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THE PERVERSE EFFECTS OF PARTIAL LABOUR MARKET REFORM: FIXED-TERM CONTRACTS IN FRANCE*

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We argue that the effects of a partial reform of employment protection by allowing firms to hire workers on fixed-term contracts may be perverse. The main effect may be high turnover in entry-level jobs, leading to higher, not lower, unemployment. Even if unemployment falls, workers may be worse off, going through many spells of unemployment and entry-level jobs, before obtaining a regular job. Considering French data for young workers since the early 1980s, we conclude that the reforms have substantially increased turnover, without a substantial reduction in unemployment duration. If anything, the effect on their welfare appears to have been negative.

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

Broad reductions in employment protection, however, run 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 either done little, or have tried to reform at the margin, allowing for reduced protection, but only for (some) new contracts. In France, for example, firms now can, under some conditions, hire workers for a fixed term, at the end of which separation occurs with low separation costs. If workers are kept beyond this fixed term, however, later separation becomes subject to normal firing costs.

Are such partial reforms better than none? The motivation for this paper was our suspicion that the answer might actually be negative, that the effects of such a partial reform might be perverse, leading to higher unemployment, lower output and to 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 to keep the workers in 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. Second, it will make firms more reluctant to keep them in 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.

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[1] See OECD (1999) and Blanchard and Portugal (2001).

- One may therefore worry that the result of such a reform may be more low productivity entry-level jobs, fewer regular jobs and, so, lower overall productivity and output. Higher turnover in entry-level jobs may lead to higher, not lower, unemployment. 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.[2]

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

Our paper is organised as follows: We develop a formal model in Section 1. We solve it analytically in Section 2. We further explore its properties by use of simulations in Section 3. The model makes clear that partial reform can 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-term contracts in France since the early 1980s. Section 4 shows the basic evolutions. Section 5 focuses on labour market evolutions for 20–24-year-olds, the group most affected by the increase in fixed-term contracts. The section looks at the evolution of transitions between entry-level jobs, regular jobs and unemployment, and also looks at wages by contract type. The reforms appear to have substantially increased turnover, without a substantial reduction in unemployment duration. If anything, their effect on the welfare of young workers appears to have been negative. Section 6 concludes.[3]

1. A Simple Model

In formalising the labour market, we think of it 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 characterise the equilibrium conditions.

1.1. *Assumptions*

The economy has a labour 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] The French have a word for such a succession of unemployment spells and low-productivity jobs: They call this ‘precarité’. There does not seem to be an equivalent English expression – although there is an adjective, ‘precarious’. ‘Insecurity’ may come close.

[3] Throughout, our focus is on the economic effects of the introduction of fixed-term contracts, not on their political economy implications. These political economy issues, which are highly relevant to the design of employment protection reforms, have been studied by Gilles Saint-Paul in a series of contributions, in particular Saint-Paul (1996, 2000).

Firms are risk-neutral value maximisers. They can create a position at cost k, and then operate it forever.[4] 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'.[5] 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 natural to think of y_0 as smaller than Ey. This captures the idea that workers start in 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 in 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 centre 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.[6] The firing cost associated with an entry-level 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 (ie 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 labour 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 normalisation, the flow utility of being unemployed is equal to 0. New workers enter the labour 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 in a regular job. If they are laid off, they become unemployed and look for another entry-level 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.

[4] Allowing for Poisson stochastic depreciation for positions would introduce an additional parameter, but not change anything of substance.

[5] The effects of matching frictions on the equilibrium are well understood. Leaving them out makes it easier to focus on the distortions implied by employment protection.

[6] What we need is that at least some component of firing costs be waste. The implications of thinking about firing costs as waste or as transfers, and the scope for bonding to cancel the effects of the transfer component, are well understood; see, for example, Lazear (1990). We think that there is enough evidence of waste and limited bonding to warrant our assumptions.

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 in 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, ie of a decrease in the firing costs associated with entry-level jobs, keeping unchanged the firing costs associated with regular jobs.[7]

1.2. *Bellman Equations*

Consider first the Bellman equations characterising the firm. Let V_0 be the expected present value of profits from a position currently filled as an entry-level job (the value of an entry-level job for short), 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

$$rV_0 = (y_0 - w_0) - c_0\lambda F(y^*) + \lambda \int_{y^*}^{\infty} [V(y) - V_0]\mathrm{d}F(y).$$

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 reflects the expected change in the value of the job if the worker is kept in a regular job.[8] The sum of these three terms must be equal to the annuity value of an entry level job, rV_0.

$V(y)$ 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, $rV(y)$.

[7] Note that our assumption that regular jobs are not subject to productivity shocks implies that the only role of c, the firing cost associated with regular jobs, is to affect wage bargaining in regular jobs, not layoffs from regular jobs. Allowing for productivity shocks to regular jobs would complicate the algebra, generate a richer structure of flows, but not change anything of substance.

[8] 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 $s(V_0 - V_0) = 0$.

Turn to the Bellman equations for a worker. Let V_0^e denote the expected present value of utility for a worker currently in an entry-level job (the value of being in an entry-level job for short), V^u the present value of utility for a worker currently unemployed (the value of being unemployed for short), and $V^e[w(y)]$ is the value of being employed in a regular job with productivity y. Note that V^u is also the expected lifetime utility of an entrant in the labour market; for this reason, it is a natural measure of welfare in this model.

V_0^e is given by

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

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

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 is the probability of retiring while unemployed, times the loss in value from retirement. The sum of these two terms must be equal to the annuity value of being unemployed.

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:

$$V_0 = k. \tag{1}$$

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:

$$V(y^*) = V_0 - c_0. \tag{2}$$

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 in an entry-level job loses $V_0 - V_0 + c_0 = c_0$. This implies

$$V_0^e - V^u = c_0. \tag{3}$$

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 in a regular job loses $V(y) - V_0 + c$. The Nash condition therefore takes the form

$$V^e[w(y)] - V^u = V(y) - V_0 + c. \tag{4}$$

We now turn to a characterisation of the equilibrium.

2. The Equilibrium

The equilibrium is easiest to characterise by focusing on two variables, V^u, the value of being unemployed, and y^*, the threshold level of productivity below which workers are laid off.

One can then think of the equilibrium in terms of two relations. The first, which we shall call the 'lay-off relation', gives threshold productivity y^* as a function of labour market conditions, summarised by V^u, and of the two firing costs c and c_0. The second, which we shall call the 'hiring relation' gives V^u, the value of being unemployed as a function of y^* and the two firing costs c and c_0. Together, the two relations determine V^u and y^*. Once this is done, all other variables can easily be derived, and so can the effects of changes in firing costs.

2.1. *The Lay-off Relation*

The condition determining the choice of the threshold productivity value y^* by the firm is given by (2). Using (4), it can be rewritten as

$$[V(y^*) - V_0 + c_0] + \{V^e[w(y^*)] - V^u\} = c - c_0. \tag{5}$$

Note that the left-hand side gives the total surplus (ie the surplus to the firm and the surplus to the worker from staying together rather than separating) from a match with productivity y^*. Were the choice of the threshold productivity level privately efficient, the threshold productivity level would be chosen so that the total surplus was equal to zero. As (5) shows, unless $c - c_0$ is equal to zero, this is not the case here. If c exceeds c_0, so $c - c_0$ is positive, some workers will be laid off despite the fact that keeping them would yield a positive total surplus. The source of the distortion is clear: if c is higher than c_0, the worker, if kept in a regular job, will be in a stronger bargaining position and thus be able to extract a higher wage. Anticipating this, the firm will only keep jobs where the surplus is sufficiently large to offset this increase in the worker's bargaining power.

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

$$\frac{y^* + sk}{r + s} - V^u - k = -c_0 + (c - c_0). \tag{6}$$

We shall refer to this relation as the 'lay-off relation' between y^* and V^u. The left-hand side gives the total gross surplus (i.e. ignoring firing costs) of a match of productivity y^*. The first term is the expected value of output. The next two terms subtract the outside options of workers and firms.

The two terms on the right-hand side show the two roles of c_0 in determining y^*. If the lay-off decision was *privately efficient*, only the first term would be present: the firm would choose y^* so that the net surplus on a job with productivity y^* was equal to zero. The second term reflects the private distortion due to bargaining. It implies that, if c is higher than c_0, then y^* will be (privately) inefficiently high.

We can now look at the effects of V^u, c and c_0 on y^*. The derivatives are as follows:

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

The higher the value 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 for entry-level jobs, c_0, the higher the threshold (and also the larger the deviation of the threshold y^* from its privately efficient level, thus the larger the overdestruction).

2.2. *The Hiring Relation*

The derivation of the second relation between V^u and y^* starts with the Nash bargaining condition for entry-level jobs, (3). Adding and subtracting V_0, this equation can be rewritten as

$$(V_0^e + V_0) - (V_0 + V^u) = c_0.$$

Note that the left-hand side is equal to the surplus from a new match. The first term in parentheses is the expected value of output from the match. The second term in parentheses is equal to the sum of the outside option of the worker and the firm. Note that, again, this condition is not (privately) efficient. Firms should hire workers until the surplus from a match was equal to zero. This is not the case here: the surplus is only driven down to c_0, not to zero. Just as before, this distortion reflects the increased bargaining power of workers coming from renegotiation in the presence of firing costs.

Using the Bellman equations to replace $V_0^e + V_0$, together with the free entry condition $V_0 = k$ gives

$$\begin{aligned} y_0 + sk + \lambda \int_{y^*}^{\infty} \frac{y + sk}{r + s} dF(y) - \{r + s + \lambda[1 - F(y^*)]\}(V^u + k) \\ = \lambda F(y^*)c_0 + (r + s + \lambda)c_0. \end{aligned} \tag{7}$$

This gives the second relation between V^u, y^*, and c_0 (c does not appear here). In effect, it gives the value 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 and hiring the worker. We shall call it the 'hiring relation'.

Up to a discount factor $(r + s + \lambda)$, the left-hand side gives the total gross surplus from creating a new job and hiring a worker (gross of the firing cost which may have to be paid if the productivity shock turns out to be lower than the threshold).

Turning to the right-hand side, note that there are two terms in c_0. If the hiring decision was *privately efficient*, then only the first term on the right-hand side would be present. Hiring would take place until the total gross surplus was equal to the expected firing cost (the probability that firing takes place times the firing cost). The second term reflects the distortion coming from the effect of c_0 on the bargaining position of workers.[9]

We can now look at the effects of y^* and c_0 on V^u. The effect of y^* on V^u is given by

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

The sign of the derivative appears 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. However, in fact, we can say more, and this will be important later on.

At the equilibrium (ie at the intersection with the first relation, (6), 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 lay-off 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 regular job generates a positive surplus, so an increase in y^*, if it leads to an increase in the lay-off rate (ie 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 (given y^*). From (7)

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

An increase in c_0 decreases the feasible value of being unemployed, 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 actually paid by firms 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. Both effects require new matches to generate a larger surplus. In equilibrium, this is achieved through a lower value of V^u.[10]

[9] The 'no bonding' assumption is important here. Indeed, in our model, both private distortions – in the lay-off and in the hiring relations – could be eliminated by bonding. A large enough payment by the worker to the firm before he was hired would eliminate the private distortion in the hiring relation. A large enough payment by the worker to the firm before he was promoted to a regular job would eliminate the private distortion in the lay-off decision. For reasons discussed at length in the literature, we believe that, while there is some scope for bonding, it is too limited to eliminate these bargaining distortions.

[10] 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.

2.3. *The Equilibrium*

The two relations we have just derived are drawn in Fig. 1. The first relation, (6), the 'lay-off relation', is upward sloping: The higher V^u, the higher the threshold y^*. The second relation, the 'hiring relation', is either flat or downward sloping (it is drawn as downward sloping here), at least around the equilibrium: V^u is either invariant to, or a decreasing function of, y^*. Together the two relations determine the threshold productivity level and the value of being unemployed. The equilibrium is given by point A.

The effects of a partial reform of employment protection – ie the effects of a decrease in c_0 on y^* and on V^u, keeping c constant – are then easy to derive. The lay-off relation shifts to the right: for given V^u, the lower value of c_0 makes it more attractive to lay-off entry-level workers, and thus increases y^*. The hiring relation condition shifts up: for given y^*, lower c_0 leads to a higher value of V^u, 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 to an increase in the distortion affecting the lay-off relation (a distortion which

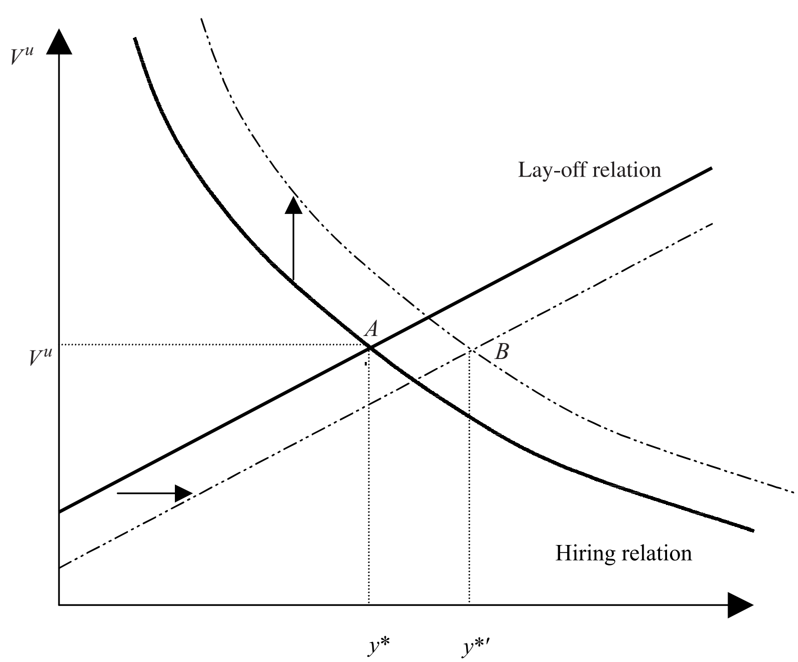

Fig. 1. *Equilibrium Value of being Unemployed and Threshold Productivity, and the Effects of a Decrease in* c_0

depends on the bargaining power in regular jobs *relative to* entry-level jobs). 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 relation (a distortion which depends on the bargaining power of workers in entry-level jobs). This tends to increase V^u.

To see the two effects more clearly, suppose first that $(c - c_0)$ is equal to zero to start. In this case, the first distortion is absent and, as we saw, small changes in y^* have no effect on V^u in the hiring relation. Thus, the only effect of a decrease in c_0 on V^u is through its direct effect in the hiring relation 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 Fig. 2. We know that, if $(c - c_0) = 0$, the hiring relation is flat at the equilibrium. The decrease in c_0 shifts the hiring relation 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 lay-off relation 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 $V^{u'}$, 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

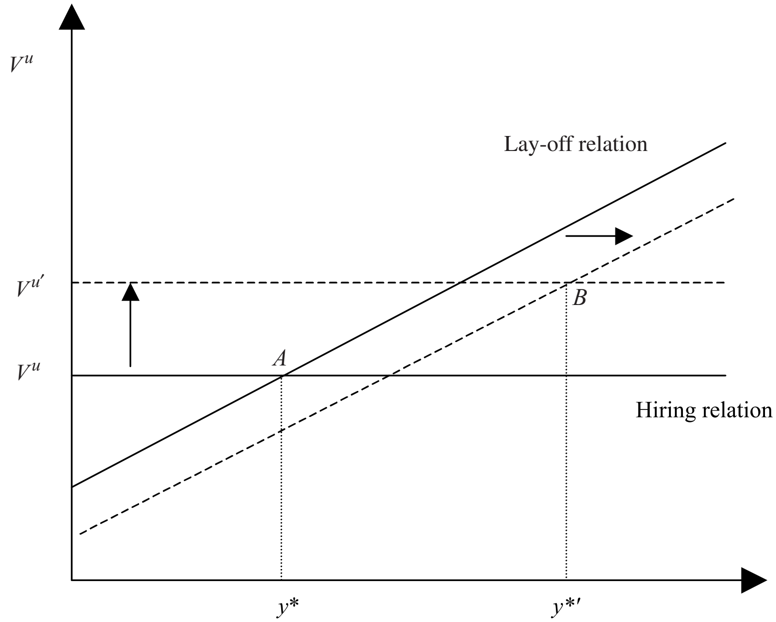

Fig. 2. *The Effects of a Decrease in* c_0 *Starting from* $c - c_0 = 0$

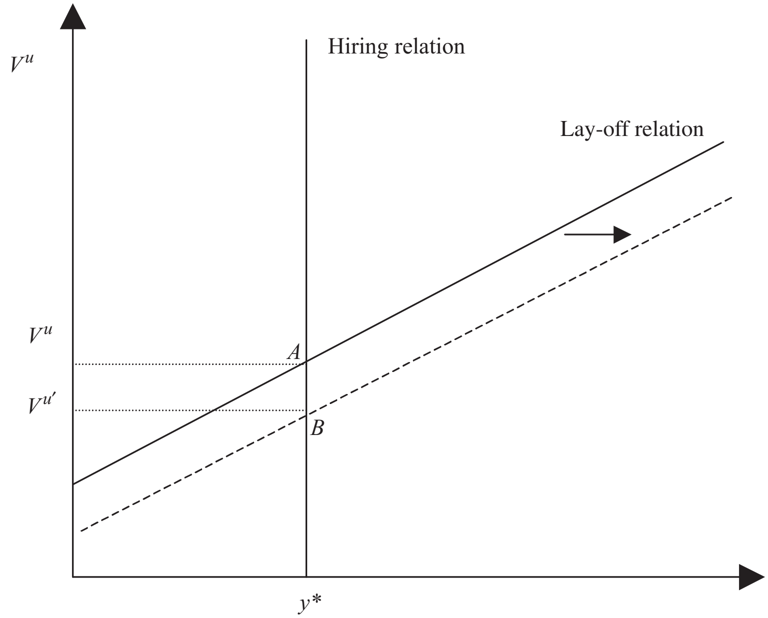

Fig. 3. *The Effects of a Decrease in c_0 when $(c - c_0)$ is Positive and $f(\cdot)$ is Very Large*

evaluated at the equilibrium – in the number of entry-level jobs which are (inefficiently) terminated as a result of the increase in y^*. If either $(c - c_0)$ or $f(y^*)$ are sufficiently large, this adverse effect can dominate. Fig. 3 is drawn on the assumption that $f(y)$ is very large around $y = y^*$, so the hiring relation is (nearly) vertical. In this case, a decrease in c_0 does not shift the hiring relation. However, as before, it shifts the lay-off relation to the right: for given V^u, a decrease in c_0 makes lay-offs more attractive, leading to an increase in y^*. The equilibrium moves from A to B, with lower value $V^{u'}$, and an unchanged threshold, y^*.

To summarise, 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 the value of being unemployed.[11]

2.4. *Other Implications*

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

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

[11] Note that, for values of the parameters that give rise to this effect, the value of c_0 that maximises V^u will be less than c but positive. Thus, this can be seen as an argument for *partial* 'partial reform' (ie some decrease in c_0 from c, but not all the way to zero)…

- 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, of being employed in a regular job with productivity equal to the threshold, and of being unemployed, 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-level jobs more like unemployment (decreasing c_0), and entry-level jobs less like regular jobs (increasing $c - 2c_0$). In this sense, a reduction in c_0 leads to increased dualism in the labour market.

To characterise fully 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 parameters as follows:

- We normalise the level of output on an entry-level job, y_0 to be equal to 1.
- We take k to be equal to 24, implying a ratio of capital to annual output on an entry-level job 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 labour in output on entry-level jobs, of $(1 - 0.01 \times 24) = 76\%$.
- We take the monthly probability of exogenous separation ('retirement') s, to be equal to 1.5%.
- We take the monthly probability of a productivity 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 set 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 Section 2 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 which follow 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 represents 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. If c_0 is 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 lay-off 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 lay-off rate. The results below are presented in Figs 4 and 5 for the range where c_0 decreases from 6 to 2 months of output.

Fig. 4 shows the effects of partial reform on different aspects of a worker's individual experience, namely the value of being unemployed (V^u), the probability that the worker is laid off at the end of an entry-level job ($F(y^*)$), the monthly hiring rate from unemployment (x), and the expected time to a regular job starting from unemployment (T^u). For each 3D box, the firing cost c_0 is 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. For low density – low f – a decrease in c_0 increases V^u; for high density f, it decreases V^u. 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 increases the probability that an entry-level job will lead to a layoff (this effect is theoretically unambiguous). 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 shows that reform increases the average time it takes a new entrant to obtain 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.

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

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.

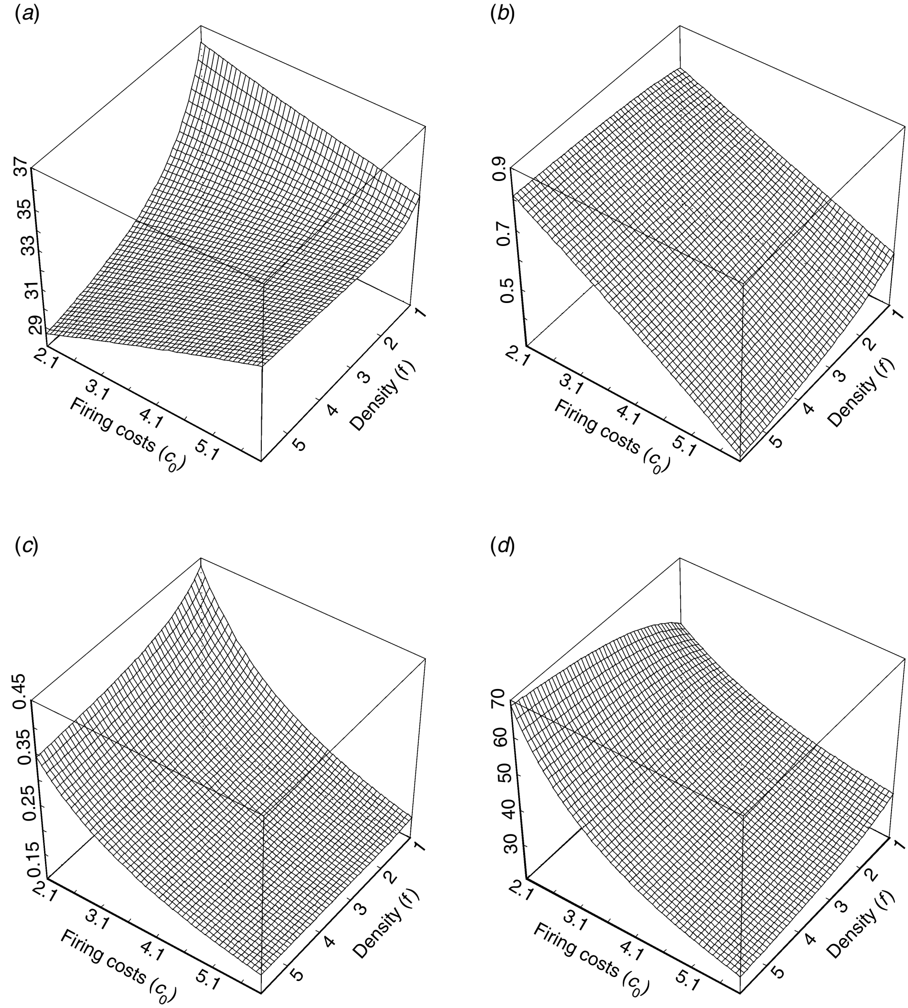

Fig. 4. *Implications of Reform for Workers: (a) utility of an entrant; (b) destruction rate $F(y*)$; (c) hiring rate; and (d) T^u: expected U to CDI transition time*

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 aim is to grasp at the concept of 'precarité': the decrease in unemployment, if any, may come with a large increase in low productivity 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 'precarité'.

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

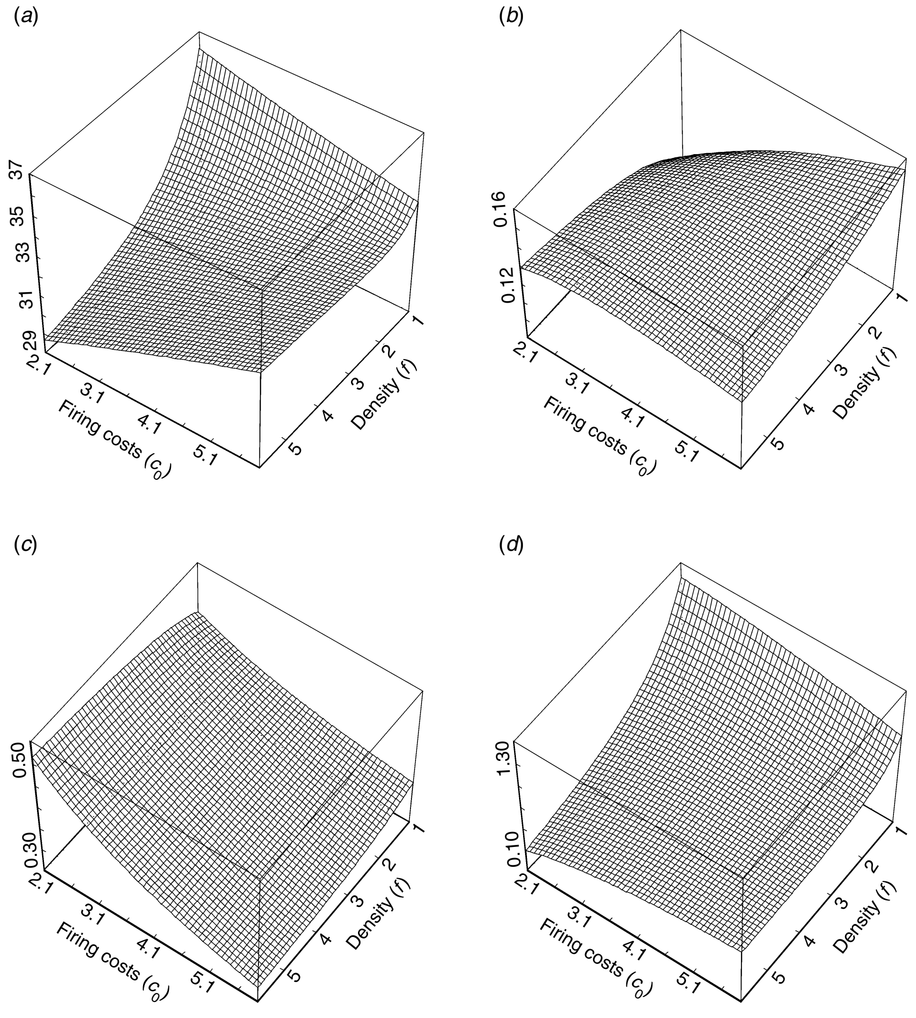

Fig. 5. *Implications of Reform for Macroeconomic Aggregates: (a) utility of an entrant; (b) unemployment rate; (c) CDD + U; and (d) GDP*

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

4. The Development of CDDs in France: Basic Facts and Evolutions

In France, regular contracts, called 'Contrats a durée indeterminée', or 'CDI' for short, are subject to employment protection rules. 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 or she was hired for, or for 'economic reasons', in which case, the firm must prove that it needs to reduce its employment.[12]

Barring serious negligence on the part of the worker, the law requires a firm to 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. In the absence of a specific contract between unions and firms, the amount of severance pay set by law is also modest, typically 1/10 of a month per year of work, plus 1/15 of a month for years above 10 years. Sectoral agreements typically set higher amounts, and firms perceive the costs to be even 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 or the contractual minimum.[13]

Since the late 1970s, successive governments have tried to reduce these costs by introducing fixed-term 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.[14]

4.1. *The History and the Current Rules*

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 reduced: a list of 12 conditions was drawn, and only under those conditions could firms use fixed-term 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 for the most part 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 labour market outcomes for one group or another; some of these contracts require the firm to provide training, and many come with subsidies to firms.

CDDs are subject to a very short trial period, typically one 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

[12] A useful source on French labour legislation is Lamy (2000).
[13] For a comparison of France with other OECD countries, see OECD (1999).
[14] Poulain (1994) gives a detailed description of the rules governing CDDs.

severance payment equal to 6% of the total salary received during the life of the contract (a law currently under consideration would raise this amount to 10%).

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, receives benefits for 4 months; a worker who has been working for 6 out of the previous 12 months receives 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-term contracts at the extensive margin (an increase in the number of eligible workers and jobs), rather than as an increase in the intensive margin (a decrease in c_0).[15]
- 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.[16]

4.2. *Data Sources*

Our data, here and in the next section, come from 'Enquêtes Emploi', a survey of about 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 2000. 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.

We use the 'Enquêtes Emploi' to look at the evolution of both stocks and flows. Measures of flows can be constructed in two ways:

[15] A model which formalises the introduction of CDDs at the extensive margin, and which shares some of the features of our model (but was developed independently), is given in Cahuc and Postel-Vinay (2000).

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

- The 3-year panel data structure of the survey allows us to follow two-thirds of individuals across consecutive surveys, and so to measure their annual transitions. Panel-based transition probabilities ('panel transitions' for short) can be constructed from every year since 1984 on, with one exception: changes in survey design in 1990 make it impossible to compute transitions for 1990.
- In addition, from 1990 on, the survey includes a question asking for status 12 months earlier. Thus, except for 1999 when the answer to the question has not yet been tabulated, we can also construct retrospective transition probabilities ('retrospective transitions' for short) for each year since 1990.[17]

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,[18] but these memory biases are likely to be fairly stable over time. Panel transitions 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 transitions from 1984 to 2000, and for retrospective transitions for 1991 to 2000.

4.3. *Basic Evolutions*

As a start, Fig. 6 plots the evolution of CDD employment as a proportion of total (salaried) employment, since 1983. It shows how this proportion has increased from 1.4% of salaried employment in 1983 to 10.8% in 2000. At the same time, the graph 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-term contracts.

While the proportion of CDDs in total employment remains limited, the introduction and development of CDDs have completely changed the nature of the labour market for the young. Fig. 7 shows the evolution of the proportions of individuals, aged 20–24, who are either employed under a CDI, employed under a CDD, or unemployed, or students, from 1983 to 2000. The figure yields a number of conclusions:

- The proportion of students in this age group has increased dramatically, from 21% in 1983 to 49% in 2000. This increase is due in large part to a deliberate policy aimed at increasing the proportion of children taking and passing the baccalaureat (the examination at the end of high school); this proportion has increased over the same period from 28% to 59%. However, it is also a

[17] The 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. Because of well-known issues such as rounding up by respondents, these monthly probabilities are very noisy, and we have not explored these data further.

[18] For more on the differences between the two sets of transition probabilities in the context of Enquêtes Emploi, see Magnac and Visser (1999) and Philippon (2000).

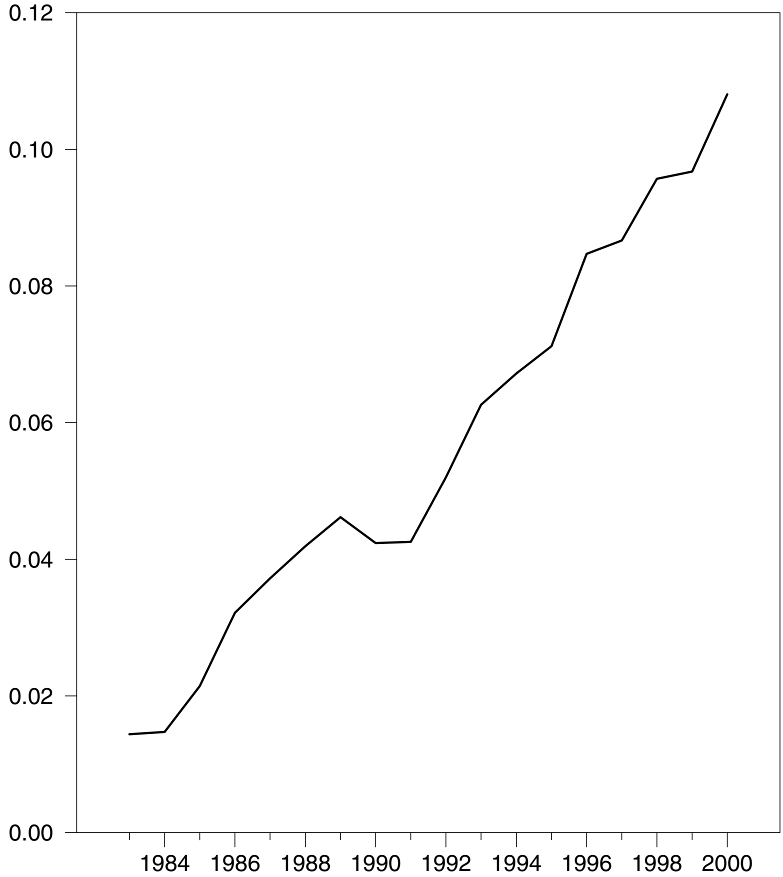

Fig. 6. *Proportion of CDD in Employment* CDD/(CDD+CDI), 1983–2000

reflection of the poor labour market prospects faced by the young; indeed, as unemployment has decreased since the mid-1990s, so has the proportion of students. This 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% in 1983 to 16% in 1999, and down to 12% in 2000 (although, because of the steady decrease in participation, the unemployment rate has increased from 20% in 1983 to 32% in 1999, and 24% in 2000).
- Most relevant for our purposes, the proportion of CDIs has sharply dropped while the proportion of CDDs has sharply increased. In 1983, 60% of a cohort (equivalently 95% of those employed) were employed under CDIs; in 2000, the proportion was down to 21% (54% of those employed). During the same period, the proportion of those employed under CDDs went from 3.0% (5% of employment) to 17% (46% of employment).

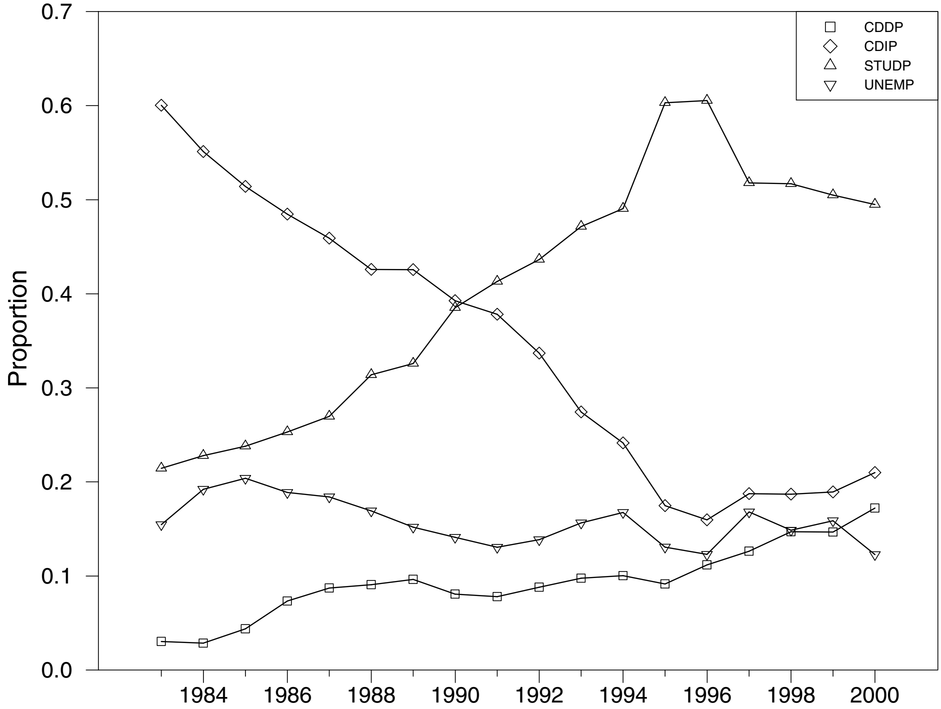

Fig. 7. *CDDs, CDIs, Students and Unemployed* 20–24-year-olds, 1983–2000

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 2000 for the 25–29 cohort, from 1.1% in 1983 to 6% in 2000 for the 30–34 cohort, and so on. For this reason, it makes good sense to focus on market evolutions for the 20–24 cohort, and this is what we do in the next section.[19]

5. Transitions, Wages, and Utility

We now look at labour market evolutions for 20–24-year-olds, for the period 1983–2000, with the goal of learning something about the effects of CDDs on the labour market. Our approach is descriptive, and its limitations are obvious.

First, there has been many other institutional changes in the labour market during that period, from the introduction of a minimum income floor (the RMI), to the reduction in social contributions on low wage workers, to a number of other programmes aimed at specific groups in the labour market.[20]

[19] We have focused here 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 2000, the proportion of CDDs was roughly the same across education levels, probably reflecting the restrictions under which CDDs can be used by firms.

[20] For a description of some of the programmes aimed at the youth, look for example at Fougere *et al.* (2000).

We believe, however, that, for the group we focus on below – the 20–24 age group – the increase in the proportion of CDDs is indeed the dominant development.

Second, much of the evolution of unemployment during the period, either for the 20–24-year-olds or for the population at large, has been due not so much to institutional changes but to macroeconomic factors. Until recently, this would have raised a very serious identification issue: from the early 1980s to the late 1990s, macroeconomic factors had led to a trend increase in unemployment, making it very difficult to disentangle the effects of that trend from those of the trend increase in CDDs. Fortunately (both for France and for us), unemployment has started decreasing, so there is now hope of disentangling the two. To see why and how, we start this section by looking at aggregate evolutions.

5.1. *Aggregate Evolutions*

The top panel of Fig. 8 plots the evolution of the aggregate unemployment rate in France since 1983.[21] The general picture is of a trend increase from 1983 to the mid-1990s, and of a limited decrease since then.

What is relevant to a worker in the labour market is not however the unemployment rate *per se*, but the probabilities of becoming unemployed if he is currently employed, or of becoming employed if he is currently unemployed. The evolutions of these two transition probabilities are given in the two bottom panels of Fig. 8. For each panel, the series with squares gives panel transitions, the series with triangles gives retrospective transitions.[22] We draw two main conclusions from these two panels:

- The 1980s appear different from the 1990s. In the 1980s, the transition probability from employment to unemployment barely increased, and the transition probability from unemployment to employment actually increased. By contrast, in the 1990s, the first transition increased, and the second decreased: the labour market clearly became worse in both dimensions. This worsening surely had a strong effect on the labour market for the 20–24-year-olds we focus on below.
- The panel transition from employment to unemployment was lower in 2000 than in any previous year in the sample. The panel transition from unemployment to employment in 2000 was one of the highest in the sample.

[21] For our purposes, the relevant series (in the sense of a series consistent with the other series we look at below) is that from Enquêtes Emploi. That series gives a more pessimistic assessment of the evolution of the labour market in France than the series for the official rate. In 2000, the series implies an unemployment rate of 11.7%, compared to an official rate of 9.7%.

[22] We discussed earlier why 1990 is missing for panel transitions, and why 1999 is missing for retrospective transitions. Note that 1995 is also missing for panel transitions in Fig. 8: the reason is that transitions computed from Enquêtes Emploi are very different from those in other years. Most of this is due to a programme introduced in that year which subsidised the re-employment of the older long-term unemployed, leading to a very different pattern of flows in 1995. Part of it appears to be due to other problems with the data. We decided to exclude this year here and in most of the graphs below.

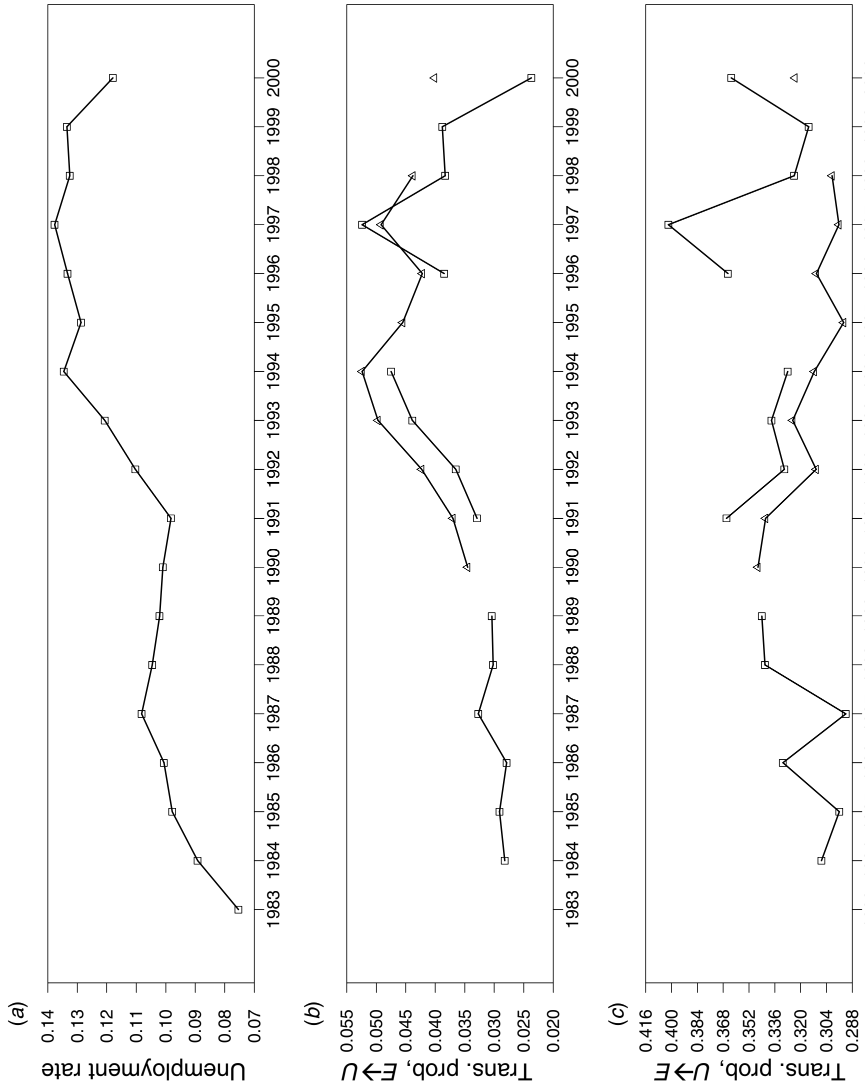

Fig. 8. *Aggregate Labour Market Conditions*, 1983–2000: (*a*) unemployment rate; (*b*) transition probability from *E* to *U*; (*c*) transition probability from *U* to *E*

In other words, despite the fact that the unemployment rate was still high, labour market prospects were, from the point of view of an individual in the labour market, arguably the best since 1984. Thus a comparison of endpoints – 1984 with 2000 – can help us to separate out the role of cyclical and structural components. We shall use this below.

5.2. *Transition Probabilities for the 20–24-year-olds*

Fig. 9 gives the evolution of transition probabilities between CDD employment, CDI employment, and unemployment, for 20–24-year-olds, from 1984 to 1998. Each of the nine panels plots two series. The first, in black, give panel transitions; the second in grey gives retrospective transitions. Transitions for year t refer to the change in status from March of year $t-1$ to March of year t.

We draw three main conclusions from this figure:

- The three left panels show the transition probabilities from unemployment.[23] The probability of a CDI decreases in both subperiods (the 1980s and the 1990s). The probability of a CDD increases in both subperiods. 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. However, there is no evidence of a further decrease in the 1990s. (Note that the retrospective measure is much higher than the panel measure, but shows the same evolution.) In other words, during the 1990s, the higher likelihood of a CDD rather than a CDI did not come with an overall increase in the probability of obtaining a job.
- The three centre panels show the transition probabilities from CDD employment.

  The probability of moving from a CDD to a CDI decreases in each of the two subperiods. The probability of remaining on a CDD (the same or another one) increases throughout the period, nearly doubling in each of the two subperiods (Recall that the level shifts between 1989 to 1991, which are often large in the figure, reflect largely differences in measurement.) Note, again, that while panel and retrospective transitions have rather different levels, their evolution is largely similar over time. The probability of becoming unemployed decreases steadily in the 1980s. As we look at year-to-year transitions, this presumably reflects the higher probability of finding another job when the current CDD comes to an end. Again, through, there appears to be a difference across the two decades. In the 1990s, the transition probability does not exhibit much of a trend.

[23] 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.

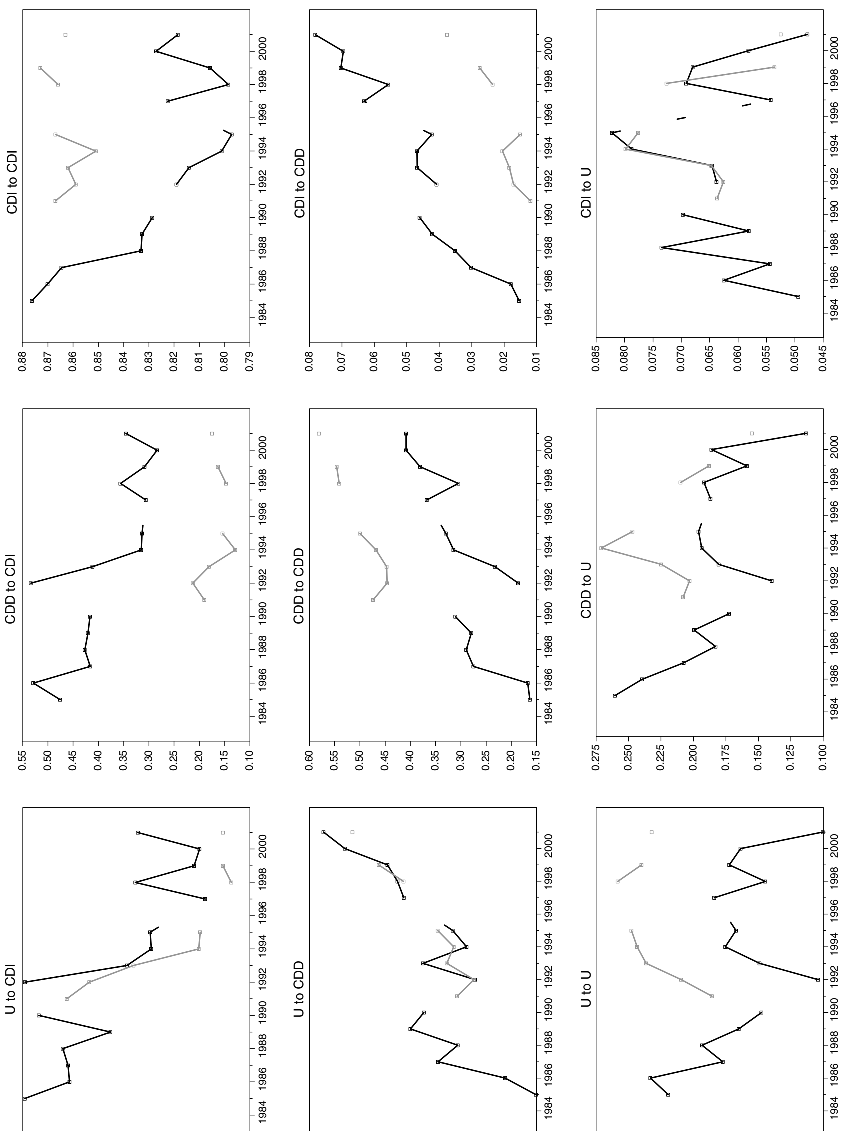

Fig. 9. *Transition Probabilities. U, CDI, CDD* 20–24-year-olds, 1984–2000

- The three right panels of Fig. 9 show transition probabilities from CDI employment. They are less central to our discussion (indeed in our formal model, these three transition probabilities were all equal to zero, by assumption). One evolution is, however, worth mentioning. One might have expected that allowing firms to use CDDs would have reduced the flows from CDI employment. The top panel show that this has not been the case: the probability of keeping a CDI has decreased, not increased. This suggests that other factors than changes in firing costs have played a role in determining general trends in separations.

To summarise: the transition probabilities give a picture of a labour market for 20–24-year-olds where the probability of a CDD has steadily increased, the probability of a CDI has decreased, and the probability of staying or becoming unemployed shows no clear trend. In this 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.

5.3. *Expected Time to a CDI*

One way of summarising the information from the transition matrices is to compute the expected time to a CDI starting from different labour 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 20–24-year-olds. Note that this computation assumes static expectations in two dimensions. First, it assumes that future transition probabilities for 20–24-year-olds will be the same as this year's. Second, it ignores the fact that, as those currently 20–24 years old become older, the relevant transition probabilities will become those relevant for the 25–29-year-olds, and so on. This second bias leads to an overestimation of the level of expected times to a CDI. What we care about here, though, are changes over time, and this simple approach is likely to capture them.

The evolution of expected times for the 20–24 age group, starting either from a CDD or from unemployment, is plotted in Fig. 10.

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 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 a CDD when unemployed, together with a higher probability of a CDI starting from a CDD than starting from unemployment. In the 1980s, the two effects roughly cancel each other.

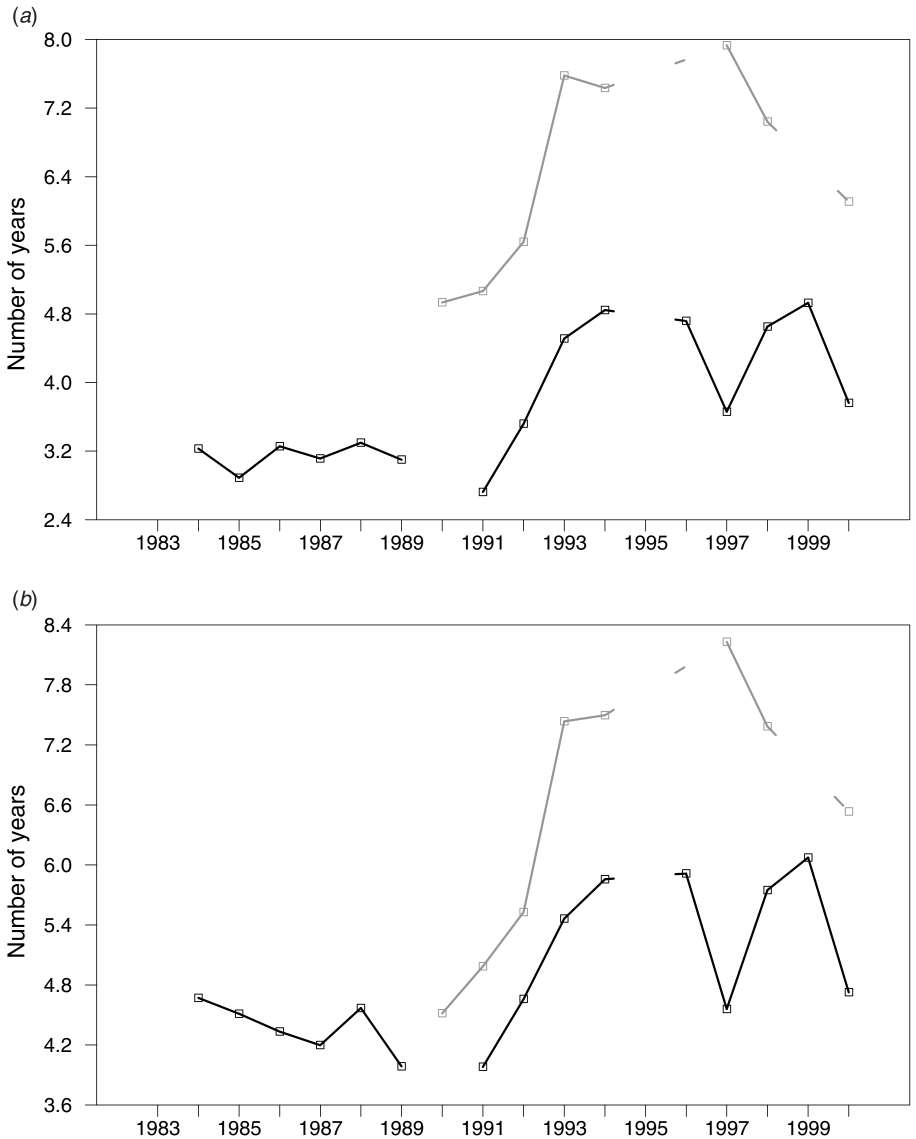

Fig. 10. *Expected Time to a Regular Job: (a) starting from a CDD; (b) starting from unemployment*

The picture is different in the 1990s, where the expected time increases significantly until the late 1990s, declining partially thereafter. While the expected time based on retrospective information is higher than the expected time based on panel data, both series rise during the period. The expected time from unemployment based on retrospective information increases from 4.8 years in 1990 to 8.2 years in 1996, to decline to 6.5 years in 2000; its panel data counterpart goes from 4.0 to 6.0, down to 4.7 years in 2000.

5.4. *Wages*

A complete picture requires looking also at wages. To do so, we run a standard wage regression, regressing for each year, from 1983 to 2000, the logarithm of the monthly net wage on a set of controls – education (15 categories), age (10 categories) and a dummy, D, equal to 1 if the worker is on a CDD, 0 if on a CDI:

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

Fig. 11 plots the time series of estimated bs, 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 29% in 1993, and to 22.5% in 2000.

5.5. *Values*

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. This is what we do in this last subsection. More specifically, because not all entrants enter as unemployed, we construct not V^u, but the average value $\bar{V}$, the average expected present value of utility for a 20–24-year-old, and look at its evolution over time.

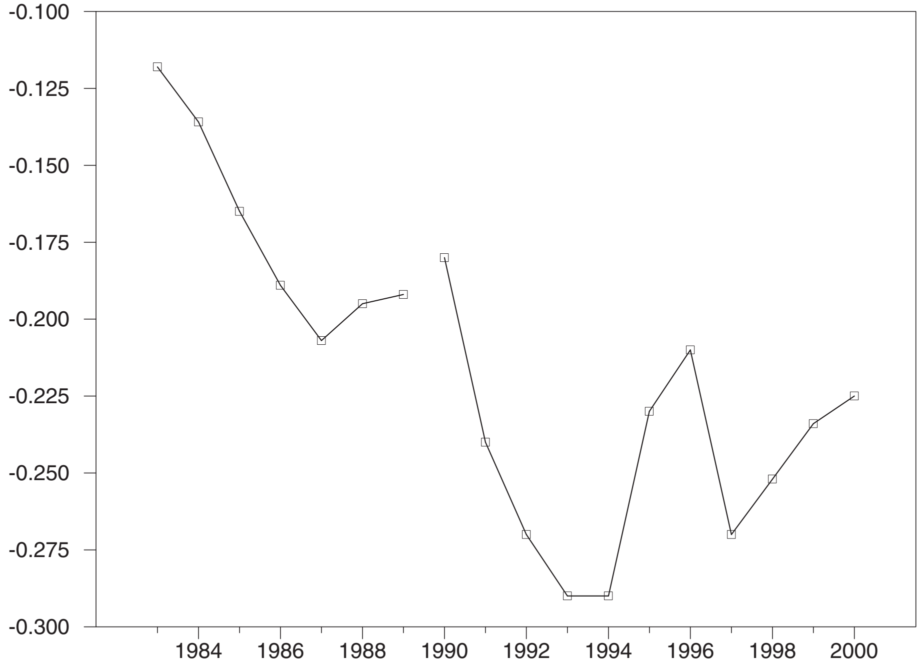

Fig. 11. *(Log) Wage Discount for CDDs, with Controls* 1983–2000

The results of this exercise must obviously be interpreted with more than a grain of salt: there are many assumptions and many steps involved in the construction of $\bar{V}$, all likely to imply substantial measurement error. Nevertheless, we think this provides a simple way of summarising what we have seen about the evolutions of transition probabilities and wages in a single statistic.

Let V^i be the expected present value of utility conditional on being in state i today. We consider five states in our computation (CDI, CDD, unemployed, intern, self employed).[24] 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

$$\mathbf{V} = \mathbf{w} + \frac{1}{1+r}\mathbf{A}\mathbf{V}.$$

Or equivalently,

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

$\bar{V}$ is then constructed as

$$\bar{V} = \sum p_i V_i$$

where the p_i are the proportions of individuals in state i, and sum to one, and V_i are the elements of **V**.

We focus on the 20–24 age group. For **A**, we use for each year the estimated transition matrix obtained using either panel data or retrospective information. Just as for the construction of expected times earlier, this computation assumes static expectations in two dimensions, ie an unchanged value of the matrix for a given age group over time, and an unchanged transition matrix as individuals in the group grow older. 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 normalise the CDI wage to 1 (ie we ignore general wage growth over time). We take the CDD wage to be equal to 1 minus the discount shown in Fig. 11 for each year. Based on unemployment benefit rules, we use a value of 0.5 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, a value equal to the CDD wage for internships. We use an annual interest rate of 12%.

The results are presented in the top panel of Fig. 12. The black line gives the series for $\bar{V}$ using panel transitions; the grey line gives the series using retrospective transitions.

[24] Note that we exclude three states: student, army and out of the labour force. If these states were included, our results would be much stronger (ie show a larger decline in $\bar{V}$.) This is because, if the flow utility of being a student is assumed to be low relative to the wage, the increase in the proportion of students would dominate the series, and lead to a large downward trend in $\bar{V}$. This trend, however, would be largely unrelated to the issue at hand, namely the role of CDDs.

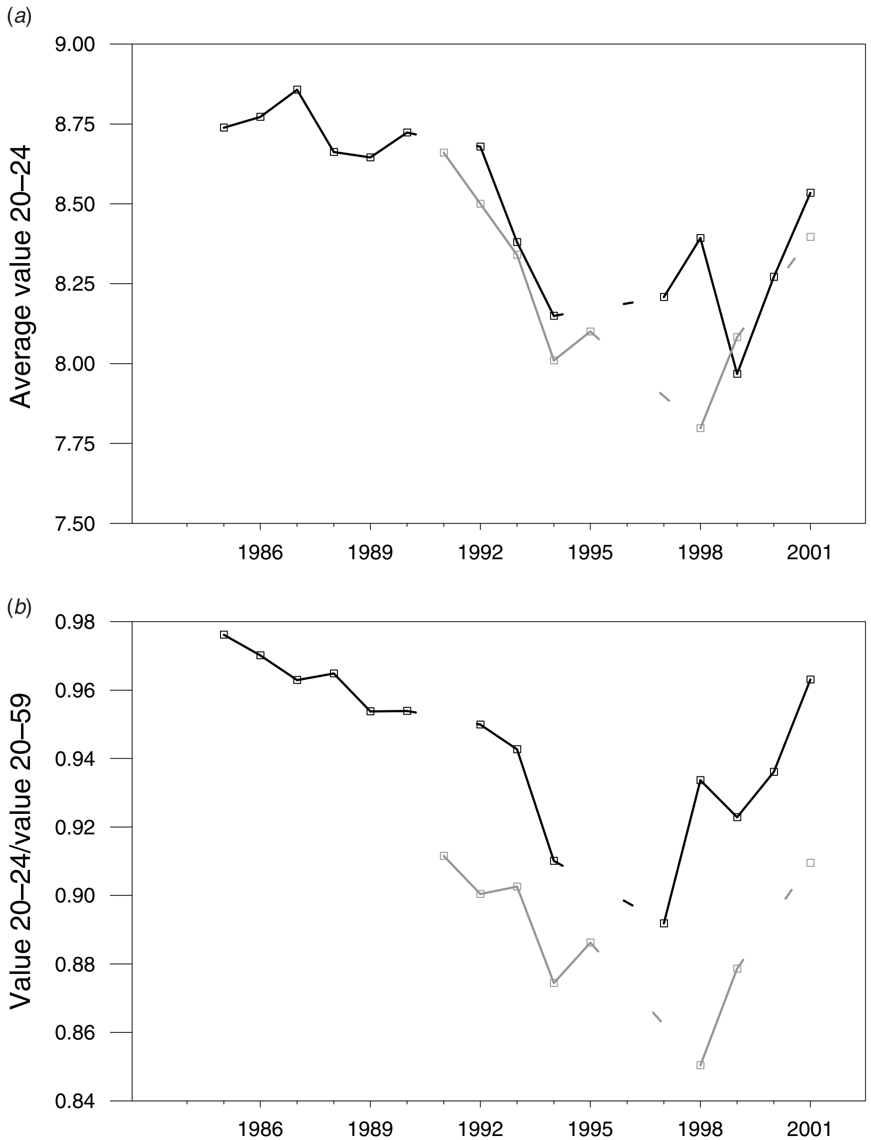

Fig. 12. *Values,* 1984–2000: (*a*) average value 20–24; (*b*) value 20–24/value 20–59

The general impression is one of little change in the 1980s, followed by a steady worsening until the late 1990s, and a partial improvement at the end. According to this measure (and leaving aside the general increase in real wages over time), the average welfare of the 20–24-year-old is slightly lower in 2000 than it was either in 1984, or (and this comparison is safer given the changes in the survey in 1990) than in 1991.[25]

[25] Another finding, not reported here, is how much closer V^{CDD} is to V^{u} than to V^{CDI}. In that sense, the French labour market has become increasingly dual.

Can we conclude from this that the effects of CDDs have been perverse? The answer is obviously not. Many other factors have been relevant during that period, and attributing all the change in $\bar{V}$ to the introduction of CDDs would obviously be wrong. However, we can make some progress.

Clearly much of the decrease in $\bar{V}$, especially in the 1990s, must have been due to macroeconomic factors, rather than to the increase in the proportion of CDDs. Here, the evidence from year 2000 is helpful. As we saw earlier, in terms of aggregate transition probabilities, 2000 is arguably the best year of the sample. Yet, in that year $\bar{V}$ is still lower than it was in either 1984, or 1991. In short, the lower value of $\bar{V}$ in 2000 cannot easily be attributed to macroeconomic factors.

We can actually go one step further. Some of the changes in $\bar{V}$ are likely to reflect structural changes in the labour market other than CDDs, changes which might affect all cohorts. In that case, attributing the decline in $\bar{V}$ over the sample to the introduction of CDDs would clearly be wrong. This suggests looking not at the evolution of the average value $\bar{V}$ for the 20–24 age group, but rather at the evolution of this average value relative to the average value for the whole labour force – which is much less affected by the introduction of CDDs.

With this motivation, we plot the evolution of the ratio of the average value for the 20–24 age group to the average value for the 20–59 age group in the bottom panel of Fig. 12 (We use the same wages for both groups, thus not taking into account the age profile of wages in computing the two values. This would change the level, but not the evolution, of the ratio over time.)

The graph has two main characteristics: there is a nearly continuous decline in the relative value from 1984 to 1997, then an increase, but to a lower level than at the start of the sample. This suggests two conclusions. First, much of the evolution of the relative value for the 20–24 age group reflects aggregate evolutions, the long worsening and the recent improvement in the labour market: the young suffer more in a depressed labour market. Second, the fact that the value remains lower in 2000 suggests that more has been at work. The extension of CDDs, which disproportionately affects that group, is a plausible candidate explanation for this underlying deterioration. Put more conservatively, there is no evidence that the introduction and development of CDDs has improved the relative welfare of those most affected by it, namely the young.

6. Conclusions

We have looked at the effects of the introduction of fixed-term contracts.

On the theoretical side, we argued that the effects of such partial reform may be perverse, leading to higher turnover and, possibly, lower welfare. The excess turnover induced by the forced coexistence of fixed-term and regular contracts can be high enough to offset the efficiency gains of improved flexibility.

On the empirical side, we looked at the evolution of labour market experiences for young workers in France since 1983. We found strong evidence of increased turnover, and argued that, if anything, the effect of the fixed-term contracts on the welfare of young workers appears to have been negative.

If our theoretical and empirical conclusions are valid, this suggests that, at least from an economic viewpoint (ie leaving aside political economy implications), such partial reform may be a very poor substitute for broader reform, i.e. an across the board reduction in firing costs for all workers.

Many questions remain open for future research. To us, the most important may be how such a reform affects the nature of the jobs offered to workers. We have assumed in our model that contracts had no impact on the nature of the jobs created by firms. There are good theoretical and empirical reasons to think they have. There are two potential effects at work (which parallel the two effects at work on firms' decisions in our model). On the one hand, lower costs on fixed-term contracts give more incentives for firms to take more risks, and to design jobs which, associated with the right worker, lead to high productivity. On the other, lower costs on fixed-term contracts may instead induce firms to design routine, low productivity jobs, which they can fill through the use of fixed-term contracts. The wage evidence we reviewed in our paper suggests that this second effect might indeed be at work.

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