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Effects of e-Government on Social Welfare

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Abstract : *The e-government policy is to modernize public administrative services to improve services to businesses and individuals through the introduction of new information and communication technologies. Generally, the introduction of ICT is not neutral since it could destroy the employment of the unskilled.*
In our paper, we have shown using a general equilibrium model of imperfect competition that the e-government policy destroys the employment of the unskilled. But the measure of the welfare, which constitutes an argument for public intervention in the economy, shows that the welfare of the whole society is increasing, including that of the unemployed.
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I. Introduction

Dempsy (2003) defined e-government as the use of NICT to transform government by making it more accessible to citizens, more efficient and more accountable. E-Government (or e-government or e-government) consists of developing government service delivery by taking advantages from opportunities offered by new information and communication technologies (NICTs). This implies an in-depth rethinking of the interaction inside the public authorities, between the public authorities and the companies, and also between the public authorities and the citizens. It is not a question of the "traditional" government to which we would have added the Internet but of a radical process of change of the way the State works and communicates.

E-government is also a major technical challenge for state services. How to put thousands of administrative texts online in a simple and effective way? How can state services enrich sites through effective collaborative work? The e-government raises all the problems of content management and user interaction with the web. How to implement an effective e-government for the services of the State as for the citizens?

Johnston (2001) presents e-government as a process that allows the use of the Internet to: (1) provide services to customers and businesses, (2) to enable government organizations to connect employees, suppliers and customers; and (3) to transform government operations by also including government - government relations.

In this definition, the focus is on two main concepts: e-services and relations between the government and its various partners. An e-service corresponds to the electronic exchange of formalities between public authorities (ministries, decentralized services, public bodies ...) and their partners and users. In other words, it is a service that a citizen can access through a kit of digital keys such as the smart card to perform for example a type of formality: calculation or simulation of taxes, online assistance, file tracking personalized, etc.

The second and third parts of this definition specify that e-government can be used to improve communication between administration and citizens ("A to C", ie Administration to Citizen), but also communication with companies ("A to B", ie Administration to Business), as well as the communication of the various administrations ("A to A", that is to say Administration to Administration).

Putting the administration online has many advantages:

- make services available on the Internet 7 days a week, 24 hours a day;
- used new access channels such as personal computer connected to the Internet, interactive television, mobile phone;
- improve user comfort (no queues, more information, no need to move);
- structure the services according to the needs of the citizens (the intentions) and not according to the internal structure of the administration;
- offer new personalized services to citizens and businesses (eg online tax calculation, monitoring of outstanding administrative procedures, consultation of personal file);

- improve and speed up the tracking and processing of applications;
- ensure greater transparency and proactivity of the administration;
- provide better targeted information and faster;
- simplify administrative procedures, in particular by reducing the number of forms and certificates to be completed;
- promote greater involvement and participation of citizens;
- serve as an example for all economic agents and encourage them to appropriate new technologies.

We can deduce that the introduction of the e-government policy has positive effects on the administrative and private services. However, the welfare of unskilled workers would be negatively affected by this policy either by remaining unemployed or by being licensed from the private sector. Indeed, the integration of NICTs in the production process of goods and services generates a demand for skilled workers rather than unskilled workers.

Cost-benefit analysis is a well-established technique in the area of project evaluation (Gramlich, 1997) and often a prerequisite for accessing a wide range of public funding. Our strategy is not to evaluate the cost-benefit of e-government policy, but to see what effect such a policy has on social well-being.

To do so, we propose a model to assess the social well-being measured by the national income and well-being of the different components of society, namely: companies, skilled workers, unskilled workers and the unemployed. The modeling strategy is based on a system of equations linking e-government policy, public administration and citizens. Our paper is organized as follows. In the second section, we present the model by describing the behavior of the different agents that make up our economy. In the third section, we analyze the results following the e-government policy and we conclude in the last section.

II. Model

Our economy is made up of private enterprises, of a population group $N = l^s + l^u + U$, normalized to the unit, composed of skilled l^s, unskilled workers l^u and unemployed U. The government levies taxes on the production of private enterprises to compensate the unemployed and invest in improving services for private companies and individuals (e-government).

2.1 The company

There are a very large number of identical firms in the economy. To produce a composite good, each representative company uses skilled and unskilled workers. The production function is given by the following equation.

$$Y_p = A^s (l^s)^{\alpha} + A^u (l^u)^{\beta} \qquad (1)$$

With, Y_p, the level of production of private enterprise, l^s and l^u are respectively skilled and unskilled workers. A^s And A^u are the scale parameters of both types of workers.

Given the wages, the company determines its level of employment by maximizing its profit. Its demand for skilled and unskilled workers is given by:

$$l^s = \left(\frac{\alpha A^s}{w^s} \right)^{\frac{1}{1-\alpha}}$$

$$l^u = \left(\frac{\beta A^u}{w^u} \right)^{\frac{1}{1-\beta}}$$

w^s And w^u are the wages of skilled and unskilled workers respectively

We assume that the wages of the skilled are flexible, which implies the absence of qualified unemployed. On the other hand, the wages of the unskilled are determined by wage bargaining between the company and the union, hence the existence of the unskilled unemployed.

2.2 The Government

The government collects social contributions proportional to the income generated by private companies. These levies serve to compensate the unemployed and to invest in improving services for private companies as well as for individuals. The government's balanced budget is as follows:

$$tY_p = BU + SI \quad (2)$$

With t the rate of the tax, SI government spending to finance the investment allocated to improving public administrative services, $B = \delta(1-t)\overline{Y}$ unemployment benefit, $\overline{Y} = \frac{Y}{N}$ average income per capita1, δ indexation rate and U the level of the unemployment.

2.3 Technology

E-Government aim to develop government services delivery by taking advantages of the new possibilities offered by the new information and communication technologies (NICTs). In the modeling strategy, the EGOUV is characterized by the SI government expenditures allocated to the modernization of public administration. This modernization allows private companies to reduce transaction costs such as the costs of paperwork, good information on the job sought, etc.

Private companies well connected to the public sector could benefit from technical improvements thanks to the positive effects of the modernization of public administration. Improved organizational technology, as a result of an effective e-government policy, has a positive and lasting effect on private enterprise technology especially the productivity of skilled people. The relationship between EGOUV policy and the private sector is modeled as follows:

$$A^s = \overline{A^s}\ \theta\, EGOUV \quad (3)$$

With EGOUV = SI the amount spent by the government to improve public administration, $0< \theta <1$ the degree of impact of public investment on the technical improvement of private enterprise symbolized by the scale of workers parameter qualified and $\overline{A}^s$ the scale parameter without EGOUV.

2.4 Salary bargaining

We assume that unskilled workers are unionized. Wages are determined by negotiation between the representative of the workers (unskilled) and the managers of a company. The goal of the union is to maximize the utility V of each member of the union. Thus, the utility function of each member is written as follows:

$$V = q\ln(w^u(1-t)) + (1-q)\ln B \quad (4)$$

With $q = \frac{l^u}{N}$ the probability for each union member finding a job or keeping his job, and $(1-q)$ the probability of being unemployed. If negotiation between the two partners fails, the utility of each union member is described by the following V^0 function:

$$V^0 = \ln B \quad (5)$$

In this case the company only employs skilled workers and its profit becomes:

$$\pi^0 = A^s(l^s)^\alpha - w^s l^s \quad (6)$$

We assume that negotiation between the union and the company covers only the salary, the level of employment is determined by the company unilaterally. The negotiation solution is obtained by maximizing, relative to the current wage, the Nash criterion which corresponds to the weighted product of the gains that the partners withdraw from their relationship. The solution is obtained from the following program:

$$w = \underset{w^u}{\arg\max}\left(V - V^0\right)^\lambda \left(\pi - \pi^0\right)^{1-\lambda} \quad (7)$$

With $0 < \lambda < 1$ Measure the bargaining power of the union.
The resolution of this program gives us the following result:

$$w^u = \exp\left(\frac{\lambda(1-\beta)}{\lambda + \beta(1-\lambda)}\right)\frac{B}{1-t}$$

Unqualified wages are a growing function of the level of compensation and union power.

1

2.5 Calibration

The calibration procedure consists in numerically specifying the parameters of the model so that they reflect a given economic reality. Our study is qualitative in nature, that is, we calibrate the model to take into account.

The parameters $\alpha = 0.15$ and $\beta = 0.55$ are calibrated to have the salary of the qualified is double that of the unskilled with the parameters of scale $A^s = A^u = 14$. We assume that the company and the union have the same weight in wage bargaining ($\lambda = 0.5$) and the indexation rate of unemployment benefits is $\delta = 0.2$ to have an unemployment rate of 9.7%.

III. Comparative Analysis of the Results

Our simulation exercise focuses on the effect of e-government on the demand for both factors of production and national income. Government expenditure to improve public administration is characterized, in the model, by the increase in the parameter of scale of the qualified. This is a variation of the θ parameter that measures the degree of impact of e-government policy on private companies.

The e-government improves the national production, increases the demand of the qualified workers but it destroys the employment of the unskilled ones. The modernization of public administration allows the private enterprise to benefit from efficient and sustainable services. Thus, the increase in the parameter of the scale of qualified people following the e-government policy has the effect of increasing the productivity of the qualified and the national income. However, it wills results on an increase of wages of the unskilled and by the way the increase of unemployment. Otherwise, the demand for skilled workers is increasing despite the increase in their wages (Chart 1).

In fact, increasing the productivity of skilled workers increases the output of private firms, which in turn increases the national income (Chart 2). As a result, the wages of the unskilled increase via the increase of the unemployment benefits which are positively correlated with the national income, and thereby the decline in demand for unskilled workers (Chart 3).

According to our simulation, the more the public administration is modernized, the more the private enterprise benefits from an improved and modernized service and this has the consequence of reducing the demand for unskilled workers. Indeed, as we explained above, the modernization of the public administration encourages the company to call on the skilled workers since their productivities will increase.

Well-being is measured by the utility provided by each member of society - the skilled, the unskilled and the unemployed. Our result shows that the well-being of the whole society increases with the e-government policy. In fact, e-government raises the salaries of skilled workers and improves the National income. And this national income will increase the income of the unskilled and the unemployed, which explain the increase in the well-being of the whole society (Chart 4).

IV. Conclusion

E-Government is aim to develop government services delivery by taking advantages of the opportunities offered by new information and communication technologies (NICTs).

Using a general equilibrium model with wage bargaining, we have shown that e-government decreases the demand for unskilled workers but improves the national income. These resultants have positive effects on the well-being of society which could constitute an argument in favor of the intervention of the public power.

The results of this paper are based mainly on the indexation of unemployment benefits on average income per capita. Relaxing this hypothesis by indexing, for example, unemployment benefits in relation to workers' wages does not change the quality of the results. Among the perspectives of this paper is to integrate the dynamics of capital and to distinguish between the behaviors of the central and local administration.

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Annex

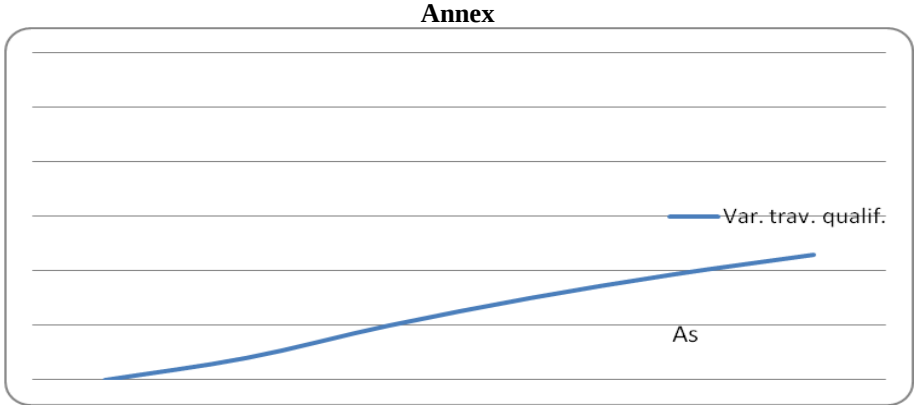

Chart 1, Percent change in demand for skilled workers

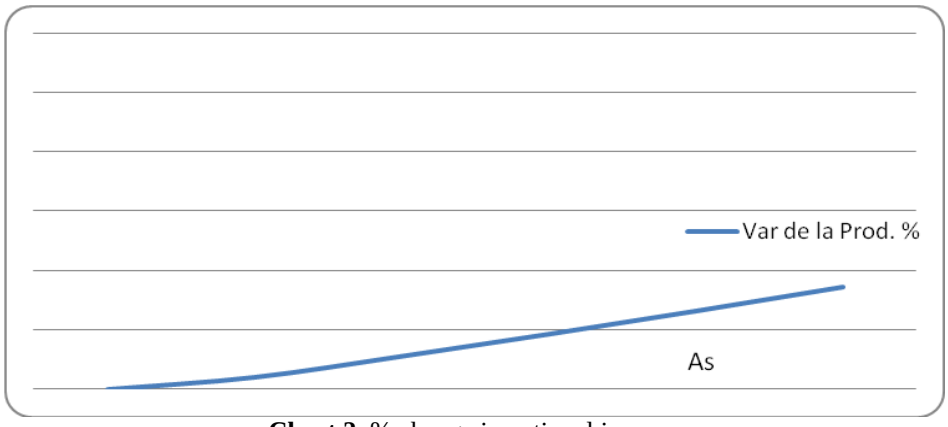

Chart 2, % change in national income

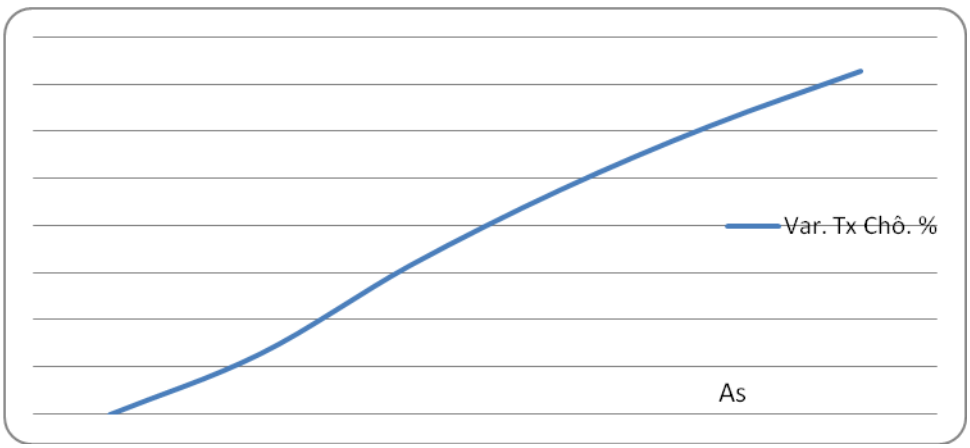

Chart 3, the% change in the unemployment rate of the unskilled

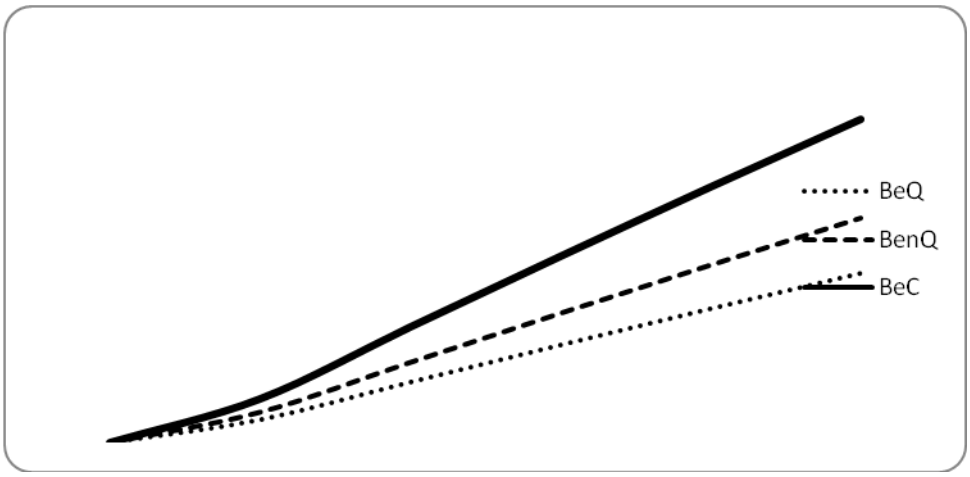

Chart 4, the percentage change in the welfare of the skilled (BeQ), the unskilled (BenQ) and the unemployed (BeC)

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