Workers and Firms sorting into Temporary Jobs

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Increasing Labor Market Flexibility - Boon or Bane?  
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Outline of the paper

• Deregulation of fixed-term contracts has been the main labour market policy during the last twenty years
• Observers wondered whether temporary employment would eventually absorb the whole workforce
• We propose a matching model with direct search in which both temporary and permanent jobs coexist in equilibrium
• Ex post firms are better off with temporary contracts, but in order to fill a temporary vacancy they need to keep it open longer; similarly, ex post all workers prefer a permanent contract, but finding a temporary one is easier
• The model is extended in order to include training and on the job search
The matching framework

- Workforce consists of a mass one of risk neutral workers
- They are subject to natural turnover and separate from the job at rate $s$
- Workers only differ in their outside flow utility $z$. This $z$ is drawn from a c.d.f. $F(z)$ with upper support $z^u < w$ (wage) and is not observable to firms
- Labour productivity $y_h > w$ has an instantaneous probability $\lambda$ of experiencing a permanent adverse shock. Conditional on the shock productivity falls to $y_l < w < y_h$
- Firms create jobs by posting costly vacancies; keeping open a vacancy involves a flow cost $c$
The matching framework/2

- Two types of contracts exist: temporary and permanent; temporary contracts can be broken by the firm at will
- Temporary and permanent contracts are offered in different submarkets; workers and firms can freely move across submarkets but they can’t search simultaneously in both: the search is directed
- In each market the meeting of unemployed workers and vacant jobs is described by a well defined matching function $m(v_i, u_i)$, with constant returns to scale, where $i = (p, t)$ i.e. permanent or temporary
- Unemployed workers searching in the permanent market receive an exogenous fixed benefit $b > 0$
The matching framework/3

- As usual, $\theta_i$ denotes the submarket specific tightness $v_i/ u_i$; $h(\theta_i)$ is the job finding rate and $q(\theta_i)$ is the vacancy filling rate

$$\lim_{\theta_i \to 0} h(\theta_i) = \lim_{\theta_i \to \infty} q(\theta_i) = 0 \quad i = p, t$$

$$\lim_{\theta_i \to \infty} h(\theta_i) = \lim_{\theta_i \to 0} q(\theta_i) = \infty \quad i = p, t$$

- The exogenous wage $w$ is fixed for the entire employment relationship with no possibility of rollover. All workers enjoy the same wage. Any wage within the parties bargaining set can be supported as an equilibrium

- $r$ is the pure discount rate
Job creation in the permanent market

• The p.d.v. of a permanent job when productivity is high or low reads
  \[ r J^h_p = y_h - w + \lambda [J^l_p - J^h_p] + s [V_p - J^h_p] \]
  \[ r J^l_p = y_l - w + s [V_p - J^l_p] \]
  \[ r V_p = -c + q(\theta_p) [J^h_p - V_p] \]

• Assuming free entry \( V_p = 0 \) one gets one of the key equations of the model
  \[ c = q(\theta_p) J^h_p \]

• Moreover the values of a filled job can be rewritten as
  \[ J^h_p = \frac{y_h - w}{r + s + \lambda} + \frac{\lambda(y_l - w)}{(r + s)(r + s + \lambda)} \]
  \[ J^l_p = \frac{y_l - w}{r + s} < 0 \]
Job creation in the temporary market

• In the temporary market firms are not forced to retain the worker when the productivity is low, so that $J_{t,l} = 0 > J_{p,l}$ and

$$rJ^h_t = y_h - w + (s + \lambda)[V_t - J^h_t]$$

$$rV_t = -c + q(\theta_t)[J^h_t - V_t] \Rightarrow V_t = -\frac{c}{r + q(\theta_t)} + \frac{q(\theta_t)}{r + q(\theta_t)}J^h_t$$

• Assuming free entry

$$c = q(\theta_t)J^h_t$$

$$J_{t,h} = \frac{y_h - w}{r + s + \lambda} > J_{p,h}$$

• Ex post the value of a temporary job is higher whatever the level of productivity, but...
The equilibrium trade off

• Free entry leads to an ex ante indifference condition on the demand side of the market

\[ q(\theta_t) J_t^h = q(\theta_p) J_p^h \]

• Since we proved that \( J_{p,h} < J_{t,h} \) it must be that

\[ q(\theta_t) < q(\theta_p) \]

• And therefore \( \theta_t > \theta_p \). As a consequence, in equilibrium

\[ h(\theta_t) > h(\theta_p) \]
Workers’ sorting/1

• Permanent workers are subject to natural turnover and enjoy the benefit \( b \) when unemployed

\[
rt_{p}(z) = z + b + h(\theta_p)[E_p(z) - U_p(z)]
\]

\[
re_p(z) = w + s[U_p(z) - E_p(z)]
\]

• On the contrary, temporary workers face the risk of being fired when a productivity shock occurs and do not receive any benefit

\[
re_t(z) = w + (s + \lambda)[U_t(z) - E_t(z)]
\]

\[
rt_t(z) = z + h(\theta_t)[E_t - U_t]
\]
Workers’ sorting/2

- Since workers can freely move across markets, their optimal allocation will be

\[ U(z) = \max[U_t(z), U_p(z)] \]

- where

\[
\begin{align*}
rU_t(z) &= \frac{z(r + s + \lambda) + h(\theta_t)w}{r + s + \lambda + h(\theta_t)} \\
rU_p(z) &= \frac{(z + b)(r + s) + h(\theta_p)w}{r + s + h(\theta_p)}
\end{align*}
\]

- Workers take the tightness as given so that the value of unemployment is increasing in \( z \) in both markets; in what follows we look for a reservation value \( R \) such that

\[ rU_p(R) = rU_t(R) \]
Workers’ sorting/3

• The formal value of $R$ reads

$$R = w - b \frac{(r + s)(r + s + \lambda + h(\theta_t))}{(r + s)h(\theta_t) - (r + s + \lambda)h(\theta_p)}$$

• As long as the existence condition holds, $R < w$. Workers with $z < R$ will search for a temporary job; the marginal worker (the one with $z = R$) is indifferent and the others stay on the permanent market.
Dynamics/1

• We define the introduction of temporary jobs as a permanent unexpected shock to the steady state of an “old regime” market

• In the “pre-reform” labour market only permanent contracts are allowed
  – all the labour force is either employed or unemployed with a permanent contract (whatever the outside utility)

\[ u_p + n_p = 1 \]

– the steady state stock of unemployed reads

\[ u_p = \frac{s}{s + h(\theta_p)} \]
• When the shock occurs unemployed workers of the old regime are immediately split into unemployed on the permanent and on the temporary submarket, depending on the outside option.

\[
\begin{align*}
  u_p &= \frac{s}{s + h(\theta_p)} \\
  \text{If } z < R &\Rightarrow u_t(\tau = 0) = \frac{sF(R)}{s + h(\theta_p)} \\
  \text{If } z > R &\Rightarrow u_p(\tau = 0) = \frac{s[1 - F(R)]}{s + h(\theta_p)}
\end{align*}
\]
• On the contrary, the transition of workers with low $z$ from employment in the old (permanent) regime, to the temporary market is not immediate

\[ n_p = \frac{h(\theta_p)}{s + h(\theta_p)} \]

- If $z < R$:
  - Start searching in the temporary market
- If $z > R$:
  - Start searching in the permanent market
Dynamics/4

• This dynamic problem has an analytical
• Labour market tightness immediately shifts at its long-run level on both submarkets
• This implies that the stock of unemployed workers in the permanent submarket is constant during the transition
• Instead the stock of unemployed workers in the temporary one first falls due to higher job finding rate, then rises due to natural turnover of low-outside-option workers from the old regime
• The new overall stock of unemployed may be higher than the rigid regime’s one, depending on the parameters
Further results

• The main conclusions still hold when workers with a low outside option are allowed to search on both temporary and permanent submarkets

• By allowing firms to pay a lump-sum cost to re-train workers in the face of an adverse shock, we prove that permanent workers are more likely than temporary ones to receive training

• By estimating a discrete-time competing-risk model on a flow sample of involuntary unemployment spells experienced by prime-aged non-seasonal male workers from Italian Northern regions, we also prove that unemployment duration is shorter when terminated by a fixed-term job