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How Does Employment Protection Legislation Affect Unemployment in Tunisia? A Search Equilibrium Approach

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Abstract

This paper applies a search matching model with firing restrictions to examine whether the existence of firing restrictions affects the outcome of the matching process and the natural rate of unemployment in Tunisia. The paper concludes that the removal of firing restrictions is likely to produce a favorable but limited impact on unemployment in Tunisia.

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I. Introduction

Job security provisions have often been held responsible for poor employment performance. The literature and country experiences show that high unemployment rates are not only associated with low economic activity, but can also reflect strict labor market regulations that hamper growth and impede labor market adjustment to shocks. Bentolila and Bertola (1990) and Bertola (1990) argue that high firing costs in Europe and differences in employment protection legislation between countries may explain differences in the dynamics of employment. Similarly, Garibaldi (1998) shows that different dynamics in the U.S. and European labor markets are partly due to the existence of employment protection legislation in Europe.

There has so far been little analysis on the impact of labor market regulations on employment in emerging market economies. Most studies focus instead on the role of economic growth in promoting employment. In this paper, we study the impact of easing labor market regulations, in particular of employment protection legislation (EPL), on steady state unemployment in Tunisia. We use a search equilibrium model with firing restrictions following Garibaldi (1998). We calibrate the model for Tunisia (i.e., defining the rate at which vacant jobs and unemployed workers meet in Tunisia) by estimating a matching function for the period 1974–2003. Simulating the calibrated model provides us with indications on how the existence of firing restrictions affects the outcome of the matching process and the natural rate of unemployment.

We conclude that increasing labor market flexibility will not solve Tunisia's unemployment problem per se, but would have a favorable impact on steady state unemployment. The simulations show that the removal of firing restrictions could have a limited impact on reducing unemployment. Furthermore, Tunisia's increased integration into the world economy could translate into a higher volatility of the shocks to which the labor market needs to adjust. The simulations with higher variance of shocks that could result from increased opening show that in the absence of firing restrictions the labor market would be more resilient to adverse shocks. Therefore, Tunisia would benefit from considering alternative approaches that rely less on protecting workers within the firm. However, to generate a substantial reduction in the unemployment rate, lower employment protection needs to be accompanied by continued efforts to implement sound economic policies aimed at enhancing Tunisia's growth performance and job creation. The paper does not study the impact that easing EPL could have on growth, which is considered completely exogenous.[2] Of course, studying the impact of reducing EPL could lead to radically different conclusions in the context of an endogenous growth model.

The remainder of this paper is organized as follows. Section II reviews the literature on the impact of employment protection regulation on unemployment. Section III provides a

[2] Mortensen (2004) has developed a model that studies how labor market policies could affect growth through the process of "creative destruction" in a Schumpeterian model of endogenous growth.

background on the institutional settings of Tunisia's labor market. Section IV presents the broad features of a search matching model with firing restrictions. Section V analyzes the impact of firing restrictions on current unemployment in Tunisia by calibrating and simulating the matching model. It also assesses the impact of these restrictions as Tunisia increases its integration into the world economy. Section VI presents the main conclusions.

II. Review of the Literature

Employment protection legislation is a form of employment regulation which relates to employers' freedom to dismiss workers. According to OECD (1994), employers' freedom to dismiss workers may be restricted in several ways: penalties on unfair dismissals, restrictions on lay-offs for economic reasons, compulsory severance payments, minimum notice periods, written justifications, administrative authorizations, etc. The effect of this legislation is similar to a tax on dismissals, even though the firm may not always be required to pay money before it dismisses an employee.

Much attention has been devoted to the analysis of the consequences of EPL in industrial countries. EPL inhibits labor market flexibility by reducing the ability of firms to hire or fire workers. The perception that flexible labor markets promote employment and reduce unemployment is widely accepted. Yet, the theoretical and empirical evidence on the net effects of firing restrictions on employment and unemployment are ambiguous. Nevertheless, it has often been suggested that the elevated severance pay and job security requirements in Europe are in part to blame for the high unemployment levels in this continent (Kugler and Pica, 2004).

The theory of job creation and job destruction implies that EPL reduces job destruction, but it also reduces job creation (Millard and Mortensen, 1997; Millard, 1996; Nickell, 1982). The reason for the reduction in job destruction is obvious enough. EPL is a firing cost (direct or indirect) imposed on the employer, so job destruction, which necessitates firing the employee, becomes more expensive and difficult. Job creation would fall for two reasons: (i) since dismissal is costlier (direct cost or lengthier process), the firm creates a job and recruits an employee only if it expects to need the employee for a longer length of time. Equivalently, jobs that are not expected to have a long life are not created when there are strict job destruction rules (Pissarides, 1999); and (ii) with less job destruction, and less flow into unemployment, there are both fewer job seekers and fewer vacancies, which implies that fewer job matches take place.

Theoretical work on the effects of firing costs shows that while reductions (increases) in firing costs are expected to increase (reduce) hiring and firing, as well as employment volatility, the net effects of reducing firing costs on employment are ambiguous. While a recent study (Elmeskov, Martin, and Scarpetta, 1998) suggests a somewhat more robust effect on unemployment if changes in the EPL member countries of the Organization for Economic Cooperation and Development (OECD) over the past two decades are taken into account, OECD (1999) could not find a statistically significant effect of EPL on aggregate employment. Most of the models in the literature provide the same type of prediction: stricter employment protection has an ambiguous impact on the level of overall employment, because it reduces both job creation (unemployment outflows) and destruction (unemployment inflows). Moreover, empirical evidence has shown that EPL has important effects on the composition of employment, since countries with stricter EPL experience higher youth unemployment and larger self-employment.

The multiple dimensions of employment protections are difficult to model in a simple way. The simplest and most widely modeled form of EPL is a fixed firing cost to be incurred by the firm when firing takes place (Bentolila and Bertola (1990) and Bentolila and Saint-Paul (1994) in partial equilibrium models of labor demand, Burda (1992), Millard (1996) and Millard and Mortensen (1997) in search equilibrium models). Another form of job security provision consists of the existence of firing permissions that cannot be quantified as fixed firing costs (Garibaldi (1998) in search equilibrium model). The way to capture the effects of procedural constraints in an aggregate model is to assume that a firm can accomplish firing only when it is granted an exogenous firing permission.

This paper uses a search equilibrium approach with firing restrictions, which has the advantage of being dynamic and able to analyze the impact of legal and not cost-related restrictions on labor market dynamics. By being dynamic, this approach can model both the unemployment stock and its duration. It is also known as the flow approach to the model of unemployment, because unemployment flows play a key role in the model.[3] The natural rate of unemployment equates the flow into unemployment with the flow out of unemployment. This modeling strategy enables the study of questions related to job search and job turnover, which often provide the key link between policy and unemployment. Modeling legal restrictions on dismissals explicitly seems to fit well the labor market in Tunisia, where severance payments are relatively low but legal restrictions are significant.

III. The Tunisian Labor Market: Institutional Settings

Tunisia has extensive labor market regulations, including employment protection. Government intervention in the labor market has traditionally been substantial. The social dialogue too, operating through a tripartite mechanism, has been important in shaping a wide range of labor market outcomes, including labor reallocation and wage setting. The justification has been to limit the impact of economic change on the labor market through strong job security rules.

Hiring rules are flexible but termination regulations are rigid and protective. Labor regulation reforms in 1994 and 1996 introduced flexibility in hiring through fixed-term contracts and part-time work.[4] However, termination regulations are substantial: dismissals

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[3] Pissarides, 1990; Mortensen and Pissarides, 1994.

[4] The main reforms included:

(continued…)

for economic reasons are still heavily regulated, and there is strong government interference. Reforms to the Labor Code in 1994 and 1996 accelerated the administrative procedures and clarified the definition of "*licenciement abusif.*"[5] In the end, however, firms wanting to adjust their work forces for economic or technological reasons still must engage in a heavily bureaucratic process where the government and a tripartite mechanism have substantial powers to intervene. Moreover, firms wanting to downsize must first notify the *Inspection du Travail* in writing, with at least one month advance notice indicating the reasons and listing the workers to be affected. The *Inspection du Travail* then has 15 days to review the request. If its mediation is not accepted by the employer, then within 3 days the case goes to the central or regional *Commission du contrôle des licenciements* (CCL), which has again 15 days to decide on the downsizing application and, where layoffs are involved, on the severance payments owed to the workers.

As a result, temporary jobs have increased and small firms have often found solutions outside the legal framework to circumvent those regulations. In 2001, 13 percent of the labor force had a fixed-term contract as employers seeking flexibility found it more attractive to offer fixed-term positions and avoid the obligations that still exist regarding layoff rights. With an employed labor force of over 2.5 million during 1998–2001, the total number of proposed layoffs represented less than 1 percent of total employment, compared to 10 percent in OECD countries (OECD 1994).[6] Furthermore, actual layoffs decreased as temporary unemployment and part-time work became much more important adjustment mechanisms: in 2001, only 14 percent of all proposed layoffs were approved by the CCL compared to 30 percent in 1998. Finally, cases going to the CCL declined (33 percent in 2001 compared to 60 percent in 1998), suggesting that solutions are being found outside the CCL.

IV. THE MODEL

We use the matching framework developed by Garibaldi (1998). It is a model *à la* Mortensen and Pissarides (MP) with firing constraints. The features of the model are as follows:

- Introduction of two categories of fixed-term contracts of determinate and indeterminate periods of time, respectively. Fixed-term contracts are permitted for a maximum of four years, subject to the agreement of the parties concerned.
- Introduction of part-time work. Part time is defined as less than 70 percent of the normal working hours. It is based on two principles: freedom of choice for employees and equal treatment with full-time employees.

[5] These reforms stipulated that the complete process, from initial application for downsizing to a final decision of the *Commission du contrôle des licenciements*, should take a maximum of 33 days, unless the parties agree to an extension.

[6] This includes job turnover from closures and firm contraction. Data cover the 1980s and early 1990s for 16 OECD countries.

The model considers an economy populated by a continuum of risk-neutral workers of fixed quantity. Workers can be either employed or unemployed. Each firm has one job that can be either filled or vacant. A filled job can be either fully operational or idle, depending on whether the firm is actually waiting for firing permissions. Firms with a vacant position search for unemployed workers, and unemployed workers search for vacant jobs. Job creation takes place when a firm with a vacant job and an unemployed worker meet. Job destruction takes place when a filled job gets a firing permission, separates and leaves the market.

The rate at which vacant jobs and unemployed workers meet is determined by the simple matching function *m(v,u)*, where m is a first degree homogeneous function, in which the arguments v and u represent the number of vacancies and unemployed workers, respectively, normalized by the fixed labor force size. Vacancies are filled at the rate

$$q(\theta)=m(v, u)/v=m(1, u/v);\ \theta=v/u \text{ and } q'(\theta) < 0$$

where θ can be interpreted as an index of market tightness from the firm's point of view. The smaller the number of vacancies in relation to the number of unemployed workers, the easier for the firm is to fill vacant jobs. The rate at which workers find jobs is

$$\gamma(\theta) = m(v,u)/u = m(v/u,1) = \theta q(\theta);\ \gamma'(\theta) >0$$

thus, the larger the number of vacancies in relation to the number of unemployed workers, the easier it is for a worker to find a vacant job. Job creation is defined by the number of matches

$$m(v,u)=vq(\theta) = u\,\gamma(\theta)\ .$$

Each job is characterized by a fixed irreversible technology and produces a unit of a differentiated product. There productivity of a job is $p + \sigma\epsilon$. The productivity is made up of an aggregate component p, common to every job, and a job specific component ϵ, which differs across jobs. The parameter σ reflects dispersion, and increases in σ represent a symmetric mean-preserving spread in the job-specific shock distribution or equivalently an increase in productivity variance.[7]

The process that changes the idiosyncratic component of productivity ϵ follows a Poisson distribution with arrival rate equal to λ. When there is a change in ϵ, the new value of the job-specific productivity ϵ is a drawing from the fixed distribution $F(\epsilon)$, which has finite upper support ϵ_u, lower support ϵ_l, and no mass point other than at the upper support ϵ_u. This way of modeling implies a memoryless but persistent idiosyncratic productivity. The persistence of any given idiosyncratic productivity shock ϵ is $1/\lambda$.

[7] σ is common to every job. It is a normalizing parameter useful for the simulations.

The model assumes that firms have the option to select the best productivity in the market, and create jobs at the upper support $p + \sigma\epsilon_u$. Once a job is created, however, the firm has no choice over its productivity. Filled jobs are said to be fully operative if the idiosyncratic productivity is above some critical value ϵ_d, while they are said to be idle if the job specific productivity is below ϵ_d. Therefore, the rate at which jobs turn idle is $\lambda F(\epsilon_d)$, while workers in idle jobs can be dismissed and leave the market at a rate *s*. The parameter *s* summarizes EPL in the model: as s $\rightarrow\infty$, EPL is eliminated. Finally, idle jobs are subject to idiosyncratic uncertainty and can return fully operational at rate $\lambda(1-F(\epsilon_d))$.

The model departs from the standard Mortensen-Pissarides (1994) framework in the wage-setting behavior. It assumes that employers capture all the rents associated with a job-worker match by paying workers the common alternative value of their time, *b*.[8] It is well known that in search equilibrium models, wages do not clear the market since there is no supply and demand to equate. The matching process generates economic rents that need to be shared between the employer and employee according to some exogenous bargaining rule. While often the literature assumes a Nash-symmetric solution for the wage bargaining game, in this model we follow Fanizza (1996) and Garibaldi (1998) assuming that all the rents generated by a match accrue to the employer. This rule can be interpreted as the one that maximizes the flow out of unemployment.

The unknowns of the model are the number of job vacancies *v* and unemployment *u*, which determine, through the matching technology, job creation, and the critical value for the idiosyncratic component of productivity, ϵ_d, that induces idle jobs.

The value of a filled job, conditional on an idiosyncratic productivity ϵ, is:

$$rJ(\epsilon) = p + \sigma\epsilon - b + \lambda\left[\int_{\epsilon_1}^{\epsilon_u} J(x)\,dF(x) - J(\epsilon)\right] + s[max\,\{0, J(\epsilon)\} - J(\epsilon)], \tag{1}$$

where $J(.)$ is the asset value of a job, r is the exogenous interest rate, $p + \sigma\epsilon - b$ are operational profits at idiosyncratic productivity ϵ. Apart from the flow-term $p + \sigma\epsilon - b$, equation (1) involves two capital gain terms. At rate λ the firm loses its current asset value

[8] As Diamond (1971) has shown, this outcome is an equilibrium in a wage setting game played among employers when workers have only the power to accept or reject offers and workers search sequentially at some positive costs. Given this outcome, workers have no incentive to search on the job and their parameters, other than *b*, do not affect the equilibrium. Alternatively, if we allowed a continuously renegotiated Nash bargain between the firm and the worker, the wage would be higher than the worker reservation utility in operational jobs, where the surplus from the match is positive. But the presence of firing restrictions, would force the firm to pay the worker even when the job is idle and the worker's participation constraint is binding. This would force idle firms to offer the worker his reservation utility *b*, exactly as in the present model. Thus, a continuously renegotiated bargain would only affect the wage of operational jobs, leaving unchanged the behavior of idle jobs, the distinctive feature of this model. To keep track of such bargains would be analytically tedious and would not change the qualitative results of the paper.

J(ϵ) and draws a new ϵ from the productivity distribution. At rate s firing permissions arrive and the firm gets an option to destroy the job. Since a destroyed job has zero value, the max operator in equation (1) captures the idea that a firm will keep running a job as long as its value is positive. It follows that an operational job is a positively valued job that ignores firing permissions, while an idle job is a negatively valued job that is destroyed when permissions arrive. Differentiating equation (1) with respect to ϵ shows that J(.) is a piece-wise increasing function of ϵ and its derivative reads:

$$J'(\epsilon) = \sigma/(r + \lambda) \;\forall\; J(\epsilon) \geq 0, \tag{2}$$

and,

$$J'(\epsilon) = \sigma/(r + \lambda + s) \;\forall\; J(\epsilon) < 0. \tag{3}$$

If we define the reservation productivity ϵ_d as:

$$J(\epsilon_d) \equiv 0,$$

and make use of equations (1) and (3), after an integration by parts, the expected value of a job in equation (1) reads:

$$\int_{\epsilon_1}^{\epsilon_u} J(x)\, dF(x) - J(\epsilon) = \sigma/(r + \lambda) \int_{\epsilon_d}^{\epsilon_u} (1 - F(z))\, dz - \sigma/(r + \lambda + s) \int_{\epsilon_1}^{\epsilon_d} F(z)\, dz \tag{4}$$

The last term of equation (4) is the negative value of an idle job and is a measure of expected firing costs. As the average waiting time goes to zero ($s \to \infty$), the second term on the right hand side of equation (4) vanishes: firing is always possible and accomplished as soon as the value of the job is negative. To obtain the cut-off value ϵ_d, below which the firm will accept firing permission, we make use of equation (4) and we evaluate equation (1) at J(.)=0. The reservation productivity solves:

$$p + \sigma\epsilon - b = \sigma/(r + \lambda) \int_{\epsilon_d}^{\epsilon_u} (1 - F(z))\, dz - \sigma/(r + \lambda + s) \int_{\epsilon_1}^{\epsilon_d} F(z)\, dz \tag{5}$$

Equation (5) is one of the key equations of the model and uniquely determines the reservation productivity as a function of the parameters $r, \lambda, p, s, b, \sigma$ and the productivity distribution $F(\epsilon)$. The left hand side of equation (5) is the profit from the marginal operational job. In an economy with no firing constraints ($s \to \infty$), the second term of the right hand side vanishes, and there is *voluntary labor hoarding* in equilibrium. In fact, when firing is instantaneous ($s \to \infty$) but hiring is costly, the firm will hoard labor up to the level at which current losses compensate savings of hiring costs if conditions improve. The presence of firing delays increases, through the last term in equation (5), the value of the marginal profits. As the average waiting time for firing permissions increases, a job will be kept running in bad times for a longer period because of exogenous constraints and there will be *institutional labor hoarding*. Since the firm anticipates firing restrictions when conditions are bad, in equation (5) the firm reduces the extent of voluntary labor hoarding. As s falls, it is possible that firing restrictions become so high that the firm will accept firing permissions at a positive profit per period.

Differentiating equation (5) with respect to *s* and rearranging, yields:

$$(\partial \epsilon_d/\partial s)\ [s(r+\lambda F(\epsilon_d))+r(r+\lambda)]/(r+\lambda)(r+\lambda+s) = -\lambda/(r+\lambda+s)^2 \int_{\epsilon_1}^{\epsilon_d} F(z)\,dz \tag{6}$$

Thus $\partial \epsilon_d/\partial s \leq 0$: an increase in the average waiting time of permission (fall in *s*) increases the productivity at which the firm takes advantage of firing permissions. This is consistent with the firm anticipating a long waiting time when conditions worsen.

The reservation productivity falls with *p*, the common productivity. Differentiating equation (5) with respect to (*p-b*) and rearranging, yields:

$$\sigma\ [\partial \epsilon_d/\partial(p-b)]\ [s(r+\lambda F(\epsilon_d))+r(r+\lambda)]/(r+\lambda)(r+\lambda+s) = -1 \tag{7}$$

Thus $\partial \epsilon_d/\partial p \leq 0$: as the productivity increases the firm will find it profitable to keep a job operational for a larger range of productivities. The effect of other parameters on the reservation productivity is ambiguous. A higher discount rate, *r*, reduces the flow of income from the job and makes labor hoarding less profitable. This would reduce ϵ_d. But simultaneously, the higher discount rate reduces expected firing costs and makes voluntary labor hoarding profitable. Similar arguments hold for changes in the arrival rate of idiosyncratic shocks. A higher λ corresponds to an increase in the arrival rate of productivity shocks. On the one hand the reservation productivity tends to decrease since the firm expects the duration of adverse conditions to be shorter. At the same time, the probability of facing a firing procedure is higher and the net effect depends mainly on the distribution *F*(.).

Job creation comes through the posting of vacancies. When creating a job, we assume the existing technology to be fully flexible and that the productivity distribution is common knowledge. This implies that new firms have the option to select the best productivity in the market and job creation takes place at the upper support of the distribution (ϵ_u). A posted vacancy yields an asset return of $-c$ per period, *c* being the constant cost of hiring, and a probability $q(\theta)$ of being filled with a job created at the upper support of the distribution. The vacancy asset valuation is:

$$rV = -c + q(\theta)[J(\epsilon_u) - V]. \tag{8}$$

With free entry into the job market, there are, in equilibrium, zero expected profits (*V*=0) (Pissarides, 1990) and the value of a job equals the expected searching costs:

$$J(\epsilon_u) = c/q(\theta), \tag{9}$$

where the value of a job at the upper support of the distribution is obtained subtracting equation (5) from equation (1) and reads:

$$J(\epsilon_u) = (\epsilon_u - \epsilon_d)/\ (r+\lambda), \quad (10)$$

Equation (9) is the job creation condition and uniquely determines the vacancy to unemployment ratio θ as a function of the parameters r, λ, c, the matching function $q(.)$, the upper support of the distribution ϵ_u and the reservation productivity ϵ_d:

$$(\epsilon_u - \epsilon_d)/\ (r+\lambda) = c/q(\theta), \quad (11)$$

Differentiating equation (11) with respect to common productivity p, yields

$$[\partial\epsilon_d/\partial p]\ [1/(r+\lambda)] = [q'(\theta)c/q(\theta)^2]\ [\partial\theta/\partial p], \quad (12)$$

and, making use of the facts that $\partial\epsilon_d/\partial p< 0$ and $q'(.)< 0$, it follows that $\partial\theta/\partial p>0$. Higher common productivity, increasing the flow of future profits, increases job creation at given unemployment Conversely, higher job security provisions reduce the expected value of a job and reduce the profitability of new jobs. Job creation at given unemployment falls. Differentiating equation (11) with respect to s,

$$[\partial\epsilon_d/\partial s]\ [1/(r+\lambda)] = [-c\ q'(\theta)\ /q(\theta)^2]\ [\partial\theta/\partial s], \quad (13)$$

and making use of $\partial\epsilon_d/\partial s< 0$, implies that $\partial\theta/\partial s>0$.

To close the model, we need to introduce unemployment. With a fixed labor force, a worker can be either unemployed or employed. If employed, a worker can be attached to a fully operational ($\epsilon \geq \epsilon_d$) or to an idle job $\epsilon < \epsilon_d$. Normalizing variables in terms of a constant labor force, the relationship among different labor force status is:

$$u + n_j + n_i = 1, \quad (14)$$

where u is the unemployment rate, n_i is the portion of workers employed in idle jobs, and n_j is the portion of workers employed in operational jobs. In an interval dt, the outflow rate (job creation) corresponds to the number of matches per unemployed times the number of unemployed, while the inflow rate (job destruction) corresponds to the fraction of workers in the idle state whose employers obtained firing permissions. Thus, the unemployment rate will follow the law of motion:

$$\Delta u(t) = s\ n_i(t) - \theta\ q(\theta)\ u(t), \quad (15)$$

where $\theta\ q(\theta)$ is the job finding rate and $s\ n_i(t)$ the employment outflow rate. Equation (15) defines unemployment variation as the difference between job destruction and job creation. Simultaneously, there are a number of fully operational jobs that are hit by a shock that brings productivity below the reservation level and enter the idle state. The outflow from the idle state corresponds to the idle jobs that have obtained firing permissions plus those idle jobs that, hit by a positive productivity shock, return to be fully operational. The inflow into the idle state is given by the operational jobs hit by a shock below the reservation productivity. The change in the idle rate is:

$$\Delta n_i(t) = \lambda F(\epsilon_d)\, n_j(t) - [s - \lambda\,(1 - F(\epsilon_d))]\, n_i(t). \tag{16}$$

In steady state equilibrium, the unemployment rate and the employment composition between idle and operational jobs is constant. From equations (15) and (16) it follows that unemployment and the idle rate are constant if the inflow rate is equal to the outflow rate. The steady state idle rate is:

$$n_i^* = [\theta\, q(\theta)\, u^*] / s, \tag{17}$$

and steady state equilibrium unemployment is:

$$u^* = \lambda F(\epsilon_d) / [\lambda F(\epsilon_d) + \theta\, q(\theta)\, (s + \lambda)/s]. \tag{18}$$

In steady state, the system is recursive and it reduces down to four equations. Equation (5) uniquely determines the reservation productivity ϵ_d, while equation (11), given ϵ_d, uniquely determines the vacancy/unemployment ratio θ. Given θ and ϵ_d, equations (17) and (18) simultaneously determine unemployment and the idle rate. Finally, given the unemployment rate, θ determines vacancies.

Solving the model in steady state produces the following results:

- If dismissal of idle workers is unrestricted ($s \to \infty$), the idle rate tends to zero and equilibrium unemployment coincides with equilibrium unemployment in the search equilibrium models (Mortensen and Pissarides, 1994; Pissarides, 1990). As the average waiting time increases, EPL affects both job creation and job destruction decisions, and has an ambiguous impact on unemployment.

- On the one hand, stricter EPL has a favorable impact on unemployment since it reduces the flow out of employment by obliging firms to keep workers occupied in idle jobs. On the other hand, stricter EPL reduces the rate at which workers escape unemployment ($\theta q(\theta)$) by directly decreasing the number of vacant jobs and indirectly by decreasing the expected returns from employing a worker. However, the final result of changes in EPL on the steady state unemployment rate is an empirical question that will depend upon the values of the parameters of the model, in particular α and λ.

In the next section, we will use this analytical framework to assess the likely impact of easing EPL in Tunisia.

V. Simulation Results

To implement the general stochastic model of the previous sections, we first specify the matching elasticity α by estimating a log-linear Cobb-Douglas matching function $m(v,u)=u^{\alpha} v^{\beta}$ with a time trend for annual data covering the period 1974-2003:

$$\text{Log } m_t = c + \alpha \log u_t + \beta \log v_t + \delta t + \varepsilon_t$$

The results of the estimation show that the parameter α is equal to 0.14 in Tunisia (Table 1). Compared to the coefficient of the matching function in industrial countries (0.25), the matching process appears to be relatively inefficient in Tunisia.

Table 1. The Matching Function in Tunisia, 1974-2003

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.03	0.270	4.75	0.0002
LU	0.14	0.056	2.53	0.0010
LV	0.59	0.009	5.39	0.0000
TIME	0.02	0.005	3.87	0.0011

R-squared	0.95	Sum squared residuals	0.07
Adjusted R-squared	0.94	Log likelihood	31.89
S.E. of regression	0.006	Durbin-Watson statistic	2.15

Calibrating the model for the Tunisian labor market yields λ=0.053. The real interest rate is set at 0.03, consistent with the last five-year average. The other parameters values are similar to Mortensen and Pissarides (1994) and to Garibaldi (1998). They are summarized in Table 2.

Table 2. Baseline Parameter Values

Variables	Notation	Value
Natural turnover	δ	0.02
Productivity dispersion	σ	0.037
Productivity distribution	F (.)	uniform
Upper support	ϵ_u	1
Lower support	ϵ_l	-1
Firing restrictions (max)	s	0.2
Firing restrictions (min)	s	1.2

Table 3 summarizes the results of the simulation. A high *s* is equivalent to low firing restrictions, with the average waiting time being 1/*s*. The results show that easing the current firing restrictions (*s*=0.2) will reduce the equilibrium unemployment by about 1 percentage point and increase job creation (JC) by 15 percent. Furthermore, firing restrictions affect labor market dynamics through their effect on the relative volatility of job creation and job destruction. Thus, the relative variance of job destruction to job creation $\sigma^2_{JD}/\sigma^2_{JC}$ increases dramatically as firing restrictions weaken. Other statistics of Table 3 show that as EPL eases (as *s* increases from 0.2 to 1.2), both the average duration and the persistence of unemployment fall. EPL has obviously a strong effect on average idle capacity, which is the average fraction of jobs waiting for dismissal permission.

Table 3. Simulation Statistics, Current Situation

α=0.14, λ=0.053

	s=1.2	s=1.0	s=0.8	s=0.6	s=0.4	s=0.2
$\sigma^2_{JD}/\sigma^2_{JC}$	2.518	1.691	1.084	0.559	0.366	0.114
$\overline{JC}$	2.016	2.003	1.989	1.945	1.906	1.761
Unemployment	0.135	0.137	0.139	0.137	0.140	0.143
Duration unemployment	8.433	9.019	8.228	9.245	9.682	11.778
Idle capacity	0.015	0.018	0.023	0.029	0.043	0.077
Persistence unemployment	0.902	0.938	0.946	0.959	0.975	0.985

Tunisia's further integration into the world economy is likely to increase the frequency and variance of idiosyncratic shocks to the labor market (i.e., higher values of λ). However, increased integration will also push up job creation. The results of the simulation with higher values of λ show that more frequent and stronger shocks will have an adverse effect on average unemployment in Tunisia (Table 4). However, this effect will be more pronounced if Tunisia maintains its current firing restrictions than if it eases them. Thus, when λ increases from 0.053 to 0.056, unemployment could increase up to 17.7 percent if firing restrictions remain in place, while it might go up to 16.9 percent if restrictions are abolished. Job creation (JC) would be slightly larger than under the assumption of a lower λ. Furthermore, as Tunisia further opens to the world economy (higher λ), the duration and persistence of unemployment will also continue to be negatively affected by a stricter EPL. In other words, reducing only EPL could improve labor market resilience to shocks that may arise from increased integration in the world economy. For simplicity, the simulation assumes that increased economic integration translates into a higher variance of the idiosyncratic component of productivity, leaving unchanged its average value. It ignores the potentially favorable impact of increased economic integration on productivity, growth, and unemployment.

Table 4. Simulation Statistics, Higher Frequency and Variance of Idiosyncratic Shocks

α = 0.14, λ = 0.056

	s = 1.2	s = 1.0	s = 0.8	s = 0.6	s = 0.4	s = 0.2
$\sigma^2_{JD}/\sigma^2_{JC}$	2.173	1.642	0.894	0.619	0.313	0.118
JC	2.043	2.024	1.993	1.979	1.916	1.771
Unemployment	0.169	0.168	0.172	0.171	0.175	0.177
Duration employment	8.893	8.972	9.403	8.789	10.034	11.245
Idle capacity	0.015	0.018	0.023	0.03	0.043	0.078
Persistence unemployment	0.933	0.937	0.967	0.955	0.98	0.988

VI. CONCLUSIONS

Increased labor market flexibility in Tunisia will contribute to reducing unemployment. The removal of firing restrictions is likely to produce a positive but limited impact on unemployment of almost 1 percentage point. Furthermore, while Tunisia's increased integration into the world economy could expose the labor market to adverse shocks and increase the rate of unemployment, the latter would increase less in case firing restrictions are removed. However, this analysis ignores the potentially favorable impact of increased economic integration on productivity, growth, and unemployment.

Increased labor market flexibility will not solve Tunisia's unemployment problem. Given the limited impact of removing firing restrictions on unemployment, increased flexibility cannot solely address the unemployment problem in Tunisia. This result suggests that the existence of other factors that are preventing unemployment to fall rapidly. One of these factors could be the skill mismatch (i.e., gaps between skills in demand by employers and skills offered by job seekers).

Looking forward, more analytical work could be done to assess the relation between labor market flexibility and growth. This paper did not address the impact that easier employment protection could have on growth. This impact could be substantial, but would need to be assessed through an endogenous growth model that allows for a link between labor market flexibility and productive investment.

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