The Perverse Effects of Partial Labor Market Reform: Fixed Duration Contracts in France

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There is now substantial evidence that high employment protection leads to a sclerotic labor market, with low hiring and separation rates, and long unemployment duration.[1] While this may not lead to high unemployment—because of the opposite effects of low flows and high duration of the unemployment rate—it is likely to lead to both lower productivity and lower output.

Reducing employment protection runs however into strong political opposition. The reason is simple: Those who are currently protected see themselves as having more to lose than to gain from such a reduction. For this reason, governments have been reluctant to implement across-the-board decreases in employment protection. Instead, they have either done little, or they have tried to reform at the margin, allowing for reduced protection for some new contracts, but not for existing ones. In France for example, firms now can, under some conditions, hire workers for a fixed duration, at the end of which separation occurs with low separation costs. If workers are kept beyond this fixed duration however, later separation becomes subject

*MIT and NBER, and MIT respectively. Preliminary and incomplete. We thank Larry Katz for discussions.

[1]See OECD [1999], and Blanchard and Portugal [1998].

to the normal firing cost.

Are such partial reforms better than none? The motivation for this paper was our suspicion that the answer might actually be no, that the effects of such a partial reform might be perverse, leading to higher unemployment, lower output, and lower welfare for workers. Our intuition was as follows:

Think of firms as hiring workers in entry-level jobs, finding out how good the matches are, and then deciding whether or not to keep the workers on higher productivity, regular, jobs. Now think of reform as lowering firing costs for entry-level jobs while keeping them the same for regular jobs. This will have two effects: It will make firms more willing to hire new workers, and see how they perform. But, second, it will make firms more reluctant to keep them on regular jobs: Even if a match turns out to be quite productive, a firm may still prefer to fire the worker while the firing cost is low, and take a chance with a new worker. One may therefore worry that the result of such a reform may be more low productivity entry-level jobs, fewer regular jobs, and lower overall productivity and output. Higher turnover in entry level jobs may lead to higher, not lower, unemployment. And, even if unemployment comes down, workers may actually be worse off, going through many spells of unemployment and low productivity entry-level jobs, before obtaining a regular job (The French have a word for such a succession of unemployment spells and low productivity jobs: They call this "precarite". There does not seem to be an equivalent english term.)

Our purpose in this paper is to explore this argument, both theoretically and empirically. Our interest is broader than just the effects of fixed duration contracts in France. We see our paper as shedding light on two larger issues. First, the effect of labor market institutions on the nature of the labor market, a popular but often fuzzy theme. Second, the pitfalls of partial labor market reforms.

Our paper is organized as follows: We develop a formal model in Section 1, solve it analytically in Section 2, and further explore its properties by use of simulations in Section 3. The model makes clear that partial reform may indeed be perverse, increasing unemployment as well as decreasing welfare. We then turn to the empirical evidence, looking at the effects of the introduction of fixed duration contracts in France since the early 1980s. Section 4 shows the basic evolutions. Section 5 looks more closely at the evolution of wages by contract type, and at transitions between entry-level jobs, regular jobs, and unemployment. The reforms appear to have increased turnover, without substantially reducing unemployment duration. Their effect on welfare appears ambiguous at best. Section 6 concludes.[2]

1 A simple model

We think of the labor market as a market in which match-idiosyncratic productivity shocks lead to separations and new hires. In that context, we think of employment protection as layoff costs, affecting both the layoff decision and the nature of bargaining between workers and firms.

In this section, we describe the model, derive the Bellman equations, and characterize the equilibrium conditions.

1.1 Assumptions

The economy has a labor force of mass 1. There is a constant flow of entrants equal to s, and each individual retires with instantaneous probability (Poisson parameter) s, so the flow of retirements is equal to the flow of entrants.

[2]Throughout, our focus is on the economic effects of the introduction of fixed duration contracts, not on their political economy implications. These political economy issues have been studied by Gilles Saint-Paul in a series of contributions, in particular Saint-Paul [1996] and Saint-Paul [2000].

Firms are risk neutral value maximizers. They can create a position at cost k, and then operate it forever. They can always fill the position instantaneously, by hiring a worker from the pool of unemployed. In other words, the matching technology has "workers waiting at the gate" (Introducing matching frictions on both sides of the market is inessential here.) The number of positions in the economy is determined by free entry, and thus by the condition that there is zero net profit. The interest rate is equal to r.

New matches all start with productivity equal to y_0. Productivity then changes with instantaneous probability λ. The new level of productivity y is drawn from a distribution with cumulative distribution function $F(y)$ and expected value Ey. y is then constant until the worker retires.

Nothing in the algebra depends on it, but it is useful to think of y_0 as smaller than Ey. This captures the idea that workers start on low productivity, "entry-level" jobs, and, if they are not laid off, move on to higher productivity, "regular" jobs. The assumption that, after the first draw, productivity is constant until the worker retires, is also inessential but captures in the simplest way the notion that regular jobs are likely to last much longer than entry-level jobs.

When productivity changes from y_0 to y, the firm can decide either to lay off the worker—and hire a new worker in an entry-level job with productivity y_0—or keep him on a regular job, with productivity y (until the worker retires, at which point the firm hires a new worker with productivity y_0.)

At the center of our model and crucial to the firm's decisions are state imposed firing costs. We take them to be pure waste (think administrative and legal costs) rather than transfers. The firing cost associated with an entry job (i.e. up to and including the time at which the productivity level changes from y_0 to y) is c_0. The firing cost associated with a regular job (i.e. starting just after the change in productivity from y_0 to y) is c. Separations due to retirement are not subject to firing costs.

We can look at the same labor market from the point of view of the workers. *Workers* are risk neutral, with discount rate equal to r, and they retire with instantaneous probability s. By normalization, the flow utility of being unemployed is equal to 0. New workers enter the labor market unemployed. They look for an entry-level job, which they find with probability x, where $x = h/u$, with h being the flow of hires, and u being the unemployment rate. Their entry-level job comes to an end with instantaneous probability λ, at which time they are either laid off, or retained on a regular job. If they are laid off, they become unemployed, and look for another entry job. The model therefore generates a work life-cycle, in which young workers typically go through a succession of unemployment spells and entry-level jobs until they obtain a regular job, which they keep until they retire.

The flow into unemployment is composed of new entrants and of those workers who are laid off at the end of their entry-level job. The flow out of unemployment is equal to the number of workers hired on new entry-level jobs. All regular jobs are filled from within, and all regular jobs end with retirement.

The only element of the model left to specify is *wage determination.* We assume that wages, both in entry-level and in regular jobs, are set by symmetric Nash bargaining, with continuous renegotiation. All entry-level jobs have the same level of productivity y_0 and thus pay the same wage w_0. Regular jobs have different levels of productivity; the wage in a regular job with productivity y is denoted $w(y)$.

Given the way we have set up the model, distortions in this economy come only from the presence of the two firing costs, c and c_0. Our focus in this paper will be on the effects of a decrease in c_0 given c, i.e. of a decrease in the firing costs associated with entry-level jobs, keeping unchanged the firing costs associated with regular jobs.

1.2 Bellman equations

Consider first the Bellman equations characterizing the firm. Let V_0 be the value to the firm of having a position filled as an entry-level job, a job with current productivity equal to y_0. Let $V(y)$ be the value of a regular job with productivity equal to y. Let y^* be the threshold level of productivity above which the firm keeps a worker, and below which it lays him off.

V_0 is given by:

$$rV_0 = (y_0 - w_0) - c_0 \lambda F(y^*) + \lambda \int_{y^*}^{\infty} (V(y) - V_0) dF(y)$$

The first term on the right gives flow profit. The second gives the firing cost associated with terminating the entry-level job, times the probability that the worker is laid off—itself equal to the probability of a productivity change, times the probability that y is less than the threshold value y^*. The third term reflects the expected change in the value of the job if the worker is kept on a regular job. (Note the absence of a term reflecting the probability that the worker retires. If the worker retires while in an entry-level job, the firm can replace him instantaneously at no cost by a worker with the same productivity, so this term is equal to $s(V_0 - V_0) = 0$.) The sum of these three terms must be equal to the annuity value of V_0, the left side.

$V(y)$ is given in turn by:

$$rV(y) = (y - w(y)) + s(V_0 - V(y))$$

The first term on the right gives flow profit if productivity is equal to y. The second term reflects the change in value if the worker retires and the firm must hire a new worker at productivity level y_0. The sum of the two must be equal to the annuity value of a regular job, $rV(y)$.

Turn to the Bellman equations for a worker. Let V_0^e denote the utility of a worker in an entry-level job, V^u the utility of an unemployed worker, and $V^e(w(y))$ the utility of a worker in a regular job with productivity y. Note that V^u is also the expected utility of an entrant in the labor market, or, equivalently, the average utility of an individual in the economy; for this reason, we shall use it as our measure of welfare in this model.

V_0^e is given by:

$$rV_0^e = w_0 + \lambda F(y^*)(V^u - V_0^e) - sV_0^e + \lambda \int_{y^*}^{\infty} (V^e(w(y)) - V_0^e) dF(y)$$

The first term on the right is the wage on an entry-level job. The second is the probability that the job ends, times the change in utility from going from employment to unemployment. The third reflects the loss in utility from retirement. The fourth reflects the expected change in utility if the worker is retained on a regular job. The sum of these terms is equal to the annuity value of the utility of being on an entry-level job.

$V^e(w(y))$ is given by:

$$rV^e(w(y)) = w(y) - sV^e(w(y))$$

The worker receives the wage associated with productivity level y, until he retires.

Finally, V^u is given by:

$$rV^u = x(V_0^e - V^u) - sV^u$$

The first term is equal to the probability of being hired in an entry-level job, the second the probability of retiring while unemployed, times the loss in utility from retirement.

1.3 Equilibrium conditions

The model imposes four equilibrium conditions. The first is the free entry condition, that the value of a new position be equal to the cost of creating it:

$$V_0 = k$$

The second is that, at the threshold level of productivity, the firm be indifferent between keeping the worker, or laying him off, paying the firing cost, and hiring a new worker:

$$V(y^*) = V_0 - c_0$$

The third is the Nash bargaining condition for entry-level jobs. A worker who loses an entry-level job loses $V_0^e - V^u$. A firm which lays off a worker on an entry-level job loses $V_0 - V_0 + c_0 = c_0$. This implies:

$$V_0^e - V^u = c_0$$

The fourth is the Nash bargaining condition for regular jobs. A worker who loses a regular job loses $V^e(w(y)) - V^u$. A firm which lays off a worker on a regular job loses $V(y) - V_0 + c$. The Nash condition therefore takes the form:

$$V^e(w(y)) - V^u = V(y) - V_0 + c$$

We now turn to a characterization of the equilibrium.

2 The equilibrium

The nature of the equilibrium depends on two distortions—both coming from the presence of c and c_0. The first is a distortion in the choice of whether to keep a worker in a regular job, i.e. in the choice of the threshold y^*. The second is a distortion in the choice of whether to hire a worker in an entry-level job.

We examine both decisions in turn. In each case, we derive a relation between the threshold y^* and the value of being unemployed, V^u, and show the effect of the two distortions on each.[3] We then characterize the equilibrium values of y^* and V^u, and the effects of changes in c_0.

2.1 The decision to keep a worker on a regular job

Suppose that the choice of the threshold productivity level were privately efficient, i.e. maximized the total expected surplus from the match, given firing costs and labor market conditions. This privately efficient threshold, call it $\hat{y^*}$, would satisfy:

$$(V(\hat{y^*}) - V_0 + c_0) + (V^e(w(\hat{y^*})) - V^u) = 0 \tag{2.1}$$

The total surplus from a match with productivity equal to the threshold would be equal to zero.

Now turn to the derivation of the actual threshold chosen by firms. The threshold condition is $V(y^*) - V_0 + c_0 = 0$. The Nash bargaining condition for regular jobs can be rewritten as $V^e(w(y^*)) - V^u = V(y^*) - V_0 + c_0 + (c - c_0)$: What matters for the division of the surplus on regular jobs is not c_0, the firing cost applicable at the time of the productivity change, but the firing

[3] It turns out that the equilibrium is best understood using these two variables. As we show below, the other variables can all be derived from V^u and y^*.

cost c, which is the relevant firing cost at the time of renegotiation. Combining these two equations gives an implicit characterization of the threshold productivity:

$$(V(y^*) - V_0 + c_0) + (V^e(w(y^*)) - V^u) = c - c_0 \tag{2.2}$$

Note that this condition differs from the privately efficient condition by $(c - c_0)$. If c_0 is less than c, the threshold, and by implication the layoff rate, will be too high relative to the privately efficient level.

Using the Bellman equations to derive $V(y^*) + V(w(y^*))$, together with the free entry condition $V_0 = k$, gives our first relation between y^* and V^u:

$$\frac{y^* + sk}{r+s} - V^u - k + c_0 = c - c_0 \tag{2.3}$$

The derivatives are as follows:

$$\frac{dy^*}{dV^u} = (r+s)$$

The higher the utility of being unemployed V^u, the higher must be the productivity of the marginal match.

$$\frac{dy^*}{dc_0} = -2(r+s)$$

The lower the firing cost on entry-level jobs, c_0, the more attractive it is to terminate a match, thus the higher the threshold (and also the larger the deviation of the threshold y^* from its privately efficient level $\hat{y^*}$, thus the larger the overdestruction).

2.2 The decision to hire a worker for an entry-level job

Suppose that the decision to hire a worker on an entry level job were privately efficient, i.e. maximized the total expected surplus from a match, given firing costs and labor market conditions. It would then be the case that:

$$(V_0^e - V^u) = 0 \tag{2.4}$$

Hiring would take place until the total surplus from a match was driven to zero. Given that firms can hire workers costlessly and instantaneously, hiring would take place until the utility of being employed on an entry-level job was just equal to the utility of being unemployed.

Now turn to the derivation of the actual condition determining hiring. From the Nash bargaining condition for entry-level jobs, it follows that:

$$(V_0^e - V^u) = c_0 \tag{2.5}$$

The difference between the value of being employed and the value of being unemployed is not driven to zero, but rather to c_0, the firing cost for entry-level jobs. This standard distortion reflects the increased bargaining power of workers coming from renegotiation in the presence of firing costs.

Rewrite this condition as $V_0^e + V_0 - (V^u + V_0) = c_0$, use the Bellman equations to characterize the behavior of $V_0^e + V_0$ together with the free entry condition $V_0 = k$ to get:

$$y_0 + \lambda \int_{y^*}^{\infty} \frac{y + sk}{r + s} dF(y) + sk - (r + s + \lambda(1 - F(y^*)))(V^u + k) = (r + s + \lambda(1 + F(y^*))c_0 \tag{2.6}$$

This gives our second relation between V^u, y^*, and c_0. The way to think about it is that it gives the feasible level of utility of being unemployed V^u. More precisely, it gives the level of utility of being unemployed such that the wages set in bargaining, and by implication, the present value of profits associated with a new position just cover the cost of creating that position.

Now consider the effect of y^* on V^u in (2.6):

$$(r+s+\lambda(1-F(y^*)))\frac{dV^u}{dy^*} = \lambda f(y^*)(V^u + k - c_0 - \frac{y^*+sk}{r+s})$$

The sign of the derivative is in general ambiguous. An increase in y^* leads both to a higher expected output in continuing jobs, but also to a higher probability that jobs are terminated. Note however that, at the equilibrium (i.e. at the intersection with the first relation, (2.3)), the derivative is given by:

$$(r+s+\lambda(1-F(y^*)))\frac{dV^u}{dy^*} = -\lambda f(y^*)(c-c_0) \leq 0$$

If both $(c-c_0)$ and the density function $f(y^*)$ are different from zero, then an increase in y^* leads to a decrease in V^u. If either $c = c_0$ or $f(y^*) = 0$, then V^u is independent of y^*. The intuition is as follows: As we saw earlier, if $c = c_0$, the threshold decision is privately efficient, so a small change in y^* has no effect on the surplus and thus no effect on the feasible V_u. If $c > c_0$ however, the marginal job generates a positive surplus, so an increase in y^*, if it leads to an increase in the layoff rate (i.e. if $f(y^*) > 0$) leads to a smaller total surplus, requiring a decrease in the feasible V_u.

Now consider the effect of c_0 on V_u. From (2.6):

$$(r+s+\lambda(1-F(y^*)))\frac{dV^u}{dc_0} = -(r+s+\lambda) - \lambda F(y^*) < 0$$

An increase in c_0 decreases the feasible level of utility, V^u. There are two separate effects at work here. The first, captured by $-\lambda F(y^*)$, is a direct cost effect: An increase in c_0 increases firing costs, and therefore increases waste, leading to a decrease in the feasible value of V^u. The second, captured by $(r+s+\lambda)$, reflects the effects of firing costs through bargaining. As shown in (2.5), an increase in c_0 requires new matches to generate a larger surplus.

In equilibrium, this is achieved through a lower value of V^u.[4]

2.3 The equilibrium

The two relations we have just derived are drawn in Figure 1. The first relation, (2.3), refered to as the "threshold condition" in the figure, is upward sloping: The higher V^u, the higher the threshold y^*. The second relation, refered to as the "feasible utility" condition in the figure, is either flat or downward sloping (it is drawn as downward sloping here), at least around the equilibrium. Together the two relations determine the threshold productivity level and the level of utility of new entrants. The equilibrium is given by point A.

The effects of a partial reform of employment protection, i.e. the effects of a decrease in c_0 on y^* and on V^u, keeping c constant, are then easy to derive. The "threshold condition" shifts to the right: For given V^u, the lower value of c_0 makes it more attractive to layoff entry-level workers, and thus increases y^*. The "feasible utility" condition shifts up: For given y^*, lower c_0 leads to a higher level of feasible utility, both because of the reduction in costs, and because of the decrease in the bargaining power of entry-level workers.

The new equilibrium is given by point B. It is clear that, while y^* unambiguously increases, the effect on V^u is ambiguous. This is because there are two distortions at work, and they work in opposite directions. On the one hand, the decrease in c_0 leads to an increase in $(c - c_0)$ and thus

[4] This is a familiar result from bargaining or efficiency wage models, (for example Shapiro and Stiglitz [1984], or more recently Caballero and Hammour [1996]), that, in equilibrium, unemployment plays the role of a market "discipline device". In these models, the zero profit condition ties down the wage. Any factor which increases the wage given reservation utility requires, in equilibrium, a decrease in reservation utility.

to an increase in the distortion affecting the layoff decision. This tends to decrease V^u. On the other hand, the decrease in c_0 leads to a decrease in the distortion affecting the hiring decision. This tends to increase V^u.

To see the two effects more clearly, suppose first that $(c - c_0)$ is equal to zero. In this case the first distortion is absent and, as we saw, small changes in y^* have no effect on V^u in the "feasible utility" relation. Thus, the only effect of a decrease in c_0 on V^u is through its direct effect in the "feasible utility" relation: By both decreasing waste and decreasing the bargaining power of entry-level workers, the decrease in c_0 leads to an unambiguous increase in V^u.

This case is represented in Figure 2. We know from above that, if $(c - c_0) = 0$, the "feasible utility" locus is flat at the equilibrium. The decrease in c_0 shifts the "feasible utility" condition up: Lower costs and lower bargaining power by entry-level workers lead to a higher equilibrium value of V^u. The decrease in c_0 shifts the "threshold condition" locus to the right: For given V^u, a decrease in c_0 makes layoffs more attractive, leading to an increase in y^*. The equilibrium moves from A to B, with higher utility level V^u, and a higher threshold, y^*.

When $(c - c_0)$ is positive instead, the effect of the decrease in c_0 on the first distortion becomes relevant. The decrease in $(c - c_0)$ leads to an increase in the first distortion, and thus, other things equal, to a decrease in V^u. The strength of this effect is proportional to $(c - c_0)f(y^*)$ and is thus increasing in the density evaluated at the equilibrium–in the number of entry level jobs which are (inefficiently) terminated as a result of the increase in y^*. For either $(c - c_0)$ or $f(y^*)$ sufficiently large, this adverse effect can dominate. Figure 3 is drawn on the assumption that $f(y)$ is very large around $y = y^*$, so the "feasible utility" locus is (nearly) vertical. In this case, a decrease in c_0 does not shift the "feasible utility" locus. But, as before, it shifts the "threshold condition" locus to the right: For given

V^u, a decrease in c_0 makes layoffs more attractive, leading to an increase in y^*. The equilibrium moves from A to B, with lower utility level $V^{u'}$, and an unchanged threshold, y^*.

To summarize, we have a first answer to our initial question. If $(c - c_0)$ or/and $f(y^*)$ are sufficiently large, a partial reform may indeed lead to an increase in excess turnover, and, by implication, to a decrease in utility.

2.4 Other wage setting assumptions

We have assumed symmetric Nash bargaining. It is easy to extend the analysis to allow for differential bargaining power, both between firms and workers, and between workers on entry-level and on regular jobs. The results of this extension are straightforward. The higher the bargaining power of workers on regular jobs relative to that of workers on entry-level jobs, the stronger the effect of a decrease in c_0 on the first distortion, the more likely it is that partial reform leads to a decrease rather than an increase in welfare.

We have also examined the effects of a minimum wage constraint. As we shall discuss and explain below when presenting simulations, under the Nash bargaining assumptions, decreases in V^u are associated with an *increase* in w_0. Thus, a constraint which prevents the wage from decreasing, such as a minimum wage constraint, will not be binding, and will not rule out perverse effects of partial reform on welfare (A constraint which prevents the wage from increasing will increase welfare; but this does not seem to be the right representation of a minimum wage constraint.)

2.5 Other glimpses

Given the equilibrium values of y^* and V^u, it is straightforward to derive the other variables of the model. For example:

- The layoff rate is given by $\lambda F(y^*)$, so a decrease in c_0, which, as we have seen, unambiguously increases y^*, unambiguously increases the layoff rate.

- Using the condition that $V_0^e - V^u = c_0$, the hiring rate from unemployment x is given by $x = (r+s)V^u/c_0$. Thus, if reform is welfare improving—if V^u increases when c_0 decreases—we know that x increases, equivalently, unemployment duration decreases. But the effect is ambiguous in general.

- The unemployment rate is given by $u(x + s - (\lambda F(y^*)x)/(\lambda + s)) = s$. Even if unemployment duration decreases (x increases), higher turnover ($F(y^*)$ increases) implies an ambiguous effect on the unemployment rate.

- From the Nash bargaining conditions, the values of being employed in an entry-level job, and of being employed in a regular job with productivity equal to the threshold are related by $V_0^e - V^u = c_0$ and $V^e(w(y^*)) - V_0^e = c - 2c_0$. Thus, a decrease in c_0 makes entry jobs more like unemployment (decreasing c_0), and entry jobs less like regular jobs (increasing $c - 2c_0$). In this sense, a reduction in c_0 leads to increased dualism in the labor market.

To fully characterize the effects of the decrease in c_0 on the different dimensions of our economy, it is more convenient to turn to simulations. This is what we do in the next section.

3 Simulations

Our goal in this section is to show the effects of partial reform both on the work life-cycle of an individual worker, as well as on macro aggregates, from unemployment to GDP.

We think of the unit time period as one month, and choose the various parameters as follows:

- We normalize the level of output on an entry job, y_0 to be equal to 1.
- We take the capital stock, k to be equal to 24, implying a ratio of capital to annual output of 2.
- We take the monthly real interest rate, r, to be equal to 1%. Together with the two previous assumptions, this implies a share of labor in output on entry-level jobs, of (1-.01*24) = 76%.
- We take the monthly probability of exogenous separation ("retirement") s, to be equal to 1.5%.
- We take the monthly probability of a probability change on an entry-level job, λ to be equal to 10%. This implies an expected duration of an entry-level job of about a year.
- We take the distribution of productivity on regular jobs to be uniform, distributed on $[m - 1/2f, m + 1/2f]$, thus with mean m, and density f. The use of a uniform distribution makes particularly transparent the influence of the density f on the effects of partial reform.
- To capture the notion that regular jobs are more productive, we take the mean m equal to 1.4. (Because jobs below the threshold are terminated, the mean of the observed distribution will be higher.)
- Because our theoretical analysis in the previous section showed that the density function plays a crucial role in determining the outcome, we look at the effects of reform for different values of f. The graphs below show the results of reform for values of f varying from 1 to 6.
- We choose the firing cost on regular jobs, c, equal to 24—which, in most simulations, represent about a year and a half of average output. We shall discuss the legal and empirical evidence for France in the next section; we believe this to be a reasonable estimate.

- Our simulations then focus on the effects of a decrease in c_0. For c_0 either too large or too small, the equilibrium may be at a corner, i.e. at a point where y^* lies outside the support of the productivity distribution for regular jobs. In those cases, changes in c_0 have no effect on the layoff rate; their effect takes place only through bargaining. While these corner equilibria are interesting, we limit the presentation of results to the range where there is an interior solution, so changes in y^* affect the layoff rate. The results below are presented for the range where c_0 decreases from 6 to 2 months of output.

The results are presented in Figures 4a, 4b, and 5.

Figures 4a and 4b show the effects of partial reform on different aspects of a worker's individual experience. Figure 4a plots V^u, the utility of an entrant, $F(y^*)$, the probability that the worker is laid-off at the end of an entry-level job, x the monthly hiring rate from unemployment, and T_u, the expected time to a regular job starting from unemployment. Figure 4b gives the behavior of wages in entry-level and regular jobs. These wages are given by $w(y) = a + 0.5y$ and $w_0 = a_0 + 0.5y_0$ respectively. Figure 4b plots the two constant terms a and a_0—which give the levels of wages for a given level of productivity.

For each 3D box, firing costs are plotted on the y axis, decreasing as one goes away from the origin. The density function f is plotted on the x axis, with the density decreasing as one goes away from the origin. The variable of interest is plotted on the vertical axis.

Start with V^u in Figure 4a. For low density, low f, a decrease in c_0 increases utility. But, for high density f, it decreases utility. The basic intuition was given in the previous section. When f is low, the adverse effects of reform on excess turnover are small, and workers are better off. When f is high, the adverse effects of excess turnover dominate.

This intuition is confirmed by looking at x and $F(y^*)$. While the effect of reform on x is theoretically ambiguous, in our simulation reform always increases x, and thus decreases unemployment duration. It also always (this is theoretically unambiguous) increases the probability that an entry-level job will lead to a layoff. This second effect is stronger when density is high. For $f = 6$, the probability increases from 0.3 to 0.8; for $f = 1$, the probability increases from 0.45 to 0.75.

The last box in Figure 4a shows that reform increases the average time it takes a new entrant to get a regular job. The effect is stronger when the density is high. For $f = 6$, the expected time increases from two years to nearly six years.

Figure 4b gives the behavior of wages on regular and entry-level jobs for a given level of productivity. The relative level of the two wages fits one's prior: Higher firing costs lead to higher bargaining power and thus a higher wage on regular jobs. But the effect of a decrease in c_0 is less intuitive at first. One might have guessed that the decrease in the relative bargaining power of entry-level workers would lead to a decrease in their wage relative to that of workers on regular jobs. This is not necessarily the case: In general equilibrium, the duration of unemployment changes, with differential effects on the two wages. Figure 4b shows that the effect of reforms on the wage in regular jobs has the same sign as the effect on utility: Like utility, the wage may go up or down; this reflects the tight link between reservation utility and the wage set in Nash bargaining on regular jobs. Perhaps even more surprisingly, in our simulations, the wage on entry level jobs goes up, the more so the higher the density. The way to understand this is in terms of bonding. The higher the density, the more a decrease in c_0 decreases the probability of being kept on a regular job. Thus, the lower the bond workers on entry-level jobs are willing to pay in the form of low wages, or equivalently, the higher the wage they require to take an entry-level job.[5]

[5] From an interview of a worker on a CDD: "The only reason I took a CDD was to have

There is another countervailing effect at work, lower bargaining power for workers in entry-level jobs, which leads to a decrease in the wage; but in our simulation, this effect is dominated by the first.

Figure 5 shows what happens to the macroeconomic aggregates. The first box repeats the graph for V^u in Figure 4. We can think here of V^u not as the expected value of utility if unemployed, but as average lifetime utility for a worker in the economy.

The second box shows the effects of reform on the unemployment rate, and shows these effects to be ambiguous. For low density, the combined effects of lower duration and only slightly higher turnover lead to a decrease in unemployment. For high density, the effect is ambiguous. Unemployment first goes up as c_0 decreases, then goes down a bit. (This is a warning, if there was a need, that what happens to utility and to unemployment, need not have the same sign. For high density, utility goes down strongly while unemployment goes up and then down.)

The third box plots the proportion of workers who are either unemployed or employed in entry-level jobs. The idea is to get at the idea of "precarite", the idea that the decrease in unemployment, if any, may come with a large increase in low productivity level jobs. This proportion increases with reform, for all values of f. Again, it is stronger when f is high. In this sense, reform indeed increases precarite.

The last graph gives the value of GDP. For low density, the decrease in the unemployment rate, together with the limited increase in low productivity entry-level jobs, leads to an increase in output. For high density, the larger increase in the proportion of entry-level jobs, and the roughly constant unemployment rate, combine to lead to a decline in output—by nearly 5% under our parameter assumptions. Another warning is therefore

a shot at a real job later on."Liberation [2000].

in order here: What happens to output, to unemployment, and to utility, can all be quite different.

4 The introduction of CDDs in France: Basic facts and evolutions

Regular contracts in France, called "Contrats a duree indeterminée", or "CDI" for short, are subject to employment protection. Firms can layoff workers for one of two reasons: For "personal reasons", in which case they have to show that the worker cannot do the job he was hired for, or for "economic reasons", in which case, the firm must prove that it needs to reduce its employment.[6]

Barring serious negligence on the part of the worker, the firm must give both a notice period and a severance payment to the worker. The notice period is relatively short, 1 or 2 months depending on seniority. The amount of severance pay is also relatively modest, typically 1/10 of a year per year of work, plus 1/15 for years above 10 years. But firms perceive costs to be much higher, because of the administrative and legal steps required to go through the process. The monetary equivalent of these costs (which are indeed waste from the point of view of firms and workers) is hard to assess, but severance packages offered by firms in exchange for a quick resolution are typically much more generous than the legal minimum.[7]

Since the late 1970s, successive governments have tried to reduce these costs by introducing fixed duration contracts, called "Contrats à durée determinée", or CDDs. These contracts still require a severance payment, but eliminate the need for a costly administrative and legal process.[8]

[6] A useful source on French labor legislation is the Lamy [2000].

[7] For a comparison of France with other OECD countries, see OECD [1999].

[8] Poulain [1994] gives a detailed description of the rules governing CDDs.

4.1 The history and the current rules

A brief history of CDDs goes as follows: CDDs were introduced in 1979. With the election of a socialist government in 1981, and the passage of a law in 1982, their scope was drastically reduced: A list of 12 conditions was drawn, and only under those conditions could firms use fixed duration contracts. In 1986, the 12 conditions were replaced by a general rule: CDDs should not be used to fill a permanent position in the firm. The current architecture dates to an agreement signed in March 1990.

Under this agreement, CDDs can be offered by firms for only one of four reasons: (1) The replacement of an employee on leave (2) Temporary increases in activity (3) Seasonal activities (4) Special contracts, aimed at facilitating employment for targeted groups, from the young to the long term unemployed. The list of special contracts has grown in the 1990s, as each government has tried to improve labor market outcomes for one group or another; some of these contracts require the firm to provide training, and most come with subsidies to firms.

CDDs are subject to a very short trial period, typically 1 month. They have a fixed duration, from 6 to 24 months depending on the specific contract type. Mean duration is roughly one year. They typically cannot be renewed, and, in any case, cannot be renewed beyond 24 months. If the worker is kept, he or she must then be hired on a regular contract. If the worker is not kept, he or she receives a severance payment equal to 6% of the total salary received during the life of the contract.

Two other dimensions of these contracts are relevant here:

First, the law states that the wage paid to a worker under a CDD should be the same as the wage which would be paid to a worker doing the same job under a CDI. This is obviously difficult to verify and enforce, and, as we shall see, it appears not to be satisfied in practice.

Second, at the end of a CDD, workers qualify for unemployment benefits. Unemployment benefits start at either 40% of the previous gross salary, plus a fixed sum, or 57.4% of previous gross salary, whichever is more advantageous. The benefits then decrease over time; the decrease is faster the younger the worker, and the shorter the work experience. For example, a worker who has been working for 4 out of the previous 8 months, gets benefits for 4 months; a worker who has been working for 6 out of the previous 12 months gets 4 months with full benefits, then 3 months at 85%, then nothing, and so on for workers with longer employment histories. In short, workers can alternate between CDDs and unemployment spells, and receive benefits while unemployed.

For our purposes, the history and the specific set of rules regulating CDDs has two main implications:

- One should think of what has happened since the 1980s primarily as an increase in fixed duration contracts at the extensive margin (a number of workers and jobs for which temporary contracts can be used), rather than as an increase in the intensive margin (a decrease in c_0).
- The rather stringent rules governing CDDs (conditions, duration, non renewal) imply that, while the proportion of workers under CDDs has increased over time, it has not reached—and, unless rules are changed, will not reach—the levels observed in some other European countries, in particular Spain.[9]

4.2 The aggregate evidence

We now give a brief description of aggregate evolutions. Our data, here and in the next section, come from "Enquetes emploi", a survey of about

[9] For a description of the nature and the scope of fixed duration contracts in Spain, and in Italy, see for example Guell-Rotllan and Petrongolo [2000], and Adam and Canziani [1998].

1/300th of the French population, conducted annually by INSEE, the French National Statistical Institute.

Questions about CDI versus CDD status are only available from 1983 on, so we only look at the evidence from 1983 to 1998. The design of the survey, and the wording of some of the questions were changed in 1990, leading to discontinuities in some of the series in 1990; these discontinuities appear clearly in some of the figures below.

As background, Figure 6 plots the aggregate unemployment rate from 1970 to 2000, highlighting the period we shall focus on, 1983 to 1998. While the unemployment rate has increased a lot since 1970, most of the increase predates the period we shall concentrate on. In 1983, the unemployment rate was 8.3%. After a further increase, then a decline in the late 1980s, it increased again in the first half of the 1990s, reaching 12.3% in 1996. In 1998, it stood at 11.8%. Since then, it has declined further, and now stands just under 10%.

Figure 7 plots the evolution of CDD employment, as a proportion of total (salaried) employment. The figure shows a steady increase in this proportion, from 1.4% of salaried employment in 1983 to 9.6% in 1998. At the same time, the figure makes clear that the specific conditions under which firms can offer CDDs have limited their scope; by contrast, in Spain today, more than 30% of salaried employment is in the form of fixed duration contracts.

While the proportion of CDDs in total employment remains limited, the introduction and development of CDDs have completely changed the nature of the labor market for the young. Figure 8 shows the evolution of the proportions of individuals, age 20-25, who are either employed under a CDI, employed under a CDD, or unemployed, or students, from 1983 to 1998. The figure yields a number of conclusions:

- The proportion of students in this age group has increased dramatically, from 21.4% in 1983 to 51.7% in 1998. This increase is due in large part to a deliberate policy aimed at increasing the proportion of children taking and passing the baccalaureat (the exam at the end of high school); this proportion has increased over the same period from 28% to 59%. But it is also a reflection of the poor labor market prospects for the young, and indicates that, for this age group, unemployment numbers should be interpreted with caution.

- The proportion of unemployed in a given 5-year cohort has remained roughly constant, from 15.4% in 1983 to 14.8% in 1998 (although, because of decreased participation, the unemployment rate has increased from 19.6% to 30.8%).

- Most relevant for our purposes, the proportion of CDIs has sharply dropped while the proportion of CDDs sharply increased. In 1983, 60.3% of a cohort (equivalently 95.1% of those employed) were employed under CDIs; in 1998, the proportion was down to 18.7% (56% of those employed). And during the same period, the proportion of those employed under CDDs went from 3.0% (4.8% of employment) in 1983, to 14.7% (44% of employment).

  The same qualitative evolution is visible in other age groups, but its quantitative effect decreases across cohorts. The proportion of CDDs has increased from 1.6% in 1983 to 10% in 1998 for a 25-30 cohort, from 1.1% in 1983 to 5.6% in 1997 for a 30-35 cohort, and so on.

We have looked at differences by age group; one can take other cuts, such as education. One might have expected the proportion of CDDs to decrease with the level of education. This is not the case. In 1998, the proportion of CDDs was roughly the same across eduction levels. Again, this probably reflects the tight conditions under which CDDs can be used by firms.

5 Transitions, wages, and utility

Our earlier analysis suggested that the introduction of fixed duration contracts should have decreased unemployment duration, increased turnover, leading to ambiguous effects on unemployment and on welfare. We now look at the data. We first look at the evolution of transition probabilities, then at the evolution of wages, and end by constructing an empirical proxy for V^u.

Our examination of the data can only be suggestive, as the development of CDDs is only one of many changes which have taken place in the French labor market. The aggregate unemployment rate has moved during that period, in large part for reasons other than the development of CDDs. Other labor market institutions have been modified, from the introduction of a minimum income floor (the RMI), to the reduction in social contributions on low wage workers, to a number other programs aimed at specific groups in the labor market.[10] We believe however that, for the group we focus on below, namely the 20-25 age group, the increase in the proportion of CDDs is indeed the dominant development, and the exercise is a useful one. Its limits should however be clear.

5.1 Transition probabilities

Transition probabilities between employment, unemployment, and non participation can be constructed in two ways: From 1983 on, the 3-year panel data structure of the survey allows to follow two thirds of individuals across consecutive surveys, and so to measure their annual transitions. In addition, from 1990 on, the survey includes a retrospective question, asking for employment status 12 months earlier, and thus allows for the construction

[10]For a description of some of the programs aimed specifically at the youth, look for example at Fougere et al. [2000].

of retrospective annual transitions.[11]

For our purposes, namely assessing the evolutions (rather than the levels) of transition probabilities over time, it is not clear which approach dominates. As documented by many researchers, transitions based on retrospective information are subject to systematic memory biases.[12] But these memory biases are likely to be fairly stable over time. Panel based transition probabilities suffer instead from some attrition bias. This bias, while smaller, is more likely to change over time: An increase in the proportion of workers with short duration jobs may well lead to an increase in attrition.

We therefore remain agnostic and present both the numbers for panel based transitions from 1984 to 1998, and for retrospective information based transitions for 1991 to 1998. Because of the differences in the structure of the survey pre- and post-1990, we cannot compute panel based transitions for 1990 (1989 to 1990). And, for the same reason, some of the panel based series we present below show step differences pre- and post-1990; these reflect differences in measurement rather than true changes.[13]

[11] This question actually asks for status during each of the previous 12 months, thus allowing for the construction of monthly probabilities—which are closer conceptually to the instantaneous probabilities in the theoretical model. We have not yet pursued this route.

[12] For example, in the Enquetes Emploi, only 70% of those actually unemployed a year earlier report themselves today as having been unemployed one year earlier. For more on the differences between the two sets of transition probabilities in the context of Enquetes Emploi, see Philippon [2000].

[13] Our confidence that the shifts reflect only measurement issues is based on a number of factors. The main one is that, for a specific question which is worded the same way pre- and post-1990, the answer (which is used as one of the main elements in the construction of the employment categories) shows no discontinuity pre- and post-1990.

Because they are at the center of the story, we focus first on the evolution of transition probabilities for the 20-25 age group. The results are reported in Table 1a and 1b. Transitions for year t refer to the change in status from March of year $t-1$ to March of year t. Because of the change in definitions in 1990, we give numbers separately for 1983 and 1989, and for 1991 and 1998.

- Table 1a shows the transition probabilities from unemployment to CDD employment, CDI employment, and unemployment respectively (The transition probabilities sum to less than one, as we do not report transitions to self employment, internships, military status, student status, and other non participation.)

  The probability of getting a CDD increases strongly in both subperiods. The probability of getting a CDI decreases, also in both subperiods. (Recall that the level shifts between 1989 to 1991, which are often large in Tables 1a and 1b, reflect differences in measurement.) Both movements are clearly consistent with the theory.

  While the effect is theoretically ambiguous, we saw that the duration of unemployment was likely to decrease as the scope of CDDs increased. The probability of remaining unemployed indeed decreases in the 1980s. But there is no evidence of a further decrease in the 1990s (which exhibits fluctuations, but not clear trend, over the eight years). In other words, during the 1990s, the higher likelihood of getting a CDD rather than a CDI has not come with an overall increase in the probability of getting a job.

- Table 1b shows the transition probabilities from CDD status.

  The probability of remaining on a CDD (the same one, or another CDD) increases throughout the period, nearly doubling in each of the two subperiods. The probability of moving to a CDI decreases in each

> of the two subperiods as well. Note that while this is a case where panel based and retrospective transition probabilities have rather different levels, their evolution is similar over time.
>
> The probability of being unemployed decreases steadily in the 1980s: The higher probability of having a CDD rather than a CDI is compensated by an increase in the overall probability of having a job. But, again, there appears to be a difference across the two decades. In the 1990s, the transition probability, be it panel based or retrospective, exhibits substantial fluctuations but no further downward trend.

Table 1 hides (unintentionally) interesting year-to-year evolutions. One of particular interest (in the sense that it shows the strong effects of specific policies on transition probabilities) is the evolution of transition probabilities from unemployment in 1995. For example, the panel based probability of remaining unemployed goes from 0.45 in 1994 to 0.71 in 1995, back to 0.47 in 1996. The reason is a set of policy measures taken in 1995 (thus affecting 1994 to 1995 transitions) aimed at reinserting the long term unemployed adults. The subsidies given to firms lead to a large increase in transitions into CDDs for the target group, but an equally large decrease in transitions into CDDs for the other groups, especially the young.

One can construct similar tables for the other age groups. The qualitative features are the same, but the evolutions are more muted the older the age group. We do not report them here.

To summarize: The transition probabilities give a picture of a market where the probability of getting a CDD has steadily increased, the probability of getting a CDI has decreased, and the probability of staying or becoming unemployed shows no clear trend. In that last dimension, there appears to be a difference across the two decades. The probabilities of becoming unemployed when on a CDD, or remaining unemployed, both decrease in the 1980s, but show no further trend in the 1990s.

5.2 Expected times to a CDI

One way of summarizing the information from the transition matrices is to compute expected times to a CDI starting from different labor market positions.

To compute these expected times, we use, for each year, the estimated transition matrix obtained using either panel data or retrospective information, based on eight different states (CDI, CDD, unemployed, self employed, student, intern, army, other non participation), for the 20-25 group. Note that this computation assumes static expectations in two dimensions. First it assumes that future transition probabilities for the 20-25 year old group will be the same as this year's. Second, it ignores the fact that, as those currently 20 to 25 year old become older, the relevant transition probabilities will become those relevant for 25 to 30 year olds, and so on. This second bias leads to an overestimation of the level of expected times to a CDI. But what we care about here are changes over time, and this simple approach is likely to capture them.

The evolution of expected times for the 20-25 age group, starting either from a CDD or from unemployment, is plotted in Figure 9. There appears to be a clear difference between the 1980s and the 1990s:

Starting from a CDD, the expected time to a CDI appears roughly constant in the 1980s. Starting from unemployment, the expected time decreases slightly. This is the result of two offsetting changes: On the one hand, a decreased probability of getting a CDI starting either from unemployment or from a CDD, leading to an increase in the expected time. On the other, an increased probability of getting a CDD when unemployed, a decreased probability of remaining unemployed, together with a higher probability of getting a CDI from a CDD than from unemployment. In the 1980s, the two effects roughly cancel each other.

The picture is different in the 1990s, where expected times increase significantly. While the expected time based on retrospective information is higher than the expected time based on panel data, both series go up during the period. The expected time from unemployment based on retrospective information goes from about 4.8 years to about 8 years; its panel data counterpart goes from 4.2 years to 5.8 years. The main difference between the two decades can be mechanically traced to the difference in the evolutions in the probabilities of remaining or becoming unemployed. These go down in the 1980s, but remain constant or increase in the 1990s.

A tentative conclusion is therefore that "precarite" did not increase in the 1980s, but increased in the 1990s. A complete picture however requires looking also at wages. This is what we do next.

5.3 Wages

To look at the evidence on wages, we run a standard wage regression, regressing for each year, from 1983 to 1998, the logarithm of the monthly net wage on a set of controls, education (15 categories), age (10 categories), and a dummy equal to 1 if the worker is on a CDD, 0 if on a CDI. Thus, we run:

$$\log w_i = a + X_i\beta + bD + \epsilon_i$$

Figure 10 plots the time series of estimated b's, from estimation of the wage equation for each year from 1983 to 1998. Given age and education, CDDs appear to pay about 20% less than CDIs. The evidence suggests also that the gap between the two wages has increased over time, from 12% in 1983 to 19% in 1989 to 27% in 1998.

How should we interpret this decrease in the relative wage over time? In our model, partial reform has two effects on the wage of CDDs relative to CDIs: The first is a decrease in the bargaining power of CDDs, leading to a decline in their wage. The second is a decline in bonding, in how low a wage entry-level workers are willing to accept in order to have a chance at a regular job. In our model also, a decrease in the relative wage on entry level jobs, is necessarily associated with an increase in V^u. The intuition for this is that if the wage goes down, the decline in bonding is small, the effect of reform on actual and excess turnover limited, so the reform increases welfare.

Thus, if the economy conformed to our model, the finding that the wage has decreased would be prima facie evidence that partial reform has been welfare improving. There is however one important difference between our model and reality: In our model, all entry level jobs have the same productivity. This is not the case in reality, and there is a plausible argument that what has happened over time is the extension of the use of CDDs to jobs or to workers with lower productivity. If this is the case, the decrease in the wage we observe in the data may be due neither to bonding or bargaining, but to a change in the nature of CDD jobs or CDD workers over time. At this stage, we have not explored this issue further, but we intend to do so in the future.

5.4 Constructing V^u

In our model, the welfare effects of partial reform are captured by what happens to V^u, the expected present value of utility if currently unemployed. It is tempting to construct an empirical counterpart and see how it has evolved over time. The results must obviously be interpreted with more than a grain of salt: There are many assumptions and many steps involved in the construction of V^u, and the changes in constructed V^u are surely not all due to the introduction of CDDs. Nevertheless, we think this provides a rather transparent way of summarizing what we have seen about the evolutions of transition probabilities and wages in a single statistic.

To compute V^u, or more generally, V^i, the expected present value of utility if currently in state i, we proceed as follows.

Let V^i be the expected present value of utility conditional on being in state i today. We consider 8 states in our computation (CDI, CDD, unemployed, self employed, student, intern, army, other non participation). Let V be the associated vector of utilities associated with the different states. Let A be the transition matrix associated with these different states. Let w be the vector of wages or wage equivalents associated with each state. Then, we construct V as:

$$V = w + \frac{1}{1+r} AV$$

Or equivalently,

$$V = (I - \frac{1}{1+r} A)^{-1} w$$

We focus on the 20-25 age group. For A, we use for each year the estimated transition matrix obtained using either panel data or retrospective information, for the 20-25 age group. Just as for the construction of expected times earlier, this computation assumes static expectations in two dimensions, i.e. an unchanged value of the matrix for a given age group over time, and an unchanged transition matrix as individuals in the group get older. Just as for expected times, the justification is simplicity, and our belief that, as evolutions are qualitatively similar across age groups, this should capture the relevant trends.

For w, we normalize the CDI wage to 1. Based on wage regressions, we use a value of 0.8 for the wage associated with CDDs. (We have not at this point allowed for time variation in the CDD wage discount. If we did, this would clearly lead to a decline in V^u and V^{cdd} relative to V^{cdi} over time.) Based on unemployment benefit rules, we use a value of 0.6 for the wage equivalent when unemployed. Because the transition probabilities to other states are small, the other elements of w play little role in the results; we assume a value of 1 for self employment income, of 0 for other states. We use an annual interest rate of 12%.

The results, using transition probabilities both from panel data and from retrospective information, are presented in Figure 11. Not surprisingly, V^{cdi} is larger than V^{cdd}, which is in turn larger than V^{u}. Turning to evolutions, the difference between the 1980s and the 1990s we saw earlier is still visible in Figure 11.

The 1980s appear to be a period where both V^{u} and V^{cdd} both increase, both absolutely and relative to V^{cdi}. This reflects both a stable or slightly decreasing expected time to a CDI from either unemployment or a CDD, and the fact that more of that time is spent working in entry level jobs rather than in unemployment.

The 1990s appear to be a period where both V^{u} and V^{cdd} both decrease (using either retrospective or panel data based transition probabilities). We have already seen the underlying reason. The expected time to a CDI increases, and the fact that a larger proportion of it is spent working does not compensate for this. With all the appropriate caveats, Figure 11 can be read as suggesting that the effects of partial reform may indeed have been perverse, leading to a decrease in welfare among the young, at least in the 1990s.

6 Conclusions

To be written.

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Table 1 (a). Transition probabilities. 20-25 years old. From unemployment

From U to		CDD	CDI	U
(panel)	84	0.05	0.28	0.51
	89	0.15	0.27	0.43
	91	0.10	0.28	0.38
	98	0.18	0.16	0.46
(retrosp)	91	0.11	0.24	0.50
	98	0.19	0.14	0.53
As expected?		yes	yes	?

Table 1 (b). Transition probabilities. 20-25 years old. From a CDD

From CDD to		CDD	CDI	Unemp
(panel)	84	0.16	0.47	0.26
	89	0.31	0.42	0.17
	91	0.19	0.53	0.14
	98	0.38	0.31	0.16
(retrosp)	91	0.45	0.21	0.20
	98	0.55	0.16	0.19
As expected?		yes	yes	?

Figure 1.
Equilibrium utility of being unemployed and threshold productivity,   and the effects of a decrease in c0

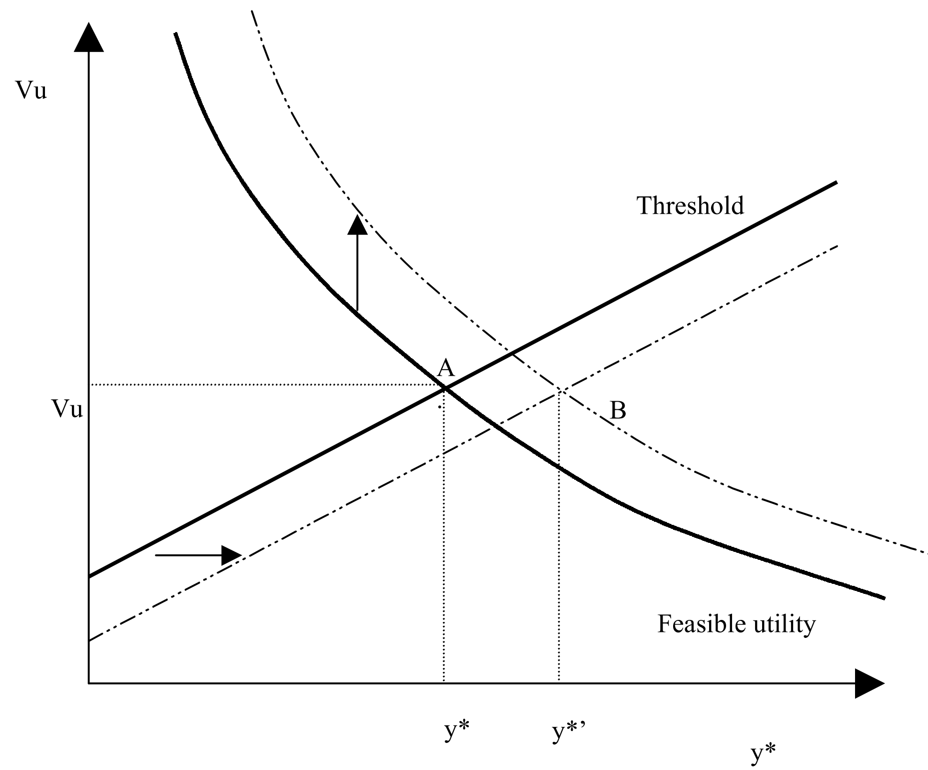


Figure 2.
The effects of a decrease in c0 when c-c0 = 0

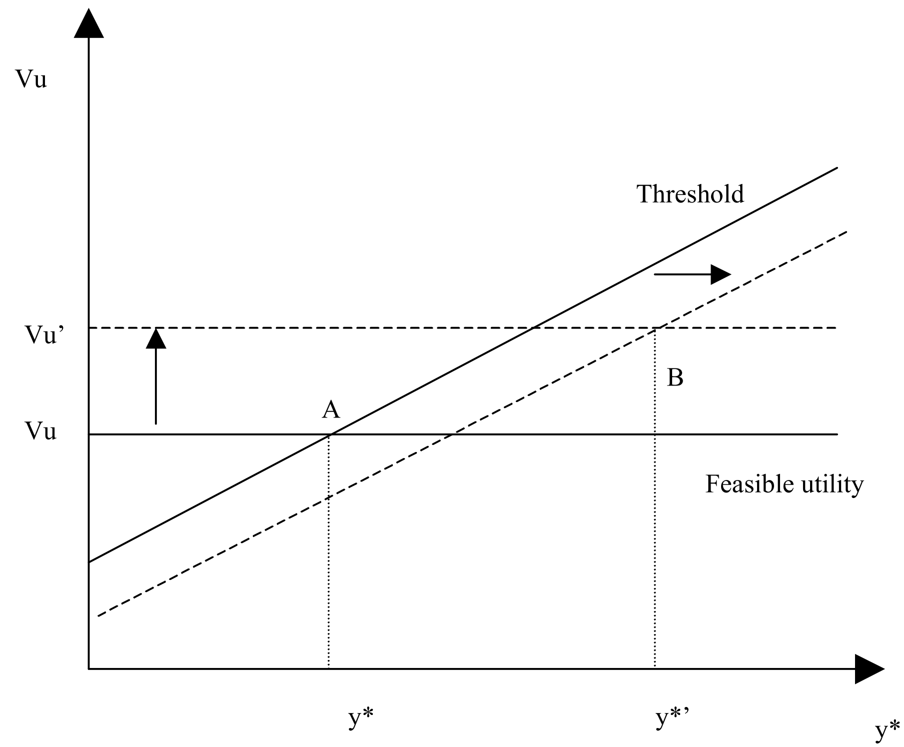
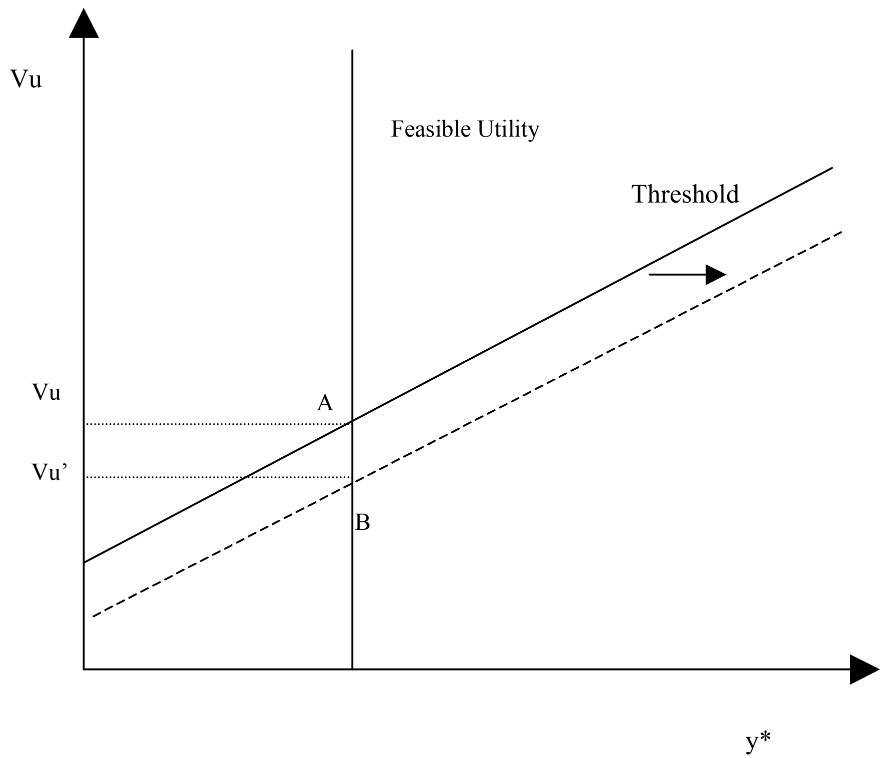
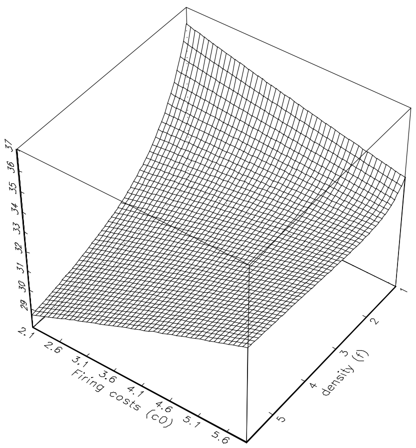


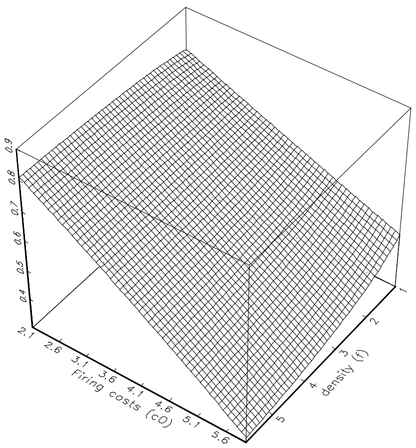
Figure 3
The effects of a decrease in c0 when c-c0 is positive and f(.) is very large



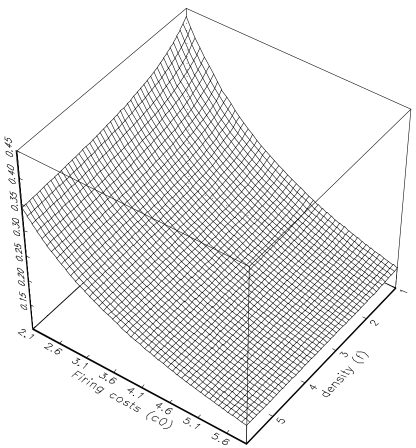
Utility of an entrant



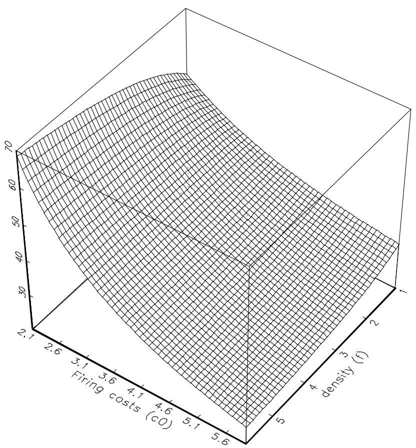
destruction rate F(y*)



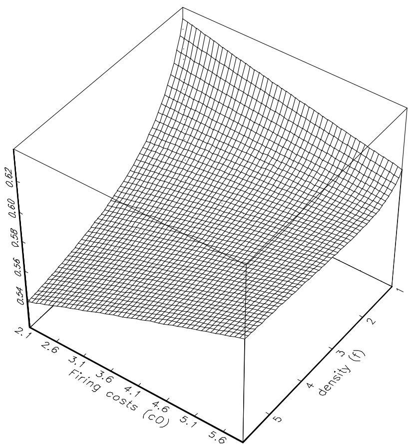
hiring rate



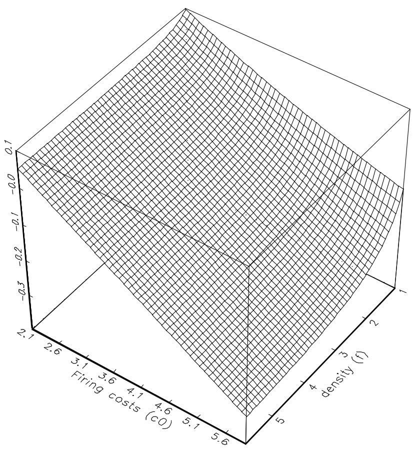
Tu: expected U to CDI trans. time



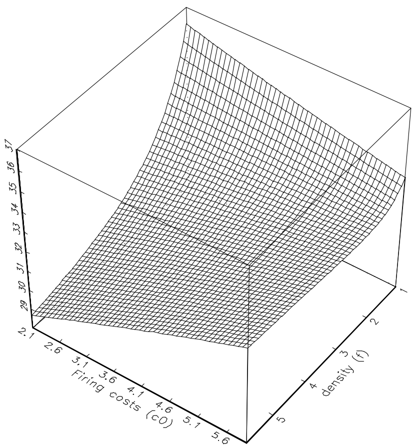
a in w(y)=a+.5y



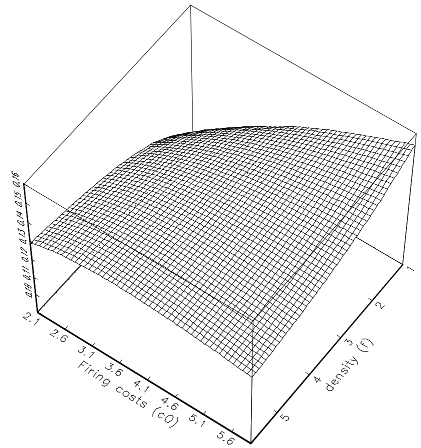
a0 in w0=a0+.5y0



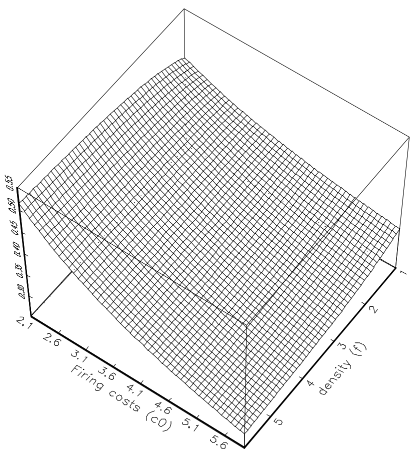
Utility of an entrant



Unemployment rate



CDD + U



GDP

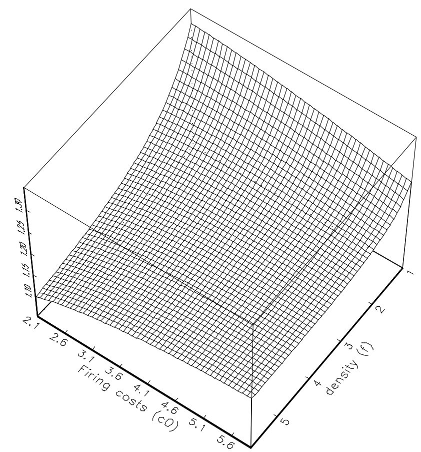


Figure 6. Unemplovment rate in France

1970-2000

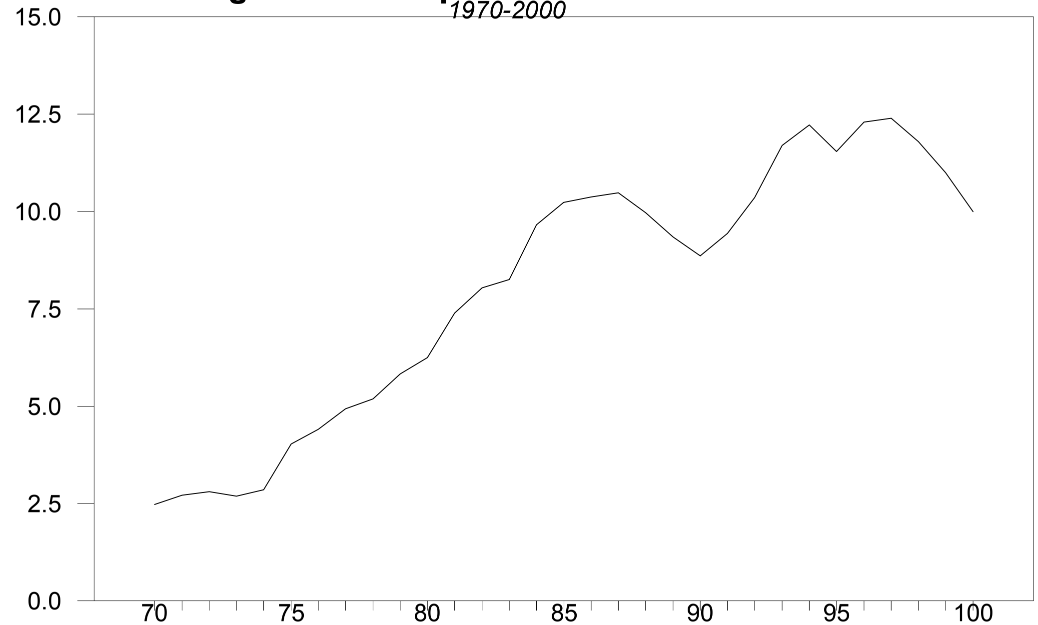


Figure 7. Proportion of CDD in salaried employment

CDD/(CDD+CDI), 1983-1998

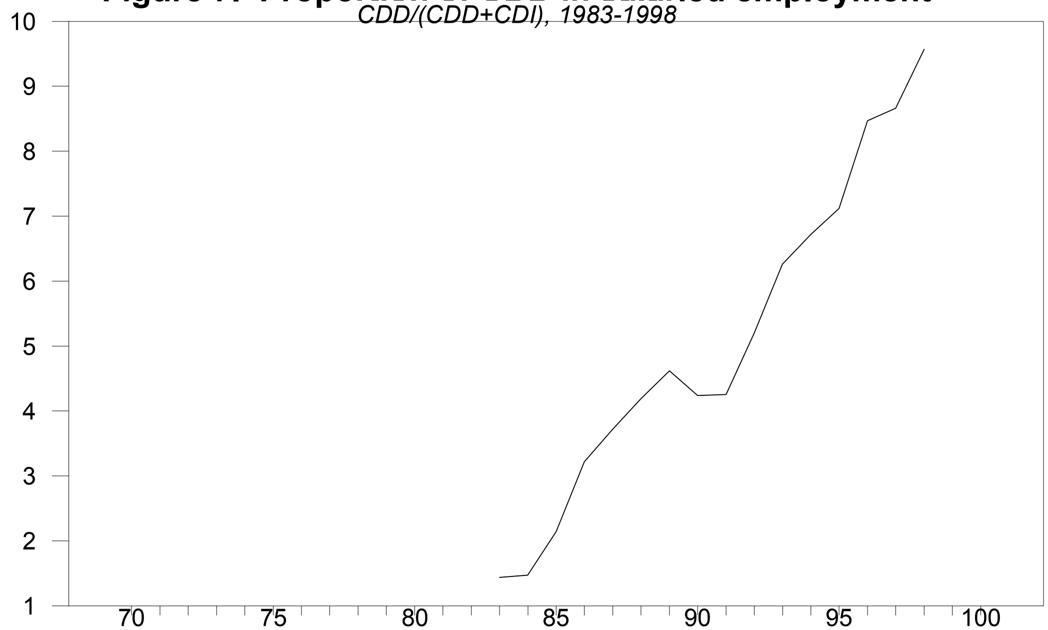
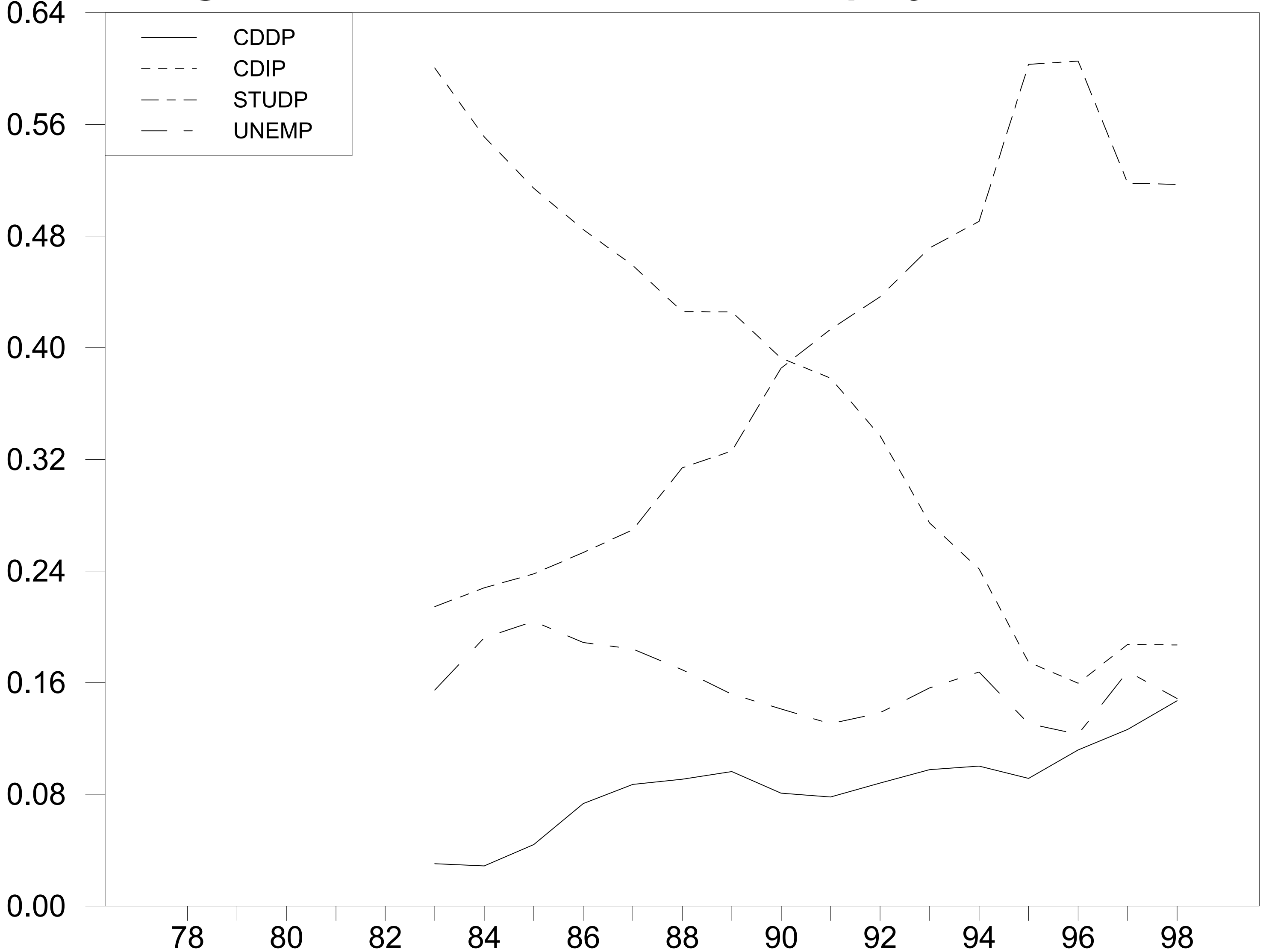
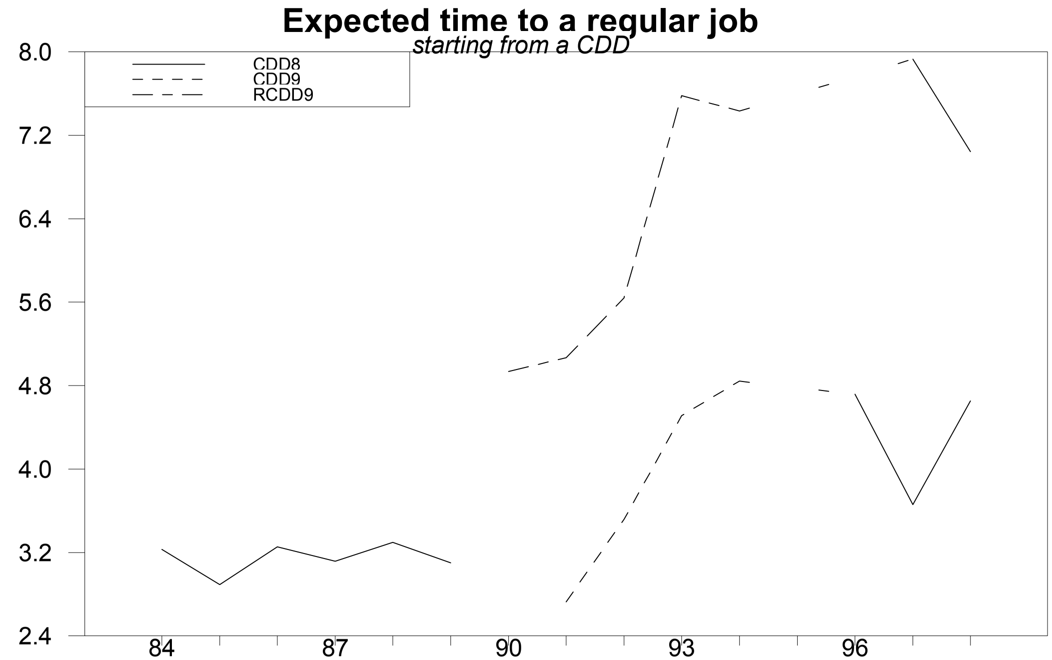
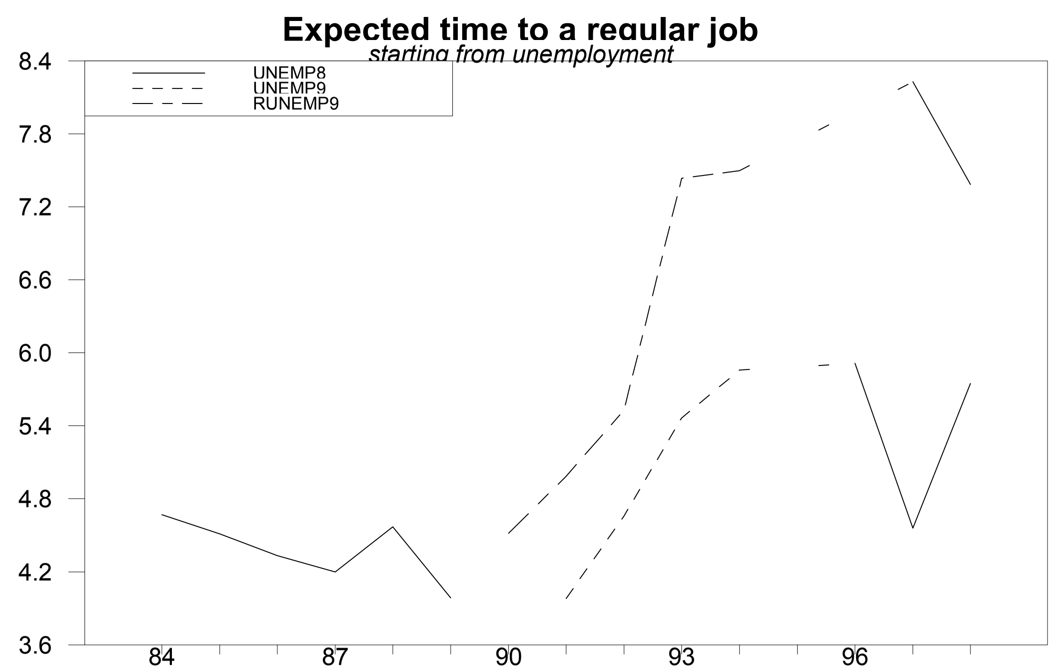


Figure 8. CDD,CDI,Students,Unemployed, 20-24





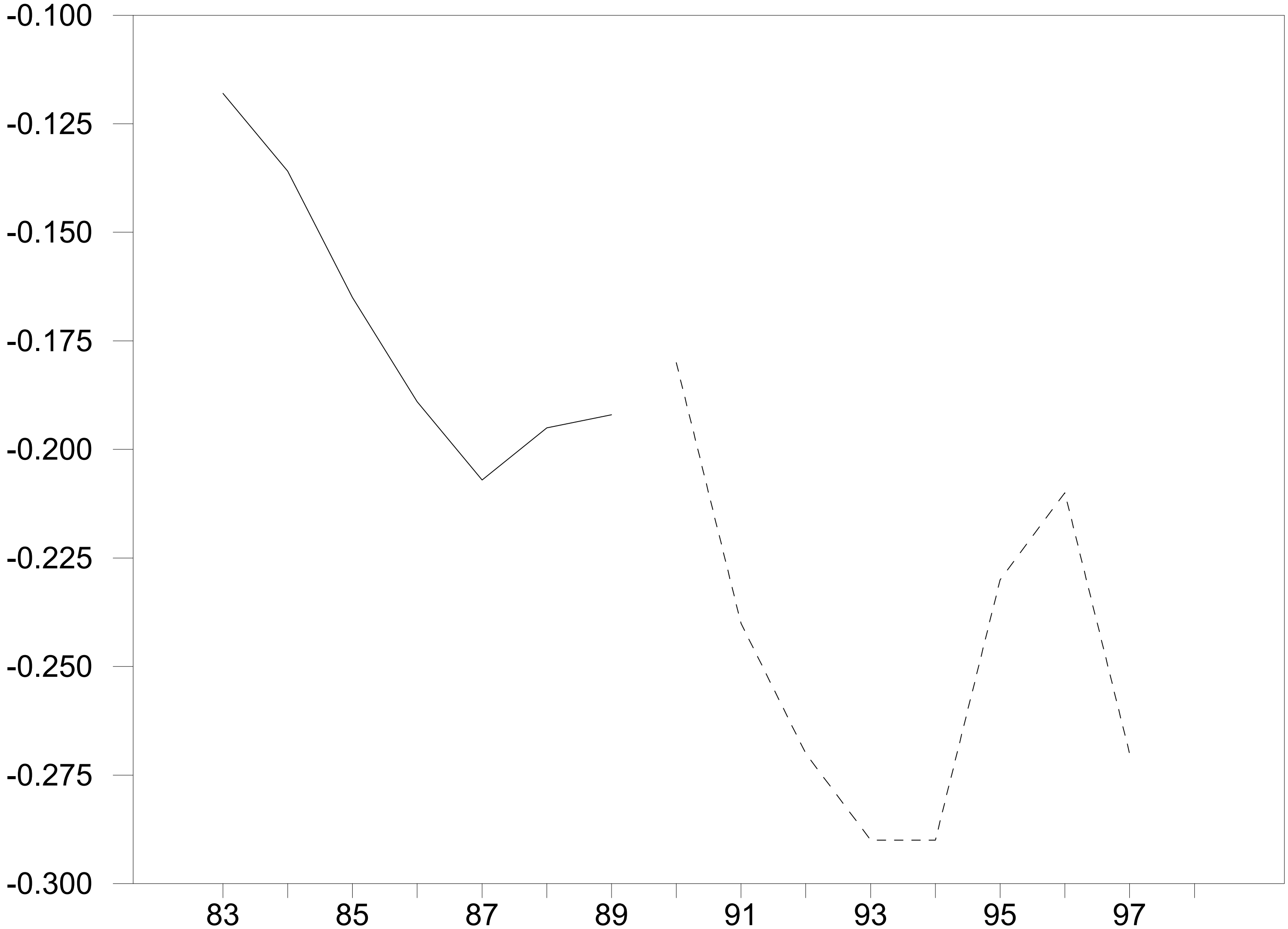
Expected time to a regular job
starting from a CDD
CDD8
CDD9
RCDD9
8.0
7.2
6.4
5.6
4.8
4.0
3.2
2.4
84
87
90
93
96

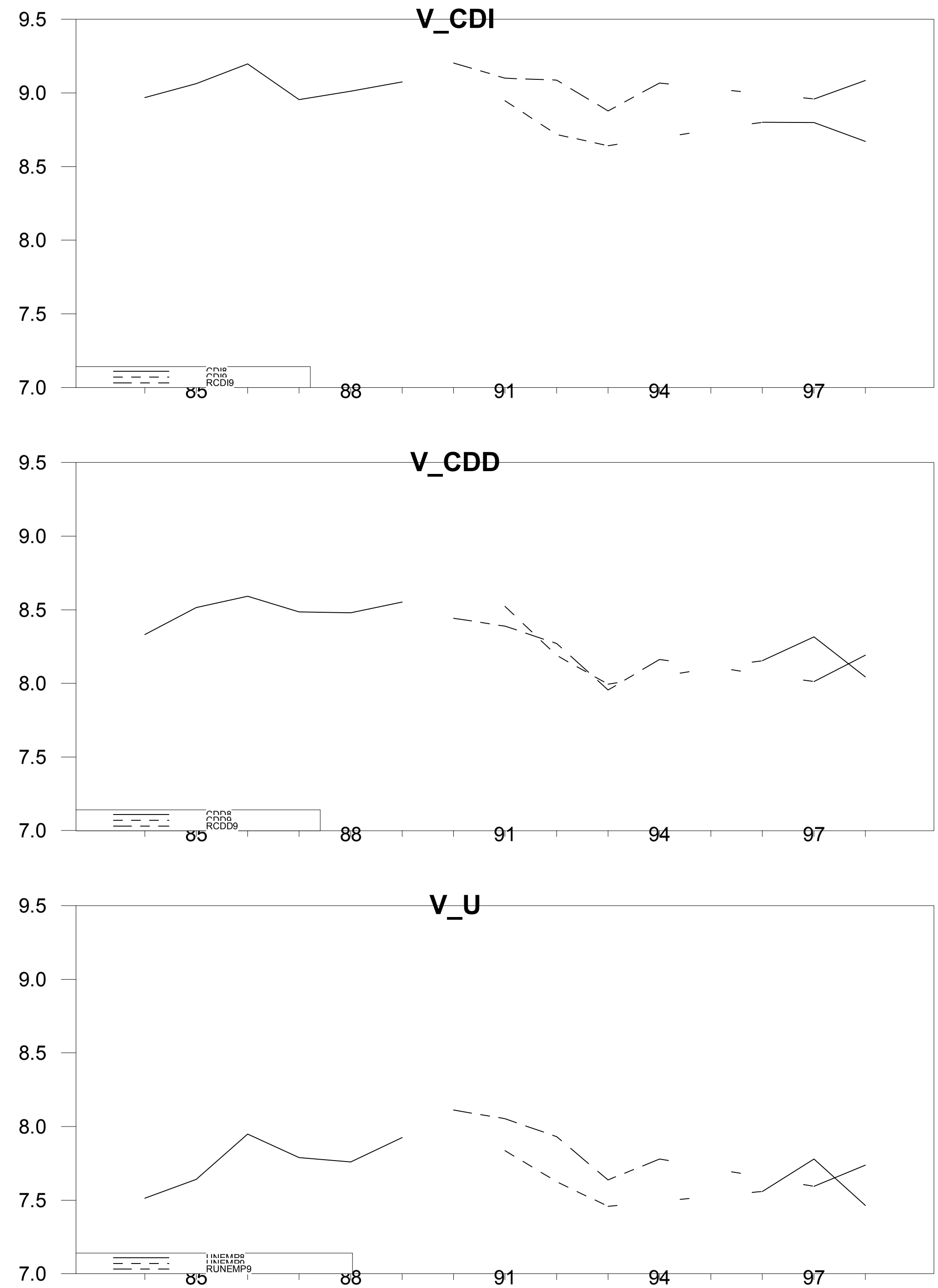


Expected time to a regular job
starting from unemployment
UNEMP8
UNEMP9
RUNEMP9
8.4
7.8
7.2
6.6
6.0
5.4
4.8
4.2
3.6
84
87
90
93
96

Figure 10. Wage discount for CDDs, with controls

1983-1998




V_CDI
V_CDD
V_U
9.5
9.0
8.5
8.0
7.5
7.0
85
88
91
94
97
RCDI9
RCDD9
RUNEMP9