ARTÍCULOS

Iberian Journal of the **History of Economic Thought**
ISSN-e: 2386-5768

EDICIONES COMPLUTENSE

https://dx.doi.org/10.5209/ijhe.70812

Important contributions of the Cambridge Equation to the role of political economy: from Pasinetti to our days

João Gabriel de Araujo Oliveira[1]; Renato Nozaki Sugahara[2]

Recibido: 12/05/2020 / Aceptado: 05/01/2021

Abstract. The theory of the long-run perspective aims to explain how economies grow. On the other hand, Kaldor developed a theory that concerns not only this objective but to build a model also considering the implications in the income distribution. This paper consists of a rigorous review of the evolution of Kaldor's Theory, treating with government activities, the financial market, and so on, to show the importance of the theme in our days. One contribution of this paper is to lead the researchers to a solid understanding of Growth and Income Distribution Models derivate from the Cambridge School and to present a new vision of the relevance of the heterodox scientific world.
Keywords: Distribution, Kaldor, Growth, Government
JEL Codes: D30, O40, P16

[pt] Contribuições importantes da equação de Cambridge para o papel da economia política: de Pasinetti aos dias de hoje

Resumo. A teoria da perspectiva de longo prazo visa explicar como as economias crescem. Por outro lado, Kaldor desenvolveu uma teoria que diz respeito não apenas a esse objetivo, mas a construir um modelo considerando também as implicações na distribuição de renda. Este trabalho consiste em uma revisão rigorosa da evolução da Teoria de Kaldor, tratando da atuação do governo, do mercado financeiro, etc., para mostrar a importância do tema em nossos dias. Uma contribuição deste artigo é levar os pesquisadores a uma compreensão sólida dos Modelos de Distribuição de Renda e Crescimento derivados da Escola de Cambridge e apresentar uma nova visão da relevância do mundo científico heterodoxo.
Palavras-chave: Distribuição, Kaldor, Crescimento, Governo
Códigos JE: D30, O40, P16

[es] Importantes contribuciones de la Ecuación de Cambridge al papel de la economía política: de Pasinetti a nuestros días

Resumen: La teoría de la perspectiva de largo plazo tiene como objetivo explicar cómo crecen las economías. Kaldor desarrolló una teoría que no solo busca este objetivo sino construir un modelo considerando también las implicaciones en la distribución del ingreso. Este trabajo es una revisión rigurosa de la evolución de la Teoría de Kaldor, que trata las actividades gubernamentales, el mercado financiero, etc., para mostrar la importancia del tema en nuestros días. Una contribución del artículo es explica de manera sólida los Modelos de Crecimiento y Distribución de Ingresos derivados de la Escuela de Cambridge y muestra la relevancia del mundo científico heterodoxo.
Palabras clave: Distribuición, Kaldor, Crecimiento, Gobierno
Códigos JEL: D30, O40, P16

Cómo citar: de Araujo Oliveira, J. G.; Nozaki Sugahara, R. (2021): "Important contributions of the Cambridge Equation to the role of political economy: from Pasinetti to our days" en *Iberian Journal of the History of Economic Thought* 8(1), 41-49.

[1] University of Brasilia
E-mail:joaogabrielaraujooliveira@gmail.com
ORCID: 0000-0002-2130-8659
The author thanks the financial support from the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES). Both authors also thanks for the comments and suggestions made by Professor Joanilio Rodolpho Teixeira and Angelo Rondina Neto. All the mistakes here are our responsible only.
[2] State University of Londrina.
E-mail: sugahara@uel.br
ORCID: https://orcid.org/0000-0002-2167-0367

1. Introduction

The theory of long-run growth macroeconomic analysis starts when Harrod (1939) and Domar (1947) present the "razor wire" problem, which implicates that the growth of the economy could be sustainable if the natural growth ratio is equal to the warranted growth ratio. Therefore, this condition, for them, only will be possible if the marginal propensity to save divided by the capital-output ratio be equal to the population growth. In this case, all the agents will have to agree with the controlling agent or maybe in dictatorial regimes to guarantee such growth.

By analysing this problem, Solow (1956) and Kaldor (1956) search for an alternative solution. The latter developed a theory of growth based on the side of income distribution and using stylised facts[3]. For him, the endogenisation of the savings rate explain the level of the natural growth rate, and this is our focus to discuss here, intending to present a review about his main contribution, as well as the extensions after him. This effort shows us that the growth rate will be given by multiplying the propensity to save by the profit rate of the economy. Such a result was named "Cambridge Equation", and all extensions from this theorem must return to the original result if the modifications are not considered.

Studying the kaldorian approach, Pasinetti (1962) divides the economy into two classes, workers, and capitalists, saying that Kaldor (1956) committed a "logical sleep" when he did not consider class division. Pasinetti proves that the "Cambridge Equation" is not given by de propensity to save of the economy, but only from the propensity to save of the capitalists. This indicates how much the economy will grow. However, he assumes that, in the case of the worker's savings rate equal to zero, the result is the same found by Kaldor.

From this perspective, a line of thought was created, introducing in this kind of models the presence of the government. The first approach elaborated from this was made by Steedman (1972), which considers just direct taxes in his extension and using this as an income transfer to workers. From this extension, researchers as Dalziel, Palley, Denicólo & Matteuzzi and others expand the model with different circumstances with fiscal and monetary policy, showing that the essential nature of the "Cambridge Theorem" is maintained in all the analysed cases. However, these authors did not consider the financial system in their models, which, some years before, had been presented by Kaldor (1966), in response to Samuelson and Modigliani about the "Pasinetti Paradox" and as an extension of his model.

Thus, considering capitalists as part of the firms, Kaldor (1966) developed the "Kaldor neo-Pasinetti Theorem". This extension showed how the existence of the financial system implicates on income distribution and the concept of capital gains to analyse the existence of firms affecting the level of income. The theorem was divided into two sides; the first one is the traditional profit rate and the second is the valuation ratio of the firms in the financial market, which is the contribution of his article. The significant point of this theorem is that the profit rate negatively affects the valuation ratio, and the existence of financial assets leads to a reduction of the profit rate. Panico (1997) presents an extension of the theorem, considering government activities. His work shows the positive implication of the fiscal policy increasing the investment, resulting in a bigger profit rate and affecting the valuation ratio negatively.

In this article, we focus on presenting a review of Kaldor's Theory. Our main objective is to construct a timeline showing the evolution of this theory and its importance nowadays. Our paper is important for precipitants by introducing them to this kind of theory as well as for seniors, who want to revisit the development of the model and construct new extensions of such an approach. We divide the present work into five sections: The first one is this introduction. The second is to present some extensions considering fiscal policy and the relevance of the theme to our days. In the third section, we discuss the implications of monetary policy, considering some recent publications. In the fourth, it is introduced the financial system by the Kaldor neo-Pasinetti Theorem and extensions considering government activities, some of them linked with the Kaleckian approach. The last section is a historical review and concluding remarks.

2. Government activities in Kaldor-Pasinetti models

Kaldor (1956) obtained a solution to the "razor wire" by endogenising the saving rate of the economy. This model is known as "Cambridge Equation", where the natural growth rate is explained by multiplying the profit rate by the saving rate. This theory represents the growth and income distribution side of the Economic Thinking in the long-run perspective, which provides not only the growth perspective from the maximisation of the firm assumptions and without dealing with the social side but introducing the concept of a better environment to society dealing with both wages and profits, which is the income of all persons in capitalism.

Unfortunately, this author did not distinguish classes in his model. Thus, Pasinetti (1962) considered these as assumptions, distinguishing workers, and capitalists in his model and showed that the "Cambridge Equation" is impacted only by capitalists' saving rate. It is essential to understand that even when workers save in the model, capitalists will be central to the determination of the natural growth rate, which means that in a possibility to reinforce the in-

[3] Abad and Khalifa (2015) presents the concept of stylized facts to the understanding of Kaldor's vision.

come distribution by the profit-share, not only this class will be favoured, but workers will earn more profits, which is guaranteed by the fact that if they can save, they will invest and own part of the capital of this economy, increasing their income and creating a virtuous cycle to the economy. These concerns determined the essential nature of the "Cambridge Theorem".

In this vein, Meade & Hahn (1963) and Samuelson & Modigliani (1966), criticise this new extension and elaborate on the "Dual Theorem" or "Pasinetti Paradox" [such paradox is well presented by Moore (1974)]. They assume that considering government activities the working class will present a saving rate bigger than the investment-share, hence only workers will own the capital and the capitalists will disappear. These arguments show the end of capitalism and reinforce the idea of socialism. On the other hand, in response to them, Steedman (1972) expands the model with government and shows that this "new" class does not affect the essential nature of the Pasinetti Theorem and increases the profit rate of the economy thus benefiting both classes. Correcting the Pasinetti seminal article, Baranzini (1975) shows that he committed a mistake by did not consider the case of , moreover, from this solution, Baranzini shows that a two-class economy may have two steady states. The Steedman arguments were recently discussed by Zamparelli (2016), generating the "Anti-Dual Pasinetti Theorem" by sampling. Even considering the results of Samuelson and Modigliani, the solution did not disappear with the capitalists in the model.

The Steedman extension shows that worker's and capitalist's incomes are directly affected by their taxations, which constitute the government revenue. However, part of this amount is transferred to workers, increasing their savings, consequently the investment part and their capital stock. It is important to stress that this extension did not consider an unbalanced government budget and only considered direct tax to wages and profits. The capitalists' savings are determined by profits, while workers swing come from wages, profits, and income transfer by government activities. This means that if the capital stock owned by workers is higher, the profit earned by them may also be higher.

He considers in his article that the profit taxation rate has to be inferior to the wage taxation rate. Furthermore, the capitalist (firms) saving rate needs to be higher than the workers saving rate. By some mathematical manipulations like the presented by Pasinetti (1962), he presents the first results of the "Cambridge Equation" to the case of considering government activities, as we can see in (1):

$$r = \frac{g_n}{s_c(1-t_p)} \tag{1}$$

The equation (1) shows us that considering the government in this kind of model does not imply in the "Dual Problem" and, more importantly, the essential nature of the "Cambridge Equation" is maintained. Furthermore, the only taxation, which affects the profit rate, is their own, and the impact is positive. Implying that, the application of fiscal policy reflects on benefits to both capitalists and workers, since both classes earn profits, even if in a different amount. Steedman was criticised by Fleck & Domenghino (1987) for having not considered an "Open Economy". As a response to this issue, Araujo Oliveira &Teixeira (2019, forthcoming) developed a simple extension, which proves that even considering Open Economy (Globalization System), we have the same result as Steedman (1972).

Dalziel (1989) extends the model with international trade, also to refute the Fleck & Domenghino (1987) ideas. He defines two different assumptions of Steedman. The first one is the determination of the government saving function, and this can be equal to or different from zero, by showing a more realistic model, which treats with the assumption that the government saves and by that, investing their capital to earn the profit. This concern easily represents countries like Brazil, which own the most or total shares of some enterprises, as well as, Petrobras, Banco do Brazil, Vale, Sercontel, and others. With the income derived from their profits, the county can reinvest more it. Own capital or use it in social programs, transferring part of it to society.

The second is considered liquid exports in the model, which can be positive (surplus), zero, or negative (deficit)—also representing a more realistic economy. The unbalanced or balanced international trade is important to show the growth of the income or product growth rate by the Thirlwall's Law, which is inspired by Kaldor (1970). On the other hand, Dalziel was concerned to present that the essential nature of the "Cambridge Equation" is maintained considering these issues and that in the long-run perspective the income distribution is more relevant than only the growth perspective. With these assumptions, Dalziel developed the profit rate and the profit share considering an Open Economy. Thus:

$$\frac{P}{K} = \frac{I+NX}{s_c K} \tag{2}$$

$$\frac{P}{Y} = \frac{I+NX}{s_c Y} \tag{3}$$

As we can see in (2) and (3), if we consider an Open Economy, both extensions maintain the essential nature of the "Cambridge Equation", which leads us to affirm that Fleck & Domenghino (1987) was wrong. The following equation shows a positive relationship between the liquid exports and the profit share and ratio only in the positive case, which means that in the case of the deficit it will be reasonable to the economy to keep itself closed to the rest of the world. In this vein, only considering (being X the ex-

port and M the import) it will be a positive relation to the income distribution, these conditions are easy to be proven by applying the partial derivative to each variable.

In the case to consider, we return to the Pasinetti Theorem. However, the liquid exports only affect the equation (2) and (3), increasing the profit rate and share, which means a higher income for all classes, including the government. Capitalists, workers, and government earn profit from their capital stock.

Denicólo and Matteuzzi (1990) wrote a paper with the assumption of the unbalanced budget, which was not considered by the authors above, and this explains the behaviour of bond transactions. These assets are remunerated by interest rates, having to be equal to the profit rate by the no-arbitrage condition. Considering the mentioned assumptions, it is possible to identify a financial system created by the government, where both workers and capitalists can be provided by an extra income, which is to most economies a way to benefit both classes, as well as enabling them to invest their income in different assets. However, in order for assets not to disappear, it is important to consider the interest rate for bonds equal to the profit rate of the capital stock in the long-run term, and the full value of the asset to each class will be the sum of capital and bonds. These bonds represent a safer investment to both classes, considering they are more stable as a long-term investment than equities or other issues. This analysis was presented by Winter (2017) when he studies the quantitative evaluation of government debt impacting the economy.

$$r_n = \frac{(1-t_p)P_c + iB_c}{K_c + B_c} \tag{4}$$

Where r_n is the natural profit ratio. If we consider $B_c = 0$ and

$$\frac{P}{K} = \frac{P_c}{K_c} = \frac{P_w}{K_w} = r$$

and since the natural growth rate in Pasinetti is determined by , we have with some mathematical manipulations in equation (4) the Steedman extension, concluding that the essential nature of the Pasinetti Theorem is maintained.

The bonds propose it was also presented by Dalziel (1991) when he considers a small close economy, showing how government titles affect the national income. These issues were also discussed by Araujo (1992), Teixeira (2009) and Araújo & Teixeira (2010), which seems to be close to the current economies since the evolution of the system and the consideration of an indirect tax and the actions of the government impact on the propensity to save of the capitalists and workers determining a formal model to discuss the existence of bonds in the economy.

All the emitted government bonds have to be remunerated by an interest rate equal to the profit rate in the private sector, as we saw above. Consequently, the saving rates are equal to the ones presented by Pasinetti (1989a) and Pasinetti (1989b) concluded that, if the government saving rate with unbalanced budget grows, the profit rate will be lower, as it is presented in the function below:

$$r = \frac{g_n}{s'_c} \tag{5}$$

Hence $s'_c = s_c (1-t_p) + s_g\alpha[t_p + t_i(1-s_c)(1-t_p)]$. From (5), we conclude that the "Cambridge Equation" is affected by the government saving function, and it is advised to this class not to keep large investments in this case. The stability condition of this model was analysed by Teixeira (2009), which concludes that in the long run, the economy will be stable, on the other hand, if the government budget is in permanent surplus, the stability condition becomes indeterminate. Araújo & Teixeira (2010) correct some determinations of this model to avoid the conclusion that, if the budget is in deficit, the government alters the essence of the "Cambridge Equation" to the case of "Dual". To introduce government to the model, La Marca (2005) also interpreted the kaldorian view considering one- or two-class in the economy. Taylor, Foley & Rezai (2018) present the solutions of the Kaldor-Pasinetti model in the steady-state, constructing a role formulation starting with short- and medium-term, as presented by Kalecki, to the long-term.

As we saw, this issue has been discussed over the last 40 years. However, the importance of the theme has been restored since the 2008 crisis, especially interacting with other approaches, like the Kaleckian. All of these extensions show the fiscal face of the economy. However, it was not considered the monetary face of the models. The next section is based on Dalziel (1991) and Palley (1997), and it is considered a monetary policy, presenting the answer to the following question: what is the implication of these models on the income distribution?

3. Cambridge Equation with monetary policy

The first kaldorian extension with the monetary policy was presented by Dalziel (1991). The money face has been the centre of the discussion in publications like Ussher (2009), Araujo and Teixeira (2010), Rubio & Carrasco-Gallego (2016), King (2016), Marcuzzo (2017), Colacchio & Davanzati (2017), Chandra (2019), and others, trying to explain the behaviour of this kind of policy in a long-run perspective based on kaldorian's proposes. The relevance of the theme tends to be less important to the Post-Keynesian based in the Pasinetti Theorem. On the other hand, it has been absorbed by important authors as a concern to alternatives to fiscal policy, especially when the economy deals with inflation.

In this vein, Dalziel developed a version, which considers that government activities are financed, in the steady-state, with money instead of bonds. Pasinetti (1989a), intending to maintain the consistency of the "Cambridge Theorem", suggests an implicit inflation rate, which must be equal to the taxations, obtaining the result . This rate of inflation shows the reduction of the workers and capitalists savings rate considering government savings in the economy. From these and with some mathematical manipulations, we can obtain the "Cambridge Equation" extension with monetary policy:

$$r = \frac{(1+\rho)g_n}{(1-t_p)s_c} \tag{6}$$

The equation (6) did not affect the essential nature of the Pasinetti Theorem and, considering inflation in the model, and we have a higher rate of profit comparing to the extensions without inflation, contradicting the Orthodox vision, which shows the neutrality of the money or considers inflation as a struggle for the economy[4]. On the other hand, considering the Phillips curve analysis, it is possible to interpret two faces of the economy; the first is an alternative to explain full employment from the level of the inflation, reducing unemployment and the second to explain the income distribution by the profit rate. From this, we have an equal income distribution, led by a bigger profit rate and sustaining the full employment considering Phillips (1958) curve. However, Dalziel did not endogenise the inflation ratio, only presenting as an exogenous variable.

Palley (1997), to extend the model, considering money stock as an assumption, which is divided into capitalists and workers. This proposal shows us that the investments can be derived from government debts, and these issues have been proved by computational simulation and empirical shreds of evidence, like Moreira (2018). Palley also defines the rate of inflation, which is represented by the difference between the money growth rate and income growth rate:

$$\dot{p} = g_M - g_y \tag{7}$$

In steady-state, the price level is determined by , considering as constant, and deriving with respect to time we can find (7). This new equation impacts on the structure of the "Cambridge Equation" and the profit share. Thus:

$$\frac{P}{K} = r = \frac{I}{s_c[1-t_p]K} + \frac{\dot{p}c_cM_m}{s_c[1-t_p]z_cK} \tag{8}$$

$$\frac{P}{Y} = \frac{I}{s_c[1-t_p]Y} + \frac{\dot{p}c_cM_m}{s_c[1-t_p]z_cY} \tag{9}$$

Being , and and considering the rate of inflation equal to zero, the equations (27) and (28) return to the results presented by Steedman (1972), proving that the essential nature of the "Cambridge Equation" is maintained. It is important to show that if the inflation tax is positive, both the profit rate and share will be higher in comparison to the Steedman case. On the other hand, in the case of deflation, the income distribution will crash to zero or, even, rate and share can be negative, which implies that this economy should assume some levels of inflation. With these proposals and considering flexible prices, Palley (1997) shows that the liquid savings amount derived from bonds affects the structure of the model. Thus:

$$\frac{P}{K} = \frac{I}{s_c[1-t_p](K+B)} - \frac{\dot{p}\{Bz_cs_c[1-t_p]-c_cM_m\}}{z_cs_c[1-t_p](K+B)} \tag{10}$$

$$\frac{P}{Y} = \frac{IK}{s_c[1-t_p](K+B)Y} - \frac{\dot{p}\{Bz_cs_c[1-t_p]-c_cM_m\}K}{z_cs_c[1-t_p](K+B)Y} \tag{11}$$

However, it is also maintained the essential nature of the theorem, the cases of the inflation rate, and it is possible to return to the Steedman extension considering the inflation tax and bonds equal to zero. The controversy of the financial system by considering debts in the economy opened the discussion for controversies likely is presented by Commendatore (2002) when he claims that Palley mis-specifies growth equilibrium condition, which corrected and answered by Palley (2002) and Park (2006). Araujo & Teixeira (2010) concludes that the Dalziel results can also be obtained if the capitalists hold money in equilibrium, on the other hand, they show that if the government monetises public deficit, the analysis of the monetary policy will be neutral. The profit rate will be determined without considering monetary variables. Marcuzzo (2017) shows that to understand money in Kaldor, it is necessary to present the context of uncertainty, on the other hand, will have a little real impact on the price level and income distribution. It is crucial to understand the role of Bank mechanism to integrate the general impact of money in the income distribution, as well as, in Colacchio & Devanzati (2017). However, the basic principles of the modelling are founded by the post-Kaldorians. All of these models presented above did not consider the financial market. Kaldor (1966) starts a whole new extension considering equities as an asset in the model. The next section is to present an extension considering government activities.

4. Review of the "Kaldor neo-Pasinetti model"[5] and an extension

Kaldor (1966) assume that there are only two classes, firms and workers. The first agent is owned by

[4] To advance in "Rational Expectations" and their accomplishment about monetary policy, we indicate Muth (1961), Lucas (1972), Sargent and Wallace (1975) and Benassy (2011).

[5] Thirlwall (2015) said "Kaldor replied with his famous neo-Pasinetti theorem, which was never challenged by Cambridge, Massachusetts, school". This theoy was a reply to Samuelson and Modigliani's "Pasinetti Paradox".

capitalists and workers[6] (households), and the profit is shared between then. The last agent will also be remunerated with wages earned from his/her jobs. The sum of these two remunerations is equal to the national income. The saving functions are similar to the one used by Pasinetti (1962) when he made the distinction between workers and capitalists. Kaldor (1956, 1966) considers the total savings composed by workers and firms. The new part of the investment function derived from the financial market is given by (xviii). An interesting property of this equation is to show that the existence of the financial market will be directly affected by workers savings[7].

Following the assumptions by Kaldor (1966), Araújo (1995), Charles (2007) and Lavoie (2014), the equilibrium between investments and savings to maintain the full employment[8] has to show the amount consumed by workers. Thus, it is presented as security for Davidson (1968), and it can be understood as retirement when we are looking for a long-run term, as it is presented by Oreiro & Magalhães (2019). In this vein, the oldest in their economy will consume all the investments made in their lives. For both Davidson (1968) and Oreiro & Magalhães (2019), it is important to the capital gain be positive, on the other hand, the oldest will be in a dangerous situation or deeply depending on the young generation or if we consider another agent, the government to survive.

The capital gains [retirement to Oreiro and Magalhães] are determined by financial market equilibrium, where the valuation ratio is equal to the amount value of equities divided by the total capital stock. In real economies, this means the real value of the firms, and by the understanding of the two authors aforementioned, we can think about private insurance. Deriving the valuation ratio concerning time and applying some algebraic manipulations, we have the capital gains function. These results can be either positive (capital gain), zero or negative (capital loss). The first case means that the economic incentive consumption by workers in retirement. On the other hand, we are having more shares of the firms but did not consider that the value per firm has increased, which means that the Financial System might be facing a crisis.

Kaldor (1966), Lavoie (1998), Araujo (1995), Charles (2007) obtained the main results as presented in Lavoie (2014). First, they find the profit rate "Cambridge Equation" (equation 12), showing that the existence of the financial market will make a decreasing impact on the profit rate. The other result presents the valuation ratio (13), which indicates the signal of capital gains. The valuation ratio positively impacts the rate of investment by the financial market:

$$r = \frac{(1-x)g_n}{s_f} \tag{12}$$

$$v_r = \frac{1}{c}\left[\frac{s_w}{g_n v} - \frac{s_w}{s_f}(1-x) - x(1-c)\right] \tag{13}$$

These values were interpreted by Bernardo, Stockhammer & Martínez (2016) as Tobin's alternative to the post-Keynesian approach, and it is based on the Stock-flow Consistence. This theory has also been linked to the Kaleckian approach, as presented by Lavoie (1998), Lavoie & Godley (2001) and Dallery and van Treeck (2011) or to the Harrodian approach by Skott & Ryoo (2008). Following the same assumptions, Panico (1997) introduced the government expenditures, which increase the investment function. He assumed that the government budget is balanced. After some mathematical manipulations, Panico (1997) shows new extensions of Kaldor (1966) approach now with government activities, as presented in (14) and (15).

$$r = \frac{(1-x)g_n + g_e}{s_f(1-t_p)} \tag{14}$$

$$v_r = \frac{1}{c}\left\{\frac{s_w}{v g_n}(1-t_w) - \frac{s_w}{g_n}(1-t_w)\left[\frac{(1-x)g_n + g_e}{s_f(1-t_p)}\right] - x(1-c)\right\} \tag{15}$$

Note that . However, the government expenditures decisions are exogenous—these results concerned with the existence of government expenditures, which positively affect the profit rate. As already knew, capitalists and workers own the firms, and this last one earns the profit, distributing between investments and income to the owners and leading both classes to a better situation of the income distribution. On the other hand, the government activities affect negatively the valuation ratio, which shows to us that the existence of this agent decreases the value of the firms. We have to make a partial derivative of and concerning. This proposal has been dealt with Ryoo and Skott (2017) when they introduce the concept of

[6] It is possible to consider that not all the workers own part of the firms, but those who have earn profits. This concept is maintained in the rest of this dissertation.

[7] We are considering in this part of the article that households only saving from wages and firms, which earn profit, share this income between households and the saving is part is designated to investments, as in Kaldor (1966).

[8] All the investments functions in this article are based on the Keynes perspective, where this variable is exogenous and the distribution is determinate from the saving function, as we can see in Bertola (2000).

monetary rules and instability to the model. Araujo Oliveira, Sugahara & Teixeira (2019), presented an alternative approach to Political Orientation in this kind of models, they treat with the close and open economy when the government can choose to encourage profit (firms) or consumption (households), showing the implications to the income distribution in the line of government activities.

5. A historical review and concluding remarks

This article has come to present the importance of Kaldor's line considering many different issues, such as fiscal and monetary policy, financial markets, structural change, political orientations, and others. We intend to collaborate with the literature with a solid review since the firsts extensions of the model, which consists of Cambridge versus Cambridge discussion between the Orthodox and Heterodox approaches, to our days, with a more sophisticated model considering structural changes, stock-flow consistency or political orientation. Another accomplishment is to present that, even in a situation considering an open economy, financial market, and government activities, the essential nature of the "Cambridge Equation" is maintained, as it was presented in section 2 by the equation 8.

The second section presents how government activities were introduced in this kind of model. It is clear that in all extensions presented here, it was only considered fiscal policy with indirect taxation. These authors showed that the government transfers income to workers by its political power to lead the economy to an equal income distribution between capitalists and workers. The result of these extensions is that the profit rate is always higher than in the original form, proving to be positive for both, capitalists and workers, especially for the latter, which owns most of the capital.

When we open the economy, we have three different situations. The first one is to return to the original model by Pasinetti (1962). That being considered, we have a deficit, resulting in a nominal profit rate and share comparing to the original form, which is better to maintain the economy closed. With that, we have surplus rising the profit rate and share, as we have already seen, this situation leads the economy to a higher income for both classes. From these results, we conclude that in a globalisation context, the economy only has a better situation with the surplus.

Dalziel (1991) and Palley (1997) presented to the field an alternative extension with monetary policy, which did not consider fiscal policy. As we saw in section three, regarding the income distribution analysis, we can accept inflation as an important coefficient to impulse the profit share and profit rate, in both cases with fixed or flexible prices. Therefore, we conclude that the existence of government activities in the "Cambridge Equation" impact positively with both police.

In the fourth section, we presented a review about the Kaldor neo-Pasinetti Theorem, which introduce the financial system to the model, intending to explain the impact of financial assets in the income distribution. Kaldor (1966) does not consider the government in his extension; however, he concludes to show the negative effect of the profit rate. However, the value of firms (valuation ratio) is affected positively.

Panico (1997) introduces the government activities to the model, summing the revenue earning by taxation to the investment, as we can see in (xxv), and applying some mathematical manipulations, he concludes that the profit rate increases, on the other hand, the valuation ratio decreases, as a result of its extension. Therefore, capitalists and workers own the firms, and both agents are benefited by a higher profit now.

In the present time, all these extensions are used to develop new theorems. As we saw in all sections, the authors treat "structural change", "stock-flow consistency" and "political orientation", intending to determinate the behaviour of the income distribution by introducing important variables to be analysed in specific contexts. However, we show, from those articles, the relevance of Kaldor since the 1950s, which is astonishing and current. The main reason for this article was to present his influence on generations of heterodox economists researchers interested in the field of income distribution.

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APPENDIX A: Notations

- α speed adjustment of government policy
- ρ inflation
- $\dot{\rho}$ inflation tax
- B total bonds
- B_c capitalists' bonds
- c marginal propensity to consume of the capital gain/loses
- c_c the propensity to consume of the capitalists
- g_n natural growth rate
- g_M money growth rate
- g_Y income growth rate
- g_e government investment share
- I domestic investment
- K capital stock
- K_c capital stock owned by capitalists
- K_w capital stock owned by workers
- M import
- M_m money stock
- NX liquid exports
- P profit
- P_c profit earns by capitalists
- P_w profit earns by workers
- r profit rate
- r_n natural profit rate
- s_c capitalists saving rate
- s'_c capitalist saving rate with government
- s_f marginal propensity to save of the firms
- s_g marginal propensity to saving of the government
- s_w marginal propensity to save of the workers
- t_i indirect taxes
- t_p marginal tribute to the profit
- t_w marginal tribute to the wages
- v technology
- v_r a valuation ratio of the share in financial markets
- x share of the investment financed by the existence of the financial market
- Y income
- z_c ownership share of the capitalists