Job Guarantee: a Structuralist Perspective

Emploi garanti : une perspective structuraliste

Empleo garantizado : una perspectiva estructuralista

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Job Guarantee: a Structuralist Perspective

1. Full Employment

During the present crisis, employment concerns have re-surfaced. Previously, while other preoccupations were at the centre of economic analysis, employment was left as a collateral of macro-economic policies. However, new concerns about the risk of current high unemployment rates becoming “structural, with permanently higher levels of unemployment in those countries where the increase in unemployment has been worst” (OECD, 2012) have surfaced. To address the high unemployment level, the IMF (2012) recommends policies such as more flexibility in the labor market, a decrease of minimum wages and of labor costs, and active labor market policies. The same recipes are used again and again, despite their poor results.

This paper aims at analysing in more detail the impact of two employment policies: the Employer of Last Resort (ELR) proposed by Minsky (1965) and a more traditional government expenditure spur. The ELR (or Job Guarantee, JG) has been highly debated in the recent year and many critiques have emerged. The goal of this paper is to formalise these critiques and to assess their validity. In order to do so, we develop a multi-sectoral Post-Keynesian Stock Flow Consistent model (PK-SFC from now on). The paper is structured as follows: this section analyses in more details Minsky and his followers’ proposal. Section 2. describes the model and the various assumption made, section 3. presents the results of the simulation and section 4. concludes.

1.1. The Job Guarantee scheme

Minsky’s main reason to advocate for full employment, or “tight full employment” as he calls it, is that it “is vital for an anti-poverty campaign” (Minsky, 1965, p. 177). He proposed ELR policies as a response to the War on Poverty that the U.S. president J. F. Kennedy started. As Minsky puts it, “The war against poverty is a conservative rebuttal to an ancient challenge of the radicals, that capitalism necessarily generates ‘poverty in the midst of plenty’” (Minsky, 1965, page 175). In this 1965 paper, he strongly criticizes the policies put in place under the War on Poverty (such as tax cuts) and advocates in favour of public works in order to reach full employment, the only state of affairs that could eradicate poverty.

JG programs have been declined in different versions according to how to set wages and benefits, target populations, type of projects to be included in the program, administrative way to deal with the program, way to finance it, etc. The

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1 For example, the Sacrifice Ratio indicating necessary unemployment to achieve low inflation illustrates this collateral aspect of employment in order to achieve other goals.
version described here is the one proposed by Wray,\textsuperscript{2} in his article published by the ILO in 2007 Wray (2007\textit{a}). Practical examples of such job guarantee schemes exist, even if never developed on a full scale.\textsuperscript{3}

Wray proposes “a universal job guarantee with a single compensation package for all participants”. He recommends that the program provides full time (or part-time when required by the applicant) jobs to anyone who is of legal age, able, ready and willing to work in exchange for a compensation package. Education and training should be part of the activities proposed under JG schemes. Since the goal of JG workers is to be hired in private enterprises, they should be given the opportunity to complete/improve their education level. In addition, job searching should be proposed as an activity during the first weeks of the beneficiary life in the program.

Community services, environment protection jobs, infrastructure creation or maintenance could be other activities proposed by the program. The administration of the program should be, according to Wray, highly decentralized in order to fit with the local realities. The federal government should provide funds for the employees and a part of the capital cost of each project funded by the JG scheme. The rest of the capital cost would be the burden of local governments. Each project would thus be implemented in cooperation between the federal and local governments and/or NGOs. A number of projects may be designed as “permanent” while the rest of the projects would be “need based”. This structure would allow postponing these need-based projects in time where JG employment is declining.

1.2. Objections to the Job Guarantee

Job guarantee policies are highly controversial, not only because some think that they might be inflationary or they might create important budget deficits but also because they are difficult to defend politically,\textsuperscript{4} we briefly sketch here some of the relevant critiques.

Sawyer (2003) claims that JG programs are no more than a “pump-priming” attempt to stimulate aggregate demand. And as such, any fiscal or monetary expansion policy would attain the same effects as a JG scheme.

\textsuperscript{2}Many scholars from the Levy Economics Institute of Bard College and the Center of Full Employment and Equity (CoFEE) propose job guarantee programs, see Forstater (1998, 2006); Mitchell (2007); Papadimitriou (1999); Wray (1998, 2007\textit{b}); Murray, Forstater (2013\textit{a, b}) among others.

Furthermore, the crisis has shed some light on the work of Minsky, creating burgeoning literature around his work. Wisman (2010) explores the functional role of unemployment and its personal costs. He then argues for the creation of a JG program. Finally, he analyses existing employment policies that are close enough to a Job Guarantee policy and wonders why no country has ever enabled a full employment scheme, given the negative impact of unemployment both on the personal level and in aggregate.

\textsuperscript{3}The National Rural Employment Guarantee Act in India and the plan Jefes y Jefas de Hogar Desocupados in Argentina are examples of such policies (UNCTAD, 2010; Kostzer, 2008)

\textsuperscript{4}Kalecki (1971) analyses the political aspects of full employment. His conclusion is that, while it would be possible to attain full employment via fiscal policies, it would be politically impossible to maintain it, unless for a change in the capitalists institutions.
Ramsay (2002-2003) argues that JG program is likely to add pressure on prices and would thus create inflation as unemployment goes under a certain limit (like NAIRU). Moreover, he adds that there would also be a wage increasing cycle due to the fact that JG is more appealing than current unemployment, triggering another form of inflation.

JG critics claim that JG advocates have underestimated the impact of JG financing on the budget (Sawyer, 2003; Aspromourgos, 2000). They argue that the financing has either inflationary effects or that the government will be increasingly indebted year after year.

Many critiques pinpoint the lack of structural analysis of JG schemes (Kadmos, O’Hara, 2000; Moudud, 2006). These authors argue that price and wage inflation might arise because of capacity constraints, or because of the structure of the economy. They claim that the JG would not be able to tackle unemployment rising from these structural aspects.

Seccareccia (2004) brings an interesting critique to JG. He considers that the JG would lead to a low-wage full employment. The argument is based on a more elaborated labor market than usually assumed in most post-Keynesian works. He notes that the labor supply curve as a function of the average real wage prevailing in the economy should not be considered completely inelastic but should rather viewed as upward sloping with varying slope (see figure 1). If we accept such a labor supply curve, then there are two full-employment equilibrium positions, A and B on the graph. He calls B the “low-wage” full employment and notes that this equilibrium might arise in developing countries in which massive underemployment (the distance between $L_B$ and $L_A$) is the norm. On the other hand, equilibrium A, the “high-wage” full employment, would prevail in developed capitalist economies. Any economy with unemployment is in a situation between $w_A$ and $w_B$ and the unemployment level is equal to the distance between the labor supply curve ($L_S$) and the labor demand curve ($L_D$).

Seccareccia goes on by discussing whether the JG program would lead to equilibrium A or B. He affirms that through inflationary pressure and due to political constraints the JG would lead to equilibrium B. He thus argues that JG schemes would be counter productive if the goal is to achieve more equal income distribution, even if these programs are an interesting step in the right direction.

2. A structural PK-SFC model

The model described in this section aims at being able to assess the validity of the critiques described above. In order to support our analysis of these critique, we decided to compare our results of the JG scheme with the results obtained via a traditional Keynesian demand spur. We claim that in order to do so, it is necessary to disaggregate both the production sector and the household sector, focusing thus on the structure of the economy.\(^5\)

A group of critiques does indeed focus on inflation and on capacity constraints.

\(^5\)This paper is a step, following Missaglia (2011), towards the creation of a structuralist/SFC model.
of the productive structure. This is why we divide the production sector into three industries: energy, capital and consumption goods (widgets). We follow Lee (1998) and allow for price interdependencies as well as supply constraints to be explicitly modelled. We introduce the complementary slackness conditions or the “complementary problem” that allows for price and output to be complementary (Missaglia, 2011, 2013). That is prices are mark-up price if the output constraint (demand smaller or equal to supply) is not binding. If the output constraint is binding, then prices are such that the market clears.

Minsky was concerned with income inequality when proposing the JG scheme. We thus decided not only to divide the household sector between rentiers and workers but to further distinguish between wage income and unemployment subsidy within the income flow for workers. This allows us to compute a crude inequality measure (namely a Gini coefficient) and to compare and contrast the outcome of the two policies analysed.

Obviously the labor market structure is essential when analysing employment policies, this is why we develop a more complex labor market than is usually observed in PK-SFC models. We follow Seccareccia (2004) and have an inelastic labor supply curve. Furthermore, we endogenize the labor supply via the introduction of endogenous participation rate and average hours worked.

This paper is not a growth model. We are aware that this is a fairly strong assumption, but we are interested in observing the dynamics emerging out of the policies analysed and thus observe the transition from a stationary state to another stationary state. The model presented here is based on the one described in Godin (2013).

Figure 2 represents the flow diagram of the model. Both household sectors and the public sector consume widgets and electricity (thin dashed lines on the diagram). All productive sectors use energy, fixed capital (produced by the capital
good sector, thin dash-dotted line) and labor (thick solid line) to produce their own goods. In order to invest, firms borrow money from banks and pay interests (thick dotted line) or emit equities and pay dividends (thick dashed line). Finally, industries pay wages to workers (thick solid line). Households sectors save part of their wealth as cash on their deposit account (thin solid lines) or as equities (thick dash line). Banks balance their liabilities (current accounts) with loans to firms and bond holding (thin dotted line) for which they receive interests. The government imposes a tax on wages and profits (thick dash-dotted lines), pay interests on bonds and gives a dole to unemployed workers (thick dashed line).

![Figure 2 - Flow diagram](image)

### 2.1. Structure of the model

Table 1 is the Balance Sheet. It represents how stocks are distributed among the different sectors. It shows that the net worth of firms is equal to the difference between their assets (capital stocks) and their liabilities (loans and equities). It also indicates that banks have no net worth as they use bond holding to balance their liabilities and assets. In the case of negative bond holdings, this could be seen as central banks advances. In that case, interests would be paid at the bonds interest rate.

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7 Private wealth is thus composed of deposits from both households and firms.
workers and rentiers and equities held by rentiers. It is assumed that unemployed workers are consuming all their income and thus have no wealth.

The Transaction Flow Matrix (TFM, table 2) ensures that the sum of all flows is always nil. A plus sign expresses an inflow while a minus sign represents an outflow. For instance, the fourth row shows that wages are paid by the three productive sectors to wage earners and thus come with a minus sign in the Energy column and with a plus sign in the Wage earners sector. We can see that dividends are distributed to the capitalist class. Household sectors consume both energy and widgets, pay taxes ($T_h$ and $T_{ca}$) and save everything left either as deposits ($\Delta D_w$ and $\Delta D_{ca}$) or as equities ($\sum \Delta (E_{xp,e,x})$). An important feature of the SFC approach is that it specifically accounts for capital gains. The variation of assets held by rentiers is equal to rentiers’ savings plus capital gains. Banks hold deposits from both kinds of households, receive interest for the loans accorded to firms and from the bonds they hold and pay interest on deposits. Finally, government, seen here as both the government and the central bank, consumes both energy and widgets, transfers an unemployment benefit ($YD_u$) to jobless workers and pays interests on bonds to banks. The change in stock is represented in the second part of the TFM.

<table>
<thead>
<tr>
<th>Table 1 - Balance sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workers</td>
</tr>
<tr>
<td>Deposits</td>
</tr>
<tr>
<td>Loans</td>
</tr>
<tr>
<td>Bonds</td>
</tr>
<tr>
<td>Capital</td>
</tr>
<tr>
<td>Equities</td>
</tr>
<tr>
<td>Net Wealth</td>
</tr>
</tbody>
</table>

2.2. Households

As explained in section 2., households are divided into three sectors. While the first division between wage earners and rentiers stems from the distinction between sources of income: wages or profits. The second division, which remains purely logical, between employed and unemployed workers allows to differentiate consumption propensities. Obviously, this division is purely logical and does not reflect the reality as some households might have either sources of income.

2.2.1. Workers

We logically divide workers disposable income between employed workers’ disposable income ($YD_n$) composed of wage income and interest on deposits minus taxes, and unemployed benefits ($YD_u$).

$$YD_n = (1 - \theta_w) [W_e N_e + W_c N_c + W_i N_i] + i_d D_{w,-1}$$  \hspace{1cm} (1)

$$YD_u = d.U$$  \hspace{1cm} (2)
Table 2 - Transaction Flow Matrix

<table>
<thead>
<tr>
<th>Category</th>
<th>Workers</th>
<th>Rentiers</th>
<th>Consumption</th>
<th>Energy</th>
<th>Capital</th>
<th>Banks</th>
<th>Gœrt</th>
<th>∑</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Current</td>
<td>Capital</td>
<td>Current</td>
<td>Capital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumption</td>
<td>$-c_{w,c}p_c$</td>
<td>$-c_{a,c}p_e$</td>
<td>$p_3y_c$</td>
<td>$-c_{k,c}p_c$</td>
<td>$-c_{k,c}p_e$</td>
<td>$-C_g,c$</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Energy</td>
<td>$-c_{w,c}p_e$</td>
<td>$-c_{a,c}p_e$</td>
<td>$p_3y_c$</td>
<td>$-c_{k,c}p_e$</td>
<td>$-c_{k,c}p_e$</td>
<td>$-C_g,e$</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Capital</td>
<td></td>
<td></td>
<td>$-I_c$</td>
<td>$-I_c$</td>
<td>$p_{3y_k}$</td>
<td>$-I_k$</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Wages</td>
<td>$\sum N_c W_e$</td>
<td></td>
<td>$-N_c W_e$</td>
<td>$-N_c W_e$</td>
<td>$-N_c W_k$</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Transfers</td>
<td>$Y D_u$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$-Y D_u$</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Taxes</td>
<td>$-T_w$</td>
<td>$-T_e$</td>
<td></td>
<td></td>
<td></td>
<td>$T$</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Loans int.</td>
<td>$-i_d L_{c,-1}$</td>
<td>$-i_d L_{e,-1}$</td>
<td>$-i_d L_{k,-1}$</td>
<td>$\sum L_{x,-1}$</td>
<td>$-i_d D_{x,-1}$</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Deposits int.</td>
<td>$i_d D_{w,-1}$</td>
<td>$i_d D_{a,-1}$</td>
<td></td>
<td></td>
<td></td>
<td>$-i_d D_{w,-1}$</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Bonds int.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$i_b B_{x,-1}$</td>
<td>$-i_b B_{x,-1}$</td>
<td>0</td>
</tr>
<tr>
<td>Dividends</td>
<td>$F_b + \sum F D_x$</td>
<td>$-F D_e$</td>
<td>$-F D_e$</td>
<td>$-F D_k$</td>
<td>$-F_b$</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Retained earn.</td>
<td>$sav_w$</td>
<td>$sav_e$</td>
<td>$sav_k$</td>
<td>$sav_y$</td>
<td></td>
<td>$sav_k$</td>
<td>$sav_y$</td>
<td>0</td>
</tr>
<tr>
<td>Capital Gains</td>
<td></td>
<td>$+ CG_k$</td>
<td>$-CG_e$</td>
<td>$-CG_e$</td>
<td>$-CG_k$</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>∆ Dep.</td>
<td>$-\Delta D_w$</td>
<td>$-\Delta D_m$</td>
<td>$\sum \Delta D_x$</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>∆ Loans</td>
<td></td>
<td></td>
<td>$\Delta L_c$</td>
<td>$\Delta L_c$</td>
<td>$\Delta L_k$</td>
<td>$-\sum \Delta L_x$</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>∆ Bonds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$-\Delta B_s$</td>
<td>$\Delta B_s$</td>
<td>0</td>
</tr>
<tr>
<td>∆ Equities</td>
<td>$-\sum (E_{x,p_{e,x}})$</td>
<td>$\Delta (E_{p_{e,c}})$</td>
<td>$\Delta (E_{p_{e,c}})$</td>
<td>$\Delta (E_{p_{e,k}})$</td>
<td>$\Delta (E_{p_{e,k}})$</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>∑</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tbody>
</table>
We suppose that wage earners construct a Consumer Price Index and an inflation rate based on their preferences and on prices of energy and widgets (3 and 4). We then define an expected real disposable income for employed workers based on Haig-Simons’ definition (8, 9).

\[ c_{pi_w} = \beta_w p_e + (1 - \beta_w) p_c \]  \hspace{1cm} (3)

\[ \pi_w = \frac{c_{pi_w} - c_{pi_{w,-1}}}{c_{pi_{w,-1}}} \]  \hspace{1cm} (4)

\[ yd_n = \frac{YD_n}{c_{pi_w}} - \frac{\pi_w V_{w,-1}}{c_{pi_w}} \]  \hspace{1cm} (5)

\[ yd_u = \frac{YD_n}{c_{pi_w}} \]  \hspace{1cm} (6)

Total real consumption (\( c_w \)) is the sum of the consumption out of expected Haig-Simons’ real disposable income, out of real unemployment benefit (\( yd_u \)) and out of real wealth in previous period (7). The consumption of energy and widgets by workers’ households is determined through a Linear Expenditure System (LES, 8 and 9) reflecting preferences over energy and widget and according to relative prices. All disposable income not consumed is saved as deposits (11 and 12).

\[ c_w = \alpha_{w,1} \cdot yd_{t_e} + yd_u + \alpha_{w,2} \cdot v_{w,-1} \]  \hspace{1cm} (7)

\[ c_{w,e} = \beta_w \frac{C_w}{p_e} \]  \hspace{1cm} (8)

\[ c_{w,c} = (1 - \beta_w) \frac{C_w}{p_c} \]  \hspace{1cm} (9)

\[ C_w = c_w \cdot c_{pi_w} \]  \hspace{1cm} (10)

\[ \Delta V_w = YD_w - C_w \]  \hspace{1cm} (11)

\[ D_w = V_w \]  \hspace{1cm} (12)

### 2.2.2. Rentiers

Rentiers’ aggregate disposable income (\( YD_{ca} \), 13) is composed of profits from all productive sectors (\( FD_x, \ x \in \{c, e, k\} \)) and banks (\( F_b \)), minus taxes plus interest from deposits. As wage earners, rentiers consume both energy and widgets and save all income that is not spent.

\[ YD_{ca} = (1 - \theta_{ca}) [FD_e + FD_c + FD_k + F_b] + i_d D_{ca,-1} \]  \hspace{1cm} (13)

\[ c_{pi_{ca}} = \beta_{ca} p_e + (1 - \beta_{ca}) p_c \]  \hspace{1cm} (14)

\[ \pi_{ca} = \frac{c_{pi_{ca}} - c_{pi_{ca,-1}}}{c_{pi_{ca,-1}}} \]  \hspace{1cm} (15)

\[ yd_{ca} = \frac{YD_{ca}}{c_{pi_{ca}}} - \frac{\pi_{ca} V_{ca,-1}}{c_{pi_{ca}}} \]  \hspace{1cm} (16)

\(^8\text{Haig (1921) and Simons (1938) define income as the sum of consumption and variation in wealth. According, to (Godley, Lavoie, 2007, p. 293-294), Haig-Simons’ real disposable income is composed of real disposable income minus the loss of real wealth due to inflation.} \)
\[ c_{ca} = \alpha_{ca,0} + \alpha_{ca,1} \cdot yd_{ca} + \alpha_{ca,2} \cdot v_{ca,-1} \]  
\[ C_{ca} = c_{ca} \cdot cpi_{ca} \]  
\[ c_{ca,e} = \beta_{ca} \frac{C_{ca}}{p_e} \]  
\[ c_{ca,c} = (1 - \beta_{ca}) \frac{C_{ca}}{p_c} \]  

Wealth of rentiers consists of their equities holding and deposits. A portfolio choice (21-25) determines the distribution of their wealth between the four different assets, where deposits are the buffer stock (30).

\[ V_{ca}^e = V_{ca,-1} + YD_{ca}^e - C_{ca} \]  
\[ D_{ca}^d = (\gamma_{10} + \gamma_{11}r_{id} - \gamma_{12}r_{c} - \gamma_{13}r_{e} - \gamma_{14}r_{k})V_{ca}^e \]  
\[ p_{e,c}E_{e} = (\gamma_{20} - \gamma_{21}r_{id} + \gamma_{22}r_{c} - \gamma_{23}r_{e} - \gamma_{24}r_{k})V_{ca}^e \]  
\[ p_{e,e}E_{e} = (\gamma_{30} - \gamma_{31}r_{id} - \gamma_{32}r_{c} + \gamma_{33}r_{e} - \gamma_{34}r_{k})V_{ca}^e \]  
\[ p_{e,k}E_{k} = (\gamma_{40} - \gamma_{41}r_{id} - \gamma_{42}r_{c} - \gamma_{43}r_{e} + \gamma_{44}r_{k})V_{ca}^e \]  
\[ r_{id} = \frac{1 + i_{d}}{1 + \pi_{ca}} - 1 \]  
\[ r_{x} = \frac{1 + \frac{FD_{x}}{p_{e,x-1}E_{x-1}}}{1 + \pi_{ca}} - 1, \forall x \in \{c, e, k\} \]  
\[ V_{ca} = V_{ca,-1} + YD_{ca} + C_{ca} + CG_{e} + CG_{e} + CG_{k} \]  
\[ CG_{x} = E_{x,-1}(p_{e,x} - p_{e,x-1}), \forall x \in \{c, e, k\} \]  
\[ D_{ca}^h = V_{ca} - p_{e,c}E_{e} - p_{e,e}E_{e} - p_{e,k}E_{k} \]  

2.3. Industrial sectors

2.3.1. Demand

All production sectors are demand-driven. They all need fixed capital stock in order to produce. All productive sectors need electricity in order to produce their respective goods. Sectorial demands in electricity (c_{x,e}, 34) are determined through energy productivity in each industry. The energy sector has a demand (y_{e}, 32) equal to household consumption plus demand from the two other productive sectors and from the public sector. Aggregate demand for widget (y_{c}, 31) is equal to households’ and government’s desired consumption. Demand in the capital good industry (y_{k}, 33) is composed of investment from the three productive sectors. Capital stock level determines maximum output to be produced in each period.

\[ y_{c} = c_{u,c} + c_{w,c} + c_{ca,c} + c_{g,c} \]  
\[ y_{e} = c_{u,e} + c_{w,e} + c_{ca,e} + c_{c,e} + c_{k,e} + c_{g,e} \]  
\[ y_{k} = i_{c} + i_{e} + i_{k} \]  
\[ c_{x,e} = \frac{y_{x}}{pr_{e,x}}, \forall x \in \{c, k\} \]
2.3.2. Employment

A novelty aspect of this model lies in the treatment of labor demand and labor supply. We describe first a simplified version of the labor market dynamics, see section 3.3, for more details. We assume that workers of each industry \( x \) target a real hourly wage (35) based on the hourly labor productivity of the industry \( (pr_{n,x}) \), aggregate unemployment \((u)\) and the difference between previous period average real hourly wage among all industries \((W_{m,-1})\) and previous period real hourly wage in industry \( x \).

\[
w^T_x = \Omega_{0,x} + \Omega_{1,x} \log(pr_{n,x}) + \Omega_{2,x} \log(1-u) + \Omega_{3,x} \frac{W_{m,-1}}{cpi_{w,-1}} - \frac{W_{x,-1}}{cpi_{w,-1}} \tag{35}
\]

Employment in each sector is demand-determined through sectoral productivity. Firms determine the number of work-hours needed to produce their output and then determine their employment level depending on the number of hours worked per employee. At first, we assume the numbers of hours worked per employee to be exogenous, however in section 3.3., we relax that assumption. If total employment is such that it would be above full employment, we assume that workers accept to work overtime\(^{10}\) so that unemployment actually disappears but does not become negative. Firms assume as many workers they need to produce enough goods to satisfy the demand they face. We assume perfect mobility of labor and no differentiation of workers. Firms hire workers from the labor force up to the level of employment they need. Unemployment is equal to the difference between labor force and aggregate employment.

\[
N_x = \frac{y_x}{pr_{n,x}}, \forall x \in \{c, e, k\} \tag{36}
\]

\[
U = LF - N_c - N_e - N_k \tag{37}
\]

2.3.3. Investments

Desired capital growth \((g_k, 38)\) is function of actual capacity utilisation\(^{11}\) \((u)\) and targeted capacity utilisation \((u^T)\).\(^{12}\) Capacity utilisation \((39)\) is defined as the ratio of actual output \((y)\) and full capacity output \((y_{fc})\) which is computed through \((40)\) where \(pr_k\) is capital productivity under normal conditions. Real investment is equal to desired capital growth plus depreciation rate but cannot be negative \((41)\).

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\(^9\)This equation differs from (Godley, Lavoie, 2007, Chapter 9) in order to account for the impact that the JG wage might have on industrial wages, as asserted by Seccareccia (2004), see section 3.3. for more details.

\(^{10}\)We assume that in that case there is no increase in hourly wage, without loss of generality. However, wages will increase in the next period due to non-existing unemployment.

\(^{11}\)In this paper, we follow Robinson (1969) in that firms might make mistakes in their estimation of output growth creating unwanted excess capacity; and Lavoie (1992) as firms also plan some excess capacity in order to avoid to constrain demand in case of large growth in demand.

\(^{12}\)We use here a simplified version of Fazzari, Mott (1986-1987), and Lavoie, Godley (2001-2002). The formulation of the investment function is similar to Lavoie et al. (2004)
\[ g_k = \gamma_0 + \gamma_1(u_{-1} - u^T) \]  
\[ u = \frac{y}{y_{fc}} \]  
\[ y_{fc} = k \cdot pr_k \]  
\[ i = \max[g_k + \delta, 0]k_{-1} \]  
\[ \Delta k = i - \delta \cdot k_{-1} \]  

2.3.4. Costs

Unit costs \((UC_x, 43 \text{ and } 44)\) are determined by unit labor costs and unit electricity costs. Unit costs thus depend on the price of labor, which is different for each industry, price of electricity, and both the productivities of labor \((pr_{n,x})\) and electricity \((pr_{e,x})\). Nominal wages are fixed in each productive sector based on previous period targeted and prevailing real wages \((45)\).

\[ UC_x = \frac{W_x}{pr_{n,x}} + \frac{p_e}{pr_{e,x}}, \forall x \in \{c, k\} \]  
\[ UC_e = \frac{W_e}{pr_{n,e}} \]  
\[ W_x = W_{x,-1} + \Omega_{4,x} \left( u^T_{x,-1} + \frac{W_{x,-1}}{cpiw_{x,-1}} \right), \forall x \in \{c, e, k\} \]  

2.3.5. Prices

Prices are determined by firms based on target-return pricing \((Lavoie, 1992)\). The markup \((\phi_x, 47)\) is endogenously determined so that the expected profit rate net of interest is equal to its target value \((r^T)\). Expected profits depend on targeted utilisation of capital. Profits \((F_x)\) are divided between dividends \((FD_x)\) and retained earnings \((FU_x)\) where dividends are a fixed share of profits \((48-51)\).

\[ p_x = (1 + \phi_x)UC_x, \forall x \in \{c, e, k\} \]  
\[ \phi_x = \frac{r^T p_{e,-1} k_{x,-1} + i_t L_{x,-1}}{UC_x \cdot u^T \cdot k_{x,-1} \cdot pr_{k,x}} \]  
\[ F_x = y_x \cdot p_x - W_x \cdot N_x - p_e \cdot c_{x,e} - i_t L_{x,-1}, \forall x \in \{c, k\} \]  
\[ F_e = y_e \cdot p_e - W_e \cdot N_e - i_t L_{e,-1} \]  
\[ FD_x = \mu_x F_x, \forall x \in \{c, e\} \]  
\[ FU_x = (1 - \mu_x)F_x, \forall x \in \{c, e, k\} \]  

2.3.6. Finance

Investments are financed via retained earnings at first and then equities emission and loans. We assume that equities emission is a fixed share of the expected needs.
for finance, defined as the difference between investments and expected retained earnings. Loans are then determined as the residual.

\[ \Delta E_x = \frac{i_x \cdot p_k - FU_x^{e}}{p_{e,x} \cdot x}, \forall x \in \{c, e, k\} \] (52)

\[ \Delta L_x = i_x \cdot p_k - FU_x - p_{e,x} \cdot \Delta E_x, \forall x \in \{c, e, k\} \] (53)

2.4. Banking sector

Banks balance the stock of deposits with the stock of loans plus the stock of government bonds. We assume that banks respond positively to all loans demanded and that loans are always repaid. Bond holdings is then a residual choice. Profits are made of interests from loans and bonds minus interest on deposits paid to households.

\[ \Delta D = \Delta D_w + \Delta D_{ca} \] (54)

\[ \Delta L = \Delta L_c + \Delta L_e + \Delta L_k \] (55)

\[ \Delta B = \Delta M - \Delta L \] (56)

\[ F_b = i_t (L_{c,-1} + L_{e,-1} + L_{k,-1}) + i_b B_{b,-1} - id (D_w + D_{ca}) \] (57)

2.5. Government sector

Public sector revenues are given by tax receipts while expenditures are composed of energy consumption, widget consumption and unemployment subsidies. We assume, at first and with no loss of generality, fixed total real public consumption of energy and widgets. Bond supply is equal to the budget deficit. Section 3.2. analyses in more depth the case of balanced budget policies.

\[ T = \theta_w [W_c N_c + W_e N_e + W_k N_k] + \theta_{ca} [F_c + F_e + F_k + F_b] \] (58)

\[ G = C_{g,c} + C_{g,e} + d \cdot U + i_b \cdot B_{s,-1} \] (59)

\[ c_{g,c} = \frac{C_{g,c}}{p_c}, c_{g,e} = \frac{C_{g,e}}{p_e} \] (60)

\[ \Delta B = G - T \] (61)

2.6. Expectations

Due to Knightian/fundamental uncertainty, we model expectations as backward looking over the last 4 periods and containing a learning process (62).

\[ X^e = \sum_{i=1}^{4} \frac{X_{i-1}}{4} + \psi (X_{-1} - X^e_{-1}) \] (62)

3. Results

Several simulations were conducted using Mathematica, this section contains the analysis of the results obtained. A list of the endogenous variable and of the value

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\[ \text{13 The code may be requested from the author.} \]
of the exogenous parameters may be found in appendix A.

3.1. Job Guarantee vs. Keynesian Demand Spur

The first set of scenarios compares the structural change the economy undergoes when two different shocks are applied, starting from a stationary state. The first shock is the creation of a JG scheme where the prevailing wage is such that the increase in total government spending is of 3%, given the level of unemployment. The JG wage is equal to 14 961 while the dole was equal to 11 882. The assumption being that all unemployed workers start working for the JG and thus that unemployment disappears. As we are interested by the comparison between two employment policies, we assume away all eventual output produced by JG workers and thus only concentrate on the impact the JG might have on aggregate demand.

The second shock is a Keynesian Demand Spur (KDS hereafter), or, in other words, an increase of real government spending in energy and consumption goods such that the increase in total real government spending is of 3%. These quantities remain fixed afterwards, regardless of the variation of prices for each good. The assumption of this shock is that the government tries to reduce unemployment by increasing the aggregate demand.

Five sets of simulations have been run for both shocks. Each scenario is distinguished by the level of capacity utilisation of the different productive sectors. The goal of these simulations is to observe how the results are affected if one or more sectors reaches full capacity output. When a sector reaches full capacity output, it reacts by increasing its prices so that the market clears. However, all actors do not have the same purchasing power: indeed since we assume that the government has real consumption targets, market clearing prices only impact their nominal consumption. On the other hand, market clearing prices impact households and productive sectors since their consumption/investment decision are nominal.

3.1.1. Without output constraints

Figures 3 and 4 shows the results for the first scenario. That is, all target capacity utilisation rates are low enough so that all sectors may respond to the increase of demand due to each shock. The solid lines are for the JG shock while the dashed ones are for the KDS. All results are percentage change from the initial stationary state. The results show that the KDS has a stronger effect on total private employment than the JG scheme. This leads to higher income and income and

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14 The value computed here is totally arbitrary, it is such that the expected increase in government spending is equal to 3%. The choice of 3% is as much arbitrary and has been calibrated with the level of expenditure observed for the NREGA scheme in India. See UNCTAD (2010) for more details. Obviously, political and public support is primordial in the determination of the wage, see Kalecki (1971) for more details on the political aspect of full employment.

15 It is obvious that the JG scheme should be developed so that its output are useful and needed by the population. For an example of Guaranteed Green Jobs, see Godin (2013).

16 Obviously it does not make sense to try to compare unemployment level as the JG schemes removes de facto all unemployment. This is why we use the concept of private employment, that is the sum of all workers employed by the three productive sectors.
wealth for wage earners in the KDS case. However, the JG scheme has a stronger impact on unemployed workers/JG workers. Indeed, in the JG case, all those that do not find a job in the private market, can work for the JG scheme and enjoy a larger income. The JG scheme is thus more efficient in terms of poverty alleviation. As a matter of fact, the Gini coefficient\(^{17}\) for the income distribution passes from 0.247 to 0.234 in the JG case, while it passes from 0.247 to 0.236 in the KDS case. This clearly shows that both policies have a positive impact on aggregate demand (and thus on aggregate private employment) and on income distribution. However, the KDS has a more important impact on the aggregate demand while the JG improves more the income distribution. The government deficit and debt graphs show one of the reasons for the better performance of the KDS policy. The government deficit to government spending ratio shows a peak when either policies are enabled (that is period 10). Interestingly while the targeted increase in spending was of 3% it leads only to a 2% deficit indicating that taxation revenue increase as well. The KDS case shows a slightly longer deficit than the JG case, leading to a higher public debt. Because the government deficit is a driver of the economy, it seems reasonable to assume that most of the difference in term of output and private employment between KDS and JG emerge out of the more persistent deficit in the KDS case.

Figure 3 - Scenario 1: Private employment and workers’ disposable income for the JG policy (solid) and the KDS policy (dashed).

3.1.2. The case of excess demand

Figure 5 and 6 shows the results for the second scenario, for the KDS case only (results for the JG have identical trends but lower magnitude). In this scenario the capacity utilisation rate of the consumption good sector before the shock is such that the increase in demand resulting from the policy shock implies to reach the limit of full capacity utilisation. Since consumption goods output is constrained, the consumption price rises so that the market clears. This increase in price in the consumption good sector implies larger profits and thus larger dividends and retained earnings. This impacts market capitalisation and loans. Once the

\(^{17}\)The Gini coefficient is a measure of statistical dispersion, in our case income dispersion. It is computed for all households having an income, that is the labor force plus rentiers (assumed to be 5% of the population). The lower the Gini, the more equal the distribution.
capital stock in the consumption sector has increased, allowing for excess capacity, the consumption price decreases. Profits follow the same trends and the market capitalisation has changed and is now below the levels of the other two sectors.

The first conclusions of this first experiment is that an increase in demand coming from either the government spending or from higher households consumption may lead to an inflationary phase, especially in those sectors that are close to full capacity utilisation before the shock. Because the consumption good is not an input for the two other sectors, its increase in price does not have any direct impact on their prices, however it does impact them indirectly via wages. Yet, this inflationary impact is only temporary as the increase in productive capacity stops the process. The second conclusion is that the structure of the production industry matters, indeed the scenario shows that the stock of loans in all sectors have changed with respect with their initial values. This shows that fiscal policies have impacts on the structure of the economy and that policy makers should try to foresee these impacts.

3.1.3. Constrained output

Figure 7 shows the results for the third scenario, for the JG case (solid) and the KDS case (dashed). In this scenario, the targeted capacity utilisation rates is
Figure 6 - Scenario 2: Market capitalisation and Loans for the consumption good sector (solid), the energy sector (dashed) and capital good sector (dotted) for the KDS shock.

99.5% in all sectors. This scenario is very similar to the second scenario except that prices increase, because of full capacity utilisation, in all sectors. The economy undergoes a phase of strong turbulences as all actors are competing to obtain capital goods, energy and consumption goods. We only show the capacity utilisation rates and prices for the capital goods industry, as it is the sector which undergoes the longest period of full capacity utilisation. This is due to the fact that investments in all sectors remain positive when capacity utilisation is above its targeted value, even if lower than one. It is thus only when both the energy and consumption goods sectors are at their targeted capacity utilisation rates that investments decrease and that the demand of capital goods decreases under full capacity supply. We observe that the inflationary period is longer in the KDS case than in the JG one. This is caused by the fact that excess demand in the KDS case is less subject to inflationary impacts. Indeed, in the KDS case, the government fixes its real demand, regardless of the prices. On the other hand, the increased demand coming from household sectors both in the KDS case and in the JG case is eroded by inflation due to wealth and income effects. The demand shock due to the JG policy is thus less persistent.

This scenario thus shows that, as previously noted, all demand-related employment policies might have inflationary impacts, depending on the current structure of production. However, households’ income and wealth is more subject to inflationary erosion than government spending and thus leads to shorter inflationary periods. Furthermore, while the KDS policy leads to a higher private employment level, it does not tackle the issue of full employment and, above all has a lower impact on poverty. Indeed, the increase in real income for unemployed workers is around 0.3% for the KDS case, because of the price decrease, while it is of 36% in the JG case both because of price deflation and because of increased income. The Gini coefficient at the end of the scenario is equal to 0.204 in the JG case and to 0.205 in the KDS case, starting from a 0.213 value.
Figure 7 - Scenario 3: Capacity utilisation and Prices for the capital good sector in the case of the GJ (solid) and the KDS (dashed).

3.2. Balanced budget

Some critiques of JG considers the impact that the scheme would have on the government budget and above all on the government deficit (Aspromourgos, 2000; Sawyer, 2003). This is why we endogenize government spending and tax rate in this section. The government reacts to a budget deficit (resp. surplus) by increasing (resp. decreasing) the tax rate and/or decreasing (resp. increasing) government spending in the next period, targeting a balanced budget.

Figure 8 - Scenario 4: Aggregate private employment and output for the consumption (solid), energy (dashed) and capital (dotted) sectors in the case of GJ (black) and KDS (gray).

The second observation regards the structural impact that each policy has. The
output graph shows that while the level of capital output (dotted lines) is roughly identical in the JG case (black) and in the KDS case (gray), output levels for the consumption (solid) and energy (dashed) industries are completely different. This can be explained by the different “preferences” parameters between government consumption and households’ consumption. This shows again the importance of evaluating the structural impact of policies.

The last observation to be made regards the impact that each policy has on the budget deficit and on the level of public debt. The peak of government deficit relative to government budget is of around 2.5% for both policies while the impact on the debt level is of around 0.1%. However, the impact on poverty and employment are radically different. In the case of the KDS, the spur of demand when the policy is enabled is rapidly compensated by the balancing budget policy. This shows that it is possible to obtain full employment through a JG scheme and a balanced budget. The resulting higher employment is due to the wealth effect of households’ consumption that the increased public debt implies. However, in the JG case, unemployed workers are now working for the JG scheme and earn an income much larger than the unemployment subsidy. The JG policy implies a redistributive process where the increase in output benefits almost only JG workers while in the KDS case this is not the case. In this scenario, the Gini coefficient is much smaller in the JG case (0.208) than in the KDS case (0.212) indicating the better redistributive performance of the JG policy.

3.3. Endogenous labour supply

Seccareccia (2004) offers a different critique of JG schemes. In substance, the objections Seccareccia sees are that the JG wage would drag private sector wages and that this would lead the economy to a low-wage full employment equilibrium. His analysis is based on a particular labor supply curve. We thus introduce two modifications to the model in order to account for Seccareccia’s framework.

The average wage prevailing in the economy is now defined by (63), that is it now accounts for the JG wage. This average wage then impacts in turn the targeted real wage for each sector (35)

\[ W_m = \frac{W_c N_c + W_e N_e + W_k N_k + W_{JG} N_{JG}}{N_c + N_e + N_k + N_{JG}} \] (63)

\[ u^T x = \Omega_{0,x} + \Omega_{1,x} \log(pr_{n,x}) + \Omega_{2,x} \log(1 - u) + \Omega_{3,x} \left( \frac{W_{m,-1}}{cpi_{w,-1}} - \frac{W_{x,-1}}{cpi_{w,-1}} \right) \] (35)

The second modification regards the labor supply. We assume that the number of worked hours is a function of the average wage prevailing in the productive sectors (that is without the JG wage). Empirically, the correlation between average wage and average number of hours worked is very strong.\footnote{This does not mean that we have in mind a sort of utility function of leisure and income but merely that households have a satisfying level of income as target and reduce their number of hours according to their income level.} Furthermore,
we assume that the participation rate is a function of the logarithm of the unemployment rate and of the average wage prevailing in the productive sector. As for the average number of hours worked, the empiric correlation of the proposed participation rate function is good.

\[
\text{hours} = \text{hours}_A + \text{hours}_B \frac{W_m}{cpi_w} \\
\text{part} = \text{part}_A + \text{part}_B \log(u_-1) + \text{part}_C \frac{W_m}{cpi_w} \\
LF = Pop \cdot part
\] (64) (65) (66)

Figure 9 and 10 show the results for a JG policy combined or not with a balancing budget policy (black without, gray with balancing policy). These scenarios show that Seccareccia’s critique is valid in certain cases and not valid in others. The wage reducing impact of the JG policy through the average wage component of equation (35) might be countered by a decrease in unemployment. If the private employment creation of the JG scheme through increased aggregate demand is high enough, the private sector wages will increase even if the aggregate wage drops suddenly due to the introduction of the JG wage (see graph Wages in figure 9).

The second set of results regards the average hours worked and the participation rates graph of figure 10. Each of these series has opposite effect on the unemployment rate. When the number of average hours worked drops, firms need to hire more workers for the same quantity of output, implying a decrease in unemployment. On the other hand an increase of the participation rate expands the labor force, which inflates the unemployment rate for a given level of aggregate employment. We observe that the JG policy implies a decrease of average hours worked and an increase in the participation rate in both scenarios. This shows the inclusive effect of the scheme: because aggregate private employment increases, citizen that would otherwise not even bother to search for a job, enter the labor force. Furthermore, the increase in private wages implies a drop in hours worked,
implying that even more people find a job. We observe that this impact is seriously dampened when a balancing budget policy is enabled (gray lines in the graphs). Indeed, by increasing taxes or by decreasing government spending, the balancing policy reduces aggregate demand and thus employment.

Figure 10 - Scenario 5 and 6: Average hours worked and participation rate in the case of a JG policy combined or not with a balancing budget policy (black without, gray with balancing policy).

4. Conclusion

This paper proposed a structuralist analysis of Job Guarantee and Keynesian Demand Spur policies. The model described accounted for price and structural interdependencies. We also introduced a more elaborated modeling of the labor market by endogenizing the labor supply curve. Finally, we explored the more elaborate fiscal policies combining each of the analyzed policy with a balancing budget policy.

The exercises conducted in this paper show a variety of results. First of all, contrary to what Sawyer (2003) sustains, a JG program is more efficient at tackling poverty and income inequality than a traditional KDS. As a matter of fact, in all scenarios, the Gini coefficient decreased more in the JG case than in the KDS case. However, the KDS policy is more effective when the goal is to attain growth. Clearly, this shows that KDS and JG are not the same thing and should be used according to the targets one has.

The second conclusion drawn from the experiments is that the structure of the economy matters, joining Kadmos, O’Hara (2000). Indeed, depending on the initial situation, each policy might have inflationary pressure. We have observed that, when inflation arises, the JG scheme is more flexible and leads to lower inflation rates. This is due to the fact that the spur in aggregate demand comes from households’ consumption, which is more sensible to inflationary pressure. On the other hand, the KDS policy spurs directly real government expenditure and thus has a stronger impact on inflation.

When implementing a balancing policy, we observe that the impacts of both the JG and the KDS policy are seriously dampened. However, the goal of full
employment through a JG scheme might be obtained while still having balanced budgets and without having inflationary pressures.

Finally, we have observed that the critiques of Seccareccia (2004) on the risk of attaining low-wage full employment are founded. However, we mitigate these results by showing that both high-wage full employment and low-wage full employment are possible outcomes of a JG policy. We observe that the combination of JG and balancing policies leads to a low-wage full employment while when there is no balancing policy, the JG scheme moves the economy towards a high-wage full employment.

Further work includes the analysis of such schemes in an open economy. Indeed, increased consumption by households is likely to impact trade (im)balances. Furthermore, austerity measures such as wage containment or balanced budget within an open economy could be analyzed.

Bibliographie


## A  Notation

Table 3 - Parameters

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<td>0.6</td>
</tr>
<tr>
<td>$\omega_{0,c}$</td>
<td>Real wage target parameter in consumption</td>
<td>$3.2132 \times 10^{-4}$</td>
</tr>
<tr>
<td>$\omega_{0,e}$</td>
<td>Real wage target parameter in energy</td>
<td>$3.32054 \times 10^{-4}$</td>
</tr>
<tr>
<td>$\omega_{0,k}$</td>
<td>Real wage target parameter in capital</td>
<td>$3.40381 \times 10^{-4}$</td>
</tr>
<tr>
<td>$\omega_1$</td>
<td>Real wage target parameter</td>
<td>$9.6 \times 10^{-6}$</td>
</tr>
<tr>
<td>$\omega_2$</td>
<td>Real wage target parameter</td>
<td>$1.32 \times 10^{-4}$</td>
</tr>
<tr>
<td>$\omega_3, \omega_4$</td>
<td>Real wage target parameters</td>
<td>0.1</td>
</tr>
<tr>
<td>$\psi$</td>
<td>Learning parameter</td>
<td>0.1</td>
</tr>
<tr>
<td>$\mu_x$</td>
<td>Share of profits distributed in all sectors</td>
<td>0.6</td>
</tr>
</tbody>
</table>

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**Résumés**
Emploi garanti : une perspective structuraliste

**Mots clés:** emploi garanti, structuralisme, stock-flux cohérent
Job Guarantee: a Structuralist Perspective

This paper aims at formalising and assessing the validity of the critiques of the Job Guarantee (JG) policy proposed by Minsky (1965). In order to do so, we develop a multisectoral Post-Keynesian Stock-Flow Consistent (PK-SFC) model. Our paper is a step, following Missaglia (2011), towards the creation of a structuralist/SFC model. We introduce several new features in an PK-SFC model: (i) a more disaggregated households sector than usual, (ii) three production sectors and the possibility of constrained output, and (iii) a more elaborated labor market with endogenous labor supply. We use the model to compare and contrast two Keynesian policies: the JG and a traditional Keynesian Demand Spur (KDS).

**Keywords:** Job Guarantee, structuralist, stock-flow consistent

Empleo garantizado : una perspectiva estructuralista

Este artículo tiene por objeto formalizar y evaluar la pertinencia de las críticas de los programas de pleno empleo (Job Guarantees - JG) propuestos por Minsky (1965). Para esto nosotros desarrollamos un modelo de stock-flujo coherente postkeynesiano (PK-SFC) multisectorial. Este artículo es un paso siguiendo el enfoque descripto por Missaglia (2011) hacia la creación de un modelo PK-SFC estructuralista. Nosotros introducimos varios nuevos aspectos con respecto a la literatura PK-SKC existente : i) un sector familias más desagregado que lo habitual, ii) tres sectores de producción con posibilidades de contraer la producción, iii) un mercado de trabajo más elaborado con una oferta de trabajo endógena. Nosotros utilizamos este modelo para comparar y contrarrestar dos políticas keynesianas : el JG y una política tradicional de reactivación de la demanda.

**Palabras claves:** empleo garantizado, estructuralismo, stock-flujo coherente

**Codes JEL:** E12, E24, L16.

Droits d’auteur

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