Back to Work Incentives in a Dynamic Perspective: an Application to French Labor Market

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Abstract

In many countries, "back to work" allowances have been adopted to resolve back to work incentive troubles caused by guaranteed minimum income devices. But one can notice that the identification of these incentive problems is mainly based on a static approach where mobility perspectives on the labor market are not taken into consideration. In this paper, we suggest an economic modeling of labor force participation microeconomic decisions in an inter-temporal framework where a minimum income coexists with a minimum wage. Results show (i) important inequalities between workers concerning "inter-temporal" returns of working and, consequently, back to work incentives troubles, (ii) no obvious link between the occurrence of a static trap (work does not pay in the short run) and incentive-to-work problems (work does not pay at all, considering short and long run gains). Moreover, these results stress that some workers do have an incentive to accept jobs that do not pay, while some others do not have any incentive to accept jobs that do pay.

JEL : J21, J22, J31,J32, J62

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1. Introduction

Most European countries have adopted a Guaranteed Minimum Income Device which works on a purely differential basis. One knows that these mechanisms are efficient (and cheap) weapons to fight monetary based poverty, as far as the level of guaranteed income is fixed above poverty line. On another hand, these mechanisms can cause an important *back to work* incentive trouble; the differential device means as a matter of facts that every additional Euro got from wage, implies one Euro less from minimum income transfers. This problem is magnified by all the other means tested social transfers given at the bottom of the wage distribution and also with the targeted benefits on minimum income recipients. All in all, it leads to very high marginal tax rates for the poorer households (*i.e.* more than one hundred per cent), especially for parents with (many) children.

Institutional answer to these problems lies in the *"Making Work Pay"* Strategy. Off course, one can increase minimum wage, when it exists, but this won't be sufficient. Everywhere, the minimum wage is fixed on an hourly basis ; it does not prevent low incomes for people at work, as far as they work at short time and/or with an instable labor contract which leads them to alternate working times and unemployment during a year. for this reason more and more European countries have adopted *back to work* allowances, following the EITC US example or copying the WFTC British device.

France is one of the European followers. Since autumn 2001, the *"Prime pour l'Emploi"(employment bonus)* is a fiscal credit given every year to 8.5 millions low wage households (many criticism says that this allowance gives too less for too many people). Other examples are the Earned Income Tax Allowance created in 1991 in Finland, the Labor Tax Credit introduced in 2001 in the Netherlands, or many temporary allowances given to *back to work* people in eight European countries.

In the present paper, we discuss the capacity of such *back to work* allowances to solve *back to work* incentive problems. Symmetrically, we put some doubt on the fact that minimum Guaranteed Income Device always causes incentive troubles. Our starting point is that theoretical and applied studies, devoted to the analysis of incentives to work problems and the corresponding economic policy recommendations, often rely on a static approach. It is particularly the case in France where most of the economic studies did not take into account a dynamic perspective (see Laroque and Salanié [2000], Gurgand and Margolis [2001], and Bourguignon [2001]). However, it seems clear that a negative immediate monetary gain, associated for example with accepting a part-time job, can be outweighed by favorable job perspectives; symmetrically, an immediate gain can be over-compensated by unfavorable mobility perspectives. In other words, work can pay immediately, but not in the long run, or pay in the long run…but not immediately.

We suggest an economic modeling of labor force participation microeconomic decisions in an inter-temporal framework in order to provide a better valuation of *back to work* gains for unemployed people. This framework includes workers' mobility between jobs. We use the observed probabilities of transitions between different kind of jobs on the French labor market, for different categories of workers (age, gender, skills etc.), and the observed incomes

associated with each kind of job, to identify the categories of workers that face inactivity or poverty trap problems[1].

The empirical results of the paper allow us to stress that there is no obvious link between the occurrence of a static trap (work does not pay immediately) linked to the minimum income scheme, on one hand and, on the other, labor force participation problems (work does not pay at all, considering short and long run gains). In other words: *(i)* yes, minimum income *can* create a static trap, but *(ii)* no, this does not *necessarily* create incentive-to-work problems. The labor force participation argument generally advanced against minimum income schemes is thus weaker than expected[2].

We first depict the general framework and address some questions to the standard static labor force participation approach; the following sections present the modeling and the role played by the main parameters. The last section deals with empirical results on the French labor market.

2. Static analysis

From a static viewpoint, identification of incentive to work problems is based on the simple comparison between all the revenues associated to work and non work. Arbitration depends on the marginal disutility of work and the revenue change associated with a transition between different states on the employment market : inactivity and employment, or part-time and full-time work, for example.

Formally, it requires to build a revenue vector corresponding to the net gains of each state on the labor market, ranking from most to least favourable. In such a framework, if the difference between net incomes utilities, associated with high and low employment levels, is small relative to the marginal disutility of work, we can say that one get an incentive-to-work problem : work simply does not pay enough to induce an unemployed worker to accept a job offer.

To illustrate these minimum income effects in the French case, we first present the French system and his potential *back to work* incentives problems ; we will then see that these troubles doesn't really match the facts as far as we trust the French statistical surveys.

2.1. The French *back to work* problem: an overview

During all the nineties, French growth is very low contrary to the US; GDP average annual growth is 1.3 % until the end of 1996 and unemployment rate reaches a 12.6 % peak at the same time. Since 1997, after an economic upturn, annual GDP growth is near 3 %, 1.7 million of jobs are created and unemployment rate declines to 8.5 % in summer 2002. The growth doesn't explain all employment creations. There is also a labor deepening due to new labor market policies. Since the beginning of the nineties, several French governments made the choice to cut social taxes on low wages. This strategy is nowadays the first French employment policy in term of people concerned as well of budgetary spending. Since the end of the nineties, those targeted tax cuts on low wages where also used to facilitated the working time decreases in the "35 hours" perspective.

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[1] From a theoretical point of view, Burdett K. and Smith E. [2002], show that such traps can occur within a simple matching model, resulting in low wage low skill workers.

[2] This is also the main conclusion of Eissa Nada and Liebman Jeffrey B. [1996] analysis of U.S. labor force participation response to the Earned Income Tax Credit (EITC).

These policies were exclusively labor demand oriented and this fact became a source of problem in a time of sustained growth. To improve employment, one need labor demand, but also unemployed people with skills that match the demand and, last but not least, one need that they accept the new jobs. It is probably why labor supply side policies became more and more a major concern in France at the end of the nineties.

In order to identify the main incentive problems characterizing the French system, we first present a quick overview of the three main components of the French minimum income/minimum wage schedule

   (i) National Minimum Income

Known as *Revenu Minimum d'Insertion* (RMI), it has been implemented in 1988. As a guaranteed minimum income, it is a differential allowance which is given to household without any condition except the fact that you need to be a French resident (there is no nationality condition, as well than anywhere in Europe), and that you have to be more than 25 year old (18 is the European norm in that field). Of course, the benefits increase with the family size with an equivalent scale that replicate the OECD one (*i.e.* 150 % of the single allowance for a couple, plus 30 % for each child). There are now more than one million of recipients. That figure is stable since 1999 after having increased of one hundred of thousand every year during ten years.

National Minimum Income (RMI)

	RMI / month
Single	€ 405
Couple	€ 405 + 50%= € 607
Couple with *n* children	€ 607 + $n \times 30\%$

In the long run, there is a perfect substitution between Minimum Income and wages, meaning that $+ 1$ € obtained from wages implies -1 € from RMI, as far as people are still recipients of the RMI. In the short run, there is a temporary back to work allowance in France as well as in most European Countries with a generous minimum income device: recipients can cumulate half of their wage with the RMI benefits.

   (ii) Local Monetary Assistance

The RMI is a legal and national social transfer. The recipient net income is not sensitive to others legal and national social transfers which are taken into account when the RMI is computed; however, the net income is sensitive to most of the extra-legal and/or local transfers. For this reason we need to distinguish a second level in the French social transfers system.

This second level, namely local transfers, is varying across areas and we do not have many statistical source to compute exactly the average amount of local transfers; in fact the only source available is a survey covering ten areas in France including the three major towns (Paris, Lyon and Marseille) and middle and small towns in all the country (Anne and L'Horty, [2002]). Following that survey, *Local monetary assistance* is on average, given by the following table.

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Local Monetary Assistance (LMA)

	Lma / month
Single	€ 136
Couple	€ 150
Couple, 1 child	€ 300
Couple, 2 children	€ 370
Couple, 3 children	€ 450

(iii) Minimum Wage

When former RMI people are back to work, they usually get paid at the minimum wage, the *"Salaire MInimum de Croissance"* (SMIC) ; generally these new workers get state aid labor contracts and the SMIC is the main reference for such contracts. The calculus bellow gives the monthly wage associated with full-time *vs* part-time jobs[3] :

SMIC is € 5.4 / hour (after withholding net income), thus :

Full-time Job   (39h/week)   =>   € 969 / month

Part-time Jobs (20h/week)   =>   € 484 / month

One notices that a single unemployed person with RMI and local aids earns in average €405 + €136 = €541/month *i.e.* more than a 20h/week part-time job worker; in this case, such individuals should refuse part-time job offers and, consequently, one would get an incentive-to-work problem: low skills/low wages unemployed workers would be *voluntarily* unemployed because they would prefer to get RMI than part-time jobs.

This is the so-called "inactivity" or "poverty trap": people do not accept jobs that do not pay enough, progressively getting trapped into long run unemployment with decreasing probabilities to find better jobs – due to loss of ability – ending with very low level of qualification and minimum income.

The main limit of this approach is that it narrows the incentive-to-work question to a comparison of the immediate gains associated with work and non-work – whereas consumption/leisure choices are by nature inter-temporal.

2.2. What can we learn from statistical surveys?

Within the French system, to accept an half time job should be a very rare experience according to the static approach of *back to work* incentive depicted above. To confirm that prediction, the best statistical source is the 1998 INSEE survey on Minimum Income recipients (RMI). It provides some elements that raise questions about the static analysis (see Afsa [1999] for details).

(i) First of all, nearly a third of the beneficiaries of minimum income support who return to work, claim to have no financial gain: 12.1% claim to be losing; 20.4% claim they are not gaining anything.

(ii) Secondly, although the beneficiaries of the minimum income support generally claim that they are looking for a minimum wage full-time job, a majority would accept a part-

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[3] If people get full time jobs they don't work automatically 35 hours a week, especially if they are employed by a small firm ; that's why we kept a 39 hours per week duration in the calculus.

time job : among the 26% of January 1997 minimum income recipients who held employment one year later, nearly two-thirds have a part-time job.

Furthermore we have observed, in France, a significant increase in the share of low-wage part-time jobs in global employment, which shifted from 10% to 15% through the 90's ; thus one can complain that the standard static analysis does not give any answers to two important questions :

- from the early 90's we had in France a significant growth of low-wage part-time jobs : if these jobs do not pay…why do some people accept such jobs ?

- it seems, from the Annual National Minimum Income Survey, that some workers accept jobs that do not pay, but others do not : why do "identical" rational utility maximizing workers make different decisions ?

The main goal of this paper is to give an economic solution to this French labor market puzzle. We suggest that if some RMI-unemployed workers accept "low wage part-time jobs" that do not pay immediately, it is because they think that such a decision will pay in the future; if some other people do not accept the same jobs it is because they think that, *for them*, it will never pay in the future. Testing this hypothesis implies departing from the standard *static* analysis to develop a *dynamic* inter-temporal analysis of the "incentive-to-work" problem: this is the aim of the paper.

3. Dynamic analysis

In a dynamic framework, to accept *versus* refuse a job offer, a worker will not only take into consideration the immediate benefit of the job, but also the fact that job tenure increases the probability of access to "better" jobs tomorrow and, therefore, higher future expected wages. A negative immediate monetary gain, associated for example with accepting a part-time job, can be outweighed by very favorable job perspectives ; in this case, unemployment incomes are higher than employment ones (static trap), but this gap does not imply any incentive-to-work problem, *i.e.* no dynamic trap : work does not pay in the short run, but pays in the long run.

Symmetrically a strictly positive immediate gain can be over-compensated by unfavorable job perspectives: in this case one does not have a static trap but a dynamic one and incentive problems: work pays immediately, but does not pay in the long run

The main interest of a dynamic approach is that it still includes all the components of the static approach, but adds new ones: immediate – positive or negative – work benefits and perspectives for future improvements (accumulation of human capital, increasing probability of access to a "better" job etc.) are all taken into consideration and, consequently, a low immediate monetary gain can be compensated by favorable wage perspectives. Such an approach breaks the "classic" link between static trap and work incentive problems, and claims that *a positive static trap is not necessary damaging in terms of incentive to work*.

As a first approximation, one can identify five components that will play a key role in the trade-off computations made by an unemployed worker who faces, for example, a part-time job offer:

- the total amount of net incomes earned if remaining unemployed
- the immediate wage associated with the job
- the probabilities of getting some better jobs in the future
- the wages associated with these future jobs

- the agent's preference rate for the present

The last parameter gives the discount rate he/she uses in his/her arbitrage: the higher the time-preference rate, the lower the weight attached to future incomes and thus the higher the discount rate.

3.1. Modeling

Let us consider a single RMI unemployed worker facing a part-time job offer that does not pay and who needs to make a decision *i.e.* to choose between two strategies – accept *vs* refuse – concerning the job offer; the problem for him is not to compare the immediate earnings these strategies bring about, but rather the present values of the flows of incomes – current and future – associated with the two strategies.

To make this calculation, the agent needs to know the probabilities of accessing to other jobs in the future, conditioned on the strategy he chooses immediately *i.e.* all the possible transitions on the labor market, associated with a decision made in the current period.

Such probabilities, called transition probabilities[4], give a summary of internal labor market flows: from unemployment to part-time or full-time employment, from part-time to full-time employment or unemployment etc. Formally, these transitions can be summarized by a single matrix that gives all the probabilities of transitions between different situations on the labor market: full-time job, part-time job, unemployment. In the example below, we distinguished unemployment and three employment situations: full-time job, long part-time jobs and short part-time jobs (less than 20 hours/week) ; the matrix gives all the probabilities of switching, during one period of time, from one situation to any other one. Of course the sum of probabilities over a whole line is equal to unity.

Situation in date $T+1$ Situation in date T	Job $\geq$ 35 h	20h $\leq$ Job < 35h	Job < 20h	Unemployment
Job $\geq$ 35 h	0.75	0.15	0.07	0.03
20h $\leq$ Job < 35h	0.35	0.50	0.10	0.05
Job < 20h	0.32	0.20	0.38	0.10
Unemployment	**0.15**	0.18	**0.30**	**0.37**

Source : Employment Survey, INSEE, 2000 and 2001.
Men and women. For the employed, private sector salaried workers except apprentices, subsidized contracts and students.

Let us now turn to the monthly earnings associated with each possible situation on the labor market; they can be summarized by a vector that gives the average earnings in each situation. For example if the average weekly labor time for long part-time job workers is 24 hours – meaning that average daily labor time is 24/5 h – and that people belonging to this category are paid on the average 20% above the minimum income, the monthly (23 days) corresponding wage will be :   (24h / 5) × [5.4€ × (1 + 20%)] × 23 = 715 €

A similar computation gives the monthly wage for full-time job workers, while unemployed single earnings correspond to the sum of National Minimum Income and Local Monetary Assistance *i.e.* € 541 as seen before.

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[4] For example of different papers using theses probabilities, see Magnac T. and Robin J.-M. [1994], Stewart M. B. and Swaffield J. K. [1999] or Dickens R. [2000]

For short part-time job workers, we need to distinguish two cases:

(i) Let us assume first, and for example, that average weekly labor time for this kind of workers is 15 hours and that people belonging to this category are paid, as before, on the average 20% above the minimum income ; a calculation similar to the previous one gives immediately an average earning of €447 ; as this income is greater than the National Minimum Income (€405), such workers will not receive any euros from National Minimum Income policy nor from Local Monetary Assistance (more or less restricted *de facto* to National Minimum Income recipients). The average earnings of this category of workers is thus €447.

(ii) Let us now assume that average weekly labor time for this kind of workers is no longer 15 hours, but rather 10 hours. A new calculation gives immediately a monthly average income of €298; as this amount stands under the National Minimum Income, workers of this kind *(i)* will receive a €107 national subsidy to take them to the €405 level of the National Minimum Income, *(ii)* will be eligible for Local Monetary Assistance programs, thus adding an average of € 136 to their income, which reaches €541.

The situation depicted below correspond to case *(i)* above :

Job ≥ 35 h	R_{FT}	€ 1132
20h ≤ Job < 35h	R_{LT}	**€ 715**
Job < 20h	R_{ST}	**€ 447**
Unemployment	R_{U}	**€ 541**

One can notice, in this example, the occurrence of a strictly positive static trap, meaning that work does not pay, at least immediately: $R_U - R_{ST} = €94 > 0$. The important question is thus following one: does work pay in the long run ? Does an unemployed worker have an interest in accepting a short part-time job that does not pay immediately, because it will pay in the long run through the interplay of transitions on the labor market? If the answer is yes, we do not have any incentive problem nor dynamic trap, despite the occurrence of a static trap.

The transition matrix and the corresponding earnings vector, allow us to calculate the payment associated with strategies *"I accept short part-time jobs"* (S_A) and *"I refuse short part-time jobs"* (S_R) ; the payments $P(\cdot)$ corresponding to each of these strategies are simply evaluated by calculating the discounted expected value of the present and future incomes implied by the application of each strategy ; the discount rate used for the computation indicates how the individual weights immediate gains and future gains. Eventually, the comparison of the respective returns gives the answer to our question : if the payment of the strategy *"I accept short part-time jobs"* is greater than the return corresponding to the other strategy, one has no incentive problem nor dynamic trap : work does pay, at least in the long run.

Table 1 below provides a quick overview of all the results concerning the occurrence of static *vs* dynamic traps, that we can possibly get by comparison of the payments corresponding to the two possible strategies depicted above.

	$R_{ST} > R_U$ Work pays immediately	$R_{ST} < R_U$ Work does not pay immediately
$P(S_A) > P(S_R)$ Work pays in the long run	No Static trap No Dynamic trap	Static trap No Dynamic trap
$P(S_A) < P(S_R)$ Work does not pay in the long run	No Static trap Dynamic trap *i.e.* incentive pb	Static trap Dynamic trap *i.e.* incentive pb

Table 1 : Static/dynamic traps configurations

3.2. Further considerations

- **A call for a distinction between different types of workers**

One of the main interests of the dynamic analysis suggested above is to underline the key role played by labor force mobility, when a static approach of incentive-to-work problems only focuses on the difference between current earnings associated with work and unemployment. This framework suggests a track to solve the so-called French labor market puzzle and to give some explanations to the two questions set forth in 2.3.

(i) Why do some people accept short part-time jobs if they do not pay ? Because they think in a "dynamic" and not a "static" way : in an inter-temporal framework a job can pay in the long run, even if it does not pay immediately.

(ii) Why do "identical" rational utility maximizing workers make different decisions concerning job acceptance? Because they are characterized by different probabilities of transitions on the labor market and/or different discount rates.

The second point is quite straightforward: for identical workers and a same job offer, different evaluations of the monetary expected returns associated with the two strategies S_A and S_R, can only originates in discount rates and/or differences in the probabilities of transitions.

Concerning the role played by the labor force mobility, it seems rather reasonable to assume that the probabilities of transitions in the labor market, from one employment situation to another, are not identical for all individuals : different kinds of workers, are characterized by specific transition matrixes, reflecting different choices of human capital accumulation (low skills *vs* high skills) as well as geographical development inequalities (urban *vs* rural areas) and discrimination phenomena in the labor market (men *vs* women, French *vs* foreigners).

It is thus straightforward that the optimal strategy for one type of worker is not necessarily optimal for another type and, thus, that one needs to analyze the incentive-to-work problem specifically for each category of workers.

- **Discount rates**

Heterogeneity of discount rates is the other side of the coin that explains the occurrence of different job decisions among unemployed workers. Let us assume here, for simplicity, that the set of transition probabilities is such that the higher the current weekly hours of work, the higher the probability of getting a "better" job and the lower the probability of returning to

unemployment or "bad" jobs[5] ; in such a situation one understands perfectly that an unemployed worker facing a short part-time job offer may accept the offer, even if it does not pay immediately – or may infer a cost – because it opens up perspectives for improvements in the future.

But, for this to work, the individual must be characterized by a low time preference rate (low discount rate), and it is only under this additional condition that the individual values future earnings enough to endure the current loss of income associated with the job offer; on the other hand, an unemployed worker with a strong time preference rate does not value future expected incomes enough to accept the temporary cost associated with job acceptance.

One sees that – for such given transition probabilities – the greater the discount rate of an individual, the greater the risk to get an incentive problem and the lower the labor force participation.

- **Relation between static and dynamic traps : the ICM static trap**

Until now, we saw that three main components drive the conclusion concerning the incentive-to-work issue *i.e.* the occurrence of a dynamic trap and labor force participation problems :

- *(i)* the size of the static trap *i.e.* the gap between current earnings corresponding to unemployment *vs* short part-time employment situations : $R_U - R_{ST}$
- *(ii)* the mobility perspectives, stylized by the transition matrix
- *(iii)* the time preference rate *i.e.* the discount rate used by an agent to evaluate the present discounted value of his inter-temporal flow of earnings

One key point here is that, for given *(ii)* and *(iii)*, the higher is *(i)*, the higher is the probability for a dynamic trap to occur. The result is quite straightforward : if the size of the static trap is too large, future perspectives of job/wage improvements are unable to outweigh the negative effect of the static trap on labor force participation.

This remark stresses the existing link between static and dynamic traps : for a given transition matrix and discount rate, there always exists a critical value of the static trap such that, under the critical value there is no incentive problem or dynamic trap, but beyond that value an incentive problem and a dynamic trap arise ; for the next sections of the paper, we will use the expression "Incentive Compatible Maximal static trap" – or, to make it shorter, "ICM static trap" – for the maximal value of the static trap that does not involve dynamic trap occurrence.

4. Testing for static *vs* dynamic traps occurrence on the labor market

4.1. Empirical background and choices

In order to test the occurrence of work incentive problems, on the French labor market, and the relevance of the distinction between static and dynamic trap, we need first :

- *(i)* to obtain for different categories of workers, their mobility perspectives and the associated average earnings vectors
- *(ii)* to identify the main types of workers whose transition matrixes are really different

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[5] Expressions "better" job and "bad" job only refer here to the following implicit ranking : short part-time job < long part-time job < full-time job ; we are thus assuming that people prefers to work more in order to get higher wages.

Concerning the first point we used the French Labor Force Surveys (INSEE [6]), for years 2000 and 2001, restricted to private sector wage earners except apprentices, government assisted workers and students. With this database one knows, for the same set of people, the number of workers at each date, in each of the four employment situations – unemployment, short part-time jobs, long part-time jobs and full-time jobs – and the number of people that shift, during the year, from one specific situation to any other one ; we can thus compute the probability transition from, say, situation A to B, as the number of workers that move from A to B between 2001 and 2000, divided by the total number of people belonging to A at time 2000. Doing this for the 16 components of the matrix, we get the whole transition matrix.

Average earnings corresponding to the different job situations, are available from the database[7]. For short part-time jobs, we used either the corresponding average income from the database or the €541 earnings associated with inactivity, depending whether or not the former is higher than the €405 National Minimum Income (see section 3.2).

We built transition matrix for different workers categories, corresponding to the intersection of three of the five following criteria :

 - gender : male *vs* female
 - skills : high school diploma *vs* no high school diploma
 - age : young (under 35) *vs* old (over 35)
 - nationality : French vs foreigners
 - marital situation : single *vs* not single

After some comparison it turns out quickly that the three leading criteria that drive the properties of the transition matrix are eventually, gender, age and skills ; we thus selected these three criteria, to define eight types of workers, each of them being characterized by specific transition matrix and earnings vector.

The implicit hypothesis here is that each individual use the transition matrix of a reference group - all the people under the same category of age, skills and gender - as a good proxy of his own mobility perspectives.

4.2. Computations and main results

The problem is *(i)* to compute, for each of the eight selected types of workers, the present discounted values $P(\cdot)$, corresponding respectively to the strategies S_A and S_R and *(ii)* to compare the two results ; one expects to find $P(S_A) > P(S_B)$ *i.e.* no incentive-to-work problems for some types of workers, and $P(S_A) < P(S_B)$ *i.e.* labor force participation problems and a dynamic trap for other categories.

The easiest way to make such comparisons is to compute, for each type of workers, the value of the ICM static trap and to compare it to the effective value of the static trap : $R_U - R_{ST}$. One can then present all the results in a very simple way by figuring the values (Static Trap, ICM Static Trap) for each categories of workers, on a single 2D graph, with the static trap value on the X-axis and the ICM static trap value on the Y-axis. If the corresponding dot lies above the 45° line, then the real value of the static trap is lower than the computed value of the ICM static trap : there is no incentive-to-work problem nor dynamic trap ; on the other hand, if the (Static Trap, ICM

Static Trap) dot, lies below the 45° line, the real value of the static trap exceeds the ICM static trap value and we get an incentive-to-work problem *i.e.* a dynamic trap.

Graph 1 presents the results we got for the eight selected types of workers depicted in table 2.

Type	Gender		Age		Skills	
	Men	*Women*	*Young*	*Old*	*≥ High school*	*< High School*
1	✓		✓		✓	
2	✓		✓			✓
3	✓			✓	✓	
4	✓			✓		✓
5		✓	✓		✓	
6		✓	✓			✓
7		✓		✓	✓	
8		✓		✓		✓

Table 2 : characteristics of the different types of workers
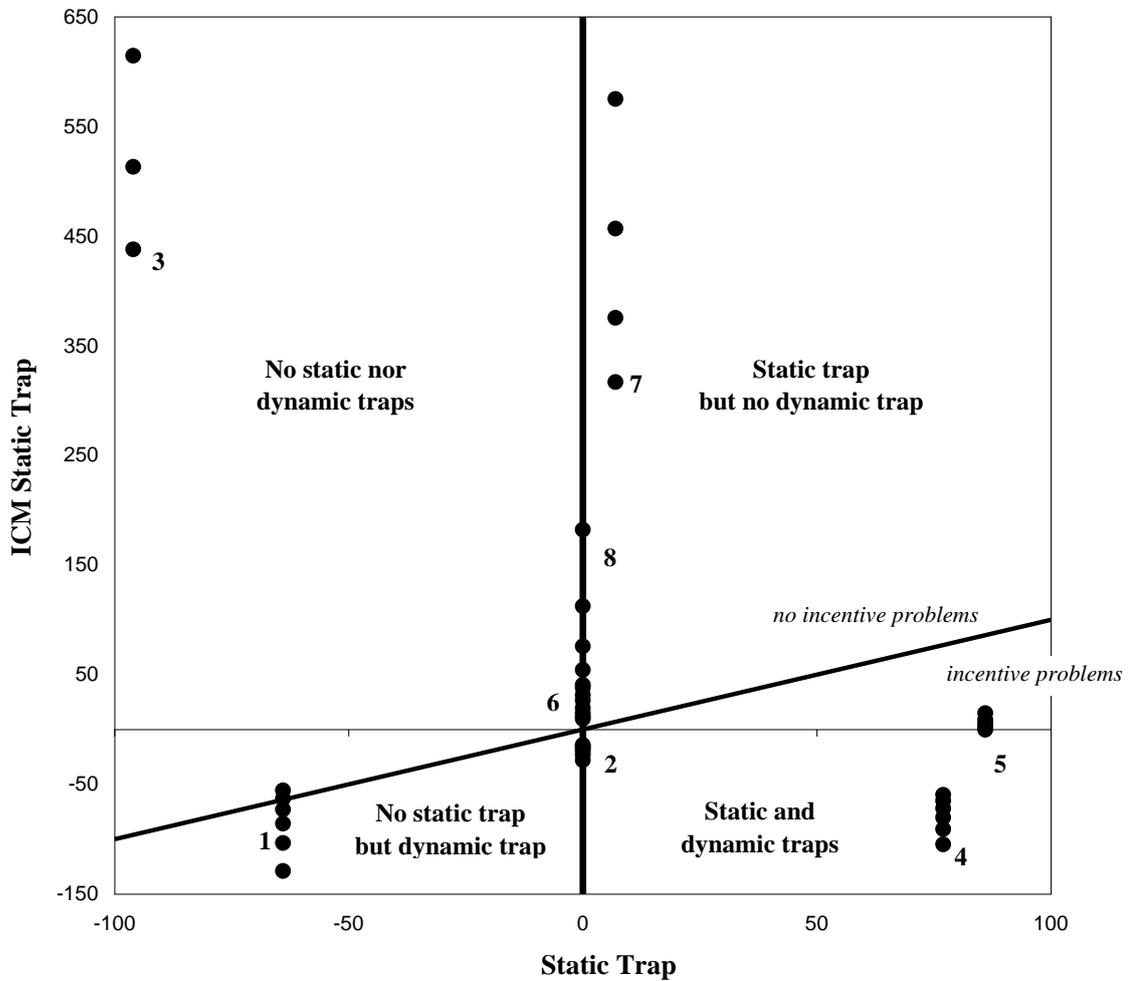
Graph 1 : Static *vs* Dynamic traps on the French labor market

One notices immediately that each category of workers is not represented by one single dot, but rather by a set of six dots [8], that reflects the specific role played by the discount rate ; in fact, one need to remember [9] that the discount rate is one of the main parameters that determines the present discounted value associated with job acceptance strategies and, consequently, the value of the ICM static trap. It is thus straightforward that, for each category of workers, one gets as many ICM static trap values as discount rate levels. Theoretically, we can thus get, for a particular type of workers, three kind of results :

- no dynamic trap *i.e.* no incentive problems, whatever the level of the discount rate
- dynamic trap *i.e.* incentive problems, whatever the level of the discount rate
- dynamic trap *vs* no dynamic trap depending of the level of the discount rate

To investigate the occurrence of these different cases, we computed – for each category – the ICM static trap values corresponding to six different levels of the discount rate, from 1% to 50%.

As seen before, the 45° line, divides the graph into two parts :

- above the line, the real static trap is lower than the computed ICM static trap value and one has no incentive problems
- the opposite arises in the area located under the 45° line, characterized by the occurrence of a dynamic trap and incentive problems.

Identically, the Y-axis divides the graph into two parts :

- on the left side of the axis one has a negative static trap[10], meaning that $R_{ST} > R_U$: work pays immediately
- on the right side of the axis, one has a positive static trap, meaning that $R_U > R_{ST}$: work does not pay immediately

This eventually allow us to divide the graph into four areas, corresponding to the four traps configurations depicted in table 1.

4.3. Comments

The main point to emphasize, is that all the static/dynamic traps possible configurations occur, as appears on table 3 below :

(i) First of all, the discount rate plays an important role concerning the level of the computed value of ICM static trap (for the third category of workers this value goes from €438 to €1308) and is thus a potentially important parameter, to analyze incentive-to-work problems ; furthermore, one can notice that, for the first type of workers, the occurrence of a dynamic trap depends of the level of the discount rate.

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[8] Upper dots corresponding to categories n°3 and 7 lies out of the graph : computed ICM static trap values corresponding to type 3 workers lies between €438 and €1308 ; between €317 and €1081 for type 7.
[9] See part 4.2.
[10] In this case we will now say that we do not have a static trap, keeping the term Static Trap to qualify positive static trap only.

	Workers characteristics						Traps configuration		
	Gender		Age		Skills		Static Trap		Dynamic Trap
Type	*Men*	*Women*	*< 35*	*> 35*	$\geq High$ *school*	*< High School*	$R_U > R_{ST}$	$R_U = R_{ST}$	$P(S_A) < P(S_R)$
1	✓		✓		✓				✓ *
2	✓		✓			✓		✓	✓
3	✓			✓	✓				
4	✓			✓		✓	✓		✓
5		✓	✓		✓		✓		✓
6		✓	✓			✓		✓	
7		✓		✓	✓		✓		
8		✓		✓		✓		✓	

(∗) occurrence of the dynamic trap depending of the discount rate

Table 3 : Summary of the results

(ii) For three categories of workers (nos. 6, 7 and 8 *i.e.* all women categories except young skilled women) one does not have any incentive-to-work problem despite the occurrence of a static trap. For these categories, a part-time job does not pay in the short run – or even is costly – but pays in the long run thanks to upward job transitions on the labor market ; these results clarify those obtained from the 1998 INSEE survey on minimum income recipients, stressing that more than 30% of beneficiaries of the minimum income support, who return to work, claim to have no financial gain (section 2.3).

(iii) For one category of workers (n°1 *i.e.* young skilled men) one does have an incentive-to work-problem despite the fact that a part-time job pays in the short run (no static trap). An analysis of the corresponding transition matrix, allow us to note that, for these kind of people, the probability of getting a full-time job is higher for an unemployed than for a short part-time worker: the probability to shift from unemployment to full-time is around 52% against 42% if coming from a short part-time job.

We thus suggest the following explanation: for young skilled men it is better to refuse short part-time jobs, that pay immediately, because if they do accept such jobs they can be trapped in short part-time jobs: *(i)* because they "waste" time that could be better used to find a full-time job, *(ii)* because they signal to employers their lack of self-confidence regarding their capacity to find a full-time job. To make it short: *it is better for young skilled men to spend their time to search a lucrative full-time job, than to waste it by accepting a part-time, low-wage, job.*

Symmetrically, for unskilled workers it is better to accept short part-time jobs, that do not pay immediately: because the lack of diploma, employers do not observe their abilities and part-time job is thus a way to signal their own productivity; *such workers see part-time jobs as a first step that will allow them to move upward.*

(iv) For four categories of workers static and dynamic results matches:

- for three categories (n°2, 4 and 5 *i.e.* unskilled men and young skilled women), the static trap is too large to be balanced by future upward mobility on the labor market : we thus have both static and dynamic traps.

- for one category – n°3 *i.e.* old skilled men – one have no static nor dynamic trap.

A quick analysis of the transitions matrixes help to understand the difference between categories 6, 7 and 8 (no dynamic trap despite a static trap) on one side and 2, 4 and 5 on the

other side (both static and dynamic trap). Let us consider, for example, categories 2 and 6 : the static trap is the same and equal to zero, meaning no difference between earnings associated respectively to unemployment and part-time job ; despite this fact, the optimal strategy is not the same for the two types of workers : type 6 picks S_A *i.e.* accepts part-time jobs that do not pay in the short run (no incentive-to-work problem) but type 2 picks S_R *i.e.* refuses part-time jobs that do not pay in the short run (incentive-to-work problem).

This phenomenon highlights the key role played by mobility perspectives in a dynamic framework. For type 6 workers, the probability to get a full-time job when coming from unemployment is low (23%) ; thus the best way to get a full-time job is first to accept a short part-time job (*i.e.* to pick strategy S_A), that will give them a high probability to get a long part-time job (44%), that will them a high probability to get a full-time job (34%) : in other words, to reach the top of the scale you need to climb step by step. For type 2 workers, the probability to get a full-time job when coming from unemployment is quite high (42%) and, moreover, higher than when coming from short part-time job (35%) ; thus, for this type of unemployed workers, the best way to get a full-time is to refuse short part-time job (*i.e.* to pick strategy S_R), in order to jump directly from unemployment to full-time job.

5. Conclusion

The aim of this paper was to stress the weakness of a static economic approach of labor force participation analysis and, on the other hand, to propose an analytical background to develop an inter-temporal approach of incentive-to-work problems.

Concerning the first point, we have seen that there is no obvious link between the short and the long run incentive-to-work problems; for four of the eight categories of workers analyzed, one find either a static trap but no dynamic trap, or no static trap but a dynamic one. This remark underlines the inherent limits of the static approach ; to the question "*Is the minimum income device responsible for labor force participation problems?* " the correct answer should emphasize that the existence of a Minimum Income scheme is not a sufficient condition, nor a necessary condition, for incentive problems to arise : some workers can accept jobs that do not pay immediately (because they will pay in the future), and some others can refuse part-time jobs even if they do pay immediately (to avoid to be trapped in part-time employment).

Turning now to the second point, we think that the dynamic modeling proposed in the paper offers a way to test *(i)* the occurrence of labor force participation problems in different countries and, *(ii)* if they originates in minimum income schemes. Moreover, the suggested approach allows us to distinguish between different kinds of workers, and to analyze labor force participation decisions from a specific microeconomic point of view. We hope that this could be useful to economic policy makers.

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