel Moura (Researcher of the Structuralist Development Macroeconomics Research Group at Universidade de Brasília) and Marwill Dávila-Fernandes (Research Fellow at University of Siena). Usual caveats apply.

** Tuscia University, Viterbo, Italy. E-mail: giulioguarini@unitus.it. Orcid: <https://orcid.org/0000-0002-9159-3360>.

*** Universidade de Brasília, Brasília/DF, Brasil. E-mail: joreiro@unb.br. Orcid: <https://orcid.org/0000-0001-8955-8868>. Submitted: 8/January/2021; Approved: 24/March/2021.

KEYWORDS: New Developmentalism; ecological structural change; eco-developmental class-coalition.

JEL Classification: Q56; Q57; O11; O14.

INTRODUCTION

The following note aims to illustrate a potential new research field: the integration of ecological approach into the new developmentalism (ND) framework. This interaction could be fruitful for both: on one side, ND can provide sound analytical instruments to the ecological investigation, on other one ecological approach can enable the ND to have a more complete vision of development process and in particular, of the urgent environmental challenges. Ecological view is founded on the interconnection across environment, economy and society, thereby it could represent an enlargement of the economy-society nexus at the base of ND. We detail the essentials of ND through the “ecological” lenses by considering the common aspects of old and new developmentalism as well as the peculiarities of ND indicated by Bresser-Pereira (2012, 2019) and Oreiro *et al.* (2020).

ECOLOGICAL STRUCTURAL CHANGE

The Ecological sustainability of economic development concerns the long-term improvement of the standards of living by considering a polyhedron of social, economic and environmental elements. A structural view of ecological sustainability should focus not on the static problem of the resource scarcity and on the allocation of them through the market mechanisms (as in the neoclassical school), but on the dynamic problem of the resource creation, driven by aggregate demand¹ and its limits. In the post-Keynesian framework is growing up a field of research called Ecological Macroeconomics² (Hardt and O’Neil, 2017; Fontana and Sawyer, 2016;

¹ “The use of produced means of production implies that the scarcity of resources in processing activities cannot be thought of as being independent of the level of activity in the economy. What is chiefly important in processing activities is the dynamic propensity of the economy to create resources (that is, to deepen and/or widen its stock of capital) rather than the static problem of resource allocation” (Setterfield 1997, p. 50).

² According to Saens and Romeiro (2019) ecological macroeconomics is a term that appeared recently in the economic literature, mainly after the world financial crisis of 2008. The main idea of ecological macroeconomics is to develop tools for achieving macroeconomic stability (full employment and a more equitable income distribution) without the need of an ever increasing level of consumption in order to allowed a transition for a low carbon economy. This is perspective adopted in the present paper. Although some developed nations can afford to live without economic growth, this is not an option for developing and emerging economies, whose populations had a standard of living much lower than the developed countries. Our approach can be named “ecological new developmentalism” in the sense that it is an attempt to make economic development – which means structural transformation, i.e., transference

Guarini and Porcile, 2016; Galindo *et al.*, 2020) that studies the main environmental issues providing an alternative view to the mainstream environmental economics. New developmentalism can be integrated into this new heterodox wave with its original contribution for understanding of economic development and hereafter it will be introduced some basic principles of that school in an ecological key.

The ecological challenges can be faced by an ecological transition based on Ecological Technological Progress and on Ecological Structural Change (ESC). The former can be captured by the increase of environmental efficiency or green productivity: the denominator can be a natural resource or an impact variable such as CO₂ emissions, while the output is the value added or GDP. The ESC is determined by supply side and demand side dynamics. Supply side one concerns the movement of labor from sectors with low green efficiency; i.e., with high CO₂ emissions per unit of output (brown sectors) to sectors with high green efficiency; i.e., with low CO₂ emissions for unit of output (green sector); demand-side one concerns the green reorientation of components of aggregate demand, for example, the composition of domestic spending can be reoriented towards a high share of public goods instead of private goods, which will decrease the CO₂ emissions per unit of output produced. Thus, ESC has a multidimensional nature because entails technological dynamic concerning the capital accumulation as well as social dynamics linked with green preferences and habits of consumers and institutions. In another terms, it entails both green innovation and social innovation (Hanusch and Pyka, 2013), because a multidimensional vision of sustainability entails a “great societal transformation” (WBGU, 2011) concerning social, economic, scientific, institutional, cultural factors (Lewandowski, 2018). It is a dynamic vision of ecological problems where the Schumpeterian study on the continuous expansion of human capacity as well as on the continuous restructuring of production system due to innovations with lights and shadows, can be integrated with the Georgescu-Roegen (student of Schumpeter) statements about entropy law and the necessary normative perspective for orienting the development processes to the sustainability (Pyka *et al.*, 2019).

This vision takes in consideration the studies on the positive link between the complexity of economy and the reduction of GHG emissions (Hidalgo *et al.*, 2007, Romero and Gramkow, 2021). In this sense, the ESC should not be reduced to development through industrialization, but it is considered an effective “productive sophistication” (Bresser-Pereira, 2019), where the sophistication regards technological, social and cultural factors. Ecological perspective points out the more and

of labor and resources from low productivity sectors to high productivity sectors – compatible with a transition of the production and employment structure to a low carbon economy. The ecological structural change, which means to change the composition of output and employment from “brown” sectors (with high carbon intensity, that is, activities that produces great quantities of CO₂ per unit of output) to “green” sectors (with low carbon intensity, that is, activities that produces low quantities of CO₂ per unit of output). This Ecological Structural Change is, in principle, being capable to make economic growth compatible with stabilization/reduction of CO₂ emissions by increasing the environmental efficiency of output production.

more deviation from the automatic correspondence between increase of labor productivity and an improvement of standard of living and well-being. Ecological view of new developmentalism can canalize the positive externalities of industrialization (Singer, 1950) to the ecological conversion (Guarini, 2015). Green innovations are characterized by the double externality: they decrease negative externalities represented by pollution and at the same time they increase positive externalities concerning all new knowledge produced. They stimulate complementarities and networks more than traditional innovations. Exist complementarity between end off pipe green technologies (the equipment for reducing pollutant emissions, inserted at the end production process) and cleaner production technologies (machineries within the production process) as well as between the green technology implemented and the organizational process innovation to manage the green conversion – regarding the Environmental Management System – (Halila, 2007). Green innovations need for new knowledge because firms hold sectorial specialized competences, and they had to acquire the new green competences, and for complex knowledge because it is composed of different dimensions regarding engineering, law, management, natural sciences. For these reasons, firms had to acquire external knowledge and to do so in the most efficiently way, they had to connect with others firm and to start-up an open-eco-innovation process (Ghisetti *et al.*, 2015).

NATIONAL ECO-DEVELOPMENTAL STRATEGY

In face of abovementioned elements, the ESC is not automatic, laissez-faire process, and it happen only by an effective interaction between market and public institutions that have an organizational role – and not only normative as in the neoliberal approach. State should be developmental in order to guide the ESC for a green creative destruction with degrowth of brown sectors and the growth of green ones. A national eco-developmental strategy is fundamental for promote green sectors and to enable them to compete at international level through the export-led industrialization. Green innovations are multidimensional, complex and multidisciplinary and developing countries need to acquire foreign green knowledge with the openness of the economy. Since, the green dumping is always linked with social dumping, trade globalization should have a multilevel governance based on negotiations to permit this sustainable path. Thus, the protection of environment is not conceived mainly as a problem of guarantee of property rights and the regulation of negative externality, but a new field of collective action. Moreover, the ecological perspective can renew the concept of big push (Rosenstein-Rodan, 1943), by promoting a sort of “Ecological Big Push”. Market fails to incentive green innovation that concern complementarities, networking and externalities. Moreover, these characteristics show how the process of green innovation entails a critical mass to start and provide returns. Moreover, the green knowledge tends to be scientific-based and thus, firms need a support of research center, universities mainly concentrate in the public sector. In this line, according to Porter Hypothesis an

appropriate regulation can stimulate also competitiveness and innovation (Porter and Van der Linde, 1995; Guarini, 2020). At the end, the eco-developmental national strategy is founded on the coordination across complementary environmental policies, such as fiscal, industrial, monetary, trade policies, such as in the case of policies proposals of ECLAC (2016).

ECOLOGICAL DIMENSION OF THE EXCHANGE RATE OVERVALUATION

The theoretical core of the new developmentalism is the tendency of overvaluation of exchange rate for middle income countries whose sources are the Dutch disease and the growth with external saving strategy. Dutch disease derives from a situation of abundance of natural resources Dutch disease pushes the exchange rate over the industrial equilibrium level causing premature deindustrialization. The case of Brazil is dramatically lighting (Ferreira Gabriel *et al.*, 2020; Oreiro *et al.*, 2020). Green industries can be the most damaged ones, because they have a higher technological intensity the brown industries, requiring more a trained and educated workforce (that is relatively scarce in middle-income countries) which demand high real wages. In this context, exchange rate overvaluation will act as an additional pressure for increasing unit labor costs for these industries, thereby reducing their price competitiveness. Moreover, the adoption of technologies that reduces the intensity of natural resources used in production of goods and services can be in serious conflict with the economic and political interests of the social classes that benefits from the Dutch disease as mining companies and big agricultural *commodities* producers. Last, but not least, these green firms hardly have access to the international market, because the “national brand” is characterized by the label of “natural resources exploiting sectors”.

The standard proposal for neutralization of Dutch disease is the introduction of taxation of *commodities* that provoke this disease, which size can be measured by difference between the *industrial equilibrium exchange rate*³ and the *current*

³ Bresser-Pereira *et al.* (2015, p. 59) defines *industrial equilibrium exchange rate* as the level of real exchange rate that “[...] makes competitive those business enterprises producing internationally tradable goods and services using state-of-the art technology that don’t benefit from Ricardian rents”. This concept was refined more recently by Oreiro (2020) and Oreiro *et al.* (2020a; 2020b), in order to incorporate the existence of technological gaps between firms of developing and developed countries and, hence, the issue of technological asymmetries (Verspagen, 1993). For Oreiro (2020, p. 241) “the problem with this definition is that most companies in middle-income countries do not operate with technology in the state of the world art, but behind the technological frontier”. Moreover, Oreiro *et al.* (2020b, pp. 325-326) says that “as a matter of fact, a fundamental feature of developing economies is that they are far from the technological frontier and therefore their firms cannot operate with state-of-the-art technology. This technological gap negatively affects the non-price competitiveness of manufacturing firms in developing economies, which produce manufactured goods that are of inferior quality and/or lower technological intensity than the manufactured goods produced in developed economies”. Thus, we will define the *industrial equilibrium exchange rate* as the level of real exchange

*account equilibrium exchange rate*⁴. Taxation over commodity exports will produce a depreciation of current account equilibrium exchange rate, thereby reducing the exchange rate overvaluation due to abundance of natural resources (See Bresser-Pereira, Oreiro and Marconi, 2015, pp. 59-65). This intervention aims to improve the price competitiveness of non-commodity goods and it can be effective to counterbalance the negative impact of Dutch disease. But it can also help to ESC in the sense that it can increase the profit rate of green industries up to a ‘international reasonable level’ for such kind of industries.

The impact of the neutralization of Dutch disease over ESC will depend, however, on the prevailing conventions regarding the “reasonable levels” of profit rate for brown industries (e.g., oil power plants) and green industries (e.g., renewable energy power plants). Due to the uncertainties regarding investment in green industries it is reasonable to assume that the profit rate considered “reasonable” for green industries will be higher than the profit rate considered “reasonable” for brown industries – i.e., investing in green industries requires a positive liquidity-premium due to more uncertainty perception. *Ceteris paribus*, this means that the industrial equilibrium exchange rate level for green industries would be more devaluated than the industrial equilibrium exchange rate level for brown industries. This means that a policy aimed to both neutralize the Dutch disease and promote an ESC will require a more devaluated exchange rate than the one designed only to eliminate the Dutch disease. One possible policy proposal to achieve the goals of both neutralize the Dutch disease and promote a ESC will be to combine a tax over export of *commodities* with a tax subsidy for investment in green industries in order to “clean” the productive structure of the economy.

Thus, a first element necessary to integrate the ecological approach into new developmentalism is to divide the manufacturing sector in two subsectors: a green and a brown manufacturing sector. The reasonable rate of profit for green industries is higher than the reasonable rate of profit for brown industries due to the higher uncertainty perception of investment in green technologies. This liquidity-premium of investment in green industries will demand a more depreciated real exchange rate for the green manufacturing sector to be competitive in international markets, which means that the “green industrial exchange equilibrium exchange rate” is higher (more devaluated) than the “brown industrial exchange equilibrium exchange rate”.

rate that *makes competitive those business enterprises producing internationally tradable goods and services at the actual level of technological gap.*

⁴ The concept of current account equilibrium exchange rate is a little ambiguous in the ND literature. Bresser-Pereira *et al.* (2015, p. 59) say that “the current equilibrium exchange rate guarantees a reasonable profit rate for producers of *commodities* that guarantees the disease and balances intertemporally the countries’ current account”. The problem is that it is impossible to say a priori that the same exchange rate that guarantees a reasonable (normal?) rate of profit will also balance intertemporally the countries’ current account. Due to these ambiguities, Oreiro *et al.* (2020a, p. 33) defines the current account equilibrium real exchange rate as the level of real exchange rate compatible with a zero deficit in balance of payments’ current account.

Another important element of the new developmentalism is the idea that growth with external saving strategy crowds-out the internal saving due to the overvaluation of the exchange rate relative to current account equilibrium required to generate the current account deficit and so attract foreign capital for finance it⁵. But we can argue that it also weakens the incentives for ESC. As a matter of fact, financial globalization cannot stimulate ESC that needs for foresight and patience: the large costs of the green efforts in the short term can be compensated by rewards in the medium-long-term, while external financial capitals are dominated by the short-termism. To fulfill green standards, firms must allocate temporal, human and financial resources to reconvert their production as well as to implement green technology. In this line, internal saving (largely originated from retained profits of domestic firms) can be more sensitive than the external saving to the ecological vision. Moreover, the increase of domestic interest rate relative to the international levels required to attract foreign capital and finance the current account deficit (the foreign savings) disincentives real investment because it appreciates the national currency, and in particular the green ones, because investment in green technology, in general, have returns more uncertain and more distant in time, making more difficult for them to have a positive NPV (net present value) with higher rates of discount. Since international capital inflows can had disruptive effects over the attempts to make an ESC due to the fact that they are attracted by interest rate differentials; macroeconomic policy regime had to be redefined in the direction of searching to avoid current account deficits, reducing the level of openness of capital account, and substituting of inflation targeting regime by a dual mandate by the Central Bank. A dual mandate for Central Banks, that set two goals for monetary policy – which are achieve low and stable inflation rate and also a high level of unemployment – will contribute to reduce the level of domestic interest rates; while reducing the level of openness of capital account by introduction of some kind of capital controls will reduce the capital inflows for a given level of interest rate differential (Bresser-Pereira et al., 2015, pp. 154-155).

ECO-DEVELOPMENTAL CLASS COALITION

One of the most important constraint for aggregate demand growth in the *neo-liberal* or *finance-dominated capitalism*⁶ is the declining wage share due to a slower

⁵ The precise mechanism by which foreign saving is attracted by such strategy can be seen at Oreiro et al. (2020a).

⁶ Hein (2012, p. 1) defines *neo-liberalism* as “policies aimed at deregulation of labor markets, reduction of government intervention into the market economy and of government demand management, redistribution of income from (lower) wages to profits and top management salaries and deregulation and liberalization of national and international financial markets”. Although neo-liberalism is interrelated and connected with *financialization* or *finance-dominated capitalism*, these concepts are not identical (Ibid, p. 2). The most accepted concept of financialization is the one created by Epstein

real wage growth compared to productivity growth (see Hein, 2012 and Palley, 2012). The overvaluation of exchange rate, however, is in general associated with an increase in real wages (Oreiro *et al.*, 2020a), making possible the existence of a perverse (consumption instead of investment oriented) class-coalition⁷ between workers and rentiers in developing or middle-income countries. As argued by Oreiro *et al.* (2020c), a real exchange rate overvaluation is associated with lower levels of inflation and a higher wage share (and thus, higher real wages), inducing policy makers to adopt a kind of *exchange rate populism* (Bresser-Pereira, 2009, ch. 4) to conciliate short-run interests of the working classes with those of the rentiers. Indeed, an overvaluation of the real exchange rate is associated with both high levels of domestic interest rates (above the international level, adjusted for the country's own risk premium), thus increasing financial incomes of the *rentier class*, but also with artificially higher purchasing powers of wages. Thus, both workers and rentiers can draw benefits from a real exchange rate overvaluation, at least in the short up to the medium term. In the long-run, however, workers will eventually be damaged by deindustrialization, since high-wage paying jobs are in the manufacturing industry and in the services activities associated with it.

Exchange-rate populism slows down the building of a developmental class coalition and at the same time provokes in the medium to the long-term the worsening of worker's standard living and stresses inequalities. A reduction of inequalities is an important result of any national developmental strategy by building a developmental coalition formed by workers, entrepreneurs and civil servants. Moreover, industrial revolution when reaches maturity was an important opportunity to flourish democratic processes (Bresser-Pereira, 2012). In the case of eco-industrial revolution, the formation of an eco-developmental class coalition (namely, a developmental coalition ecologically oriented) is a stringent necessity even more, due to the strict interaction among democracy, inequality and environmental care (Islam, 2015). Inequality can damage ecological sustainability in various ways. Poor people can have green harmful behaviors for fuel needs or to enlarge the arable land. Environmental goods can be classified as Common Property Resources or as Public Goods, thereby they can be victim of the tragedy of the commons caused by the free riding (Hardin, 1968).

The neoliberalism tries to solve this problem by privatizing environmental goods and services, but an alternative is to maintain public access and to build a sound community with an effective governance, based on light social conflict and social cohesion (Ostrom *et al.*, 1999), where benefits of the environmental protection are

(2005, p. 3) for whom “[...] financialization means the increasing role of financial motives, financial markets and financial institutions in the operation of the domestic and international economies”.

⁷ The term *class coalition* is due to Bresser-Pereira (2015) and refers to a political (implicit) alliance among groups that belongs to different social classes that aim to reach some political and economic goals. Class coalitions are possible because social classes are not homogenous, but they have internal divergences regarding goals. Such divisions allow the occurrence of political coalitions among groups that belongs to different social classes.

widespread. Moreover, social trust can make effective the collective efforts to contrast the climate change. According to the “power-weighted social decision rule” (Boyce, 1994, 2007) the policy maximizes the sum of *power-weighted* net benefits, thereby it tends to be oriented by the powerful individuals (namely rich people). In a context of inequality and scarce democracy, they can obstacles effective environmental policies when they tend to dump pollution to poor people, when they are able to insulate themselves from the negative environmental impact, and finally when their economic power is based on the factors that weaken an ecological strategy, such as Dutch disease (land rentiers) or external saving strategy (financial rentiers capitalists). Finally, gender inequality concerning social and cultural barriers to the active participation of women to the economic, social and political processes negatively impact on the environmental sustainability (Agarwal, 2007, 2010). The formation of an eco-developmental class coalition pass through the shift of attitudes and sentiments to the environmental goals, that in turn greatly influences the environmental policies and the macroeconomic internal and external stability (Dávila-Fernández and Sordi, 2020).

INTERNATIONAL ECO-DEVELOPMENTAL STRATEGY

New developmentalism underlines the centrality of the relationship between center and periphery countries, the risk and opportunities for the periphery countries of the openness to the international market as well as the relevance of reduction of technological gap and of economic catching up. The external constraint is central for new developmentalism (Oreiro, 2020) as well as for the ecological macroeconomics (Guarini and Porcile, 2016) and for the eco-developmentalism. At the same time, international inequality negatively affects the governance of global environmental sustainability (Althouse *et al.*, 2020). An important aspect of the global environmental crisis is that the environmental goods are turning more and more from public goods, non-excludable and non-rivalrous, to common property resources, non-excludability but rivalrous. Indeed, the rivalry is generated by the worsen of the quality of air or of the seas, and the international normative limitation of the pollution levels generate competition for hoarding the highest quota; obviously the core countries have the political-institutional-technological competitive advantage. Moreover, international economic inequality implies the international asymmetry in the responsibility of warming causes – mainly the case of the center-countries-, in the suffering from the warming effects – mainly the case of periphery countries-, in the capacity of warming mitigation and adaptation – higher in the center-countries- (United Nations, 2009). Then, the world appears signed of environmental asymmetries that with the well-known economic and social ones compose the international ecological asymmetry. The ESC needs for a sound and effective international cooperation. An equal global governance is necessary to open global markets to the tradable non-commodity goods with high environmental quality intensity from middle income countries and at the same time to limit the social and

green dumping by the center countries as argued by Pollution Haven Hypothesis, according to which they apply green washing by allocating pollution into the periphery countries (Destek and Okumus, 2019). Also trade globalization is a channel of this strategy through the so called “ecologically unequal exchange” (Bunker, 1985; Bunker and Ciccantell, 2005).

Given this framework, the environmental sustainability can represent the channel through which new developmentalism can also be applied to developed countries, because the ESC should be global even if the declination should be carried out at national level. Exist a sort of double ecological interdependence: for example, on one hand the destruction of Amazon harms the entire world, on the other hand the Brazilian ESC starts up if the environmental efficiency can improve its international non-price competitiveness and this fact depends on the increase of green international demand. In this sense, ESC needs for a national strategy but also for an international industrial cooperation.

FINAL REMARKS

We carried out some notes about the integration of some ecological macroeconomics issues within the new developmentalism and hereafter we list some final remarks. Ecological transition entails an ecological structural change (ESC), and, from this perspective, ecological macroeconomics can meet new developmentalism. Compared to the standard structural change, ESC is more complex by concerning a more variety of dimensions (social, economic, environmental, technological), of agents (enterprises, consumers, institutions) and more difficult to implement given the initial high costs for reorient economic, political and social preferences. It also entails an eco-developmental national strategy where renews the role of State as driver of innovations and the policies coordination; an eco-developmental class coalition that relaunch a “green new-deal” between firms and workers for green investments and green consumption; and an international eco-developmental strategy able to build a new international labor division founded on sustainability. ESC can also provide new insights about the causes of exchange rate overvaluation: Dutch disease and external saving strategy. Finally, ESC can allow new developmentalism to be adopted also by developed countries, that are engaged to face the ecological challenges.

REFERENCES

- Agarwal, Bina (2007), “Gender Inequality, Cooperation, and Environmental Sustainability”, in Baland, Jean-Marie, Pranab Bardhan, and Samuel Bowles (editors), *Inequality, Cooperation, and Environmental Sustainability*, pp. 274-313, Oxford: Oxford University Press.
- Agarwal, Bina (2010), *Gender and Green Governance*, Oxford: Oxford University Press.
- Althouse J., Guarini G., Porcile G. (2020) “Ecological macroeconomics in the open economy: Sustaina-

- bility, unequal exchange and policy coordination in a center-periphery model”, *Ecological Economics* 172: <https://doi.org/10.1016/j.ecolecon.2020.106628>.
- Bresser-Perreira L. C. (2012) “The exchange rate at the center of development economics”, *Estudos Avançados*, 26 (75): 7-28.
- Bresser-Perreira, L.C. (2015). *A Construção Política do Brasil: Sociedade, Economia e Estado desde a Independência*. Editora 34
- Bresser-Perreira L. C. (2019) “From classical developmentalism and post-Keynesian macroeconomics to new developmentalism” *Brazilian Journal of Political Economy*, 39(2), 187–210.
- Bresser-Perreira, L.C; Oreiro, J.L; Marconi, N. (2015). *Developmental Macroeconomics: New Developmentalism as a growth strategy*. Routledge: London.
- Bunker, S.G., 1985. *Underdeveloping the Amazon: Extraction, Unequal Exchange, and the Failure of the Modern State*. University of Chicago Press, Chicago, IL.
- Bunker, S.G., Ciccantell, P.S., 2005. *Globalization and the Race for Resources*. Johns Hopkins University Press, Baltimore, MD.
- Dávila-Fernández, M. J., & Sordi, S. (2020). “Attitudes towards climate policies in a macrodynamic model of the economy” *Ecological Economics*, 169, 106319. doi:10.1016/j.ecolecon.2019.04.031
- Destek MA, Okumus I (2019) “Does pollution haven hypothesis hold in newly industrialized countries? Evidence from ecological footprint”. *Environ Sci Pollut Res*:1–7.
- ECLAC, UN (2016). *Horizons 2030: Equality at the centre of sustainable development*, Santiago.
- Epstein, G. A. (2005). *Financialization and The World Economy*, Massachusetts, Edward Elgar Publishing
- Ferreira Gabriel L. “De Santana Ribeiro L.C., Gonzaga Jayme Jr F, Oreiro J.L. 2020, Manufacturing, economic growth, and real exchange rate: Empirical evidence in panel data and input-output multipliers”, *PSL Quarterly Review*, 73, (292): 51-75.
- Fontana, Giuseppe, Sawyer, Malcolm, 2016. “Towards post-Keynesian ecological macroeconomics”. *Ecological Economics* 121, 186–195.
- Galindo L., Guarini G., Porcile G.(202), “Environmental innovations, income distribution, international competitiveness and environmental policies: a Kaleckian growth model with a balance of payments constraint”, *Structural Change and Economic Dynamics* 53:16-25.
- Ghisetti, G., Marzucchi, A., Montresor, S., (2015). “The open eco-innovation mode. An empirical investigation of eleven European countries”. *Res. Policy* 44 (5), 1080–1093.
- Guarini G. (2015) “Complementarity between environmental efficiency and labour productivity in a cumulative growth process”, *PSL Quarterly Review*, 68 (272): 41-56.
- Guarini G., Porcile G. (2016) “Sustainability in a post-Keynesian growth model for an open economy” *Ecological Economics* 126: 14–22.
- Guarini G. (2020) “The Macroeconomic Impact of the Porter Hypothesis: Sustainability and Environmental Policies in a Post-Keynesian Model”, *Review of Political Economy*, <https://doi.org/10.1080/09538259.2020.1748308>.
- Halila F. 2007. “Networks as a Means of Supporting the Adoption of Organizational Innovations in SMEs: The Case of Environmental Management Systems (EMSs) Based on ISO 14001” *Corporate Social Responsibility and Environmental Management* 14: 167–181.
- Hanusch H, Pyka A (2013) “Social innovations in the perspective of comprehensive Neo-Schumpeterian economics”. In: Ruiz Vin˜als C, Parra Rodríguez C (eds) *Social innovation—new forms of organization in knowledge based societies*. Routledge, London, pp 29–43.
- Hardin G. (1968) “The Tragedy of the Commons”, *Science* 162 (3859): 1243-1248.
- Hardt L., O’Neill D.W., (2017) “Ecological Macroeconomic Models: Assessing Current Developments” *Ecological Economics*, (134): 198-211.
- Hein, E. (2012). *The Macroeconomics of Finance-Dominated Capitalism – and its Crisis*, Cheltenham, Edward Elgar Publishing.
- Hidalgo, C.; Klinger, B.; Barabasi, A. L.; Hausmann, R. 2007, *The product space conditions the development of nations*. *Science*, 317, 482–487.

- Islam S.N. (2015), “Inequality and Environmental Sustainability”, DESA Working Paper No. 145 ST/ESA/2015/DWP/145.
- Lewandowski I. (2018) *Bioeconomy Shaping the Transition to a Sustainable, Biobased Economy*, Springer OPEN.
- Oreiro, J.L. (2020). “New Developmentalism: beyond competitive exchange rate”. *Brazilian Journal of Political Economy*, 40 (2) 238-242.
- Oreiro J. L., da Silva K.M., Dávila-Fernández M.J. (2020a) “New Developmentalist model of structural change, economic growth and middle-income traps”, *Structural Change and Economic Dynamics* 55: 26–38.
- Oreiro, J.L; D’Agostini, L.L.M; Gala, P. (2020b). “Deindustrialization, Economic Complexity and Real Exchange Rate Overvaluation: The case of Brazil (1998-2017). *PSL Quarterly Review*, vol. 73 (295): 313-341.
- Oreiro J.L., Feijó C., Punzo L. and Heringer J.P. (2020a). “Peripheral Financialization and Premature Deindustrialization: A Theory and the Case of Brazil (2003-2015)”, available at https://www.researchgate.net/publication/343427720_Peripheral_Financialization_and_Premature_Deindustrialization_A_Theory_and_the_Case_of_Brazil_2003-2015
- Ostrom E., Burger J., Field C.B., Norgaard R.B., Policansky D. (1999): “Revisiting the Commons: Local Lessons, Global Challenges”, *Science*, 84 (9): 278–282.
- Palley, T. (2012). *From Financial Crisis to Stagnation: the destruction of shared prosperity and the role of economics*. Cambridge University Press: Cambridge.
- Porter, M.E., Van der Linde, C., 1995. “Toward a new conception of the environment competitiveness relationship”. *J. Econ. Perspect.* 9 (4): 97–118.
- Pyka A., Bogner K., Urmetzer S. (2019) Productivity Slowdown, Exhausted Opportunities and the Power of Human Ingenuity—Schumpeter Meets Georgescu-Roegen J. *Open Innov. Technol. Mark. Complex.* 5 (39) doi:10.3390/joitmc5030039.
- Romero J. P., Gramkow C. (2021) “Economic complexity and greenhouse gas emissions” *World Development* 139 <https://doi.org/10.1016/j.worlddev.2020.105317>.
- Rosenstein-Rodan, P. (1943) “Problems of industrialization in Eastern Europe and South-Eastern Europe”, *Economic Journal* 53: 202-211.
- Saes, B.M; Romeiro, A.R. (2019). “Ecological Macroeconomics: A methodological Review”. *Economia e Sociedade*, 28, (2): 365-392.
- Singer, H. (1950) “The distribution of gains between investing and borrowing countries”, *American Economic Review* 40: 473-85.
- United Nations (2009), *World Economic and Social Survey 2009: Promoting Development, Saving the Planet*. Sales No. E.09.II.C.1.
- Verspagen, B. (1993). *Uneven Growth Between Interdependent Economies: an evolutionary view on technological gaps, trade and growth*. Avebury: New York.
- WBGU (2011) *World in transition: a social contract for sustainability* German advisory council on global change (Wissenschaftlicher Beirat für Globale Umweltveränderungen – WBGU), Berlin.

