# Induced shifting involvements and cycles of growth and distribution

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**Abstract**

The paper builds on the concept of (Shifting) Involvements originally proposed by Albert Hirschman (1982). However, unlike Hirschman the concept is framed in class terms. A model is presented where income distribution is determined by the involvement of the two classes. Higher involvement by capitalists and lower by workers increase the profit share and vice versa. In turn, shifts in involvements are induced by the potential effect of a change in distribution on economic activity and past levels of distribution. On the other hand, as the profit share increases the economy tends to become more wage-led. The dynamics of the resulting model are interesting. The more the two classes prioritize the increase of their income share over economic activity, the more possible is that the economy is unstable. Under the stable configuration, the most possible outcome are predator prey cycles in the <distribution, distribution-ledness> space. This kind of dynamics can explain some interesting historical episodes during the 20th century. Finally, the paper discusses the possibility of conflict and cooperation within each of the distribution-led regime.

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Crisis may occur in capitalist economies because the capitalist
class is 'too strong' or because it is 'too weak'
(Gordon,Weisskopf and Bowles, 1987, p. 43)

# 1 Introduction

Albert Hirschman writing in 1982 tried to explain, what he called *Shifting Involvements*, the rapid change of the political landscape in the short time period that had lapsed since the late 1960s. How can one explain the transition between the social movements of the late 1960s to citizens retreating to a more atomistic behavior only ten years later? Hirscman provides an explanation in terms of a representative agent, who derives utility from consuming private goods and public goods. If the representative agent is more involved with her private interest she will consume realtively more of the private goods, while a higher involvement with public action allows more consumption of public goods (and provides some utility of its own). Hirschman argues that expectations are never fulfilled and that leads to endogenous oscillations of the involvements between the two states of private interests and public action.

The question Hirschman asked is also relevant today. In the recent past and especially after the recent crisis, we observe again a shift of involvements but on the opposite direction from that of the 1970s. More and more people in the United States are getting involved in public action and issues that were until recently taboos are being openly discussed. Probably the most important of these issues is distribution of income. After three decades of hegemony of the idea that everyone gets his fair share of income and that if one works hard enough will eventually enjoy a well-off living, more and more people are realizing that this is not true.

By framing his theory in terms of representative utility-maximizing agent Hirschman cannot explain shifts of the distribution of income, or how concerns about distribution of income contribute to the shift of involvements. In the present paper, we sketch a simple model that does that. The concept of involvement is kept, but is now applied to the involvement of the two classes, workers and capitalist. The distribution of income between wages and profits is the result of the level of involvement of the classes. More involvement on behalf of capitalists or less involvement on behalf of workers leads to a higher profit share and vice versa.

The question then is what causes the shift of involvements. There are three major factors that affect it. First, it is the potential effect of a change in distribution of income on economic activity. Our argument is stated in terms of a simple Kaleckian-Structuralist model of growth and distribution; therefore this effect is related to i) *whether* the economy is wage- or profit-led

and ii) *how much* wage- or profit-led it is. We capture this with what we call "wage-ledness" of the economy, the difference between the propensity to save and the propensity to invest out of profits. So, as the wage-ledness increases, the involvement of capitalists will tend to decrease and the involvement of workers will tend to increase.

Moreover, as the income share of each class increases, the class will target an even higher share of income and that will lead—*ceteris paribus*—to a shift in its involvement to achieve it. Finally, involvement carries a cost, so a shift in involvement is deterred by its respective marginal cost. The marginal cost of involvement is a negative function of income, because of increasing returns.

As a result of the aforementioned factors, the increase of involvement of capitalists and the decrease of the involvement of workers, and therefore the increase in the profit share, is a negative function of the wage-ledness of the economy and a positive function of the profit share. The latter is obviously a destabilizing factor, as the change in the profit share is a positive function of its level.

On the other hand, the economy will tend to become more wage-led as the profit share increases because the propensity to save out of the profit share increases while the propensity to invest decreases. This kind of changes in the propensities to invest and save, are intuitive and documented in economic literature, but are usually ignored in the literature using the Kaleckian-Structuralist model. For example, it is intuitive and documented in the literature that investment was very tightly linked to the profit-flows in the 1970s (when the profit share was much lower), but there has been a gradual decoupling of the two over the last decades.

The resulting system has some interesting dynamic properties. One possibility is that the unstable dynamics of distribution dominate; if the two classes press for further increases on their share of income irrespective of its effect on economic activity. In this case, the system explodes and something else from the outside is needed to stabilize.

Another possibility, when the effect on economic activity is taken into consideration, and the feedback effect of the profit share on distribution-ledness is strong, is counterclockwise cycles in the <profit share, wage-ledness> space. These are essentially predator-prey dynamics, that bear some similarities to the seminal Goodwin (1967) model. However, unlike the Goodwin model, distribution is the prey and distribution-ledness (and thus indirectly growth) is the predator. This is an interesting way to approach long run dynamics within capitalism and stresses the difficult symbiosis—partly complementary and partly hostile—of the two classes. It is also a useful way to think about the dynamics of the US economy during the 20th century. The high concentration of income in the 1920s was a basic reason for the Great Depression, which then led to the emergence of the New Deal institutions, that changed the direction of distribution of income and created the basis for the prosperity of the early decades after WWII. However, in turn this institutions endogenously led to the crisis of the 1970s—the shift of involvements—and the emergence of neoliberalism as a response. The neoliberal institutions exhausted their potential and led to the crisis of 2007-09 and the stagnation that has followed, causing the recent shift of involvements in the opposite direction.

Finally, we provide a brief discussion of the further subdivision of wage- and profit-led regimes into cooperative and conflictual subregimes. According to the predator-prey configuration of the model the economy will endogenously shift not only between wage- and profit-led periods, but also from conflictual to cooperative and then back to conflictual regimes. From that point of view the model provides a link between the what Bhaduri and Marglin (1990) call the "economic basis of contesting political ideologies" (in fact the economic basis for the *changing popularity* of contesting political ideologies) and Hirschman's Shifting Involvements.

## 2 The macro-structure

The macro structure of the model follows a simple version of the Kaleckian-Structuralist model of growth and distribution (Steindl, 1952, Rowthorn, 1981, Taylor, 1983, 1990, 2004, Dutt, 1984, 1990, Amadeo, 1986, Kurz, 1990). We assume a closed economy without government sector. At any given point in distribution of income is assumed to be constant; therefore the macro-structure of the economy is fully described by the investment and saving functions. We assume a generic investment function

$$g^i = g^i[r(\pi, u)] = g^i(\pi, u) \tag{1}$$

where $g^i$ is investment normalized for the capital stock, $r$ is the profit rate,$\pi$ is the profit share, and $u$ is the rate of capacity utilization with $g^i_\pi > 0$ and $g^i_u > 0$ (the subscript denotes the partial derivative for this variable).

The saving function is

$$g^s = g^s(\pi, u) \tag{2}$$

where, $g^s$ is total saving normalized for the capital stock, $g^s_u$ is positive because higher income leads—*ceteris paribus*—to higher savings and $g^s_\pi$ is also positive since capitalists' saving rate is higher than workers'.

At equilibrium, investment is equal to saving: $g^i = g^s$. Based on this identity, and solving for $\underline{u}$, we can define a demand function

$$u = D(\pi) \tag{3}$$

By taking the total differentials of the the identity $g^i = g^s$, we get $dg^i = dg^s \Leftrightarrow g^i_u du + g^i_\pi \pi = g^s_u du + g^s_\pi d\pi$. Therefore,

$$du/d\pi = D'(\pi) = \frac{g^i_\pi - g^s_\pi}{g^s_u - g^i_u} \tag{4}$$

Assuming that the so-called Keynesian stability condition holds ($g^s_u - g^i_u > 0$), the effect of a change in distribution depends on $g^i_\pi - g^s_\pi$. The economy is said to be profit-led when an

increase in the profit share leads to an increase in the utilization rate ($du\Big/d\pi > 0$). The sufficient condition for that is that the propensity to invest out of profits is higher than the propensity to save ($g^i_\pi - g^s_\pi > 0$). In the opposite case (when $g^i_\pi - g^s_\pi < 0$), demand is wage-led ($du\Big/d\pi < 0$).

We can define $\lambda = -D'(\pi) = \frac{g^s_\pi - g^i_\pi}{g^s_u - g^i_u}$ as the *degree of wage-ledness* of the economy. As explained in the previous paragraph, a positive $\lambda$ means that the economy is wage-led; the higher is the value of $\lambda$, the more wage-led the economy is, the stronger will be the response of utilization to a decrease of the profit share. On the other hand, with a negative $\lambda$ the economy is profit-led. In this case, the more negative is $\lambda$ the more profit-led the economy will be, the stronger will be the response of utilization to an increase in the profit share.

## 3 Induced shifting involvements and distribution

One of the most interesting theories of long swings is put forward by Albert Hirschman in the *Shifting Involvements: Private Interest and Public Action* (1982). Hirschman wrote this book, trying to explain what had caused the shift from the massive social movements of the late 1960s to the withdrawal to the private sphere fifteen years later; what had caused the shifting involvements from the public action of the 1960s to the private interest of the time he was writing the book.

Hirshman frames his theory in terms of a utility maximizing agent who derives utility from the consumption of public action (and some goods that result from public action) and private consumption. Disappointment of expectations plays a very important role. The utility derived from private consumption will tend to be lower than what the individual had expected and that would induce her to seek satisfaction in public action, which in turn is also likely to undershoot the expectations and lead back to the pursuit of pleasure in private interest and private consumption. In that way there is an endogenous shift of involvements between private interest and public action.

Because, the argument is stated in terms of a representative agent-citizen-consumer and abstracts from any class dichotomy, Hirschman's theory is unable to explain long run variations in the distribution of income, or what is the role of distribution in the shift of involvements. However, one can easily utilize and extend the concept of involvement to arrive to such a long theory of distribution of income between labor and capital.

We can understand involvement as a synonym to engagement, organization and activism. One of the main points of this paper is that distribution of income is determined by the *involvement* of the two classes. Historically, in the late 18th century and during the 19th century, the emergence of capitalist class as the dominant class that appropriated the lion's share of the produced income was the result of an active involvement of the capitalist class and its allies.[1] More recently, the resurgence of the capital in the late 1970s and its increasing dominance

[1] It is beyond the scope of this paper to discuss the details and the complexities of that process. The classic treatment of these ages of revolution and then capital is provided by Eric Hobsbawm (1962, 1975).

since was also the result of active involvement of the capitalist class in the United States and elsewhere in the form of organization of the companies (e.g. the Business Roundtable in the United States), funding of political campaigns, think tanks and media, and of course lobbying. Similarly, the working class was able to claim an increasing share of income only after its own active involvement through trade unions, political parties (and its own think tanks and lobbying). Not coincidentally, reduction in the income shares of each class are histrocially associated with periods of decreasing involvement of the respective class and high level involvement of the other class. The first decades after WWII is a period where the capitalist class is not as active as it was before (or after), while on the opposite side there is the climax of the organization of the working class. During the neoliberal period the increase in income inequality is accompanied by increasing involvment of the capitalist and decreasing involvement of the working class.

Based on this we can write that

$$\pi = \alpha_c \cdot x_c - \alpha_w \cdot x_w \tag{5}$$

where $x_c$ and $x_w$ denote the degree of involvement of the capitalist and the working class respectively and $\alpha_c$, $\alpha_w$ are positive constants. Thus, equation (5) is simply telling us that the profit share is an increasing function of the involvement of the capitalist class and a decreasing function of the involvement of the working class. If we time-differentiate equation (5) we get

$$\dot{\pi} = \alpha_c \cdot \dot{x}_c - \alpha_w \cdot \dot{x}_w \tag{6}$$

where the dot stands for the time derivative.

So, to arrive to distribution, we need to specify how the involvement of each class is determined. We will start from the capitalists and then move to workers. To answer the question of the how the capitalist involvement is determined we will assume that the capitalists have a target level of distribution ($\pi^{T_c}$). This target level of the profit share is a negative function of the degree of wage-ledness ($\lambda$) and a positive function of the current profit share. We can write:

$$\pi^{T_c} = -\beta_{1c} \cdot \lambda + \beta_{2c} \cdot \pi \tag{7}$$

where $\beta_{1c}$, $\beta_{2c}$ are positive constants.

Starting from the second argument, the target profit share will be higher the higher is the current profit share. In other words, as the profit share increases the capitalist class aspires to an even higher share of income. The effect of distribution-ledness is also not hard to understand. Capitalists are also interested in the macroeconomic performance of the economy, captured through capacity utilization in our model. The most obvious reason is that higher utilization tends to increase the profit *rate*.

The interest of capitalists in the macro-performance of the economy can also be associated to other historical or institutional factors. For example, it is generally accepted that the fear of an increase of the influence of the Soviet Union, and the experience of the depression and

the two world wars induced the capitalist classes in the United States and Europe prioritized full employment in the decades after the war. Related to that, the relative magnitude of the $\beta_{1c}$ and $\beta_{2c}$ will also depend on the specific "variety of capitalism." For example, the social arrangements of Scandinavian capitalism are different from those in the US and would favor a relatively strong $\beta_{1c}$. Finally, the relative magnitude of $\beta_{1c}$ and $\beta_{2c}$ will also depend on the balance of power within the capitalist class. If industries with relative constant level of demand and utilization dominate we should expect a strong $\beta_{2c}$ and vice versa.

We can then assume that capitalists shift their level of involvement in response to discrepancies between the target and the actual level of the profit share. Moreover, the change in involvement will be negatively affected by a *marginal* cost of this increase in their level of involvement ($MC_c$); the engagement and organization have a cost in terms of effort required, strategic implementation and also material resources. We can write:

$$\dot{x}_c = \rho_{0c} + \rho_{1c}(\pi^{T_c} - \pi) - \rho_{2c} MC_c \tag{8}$$

where $\rho_{1c}$, $\rho_{2c}$ are positive constants.

Finally, we will assume that there are increasing returns to involvement, so that the marginal cost is a negative function of the profit share. The idea here is that as a class becomes stronger and its share of income increases, a further advancement of its position become easier. We can write this with a simple linear function

$$MC_c = -c_c \cdot \pi \tag{9}$$

Thus, if we combine equations(7), (8) and (9) we end up with:

$$\dot{x}_c = \rho_{0c} - \rho_{1c}\beta_{1c}\lambda + (\rho_{1c}\beta_{2c} + \rho_{2c}c_c - 1)\pi \tag{10}$$

We can specify the involvement of the working class in a similar way. The targeted share of income of the working class will be now a positive function of the wage-ledness and a positive function of the wage share. If we define $\pi^{T_w}$ as the targeted profit share on behalf of the working class we can write this as

$$\pi^{T_w} = -\beta_{1w} \cdot \lambda + \beta_{2w} \cdot \pi \tag{11}$$

where $\beta_{1w}$, $\beta_{2w}$ are positive constants. As in the case of capitalists the relative magnitude of $\beta_{1w}$ and $\beta_{2w}$ is associated to historical and institutional factors, like the specific "variety of capitalism." Again, the social arrangements of Scandinavian capitalism would favor a relatively strong $\beta_{1w}$ as opposed in the American variety where $\beta_{2w}$ would be relatively stronger. Finally, the relative magnitude of $\beta_{1w}$ and $\beta_{2w}$ depends on the balance of power among workers. If "insiders" who are not very much interested in the overall employment level but prioritize real wage increases play a big role, then $\beta_{2w}$ will tend to be relatively higher and vice versa.

As before, and for analogous reasons, the change in the involvement of workers will respond

to the discrepancy of the targeted level of their income share from the actual one and will be negatively affected by the marginal cost of this involvement ($MC_w$). We can write this as

$$\dot{x}_w = \rho_{0w} - \rho_{1w}(\pi^{T_w} - \pi) - \rho_{2w} MC_w \tag{12}$$

where $\rho_{1w}$, $\rho_{2w}$ are positive constants.

Finally, the marginal cost will be a negative function of their share of income, and therefore a positive function of the profit share

$$MC_w = c_w \cdot \pi \tag{13}$$

If we combine equations (11), (12) and (13) we end up with:

$$\dot{x}_w = \rho_{0w} + \rho_{1w}\beta_{1w}\lambda - (\rho_{1w}\beta_{2w} + \rho_{2w}c_w - 1)\pi \tag{14}$$

Having defined the equations of motion for the involvement of the capitalist and the working class (equations 10 and 14), we can plug them in equation (6) to get the equation of motion of income distribution. With some trivial algebra we get:

$$\dot{\pi} = \delta_0 + \delta_1\pi - \delta_2\lambda \tag{15}$$

where $\delta_0 = \alpha_c\rho_{0c} + \alpha_w\rho_{0w}$ and $\delta_1 = \alpha_c(\rho_{1c}\beta_{2c} + \rho_{2c}c_c) + \alpha_w(\rho_{1w}\beta_{2w} + \rho_{2w}c_w) - (\alpha_c + \alpha_w)$ and $\delta_2 = \alpha_c\rho_{1c}\beta_{1c} + \alpha_w\rho_{1w}\beta_{1w} > 0$ . The sign of $\delta_1$ is not certain apriori, but we will assume that $\alpha_c(\rho_{1c}\beta_{2c} + \rho_{2c}c_c) + \alpha_w(\rho_{1w}\beta_{2w} + \rho_{2w}c_w) > (\alpha_c + \alpha_w)$ so that $\delta_1 > 0$.

To sum up. First, the change in the profit share is a negative function of the wage-ledness of the economy. This negative effect works at three stages:

1. $\lambda$ has a negative effect on the targeted profit share and a positive on the targeted wage share, through parameters $\beta_{1c}$ and $\beta_{1w}$ respectively.

2. A lower targeted profit and a higher wage share induce lower and higher involvement of capitalists and workers (*ceteris paribus*) through parameters $\rho_{1c}$ and $\rho_{1w}$.

3. At the higher level lower involvement by capitalists and higher by workers leads to a lower profit share (captured with $\alpha_c$ and $\alpha_w$).

On the other hand, distribution is unstable since $\delta_1 > 0$. There are two main sources of this instability:

**i** The positive effect that the share of income of each class has on its targeted share of income. This is captured with the parameters $\beta_{2c}$ and $\beta_{2w}$ and then operates through stages 2 and 3 above (that is with the intermediation of $\rho_{1c}$ and $\rho_{1w}$ and then $\alpha_c$ and $\alpha_w$).

**ii** The increasing returns to involvement, captured with $\rho_{2c}c_c$ and $\rho_{2w}c_w$ and operating through stage 3 (with the intermediation of $\alpha_c$ and $\alpha_w$).

# 4 The propensities to invest and save

One of the most interesting stylized facts of the last thirty years is the gradual decoupling of the corporate cash flows generated by profits (and borrowing) from investment. This has happened at the same time that wages have stagnated and the profit share has increased.

There are several explanations for this behavior of the propensity to invest out of the profit share. To begin with, current profitability is important for investment as a proxy for future profitability; an increase in current profitability creates the expectation that future profitability will be high or increase as well. It is possible that the linkage between current and expected profitability weakens, at least after a certain point, and other factor become more important for the formation of the expectations.

Another role of profitability is that it provide internal funds for the investment plans of the firms. It is also possible that the internal funds constraints becomes less and less binding as these internal cash flows increase (due to the increase in the share of profit). This could be part of the explanation why so many US corporations hoard huge piles of cash.[2]

Finally, periods of increasing profitability are usually associated with increasing power of the financial sector. Polanyi (1944) referred to the *haute finance* of the late 19th and early 20th century. The period of the last four decades has been characterized as the period of *financialization*. In a finance-dominated environment it is becoming more and more appealing to firms to "invest" their retained cash flows in the financial markets instead of using them for fixed capital investment. Over the last four decades an increasingly large share of firms retained profits and borrowing is used for share buybacks or purchase of equities issued by other firms.

Based on the above we can assume that the time derivative of $g_\pi^i$ is a function of the deviation of the profit share from its long run value $(\pi - \pi^*)$, with a negative partial derivative. We will also assume that the time derivative of $g_\pi^i$ is a function of $g_\pi^i$ itself, with its partial derivative being negative. That is as $g_\pi^i$ increases, a further increase of $g_\pi^i$ becomes more and more difficult. Overall, we can write

$$\dot{g}_\pi^i = f(g_\pi^i, \pi - \pi^*) \tag{16}$$

where $\partial \dot{g}_\pi^i / \partial g_{pi}^i < 0$ and $\partial \dot{g}_\pi^i / \partial \pi < 0$. The resulting $\dot{g}_\pi^i = 0$ nullcline has a negative slope.

Two more stylized facts are of interest here. First, the saving rate of rich households is higher than the saving rate of poor households. It is this standard empirical observation—made among others by Keynes in chapter 10 of *The General Theory* (1936) and Samuelson (1939, p. 793-795)—that underlies the assumption that the propensity to save out of the profit share is positive.

Second, over the last four decades as income has concentrated towards the households at the top of the distribution, their saving rate increased as well. For example, data from Consumer Expenditure Survey of the Bureau of Labor Statistics show that the saving rate of the top 20% of

[2] According to the latest estimates the US corporations have between $1.5tn and $2.5tn just sitting around.

American households increased by 11 points as a percentage of their income after taxes between 1989 and 2010 (the same figure is 18 points as a percentage of income before taxes).

To a certain extent, the reasons that explain the first can be explain the second. Increases in income cross-sectionally are associated with increasing saving rates, but also the increase in the income of a certain household can lead to an increase in its saving rate.

More specifically, in line with the "[A] Mathematical Theory of Saving" of Frank Ramsey (1928) one can explain this kind of beahvior of saving with the existence of a "bliss point." As the consumption of rich households approaches this point further increases in their income lead to increased in their saving rate.

Also, Keynes in chapter 9 of *The General Theory* provides "eight main motives or objects of a subjective character which lead individuals to refrain from spending out of their incomes." Out of these motives one could explain the increase of the saving rate as the income increases with i) the motive to build-up of reserves against unforeseen contingencies, ii) the motive to bequeath a fortune and finally, and iii) the satisfaction of "pure miserliness, i.e. unreasonable but insistent inhibitions against acts of expenditure as such." It is possible that the safety margin against unforeseen contingencies or the desire to bequeath a fortune increase as the income of a households increases. It is also clear the no matter how much the income of the Ebenezer Scrooges of this world increases their consumption will not increase.

Based on these we will assume the following specification for the propensity to save out of the profit share:

$$\dot{g}_{\pi}^{s} = h(g_{pi}^{s}, \pi - \pi^{*}) \tag{17}$$

where $\partial \dot{g}_{\pi}^{s}/\partial \pi > 0$. Moreover, we will also assume that $\partial \dot{g}_{\pi}^{s}/\partial g_{pi}^{s} < 0$ . That is, as the propensity to save out of the profit share increases, a further increase becomes harder. The resulting $\dot{g}_{\pi}^{s} = 0$ nullcline has a positive slope.

Overall, and using equations (16) and (17) and the definiton of wage-ledness ($\lambda$) we can write

$$\dot{\lambda} = z(\lambda, \pi - \pi^{*}) \tag{18}$$

with $\partial \dot{\lambda}/\partial \lambda < 0$ and $\partial \dot{\lambda}/\partial \pi > 0$. For reasons of simplicity we can define a linear specifictation for $z(\cdot)$:

$$\dot{\lambda} = \eta_1(\pi - \pi^{*}) - \eta_2 \lambda \tag{19}$$

where $\eta_1$ and $\eta_2$ are positive constants.

# 5 Stability Analysis

The system described in the two previous sections can be summarized with equations (15) and (19), which we rewrite here for reasons of convenience:

$$\dot{\pi} = \delta_0 + \delta_1 \pi - \delta_2 \lambda \tag{15}$$

$$\dot{\lambda} = \eta_1(\pi - \pi^*) - \eta_2 \lambda \tag{19}$$

It is not hard to see that the steady state is $(\pi^*, \lambda^*) = (-\delta_0/\delta_1, 0)$. Obviously, since $\delta_1 > 0$, for the steady state value of the profit share to make economic sense we need $\delta_0 = \alpha_c \rho_{0c} + \alpha_w \rho_{0w} < 0$.

The dynamics of the system are interesting. The $\dot{\pi} = 0$ nullcline can be written as

$$\lambda = \delta_0/\delta_2 + (\delta_1/\delta_2)\pi \tag{20}$$

On the other hand the $\dot{\lambda} = 0$ nullcline can be written as

$$\lambda = (\eta_1 \delta_0)/(\eta_2 \delta_1) + (\eta_1/\eta_2)\pi \tag{21}$$

In both cases the intercept is negative because $\delta_0 < 0$ and the slope of the nullclines is positive in the $(\pi, \lambda)$ space.

The equations are linear so it is straightforward to define the Jacobian matrix:

$$J = \begin{bmatrix} \delta_1 & -\delta_2 \\ \eta_1 & -\eta_2 \end{bmatrix} \tag{22}$$

For stability, two conditions are necessary. First, $\delta_1 - \eta_2 < 0$; that is, the unstable tendency of distribution ($\delta_1$) is relatively weak-compared to the tendency of $\lambda$ to stabilize. As we explained above, there are two main forces that make distribution unstable: the positive effect that the share of income of each class has on its targeted share of income ($\beta_{2c}$ and $\beta_{2w}$) and the increasing returns to involvement captured with $\rho_{2c} c_c$ and $\rho_{2w} c_w$ and operating through stage 3 (with the intermediation of $\alpha_c$ and $\alpha_w$). Stability requires that these forces are relatively weak

Second, $\eta_1 \delta_2 - \delta_1 \eta_2 > 0$; that is, the negative feedback effect of $\lambda$ on the change of the profit share ($\delta_2$) and the positive feedback effect of an increasing profit share on the change of the wage-ledness ($\eta_1$) are strong. In other words, stability requires that the classes are interested in the macroeconomic performance of the economy, and distribution-ledness affects strongly the intensity of their involvement; that is $\beta_{1c}$ and $\beta_{1w}$ are high, and then lead to a high $\delta_2$. Also, that as the profit share increases the degree of distribution-ledness of the economy changes fast.

The second condition can be rewritten as $\eta_1/\eta_2 > \delta_1/\delta_2$. Therefore from a geometric point of view, stability requires that the slope of the $\dot{\lambda} = 0$ nullcline is higher than the slope of the $\dot{\pi} = 0$ nullcline.

# 6 Instability and Cycles

Both the unstable and the stable configuration of the model are interesting. Starting from the first one, the model is telling us that if the two classes in a capitalist system are interested solely in increasing in their power position and the share of their income and disregard the macroeconomic performance of the economy, the system becomes unstable. Other factors, outside of the scope of the present model then come to stabilize it. In historical perspective the long crisis in Europe in the period between the Great War and the end of WWII can be partly understood through this prism. A crisis that was caused by the push of the capitalist class to increase their share of income, which was eventually resolved through wars and the emergence of Nazism.

**Figure 1 around here**

An unstable configuration of the model is presented in figure 1. In period $t_1$ the economy is wage-led since $\lambda > 0$. However, the profit share keeps increasing. The increase in the profit share leads obviously to lower utilization—since the economy is wage-led—but also over time makes the economy more wage-led and thus successive increases in the profit share cause increasingly large drops of utilization. Because distribution is highly unstable (high $\delta_2$) the economy drifts away from the steady state, along the red line.[3]

**Figure 2 around here**

If the configuration of the model satisfies the conditions for stability and since we have one stable and one unstable nullcline, the chances are that we will have cyclical convergence. Such a configuration is presented in figure 2. Starting again from period $t_1$, the economy is wage-led and the profit-share increases (since we are below the $\dot{\pi} = 0$ nullcline) which makes the economy more wage-led. As before, the combination of an increasingly positive $\lambda$ and an increasing profit-share lead to a crisis: lower utilization levels with increasing speed. However, unlike the previous case the restoring forces of the system are strong enough to pull the trajectory above the $\dot{\pi} = 0$ nullcline, at period $t_2$. After that, the profit share decreases The decrease in the profit share together with the economy being wage-led lead to an upswing. In fact, at this stage of the cycle, $\lambda$ increases as well, so the decreases in $\pi$ lead to increases in $u$ with accelerating speed.

However, as $\pi$ decreases the economy tends to become less wage-led. That happens after period $t_3$. When the trajectory crosses the $\dot{\lambda} = 0$ nullcline, further decreases in $\pi$ lead to decreases in $\lambda$, so that the benefits of the redistribution in favor of workers wane as time passes by. Eventually the economy becomes profit-led at period $t_4$. The wage share keeps increasing, the economy becomes more profit-led, so we have an accelerating decline of utilization and a crisis. The solution to the crisis is given with the change in the direction of distribution. At period $t_5$ the trajectory crosses again the $\dot{\pi} = 0$ nullcline but in the opposite direction; the

[3] The case presented in figure 1is one of an unstable node. Obviously, depending on the magnitude of the parameters we could have other types of instability. If the slope of the $\dot{\lambda} = 0$ nullcline was lower than the slope of the $\dot{\pi} = 0$ nullcline we would have saddle-path instability. On the other hand, higher values of the off-diagonal elements of the Jacobian would create an unstable spiral.

economy starts growing fast since both $\pi$ increases and $\lambda$ decreases. However, the increase in $\pi$ will eventually lead to a decrease in $\lambda$. After point $t_6$the economy will keep growing but with slower and slower pace. Finally, after period $t_7$ we have made a full circle, and we have returned to a crisis situation with increasing profit share and an increasingly positive $\lambda$.

The counter-clockwise cycles of figure 2 resemble a predator-prey model, where distribution is the prey and $\lambda$, the degree of wage-ledness of the economy is the predator. As it is well know, it was Richard Goodwin (1967), who first modeled the symbiosis of the two classes—*partly complementary, partly hostile*—based on the predator-prey equations, with the growth rate being the prey and distribution the predator. Empirical observation shows that the Goodwin model provides a good way to think about the business cycle; at least during certain historical periods.

The model of this paper reverses the role of distribution, which now becomes the prey. If it was not for the restoring forces of the system the profit-share (or the wage-share) would tend to continuously increase. As we explained the increase in the profit share leads to an increase in the level of $\lambda$, the predator of our system. The crisis that ensues will induce a change in the intensity of the involvement of the two classes and eventually a switch of the direction of the distribution of income. The decreases in the level of the prey ($\pi$) will eventually lead to a decrease in the level of the predator ($\lambda$), another crisis and will induce a shift of the involvements in the opposite direction and eventually the direction of the distribution of income will switch back.

This is another way to think about the—partly complementary, partly hostile—symbiosis of workers and capitalists within the capitalist system. Compared to the Goodwin model it is more appropriate for long run variations of distribution and growth. The present model is helpful to understand the dynamics of the US economy during the 20th century. The increase in inequality and the profit share in the early decades of the century led to the crisis of the 1930s. The crisis led to the New Deal and the institutions that dominated the early postwar period. As Marglin and Bhaduri (1990) explain, the US economy was wage-led at that period, but then becomes increasingly profit-led as we approach the 1970s. As a result, the institutions that provided the solution to the crisis of the 1930s the increasingly high power of labor endogenously led to the crisis of the 1970s, which was a profitability crisis. The crisis induced a stronger involvement of capitalists and a lower involvement of workers. This is another way to explain the *Shifting Involvements* Hirschman was observing at that time. The change in the involvements led to the establishment of the neoliberal order of the 1980s. Since then the increase in the profit share made the American economy more and more wage-led and eventually led to recent crisis and the ongoing stagnation. Phenomena like the emergence of the Occupy Wall St movement, the popularity of self-proclaimed socialist politicians (a forbidden word until recently), the popularity of *Capital in the Twenty-First Century* Piketty (2014)—a book on the distributin of income—are all signs of the shifting involvements of our time.

Of course, the parameters of the real world are not fixed. So, there is always the possibility that we have moved from the stable, cyclical configuration of figure 2 to the instability of figure 1 (or that the cycles were in the first place a long unstable spiral!). Under the new administration,

the US economy (now in a position like that in $t_1$ of the two graphs will keep drifting towards the north-east. Involvements will keep shifting but it remains to be seen if, how, and when the $\dot{\pi} = 0$ nullcline will be crossed.

# 7 Cooperation and conflict

Bhaduri and Marglin (1990) provide an interesting extension to the dichotomy between wage- and profit-led growth, arguing that each one of these regimes can be further distinguished into co-operative and conflictual sub-regimes. This further dichotomy forms the "economic basis for contesting political ideologies," as the title of their paper goes. The basic idea is that if an economy is strongly wage-led, a decrease in the profit share will lead to a large increase in utilization and an increase in the profit *rate*, thus making both classes better off. This is the cooperative wage-led case. If utilization does not respond strongly, then we are in a conflictual wage-led case, since the decrease in the profit share will lead to a decrease in the profit rate as well.

Similarly, in the profit-led case, if utilization responds strongly to a decrease in the wage share, a redistribution of income towards profits might increase the wage bill normalized to potential output (an equivanlent for the profit rate for the working class). This is the cooperative profit-led regime. Under the conflictual profit-led regime the wage-bill normailized for potential output decreases as the profit share decreases.

This four-way dichotomy provides an intuitive way to think about the economic basis of contesting ideologies. The cooperative wage-led regime provides the economic justification of traditional "left-Keynesian" social-democratic policies: a redistribution of income towards wages will eventually benefit both workers and capitalists. On the opposite end, the cooperative profit-led case is the usual argument of "supply-side" economists, The redistribution of income towards profits will boost aggregate activity and thus eventually the profits will "trickle-down" to workers.

More formally, the condition for a cooperative wage-led economy is that a decrease in the profit share will increase the profit rate $d(\pi u)/d\pi < 0$, which can be rewritten as

$$\frac{d(\pi u)}{d\pi} < 0 \Leftrightarrow \frac{du}{d\pi} \cdot \frac{\pi}{u} < -1 \Leftrightarrow \lambda \cdot \frac{\pi}{u} > 1 \tag{23}$$

This is essentially an elasticity condition, which will tend to be satisfied when $\lambda$ and $\pi$ are high, and when $u$ is low. With reference to the cycle of $\lambda$ and $\pi$ that we presented in figure 2, this condition will tend to be satisfied around the time period $t_2$-$t_3$,where $\lambda$ and $\pi$ are high and $u$ is relatively low. In the remaining wage-led phase of the cycle, above the horizontal axis the economy will be conflictual.

Similarly, the condition for a cooperative profit-led economy is that an increase in the profit share will increase the wage bill rate normalized for potential output $d[(1-\pi)u]/d\pi > 0$, which can be rewritten as

$$\frac{d[(1-\pi)u]}{d\pi} > 0 \Leftrightarrow \frac{du}{d\pi} \cdot \frac{1-\pi}{u} > 1 \Leftrightarrow \\ \frac{du}{d\pi} \cdot \frac{\pi}{u} > \frac{\pi}{1-\pi} \Leftrightarrow -\lambda \cdot \frac{\pi}{u} > \frac{\pi}{1-\pi} \tag{24}$$

This condition will be satisfied, when $\lambda$, $\pi$ and $u$ are low. With reference to the cycle of figure 2, this condition will tend to be satisfied in the period around $t_5$ to $t_6$,where all $\lambda$, $\pi$ , and $u$ are low. In the remaining profit-led phase of the cycle the economy will be conflictual.

**Figure 3 around here**

These results are summarized in figure 3. As we can see, based on the aforementioned model, the economy will move from a conflictual wage-led period (the orange segment of the line), to a cooperative wage-led (the red segment), back to conflictual wage-led; and then conflictual profit-led (the yellow segment), cooperative profit-led (the blue segment), conflictual profit-led and eventually back to conflictual wage-led. It goes without saying that the exact time periods where the switch between the regimes will take place depends on the specification of the model.

More generally, we can assume that capitalists are interested in a weighted average of the profit share and utilization $\pi^{a_c} u^{b_c}$. The profit rate is a special case of that with $a_c = b_c = 1$. Under this assumption the conditions for cooperative wage-led growth is

$$\frac{d(\pi^{a_c} u^{b_c})}{d\pi} < 0 \Leftrightarrow (b_c/a_c) \cdot \frac{du}{d\pi} \cdot \frac{\pi}{u} < -1 \Leftrightarrow (b_c/a_c) \cdot \lambda \cdot \frac{\pi}{u} > 1 \tag{25}$$

Similarly, we can assume that workers are interested in $(1-\pi)^{a_w} u^{b_w}$, instead of the special case Bhaduri and Marglin (1990) consider with $a_w = b_w = 1$. In this case the condition for cooperative profit-led growth is

$$\frac{d[(1-\pi)u]}{d\pi} > 0 \Leftrightarrow (b_w/a_w) \cdot \frac{du}{d\pi} \cdot \frac{1-\pi}{u} > 1 \Leftrightarrow \\ (b_w/a_w) \cdot \frac{du}{d\pi} \cdot \frac{\pi}{u} > \frac{\pi}{1-\pi} \Leftrightarrow (b_w/a_w) \cdot (-\lambda) \cdot \frac{\pi}{u} > \frac{\pi}{1-\pi} \tag{26}$$

Equations (25) and (26) are telling us that the more workers and capitalists are interested in utilization relative to their share of income (the higher the $b/a$ ratios are) the more possible is that the cooperative conditions are satisfied. In terms of figure 3, the higher the $b/a$ ratio are the longer are the cooperative segments of the cycle.

The preceding discussion also provides a link between Hirschman's *Shifting Involvements* and the economic basis of contesting political ideologies. The model of the paper shows that the move between the profit- and wage-led regimes and their cooperative and conflictual sub-regimes provides the economic basic for shifts in ideologies. From that point of view we can understand within a unified framework the hegemony of social democracy in the early decades after WWII, the popularity of "trickle-down" economics in the early 1980s and the increase in the popularity of social democratic approaches today (at least in the US).

# 8 Conclusion

The paper presented a model where the distribution of income between capital and labor is determined by the involvement of the two classes. As the involvement of the capitalists increases, or that of workers increases, the profit share increases and vice versa. The shift of involvement is affected by its potential impact on economic activity and also has an unstable character: a higher income share will tend to further increase the involvement of a class, and thus further tilt distribution in its favor.

On the other hand, as the profit share increases the economy becomes more wage-led. As a result we have a two-dimensional dynamic system. The system is unstable if the unstable behavior of distribution dominates. In the opposite case, the most possible configuration are predator prey cycles in the <profit share, wage-ledness> space. These possibilities are useful to think historical episodes in capitalist economies and long run dynamics of growth and distribution.

Finally, we examine what Bhaduri and Marglin (1990) call cooperative and conflictual cases of profit- and wage-led growth. We show that in the long cycles of the predator-prey configuration the economy will move between wage- and profit-led periods as well as between their conflictual and cooperative sub-regimes. This provides a bridge between the economic basis for the changing popularity of contesting political ideologies and the *Shifting Involvements* as proposed by Hirschman.

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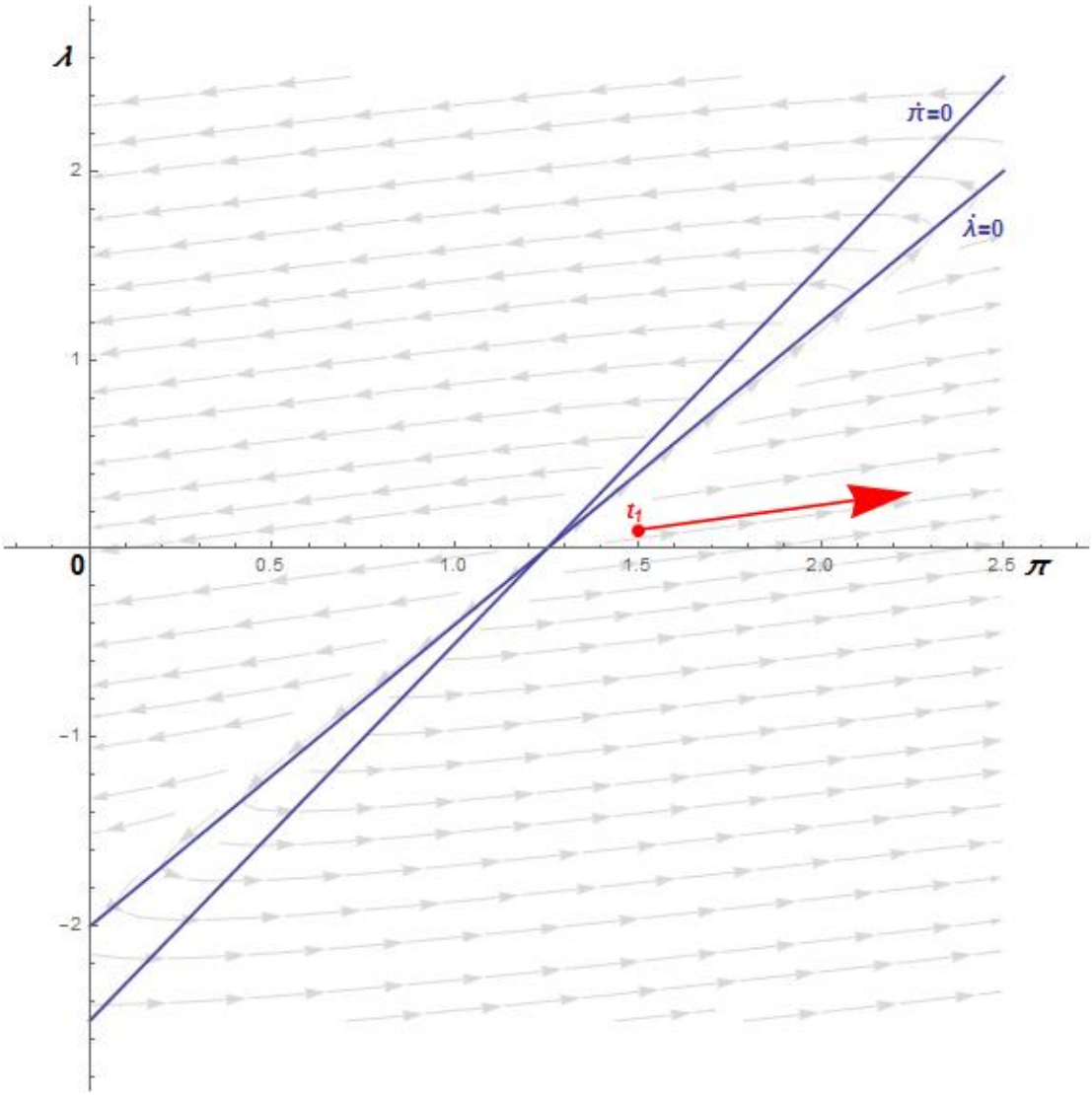


Figure 1: Unstable configuration

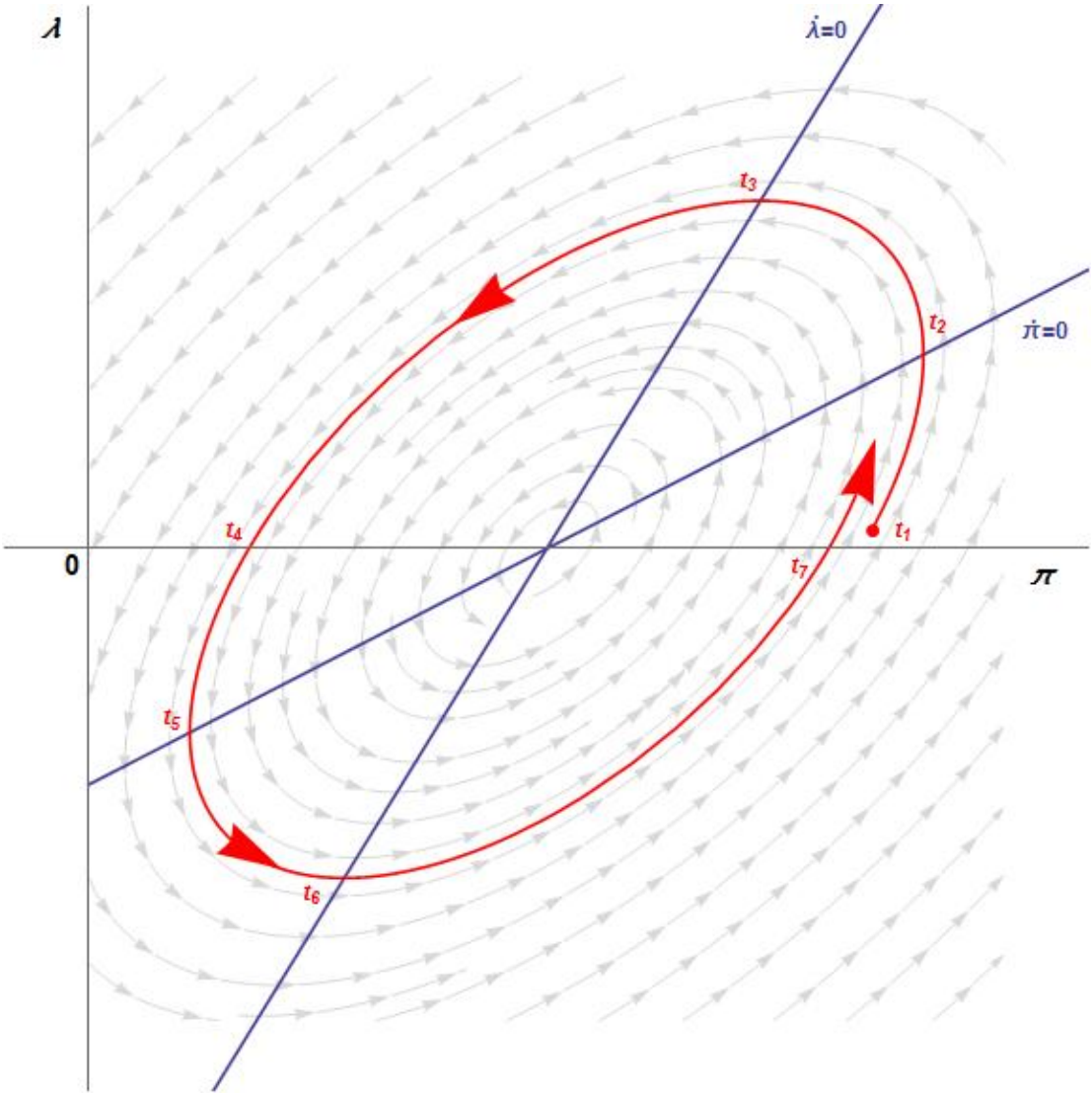


Figure 2: Predator-prey cycles in the $< \pi, \lambda >$ space

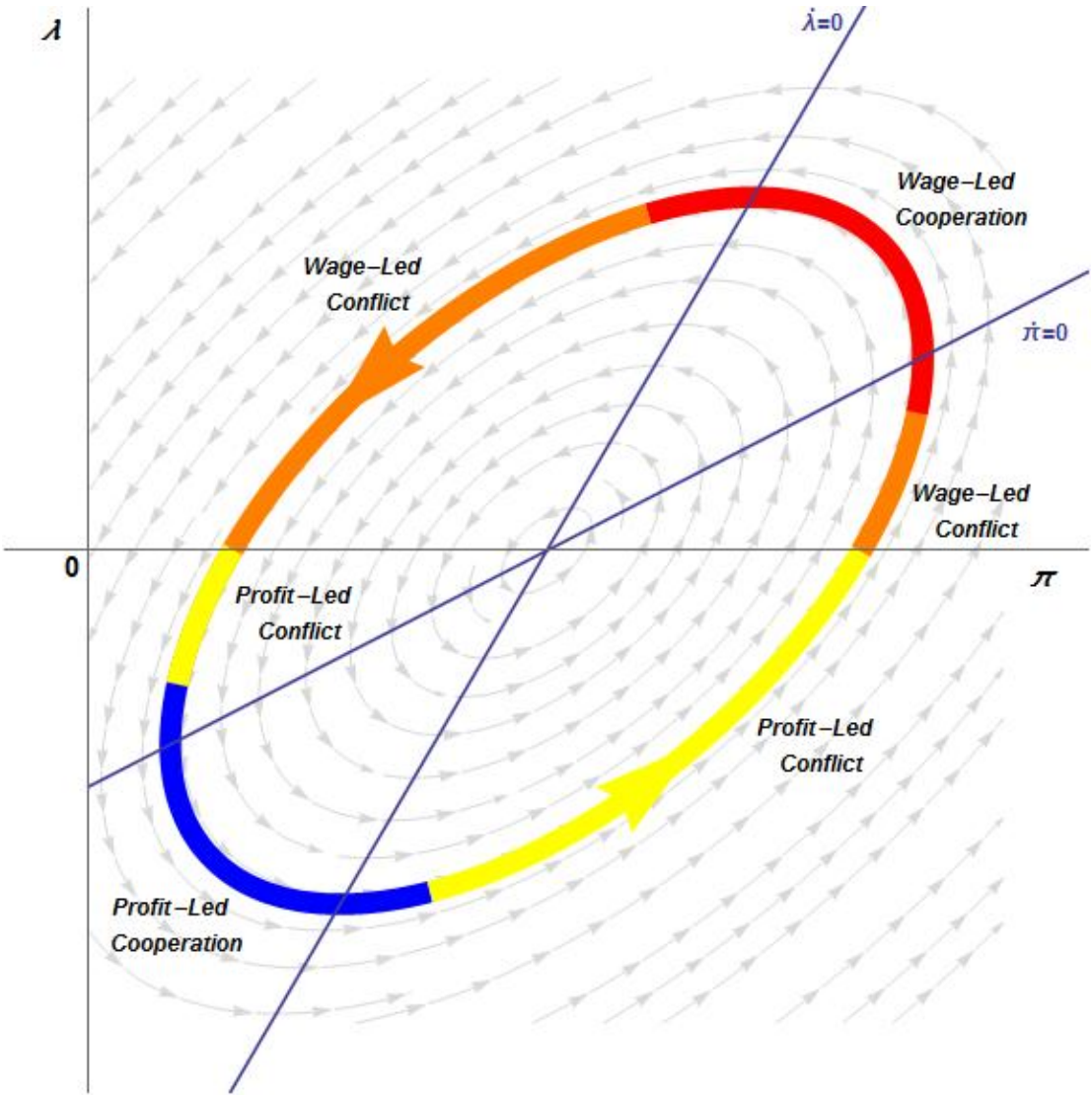


Figure 3: Cycles of conflict and cooperation