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Unemployment In A Monetary Zone: A Coordination Failure ? Le Chômage Dans Une Zone Monétaire : Un Défaut De Coordination ?

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Abstract : *The persistence of high rates of unemployment in contemporary economies, which coincides with the determination of activity and employment levels in the member economies of a monetary union, as well as consideration of the ways in which meetings are organized and carried out, makes it possible to investigate whether unemployment in a monetary zone is a result of failure or lack of coordination.*
The present paper therefore attempts to show that coordination failures, which are related to multiple equilibria, explain unemployment in a monetary union such as CEMAC, through a theoretical model based on a learning mechanism. The result shows that unemployment in the CEMAC zone can be explained by the existence of coordination failures since, in the absence of increasing returns, all production opportunities are not exploited, which increases the level of unemployment. It is therefore necessary to improve the skills of the labor force in the reproduction of efficient practices as well as the modes of operation and organization of the labor market, especially in the production of new knowledge.

Keywords: *Labour economy- Unemployment- Failure of coordination- Monetary union- Learning- Knowledge economy.*

Résumé

La persistance de taux élevés de chômage dans les économies contemporaines, qui coïncide avec la détermination des niveaux d'activité et d'emploi dans les économies membres d'une union monétaire ainsi que la prise en compte des modalités d'organisation et de réalisation des rencontres, permet de rechercher si le chômage dans une zone monétaire relève d'un échec ou d'un défaut de coordination.

Le présent papier s'attèle donc à montrer que les défauts de coordination, qui s'attachent aux équilibres multiples, expliquent le chômage au sein d'une union monétaire telle que la CEMAC, à travers une modélisation théorique qui se fonde sur un mécanisme d'apprentissage. Le résultat montre que le chômage en zone CEMAC s'explique par l'existence des défauts de coordination puisqu'en l'absence de rendements croissants, l'ensemble des opportunités de production ne sont pas exploités, ce qui augmente le niveau du chômage. Il est alors nécessaire d'améliorer des compétences de la main d'œuvre dans la reproduction des pratiques efficaces ainsi que les modes de fonctionnement et d'organisation du marché du travail surtout dans la production des connaissances nouvelles.

Mots clés : Economie du travail- Chômage- échec de coordination-défaut de coordination- Union monétaire- Apprentissage- Economie de la connaissance.

Code JEL: J21-J22-E62-E71-I23

I. Introduction

The persistence of high unemployment rates in the economies that are members of a monetary union has led many authors to investigate whether unemployment in such a zone is due to failure or lack of coordination (Artus, 2009; Julien, 2003, 2006).

In fact, the lack of coordination in trade and in the functioning of the market (crowding out of centralized coordination), often attributed either to the slowness of the price adjustment process (Patinkin, 1956) or to price rigidity (Bénassy, 1993), leads to the admission of a failure or lack of coordination.

An economy exhibits coordination failures when the result of the interaction between rational economic agents leads individuals to coordinate on an equilibrium for which the level of well-being is lower (low equilibrium) than that of other mutually advantageous equilibria (high equilibrium) (Julien, 2006; Artus, 2009). Coordination failures are thus characterized by the uncertainty of economic agents in their production and consumption plans. They are assessed through multiple equilibria (Cooper and John, 1988), which are possible both through strategic complementarities (1) (Bulow et al., 1985) and through carry-over effects (2).

The failure to coordinate relates, for its part, to individual actions on the organization of markets (Julien, 2006). It is characterized by balances with rationing, the lack of harmonization of individual interests, transaction costs (problem of friction in exchanges, delays in acquiring information) and the carrying out of transactions or meetings, which highlight social interactions (Howitt, 1985, 1990). It is based on the eviction or complete disappearance of the auctioneer, who no longer succeeds in ensuring compensation between offers and requests. The failure of coordination is thus characterized by the participation of agents in exchanges that influence individual choices and the quality of the balance (Julien, 2006).

The theory of coordination failure is thus the result of the theory of imbalance, which unfortunately does not take into account the strategic behaviour of agents on the labour market (national and sub-regional). To this is added the absence of information asymmetries, the failure to take into account uncertainty and the dynamics of interaction between agents. As a result, we are only interested in coordination failures using strategic analysis, coordination game theory, intertemporal analysis and externalities, since unemployment within a monetary union seems to be much more a result of a failure than of coordination.

The theory of coordination failures analyzes the manifestations and consequences of interactions between rational economic agents. Thus, three analytical grids applied to the theory of unemployment are of general interest: that of aggregate demand externalities (Heller, 1986), that of trade externalities (Diamond, 1982, 1984; Howitt, 1985; Howitt and McAfee, 1987) and that of externalities due to increasing returns, which are the focus of our analysis.

With regard precisely to externalities due to increasing returns, the analyses focus on examining situations of imperfect competition (Weitzman, 1982) with the existence of significant fixed costs. They make it possible to find a microeconomic explanation for unemployment based on the hypothesis of increasing returns. Three categories of increasing returns are then considered:
1°) that which uses questions of communication between agents. Thus, unemployment is caused by a lack of coordination in expenditure due to the communication problem of aggregate demand. This category highlights the existence of a multiplicity of Pareto-ordered underemployment equilibria ;
2°) the one based on the degree of agents' participation in markets and focusing on increasing returns in dating technology (Diamond, 1984; Pissarides, 2000) integrating business cycles. It reveals a multiplicity of equilibria with rational anticipations ordered in terms of well-being ;
3°) finally, the last one which insists on the technology of the function of production, storage or intermediation. It demonstrates the existence of a multiplicity of "sunspot" equilibria with effects of consumer anticipations (optimistic or pessimistic) following a storage technology with increasing returns (Weil, 1989) on both large and smaller markets (Cooper and Corbae, 2002).

Overall, it shows that the interactions between rational individual agents are based on multiple equilibria of underemployment, which assign a role to coordination failures in explaining unemployment. The present study will therefore focus on the CEMAC region, which includes six countries (3). There are three reasons for this choice:
1°) dissimilar economic situations resulting from the (professional) mobility of labour, from the ex post and ex ante reorientation of individual choices of labour offers, arising from the growing impoverishment of populations and annihilated by the common monetary policy, which characterize the defects of coordination and limit the effectiveness of structural measures to fight unemployment ;
2°) unemployment rates due to nominal and real rigidities, because the labor market remains relatively narrow and uncertain, especially since the demographic structure is relatively young. Added to this is a low level of education (schooling) and a low level of design (skilled work), leading to the development of the informal sector and the flourishing of "small trades", which contribute to the adoption of vocational training as the "par excellence" mode of integration into employment likely to lead to a lower level of well-being (low equilibrium).
3°) uncertainty about the existence of intergenerational relations, especially since the different generations no longer share intrinsic values with regard to the changes in contemporary economies and especially the lack of work effort by young people.

The structure of this article will be in two parts : The existence of coordination failures as an explanation of unemployment in the CEMAC zone (I); the interpretation of the results obtained (II).

I- Coordination failures as an explanation of unemployment in the CEMAC zone

The theoretical framework of analysis used to account for this is the New Synthesis, which reveals the hypotheses of the New Keynesian Economy (NEK) (Mankiw, Ball and Romer) and the New Classical Economy (NEC) (Lucas, Barro). The advantage of such a framework is that it takes into account the strategic behaviour of agents, intertemporal analysis, analysis of stochastic shocks and their adaptation to the theory of coordination games, which highlight coordination failures.

Such a framework also makes it possible to deal with the existence of rigidities (nominal and real) in a labour market characterized by uncertainty, the effects of the way such a market is organized and operates, and learning mechanisms that integrate the externalities of increasing returns from technology into the production and encounter function. (Weitzman, 1982; Manning, 1990).
We would first like to present the model before proceeding to its resolution and the determination of equilibria.

I.1- Presentation of the model

Following Julien (2003), the model aims to show that coordination failures explain unemployment in the CEMAC zone. Unlike Julien's model, which estimates equilibrium unemployment (4), the model is based on the labour factor as in endogenous growth models. It is augmented by reoriented job offers and highlights the intergenerational dynamics that allow the behaviour of a representative young agent to be taken into account.

It is a theoretical model (5) whose main advantage is a broader and more flexible interpretation of economic phenomena.

We present the empirical framework of analysis (the representative economy) as well as the agents and their behaviour.

a) The empirical framework of analysis: the representative economy

That is the CEMAC zone, a set of heterogeneous economies evolving in an uncertain environment and endowed with information asymmetries. We consider it to be a representative economy where unemployment mainly affects the young population, ready to be hired. Job offers are often reoriented according to the narrowness of the labor market both in the country of origin and in the other member countries due to labor mobility.

In such an economy, the distribution system is such that the work of the young allows the consumption of the old. The intergenerational characteristic admits that the two generations (old and young) coexist at each period and maintain exchange relations. They follow one another intertemporally and the individuals of the same generation are identical. The population is constant over the two periods.

We then consider the production of a single good by the young and consumed by the old against a quantity of money m distributed at the beginning of the period to each old agent, the only valuable reserve asset.

The good is likely to be produced in quantity y_t on the basis of the following production function:

$$y_t = F(n_t, N_t), \text{where } F'_{n_t} \succ 0,\ F'_{N_t} \succ 0 \ \ et \ \ F''_{n_t} \prec 0, \qquad [1]$$

with :

n_t, the quantity of work used by the firm and offered by the young agent, it is composed of n^- and n^+ represents respectively the supply of reoriented work leading to a lower welfare and the initial supply of work, a "higher" welfare;

N_t, the aggregate labour supply (aggregate effort). This effort is considered as a given by each agent, where it is perfectly and completely informative.

The production function [1] is unifactorial (labour) with decreasing individual factorial output and increasing social factorial output. It determines supply and demand on the labour market, taking into account the existing organization and mobility.

Thus, when the number of agents increases and the size of the market expands, the firm can increase its production, all the more so because the aggregate quantity of work, from which firms can benefit, represents a stock of acquired knowledge for agents ready to be hired.

It is assumed that the organization of work is such that it recences a constant number k of agents in each generation so that work constitutes a positive externality, which makes it possible to write :
$N_t = kn_t$.

The level of production of agent *j* is thus obtained by assuming increasing yields through the production function [2] below :

$$F(n_j, I_j) = \begin{cases} An_j^{\beta} I^{*\gamma}, \ si \ I_j \prec I^* \\ An_j^{\beta} I_j^{\gamma}, \ si \ I_j \geq I^* \end{cases}, \qquad [2]$$

with :

n_j ,the amount of work offered by agent *j*, it measures the contribution and associated effort (the efforts of others to which the agent has access) as a result of mobility and reorientation of work choices ;

A, a constant representing the level of technology;

I_j, the total number of ideas (in terms of information collected) due to the efforts of others (the dissemination of information) to which the agent has access. It is proportional to the functioning of the labour market and to each agent's employability (labour supply). It is determined according to a matching logic ;

I^*, a threshold at which innovations (new information) influence individual production;

$\beta, \gamma,$ elasticities with respect to work and the number of ideas due to the efforts and threshold of innovations that influence individual production.

It is considered that all information in relation to job applications is available as a result of the organization of the labor market and its functioning, but only a fraction of the total effort (the ability to search for employment) is accessible to everyone. The information transmitted is proportional to $\sum_{j \in J} n_j = kn = N$.
It is also considered that the agents are given enough time to become acquainted with the information acquired by others as well as new job offers in order to integrate them into the job search.

Then, ψ the proportion of information transmitted in terms of positions offered in the period; *N*, the number of agents, and the time that elapses before the arrival of an idea or a job offer can be formulated as follows :
$1/\psi N$.

That is to say, φ the time needed to become aware of a vacancy and to integrate it, then the time needed to receive and integrate a new idea will be :
$\varphi + (\psi N)^{-1}$.

The total number of job offers received by agent *j* in relations to the time available to him is then formulated as follows :

$$I_j = \frac{1}{\varphi + (\psi N)^{-1}} = \frac{\psi N}{1 + \varphi\psi N}. \qquad [3]$$

Equation [3] presents a matching technology that increases with the number of agents. It is bounded by $1/\varphi$ its limit when the number of agents tends towards infinity. There is thus a limit to the influence of increasing returns on aggregate effort. By combining equations [2] and [3], we specify the production function of agent *j* as follows:

$$F(n_j, N) = An_j^{\beta}\left(\max\left\{I^*, \frac{\psi N}{1 + \varphi\psi N}\right\}\right)^{\gamma} \equiv n_j^{\beta}\theta(N), \qquad [4]$$

with :

I^*, a threshold at which innovations influence individual production;

I_j, the total number of ideas perceived with respect to the time available to the agent j ;

n_j, the quantity of work offered to the firm j ;

A, a constant representing the level of technology;

$\beta, \gamma,$ the elasticities with respect to work and the number of ideas due to the efforts and the threshold of innovations that influence individual production.

b) Agents and their behaviour

These are the agents (old and young representative), who produce and consume. The old representative agent is a consumer and holds a monetary endowment to consume. His behaviour leads the young agent to make production efforts with regard to intergenerational altruism, which can lead to accepting any type of work, even the least remunerated.
The representative young agent able to work is capable of assimilating (adapting) and innovating with regard to the knowledge acquired. He considers the behavior of the older agent as a given. The utility function at period t is then as follows:

$$W = U(c_{t+1}) - V(n_t), \qquad [5]$$

with :

c_{t+1}, consumption when the agent is old (future consumption);

n_t, the labor supply of agent *j* young, composed of, a labor supply reoriented towards a less remunerated work and, inversely;

$U(\bullet)$ a continuous, homogeneous, increasing and almost concave function;

$V(\bullet)$ a continuous, homogeneous, increasing and strictly convex function.

The representative youth agent then chooses a labour supply, a demand for money and a future consumption under the following two budgetary constraints:

(i) $p_t y_t = m_t$; [6]

(ii) $p^e_{t+1} c_{t+1} = m$, [7]

with :

p_t, the price of the good at the period t ;

p^e_{t+1}, the anticipated price of the good produced at the period t+1;

m_t, the demand for money in period t.

It is assumed that the anticipated price of the period t+1 equals the price of the period t+1: $p^e_{t+1} = p_{t+1}$, which means that the agents make good anticipations with regard to the uncertain nature of the economic zone under consideration.

I.2- Model resolution and determination of equilibria

The aim is to determine the different equilibria (low and/or high equilibria) in order to show how coordination failures explain unemployment.

We start from the hypothesis that unemployment in the CEMAC zone can be explained by labour market dysfunctions due to coordination failures.

Unemployment is therefore no longer explained by rigidities (nominal or real), but rather by the inability of economic agents to coordinate.

The resolution of the maximization program of the representative youth agent is derived from equation [5] and the constraints [6] and [7], that is :

$$\begin{cases} \underset{[c_{t+1}, n_t, m_t]}{Max} U(c_{t+1}) - V(n_t) \\ S/C \\ \quad p_t y_t = m_t \\ \quad p_{t+1} c_{t+1} = m_t \end{cases} \qquad [8]$$

The condition of optimality is obtained by assuming the equilibrium of the perishable good $(y_t = c_t)$ and money markets $(m_t = m)$, taking into account the fact that $p_t y_t = p_{t+1} c_{t+1}$ and that $y_t = F(n_t, kn_t)$, is :

$$V'(n_t) = \frac{p_t}{p_{t+1}} U'\left[\frac{p_t}{p_{t+1}} F(n_t, kn_t)\right] F_{n_t}(n_t, kn_t). \qquad [9]$$

The intertemporal equilibrium, which describes the evolution of the labour supply n_t composed of n^- and n^+ according to the reorientation of the labour supply to capture the defects of coordination over time, can be written as follows:

$$n_t = \Omega(n_{t+1}). \qquad [10]$$

Equation [10] determines the interaction between rational agents and makes it possible to assess the level of well-being achieved by each agent at equilibrium, especially since there are a certain number of underemployment equilibria (a low equilibrium n_B corresponding to n^- and a high equilibrium, n_H).

There thus appears to be a multiplicity of equilibria characterizing the coordination failures resulting from the ex ante or ex post reorientation of individual job offers expressed by young people. The agent's well-being is thus captured by the level of utility $W\left(n^-, kn^-\right)=U\left[F\left(n^-, kn^-\right)\right]-V\left(n^-\right)$, which shows the revision of choices towards a lower equilibrium, revealing unemployment as the primary objective of this young agent.

Indeed, when the agent chooses to offer the quantity of work n^- leading to n_B and the others the quantity n^+ giving n_H , we obtains the utility $W\left(n_B, kn_H\right) \prec W\left(n_H, kn_H\right)=W_H$, the well-being associated with the level of employment n_H . It follows that when the supply $n_H \succ n_B$ of labour this implies that $W_H \succ W_B$, especially when $F(n, N)$ increasing with N .The utility of the rational agent will always be higher if the agents prefer a high equilibrium.

In fact, the choice of the high equilibrium seems risky in terms of opportunity cost or price to pay, which leads agents to opt for a prudent equilibrium, the sub-optimal solution (low equilibrium), corresponding to the common attitude. Thus, even when everyone thinks that it is better to choose the optimal Pareto equilibrium, the credible possibility that each individual agent is faced with is that the other one does not choose the Paretian outcome, which allows the endogenous separation of the multiple equilibria that generate the coordination failures. They thus constitute an explanation of unemployment in the CEMAC zone following labor market malfunctions, which only offer agents the possibility of remaining confined to occupations not really desired and settling for inferior well-being $W\left(n^-, kn^-\right)=U\left[F\left(n^-, kn^-\right)\right]-V\left(n^-\right)$. The existence of multiple equilibria means that the economy can remain in an inferior state as a result of labor offers redirected towards a lower equilibrium.

II. Interpretation of the results

The aim is to use the theoretical framework selected to grasp the specific problems posed by coordination failures, which amounts to identifying the various implications of coordination failures within CEMAC in order to grasp their scope and draw useful lessons.

II.1- Manifestations of lack of coordination within CEMAC

Differences in wage levels between member countries of a currency union most often lead to a search for a job at a higher wage. This situation, which creates instability in the labor market, is usually the result of labor mobility or labor migration. Thus, the altruistic behaviour existing within generations leads to the choice of a type of work in order to ensure the well-being of other agents.

Indeed, the job candidate (young agent) has no information on the jobs available or on the characteristics in terms of pay and arduousness. He chooses to migrate to a country other than his own because he is supposed to offer higher wages. The consequence is a development of survival techniques, which are particularly related to "small trades or petty trade", leading to the informal economy to ensure an existential minimum, tending towards lower welfare and a lack of coordination.

In fact, the concern to produce for the consumption of the old agent leads him to intergenerational altruism capable of multiplying efforts tenfold. In addition to this, the professional aspect covers several dimensions, including a change of company, profession, position or even qualification level for employed persons, or a transition between unemployment, inactivity and employment.

Indeed, the mobility between unemployment and employment is part of the debate on the increase in job instability and even the security of professional trajectories. Professional mobility thus covers a complex reality where individual (level of education, seniority and professional experience) and economic (labour market) parameters interfere. The orientation of the labor market is profoundly affected by economic cycles, as job offers become scarcer and layoffs multiply. Mobility is constrained: individuals are forced to accept changes (in

firm, category, residence) in order to preserve their jobs. Conversely, there is a great deal of latitude for individual preferences because of the size of the job offer, which makes mobility a voluntary act. Only those who do not want the type of job offered will then be unemployed, thus characterizing coordination failures.

Two types of mobility are then envisaged: internal mobility, on the one hand, and external mobility, on the other. Internal mobility considers internal promotion within the firm following the erosion of internal markets within firms. It takes into account socio-professional groups as well as changes in professions. External mobility, relative to the regional or local dimension, on the other hand, considers spatial differences in the chances of exiting unemployment or differences in the intensity of labour turnover. In such a perspective, there is a difference between rural labor markets with low labor turnover and mobility between firms and urban markets with higher mobility.

However, the relationship between the functioning of local labor markets and local economic development is questionable, especially since these markets are supposed to play a decisive role in the creation and circulation of knowledge. The learning mechanism thus enables economic agents to conjecturalize their choices by using a procedure for revising their anticipations (Marcet and Sargent, 1989; Woodford, 1990) and by borrowing an adaptive (6) learning scheme (7) (Evans and Honkapoha, 1995), which requires a level of qualification (a labour supply, n^{+}) capable of responding and adapting to new technological requirements. These are precisely new ideas to be integrated into the production effort, especially in an uncertain world with strong constraints. In this way, utility functions such as $W\left(n^{-}, kn^{-}\right)=U\left[F\left(n^{-}, kn^{-}\right)\right]-V\left(n^{-}\right)$.

On the other hand, the incapacity of employment regulatory bodies (especially employment offices) highlights the importance of compensation. The absence of a mutually advantageous balance (coordination) leads to coordination failures and to the reorientation of agents' preferences: ex-ante reorientation on the one hand, and ex-post reorientation on the other.

Ex-ante reorientation is the result of unsatisfied job offers. Job-seeking agents then choose to revise their claims downwards, taking into account the way the labour market is organized. They turn to other types of jobs, which are less rewarding and less remunerative (low balance).

The ex post reorientation seems similar, with the difference that the economic agent here actually completes his training. However, given the narrowness of the labour market, the existence of structural constraints and the amplification of the system of recommendations, he is obliged to turn towards less remunerated jobs (low equilibrium).

In the CEMAC zone, learning must be adapted to the needs of enterprises to contribute to the production effort. Subjective recruitment in the labor market, which is associated with incompetence (n^{-}), does not allow for better participation in this production effort. This then sets aside the possibility of new encounters, which guarantees a profusion of ideas for coordination towards a high equilibrium likely to absorb or reduce unemployment.

II.2- The need for adjustment incentives

A concerted action among agents is likely to encourage other agents to modify their initial strategy, since agents often condition their beliefs on the strategic behaviours of others. This is what justifies the intervention of the public authorities, all the more so as the government has a coordinating power capable of overcoming pessimistic expectations.

The government's major role is therefore to restore the confidence of economic agents by reducing the risks in the markets, particularly the labour market. This role is explained by the resurgence of crises (economic and financial) and their level of contagion. The reduction of the manifestations of coordination failures by agents alone is only possible if everyone shares the conviction that all the others are ready to modify their strategies in the desired direction. Only the state is capable of achieving this by making the individual preferences of agents converge.

The awareness of the possibilities open to the State reflects a new configuration of economic analysis based on complementarity between the State and the private sector. This is the private-public partnership between public authorities and firms.

On the other hand, the need for State intervention is aimed at reducing radical uncertainty, a necessary and sufficient condition for the persistence of unemployment due to insufficient demand. The increase in uncertainty generally results in transaction costs, additional risk premiums, and periods of excessive accumulation of precautionary savings, with no counterpart in terms of growth. The role of the State, through fiscal policy, is therefore to build a safety corridor.

Indeed, when the economy is initially at a low level, an increase in subsidy policy can lead to the disappearance of the low equilibrium and the learning dynamic can lead to a high equilibrium. Such a process integrates new emulation and new ideas capable of transforming the possibilities of adherence to the associated work effort. The consequence would be an increase in the employment of agents and, through a multiplication effect, an increase in economic activity and a decrease in unemployment.

III. Conclusion

The present reflection has shown that the theory of coordination failures deals with the actual functioning of the labour market where the coordination function is left to individuals alone. We have thus considered that representative young agents belong to an intergenerational household which, exposed to the uncertainty of the environment, prefers a low equilibrium, especially since the will to work comes more from the fear of not consuming tomorrow if one does not work today. This uncertainty forces young agents to work resolutely without much conviction, hence unemployment.

Only then does a reorientation of agents' individual choices bring to light the multiple ordered Pareto equilibria whose dynamics lead towards one of the equilibria that encourage agents to coordinate themselves for a better top equilibrium. This state implies overall inefficiency, with too low employment levels leading to persistent unemployment.

However, we can remedy it by envisaging an adaptive learning process that can lead to a private-public partnership that guarantees the creation of new ideas and knowledge through research centers in their role of knowledge production, especially when public finances have a positive influence on their evolution. This is what makes it possible to reconsider public intervention through its capacity to reduce uncertainties in both the functioning of the labour market and its mode of organization.

Notes

(1) Strategic complementarities characterize a situation in which an individual's optimal action is an increasing function of the actions of others. In other words, if everyone else is making an effort, then I'd better make more effort. An agent's strategy is therefore an increasing function of the strategy of others: a change of strategy (upwards) by one agent or group of agents increases the marginal gain of other agents, in turn prompting them to modify their individual strategy in order to increase their marginal gain. Strategic complementarities are necessary for an economy to have multiple equilibria.

(2) Positive (negative) carry-over effects are reflected by the fact that an increase in effort by one agent induces a net gain (a net loss) for the other agent. They measure the interactions in the gain space and allow for multiple equilibria to be scheduled by maintaining multiple equilibria.

(3) The six CEMAC member countries are : Cameroon, Central African Republic, Chad, Congo, Equatorial Guinea, Gabon and Gabon.

(4) Equilibrium unemployment is often apprehended by two definitions: the one that retains the unemployment rate that ensures inflation stability (NAIRU) (Phelps, 1967, 1968) and the one that resolves distribution conflicts between employers and employees, which finds its basis in wage setting- Price setting (WS-PS) models (Layard et al., 1991) questioning the Phillips curve.

(5) The choice of theoretical modelling is justified by the preponderance and highlighting of the risk involved in the uncontrolled use of sophisticated models used to assess economic problems. The theoretical model, however abstract and simplifying it may be, is useful (Rotillon, 2015), all the more so because it leaves the possibility of having a broad conception and of ordinary knowledge as knowledge that the theoretician does not know himself. Also, the absence of data in the study area and their reliability encourage the theoretical model. In addition, the theoretical model retains a high level of abstraction that can be summarized in a simple function. It reveals hypotheses formulated on the function used and highlights resources that are as much substitutable, complementary, strategic for economic actors as they are uncertain, without fundamentally modifying the social and individual preferences it reflects (Rotillon, 2015). The advantage of such modelling is that it gets down to the essentials, allowing us to focus on explaining the economic phenomenon under consideration. It thus offers

the capacity for a broader interpretation without restricting itself to the existence of empirical data, which limits the scope of the analysis as a whole.
(6) There are three types of learning: rational learning in which agents know the structure of the model and use expectation revision procedures based on Bayesian beliefs; then educational learning (Guesnerie, 1992) which describes a process of mental trial and error; and finally adaptive learning which can take three forms : 1) that which concerns deterministic economies and generalizes adaptive anticipations (Grandmont, 1998); 2) that whose approach is evoked precisely here, which applies to deterministic and stochastic models and consists in considering that agents act as econometricians; 3) finally, that which is based on artificial intelligence, which makes agents seem like artificial systems responding to external demands (Arifovic, 1994; Cho and Sargent, 1996).
(7) The adaptive learning algorithm means that agents act as if the economy were at equilibrium while estimating the true value of the labour supply using a weighted average of past values.

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