I Z A Institute
of Labor Economics
Initiated by Deutsche Post Foundation

DISCUSSION PAPER SERIES

IZA DP No. 12135

A Nutshell Model of Labor Demand with Permanent and Short-Term Contracts

Bruno Contini

FEBRUARY 2019

I Z A Institute
of Labor Economics

Initiated by Deutsche Post Foundation

DISCUSSION PAPER SERIES

IZA DP No. 12135

A Nutshell Model of Labor Demand with Permanent and Short-Term Contracts

Bruno Contini
University of Torino, Collegio Carlo Alberto and IZA

FEBRUARY 2019

Any opinions expressed in this paper are those of the author(s) and not those of IZA. Research published in this series may include views on policy, but IZA takes no institutional policy positions. The IZA research network is committed to the IZA Guiding Principles of Research Integrity.

The IZA Institute of Labor Economics is an independent economic research institute that conducts research in labor economics and offers evidence-based policy advice on labor market issues. Supported by the Deutsche Post Foundation, IZA runs the world's largest network of economists, whose research aims to provide answers to the global labor market challenges of our time. Our key objective is to build bridges between academic research, policymakers and society.

IZA Discussion Papers often represent preliminary work and are circulated to encourage discussion. Citation of such a paper should account for its provisional character. A revised version may be available directly from the author.

ISSN: 2365-9793

IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

A Nutshell Model of Labor Demand with Permanent and Short-Term Contracts*

The paper presents a two-period "nutshell" model that explains the composition of labour demand when the labour market is dualistic and workers may be hired via permanent (P) or temporary (T) contracts. The model does not explain the level of labor demand, nor the wage of permanent workers, assumed to be exogenous. This is the main difference with the more sophisticated structural model of Bentolila et al. (2012) where employment and wages are jointly determined. The nuthsell model delivers, however, a number of easily testable hypotheses – very relevant for policy – that the structural model does not handle.

JEL Classification: J2, J6, J63

Keywords: dual labor markets, labor demand, permanent and temporary jobs

Corresponding author:
Bruno Contini
LABORatorio R. Revelli
Collegio Carlo Alberto
Via Real Collegio 30
10024 Moncalieri (To)
Italy
E-mail: bruno.contini@unito.it

* I wish to thank Fabio Berton who contributed with many useful insghts on an older version of the script.

This paper presents a two-period "nutshell" model that explains the composition of labour demand when the labour market is dualistic and workers may be hired via permanent (**P**) or temporary **(T**) contracts. The model does not explain the level of labor demand, nor the wage of permanent workers, assumed to be exogenous. This is the main difference with the more sophisticated structural model of Bentolila et al. (2012) where employment and wages are jointly determined. The nutshell model delivers, however, a number of easily testable hypotheses – very relevant for policy – that the structural model does not handle.

I assume that the firm faces a vacancy which may be filled by two alternative contracts: (1) a permanent working contract (**P**) with an experienced worker; (2) a subsidized temporary contract (**T**) for unskilled young people. The permanent contract (**P**) pays an exogenous wage **w** and carries a firing cost equal to **FC**. **FC =0** denotes full contract flexibility. The temporary contract (**T**) is a one-year contract, that can be interrupted at no cost at the end of year 1. It pays a lower wage **s w**, where **[1 – s]** is the subsidized fraction of total wage. Given that **T** contracts aim at unskilled workers, they require a training period at the cost of **f** per year (**f** may be interpreted also as a productivity loss). At the beginning of year 2 the temporary contract must be renewed as a **P**-contract.

Nature (the business cycle) has two states: a "good" state, with probability **g**; and a "bad" state with probability **(1-g).** If "good" occurs, the firm's revenue is **R**, otherwise it is **0**. At the end of period 1 the firm assesses the performance of her worker: the worker is "able" with probability **p** and "unable" with probability **(1 –p).** Only if nature is "good" will the firm continue operations in period 2. If year 1 is "bad", the firm will fire her worker (at cost **FC** if the contract is permanent, **0** if temporary), no matter how "able" he/she is. If the worker turns out to be "able" he is retained; otherwise he is fired.

V is the value of the contract.

The decision tree for the **P** contract is as follows:

Initial choice	State of nature period 1	Payoff period 1	Observe worker's ability	Renew or fire	State of nature period 2	Payoff period 2
	g	R -w	p	renew P	g	R – w
	g	R –w	p	renew P	1–g	-w - FC
P	g	R –w	1- p	fire & open new vacancy	**new start**	V- FC
	1-g	- w	p	fire & closeout	exit	-FC
	1-g	- w	1 -p	fire & closeout	exit	-FC

With **g** probability of the business cycle being favorable, the firm stays in activity, otherwise it shuts down. If the **T**-worker is found "able" he is retained and promoted with a **P**-contract, otherwise he is fired.

The **T**-contract implies the following decision tree:

Initial choice	State of nature period 1	Payoff period 1	Observe worker's ability	Renew or fire	State of nature period 2	Payoff period 2
	g	R-f-sw	p	renew & promote	g	R – w
T	g	R-f-sw	p	renew & promote	1–g	-w - FC
	g	R-f-sw	1- p	fire & open new vacancy	**new start**	V
	1-g	- f – sw	p	fire & closeout	exit	0
	1-g	- f – sw	1 -p	fire & closeout	exit	0

The trees yield the values **V** of each contract, and the inequality that establishes the employer's preference:

< contract **P** (permanent) is preferred to contract **T** (temporary) >

$$V(P) > V(T) \quad \text{iff} \quad w(1-s) + (1-gp)FC < f$$

The condition states that the **P** contract will be preferred if the opportunity cost of not using a **T**-contract **[w(1 - s)]** plus the expected firing cost **[(1 – gp) * FC]** is less than the training cost **f** associated with the **T**-contract. The firing cost will be incurred if both events turn out unfavourable ("bad" business cycle and "unable" worker, whose probability is **(1 – gp)**). Costless dismissal **(FC=0)** is not sufficient for the **T-** contract option, but leads in that direction.

The negative tradeoff between labour cost and firing costs (**FC** can be viewed as the inverse of flexibility) is given by

$$\frac{\Delta w(1-t)}{\Delta FC} = -(1-gp)$$

The more favorable is the environment faced by the firm (in terms of workers' ability and business cycle (implying **(1 – gp)** approaching **0**), the flatter is the tradeoff, i.e. the less important becomes flexibility vis-à-vis labour cost.

Notice that the same conditions hold under firm heterogeneity, with **m** being the share of type-1 firms , and **(1-m)** the share of type 2- firms.

The model suggests the following testable hypotheses:

(1) the permanent **P**-contract will be preferred in positions that require skills, i.e. where **f** (training cost or foregone productivity) is high and the opportunity loss associated to the subsidy is low.

If human capital is highly valued, this has two implications:

(i) hi-tech firms will have a preference for **P** contracts;

(ii) small firms will also have a preference for **P** – contracts. In small firms workers are often faced with a variety of tasks: therefore training (implying a high **f)** becomes an important investment, thus establishing the same preference as above.

(2) the higher the "quality" of the candidate recruits (i.e. the higher **p**), the higher the advantage of hiring via permanent **P**-contracts. To the extent that individual abilities are often rewarded with higher wages, the model suggests that high wage people will be hired mainly via **P**-contracts;

(3) the higher **[w(1-s)]**, i.e. the lower the subsidy offered for **T-** contracts, the lower the employers' preference for **T**- hires;

(4) the higher the firing costs **FC**, i.e. the lower is contract flexibility, the higher the preference for **T**- hires;

(5) in times of recession **(g → 0)** – i.e. low labour demand - **T**-hires will be preferred to **P** hires as **(1-pg)** will approach **1**. As a consequence, job destruction in the course of recessions will mainly hit **P**-jobs;

(6) by the same argument, high growth firms will have a preference for **P**- contracts.

The model delivers some important policy conclusions. The first one relates to the size of the subsidy **s** granted to firms willing to hire unskilled individuals via T- contracts. The second one to the flexibility allowed by that contract, proxied by the **FC** layoff cost. It is well known that in the last decade in many EU countries firms have increasingly priviledged hiring via T-contracts: precarious (temporary) jobs may be convenient in the short run, but the resulting excessive labour market turnover precludes the accumulation of human capital and is responsible for the low and often negative productivity growth. In such countries, Italy in first place, there would be scope for reducing the incentives granted to the precarious T – contracts. A mild attempt along these lines was implemented in 2013, yielding no impact, almost certainly due to the fact that the **s** reduction was much too low (1.5% of social security contributions): as a matter of fact the share of precarious new T-hires has continued its upward trend, hiking from 65% of the first decade of the 2000s to almost 80% nowadays.

Related bibliography

Bentolila, S., Dolado, J. and Jimeno, J.F. (2019): Dual Labor Markets Revisited, IZA DP No. 12126.

Berton, F., Devicienti, F. and Pacelli, L. (2011): Are temporary jobs a port of entry into permanent employment? Evidence from matched employer-employee. *International Journal of Manpower*, 32(8), 879-899.

Berton, F. and Garibaldi, P. (2012): Workers and firms sorting into temporary jobs. *The Economic Journal*, 122(562), F125-F154.

Booth, A., Francesconi, M. and Frank, J. (2002): Temporary jobs: stepping stones or dead ends? *The Economic Journal*, 112(480), F189-F213.

Bentolila .S., Boeri, T. and Cahuc, P. (2010): Ending the scourge of dual labour markets in Europe, VoxEU.org, 12 July.

Cahuc, P., Charlot, O. and Mahlerbet, F. (2016): Explaining the Spread of Temporary Jobs and its Impact on Labor Turnover. *International Economic Review*, 57, 533-571.

Cahuc, P. and Postel-Vinay, F. (2002): Temporary Jobs, Employment Protection and Labor Market Performance. *Labour Economics*, 9, 63-91.