

Unemployment dynamics in the Greek crisis

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Draft Version: September 2012

Abstract

This short empirical paper examines the unemployment dynamics in Greece both in the long run and during the current crisis. Using monthly data from 2001 until mid-2012 it finds that unemployment fluctuations were predominantly driven by the job finding rate. Nevertheless, during the current unemployment boom, the separation rate has become more significant, indicating that the recent reforms relaxing Employment Protection Legislation (EPL) have deteriorated the situation.

1. Introduction

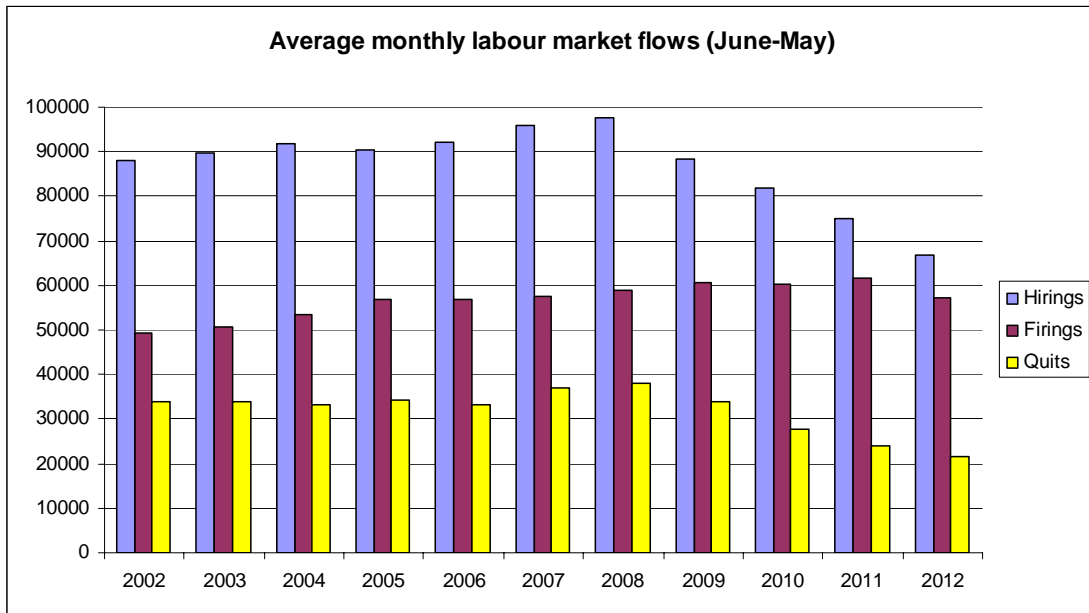
Since 2009 Greece is experiencing a major economic crisis. The most dramatic impact can be witnessed in the labour market where the unemployment rate from 7.7% in 2008 reached 17.7% in 2011 and 22.7% in the first five months of 2012.

This sharp unemployment increase is the obvious consequence of extreme fiscal contraction and deep recession. At the same period, a series of labour market reforms focusing on wage setting and employment protection have been introduced.

The present paper explores the underlying dynamics behind the unemployment boom presenting the evolution of the hiring, firing and quit rates for the period 2001 until May 2012. It employs a simple methodology that quantifies the contributions of the job finding and separation rate to the evolution of the unemployment rate. Finally it offers a preliminary evaluation of the reforms relaxing Employment Protection Legislation (EPL)

We begin with a simple impression of the data. Figure 1 reports the absolute number of hires, dismissals and quits for the period 2002-2012. Data on flows are taken from OAED and data on employment and unemployment from Eurostat, (see appendix 1 for details). Since the latest LFS data are of May 2012 we take the annual average from June of the previous year to May of the current year, in order to be comparable.

Figure 1



The most impressive fact is the rapid fall of hirings since 2009. While in the period June 2007-May 2008 they stood on average slightly below 100,000 per month, they have substantially fallen to a monthly average of less than 70,000 in June 2011-May 2012. On the other hand, firings have not substantially increased remaining at around 60,000 per month. Unsurprisingly, quits have decreased: when hiring opportunities fall, leaving a job becomes a risky choice.

Next, Figures 2 and 3 show the hiring, firing and quit probabilities that are the absolute numbers above as a percentage of the dependent employed and unemployed population of the respective period. (See appendix 1).

Figure 2

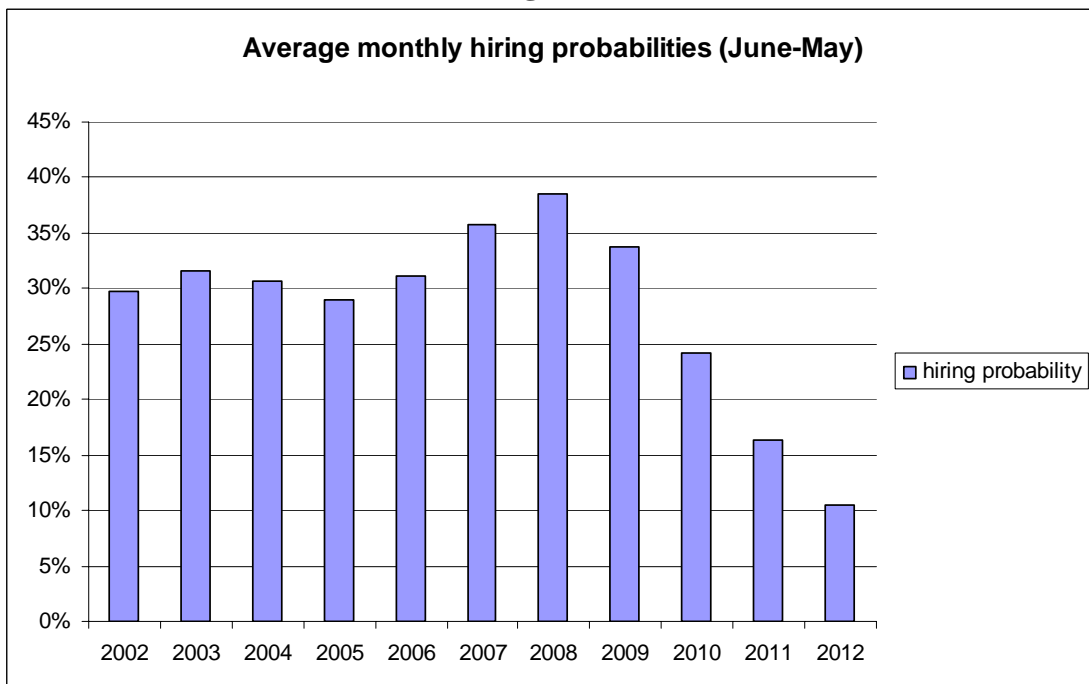
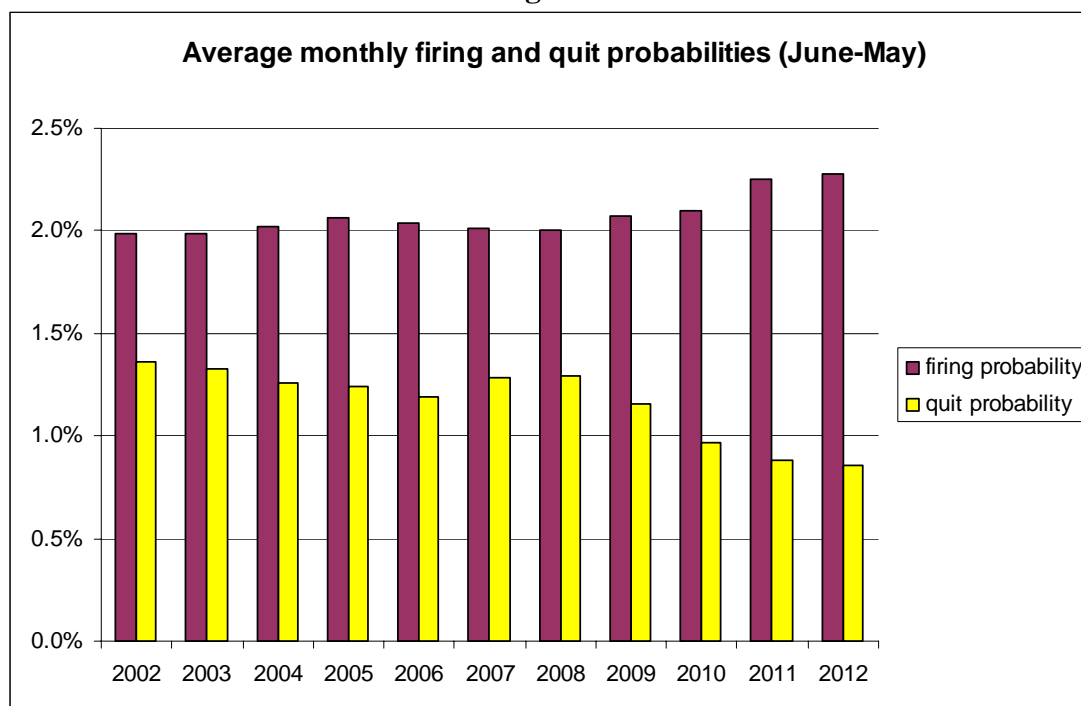


Figure 3



We can easily identify that the fall in the hiring probabilities is even more impressive. Whereas in 2008 (June 2007-May 2008) about 38% of the unemployed were hired each month, this has collapsed to around 11% in 2012 (June 2011-May 2012). Of course, the increasing denominator (unemployment) has played some part in this. On the other hand we can observe that despite the stability in the absolute level of firings, the firing probability has increased. This is partially the outcome of falling denominator (employment) but the increasing trend has become more evident since 2011. The quit probabilities have also fallen. It is notable though that the separation probability, i.e. the sum of firing plus quit probabilities (not shown in graph), was falling in 2008-2010 but increasing in 2011 and 2012.

Two early indications can be drawn from the above data: First, the strongest impact of the crisis in terms of labour market dynamics concerns hiring, indicating the primary suspect behind the unemployment boom. Our data show only a moderate increase in firing, most evident since 2011. This latter fact can be attributed to the relaxation of EPL introduced in 2010. Second, the deregulating labour market reforms, in particular those concerning the relaxation of EPL, have not only failed to reverse the unpleasant dynamics but on the contrary seem to deteriorate the situation. Both will be further discussed below.

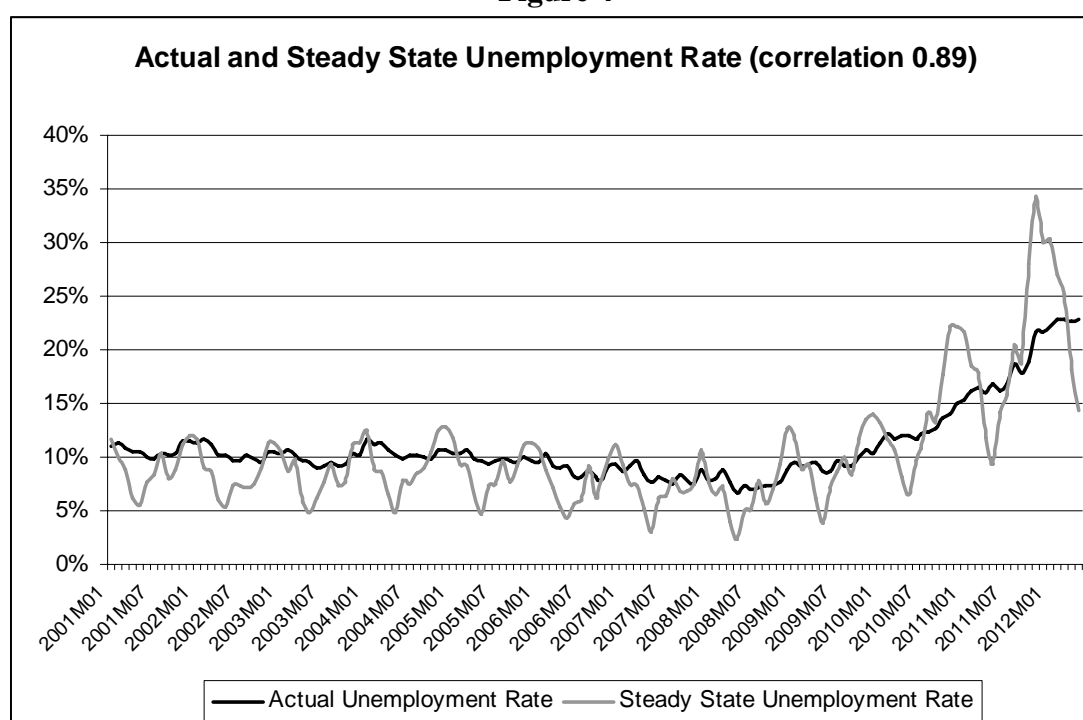
2. Steady state unemployment and the contributions of the flow rates

In this section we calculate the implied steady state unemployment rate and decompose its fluctuations to those attributed to changes in the job finding rate and those attributed to changes in the separation rate. This will offer a quantitative

measure of the relative contribution of each flow rate to the determination of the unemployment rate. (See Appendix 2 for the methodology)

First we calculate the job finding and separation rates as Poisson arrival rates from the respective probabilities, which in turn allow us to construct the steady state unemployment rate. The steady state unemployment rate is the rate where unemployment would stabilise if the flow rates of the particular month were maintained forever and had not been any transitions into or out from the labour force. Evidently, it is not equal to the actual unemployment rate, though their fluctuations are highly correlated (correlation coefficient 0.89). The calculated steady state unemployment rate is shown in the next figure (grey line) along with the actual unemployment rate (black line).

Figure 4



Finally, Table 1, reports the contribution of each flow rate to the evolution of the steady state unemployment rate. For the whole period 2001 to May 2012 the contributions of the job finding and separation rates were approximately 90/10, that is for every percentage point of change of the unemployment rate, about 0.9 points reflected change of the job finding rate and the remaining 0.1 points reflected change of the separation rate. The important conclusion is that the job finding rate is the crucial driver of the unemployment rate in the long run.

This latter finding, combined with the early indication from the descriptive data that the recession was predominantly expressed in a rapid decline of hiring by the firms, suggests that this decline has been the crucial factor explaining the unemployment boom. However, the short run contributions may differ from the long run. To further investigate this issue we narrow the time period and estimate the contributions of the flow rates during the current unemployment increase, namely the three and half years

2009-2012. Interestingly, the contributions have shifted to 77/23, suggesting a higher importance of the separation rate. The falling job finding rate is still the predominant factor behind the unemployment boom, though in a lesser extend compared to the long run picture.

Table 1
Contributions of the flow rates to unemployment

	2001-2012May	2009-2012May	2009-2010	2011-2012May
Sample period		Unemployment rising	Strict EPL	Weak EPL
Job finding	0.89	0.77	0.92	0.68
Separation	0.12	0.23	0.08	0.29

Attempting to explain this change in the contributions we examine the effect of EPL reforms. EPL in Greece is perceived as rather strict with the OECD indices, most notably for white collar workers (Venn, 2009). Recently, there were two major laws relaxing EPL dictated by the adjustment program: Law 3863 (July 2010) that reduced the notification period before dismissal and increased the collective dismissals ceiling and Law 3899 (December 2010) that increased the probation period (without eligibility for dismissal compensation) from two months to one year.

We repeat the same estimations for the periods 2009-2010, when the standard regime was in place, “strict EPL” and 2011-2012, when the reforms were put into effect, “weak EPL”. While for the first two years the contributions were maintained around their long run values (92/8), for the more recent period they were about 70/30. The relaxation of EPL has increased the contribution of job separations to the fluctuations of unemployment.

3. Conclusions

Our results offered an account of the dynamics behind the evolution of the unemployment rate in Greece focusing on the recent crisis. The current recession was primarily expressed in a substantial decrease of hiring by firms, resulting in rapid unemployment rise. We verified that the fluctuations of the job finding rate are the predominant factor behind the fluctuations of the unemployment rate. This holds both in the long run account as well as in the recent unemployment boom. However, we identified an increase in the contribution of the separation rate after the relaxation of EPL. This latter observation casts doubt on the desirability of the particular reform, at least in terms of combating unemployment.

Theoretically, one may argue whether or not EPL is relevant in the fight against unemployment: weak EPL favours firings in the recession and hirings in the expansion, without strong evidence concerning the effect on the average unemployment rate (Lazear, 1990; Bertola, 1990; OECD, 2004). The rationale for EPL relaxation stands on boosting hiring in the expansion period. Even if one accepts this rationale, it would be appropriate to wait for signs of expansion before applying

the reforms. In a recession period as severe as the one experiencing Greece at the moment, the timing of reform is hardly legitimized. Our results suggest that the reduction of firing costs brought acceleration to the firing rates, boosting unemployment further.

References

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Appendix 1: Data

Data are monthly from January 2001 to May 2012.

Data on hires, dismissals and voluntary quits are taken from the State Employment Agency ([Organisation for Employment of the Labour Force, OAED](#)).

Data on employment and unemployment are taken from the [Eurostat](#) Labour Force Survey. LFS main indicators->unemployment-> unemployment (persons) and unemployment rate monthly average. Eurostat provides monthly data for unemployed persons and unemployment rate based on the quarterly Labour Force Surveys. Using these we calculate the employed persons.

Labour market flows concern dependent employment that is 60-65% of total employment in Greece. Only dependent workers are fired and quit and only a fraction of the unemployed seeks dependent employment and is available for hiring. To obtain the hiring and firing probabilities we must adjust. Since LFS data on dependent employment are available only quarterly, we assume that the rate of dependent employment does not change during the quarter, and multiply total monthly employment and unemployment by the dependent rate of the respective quarter.

Appendix 2: Methodology

The method is built in continuous time with basic stock-flow relationships. Assuming that the labour force is constant, i.e. all unemployment variations derive from transitions between two states, employment and unemployment, the unemployment stock U (i.e. the number of unemployed persons) evolves according to

$$\frac{dU}{dt} = sN - fU \quad (1)$$

In equation (1), N is the employment stock, s is the flow rate from employment to unemployment, i.e. the separation rate, and f is the flow rate from unemployment to employment, i.e. the job finding rate.

Denoting the constant labour force by L , and substituting $N = L - U$ into equation (1) we find that,

$$\frac{dU}{dt} = sL - (s + f)U \quad (2)$$

The implied steady state unemployment rate is found by setting $\frac{dU}{dt} = 0$ in equation

(2) and noting that the unemployment rate is given by $u \equiv \frac{U}{L}$

We thus reach the standard expression:

$$u^{ss} = \frac{s}{s+f} \quad (3)$$

We calculate the job finding (F) and separation (S) probabilities with the formulas

$$F = \frac{H}{U}$$

$$S = \frac{D+Q}{N}$$

With H, D, Q denoting the flow variables, hires, dismissals and voluntary quits, respectively and U, N denoting the stock variables, unemployment and employment, respectively.

The associated Poisson arrival rates that capture the average number of jobs found or left in the respective month are derived from the above probabilities

Note that in a Poisson distribution the probability that a variable X takes the value x is given by

$$P(X = x) = \frac{e^{-\lambda} \lambda^x}{x!}$$

The probabilities F, S we measure are equivalent to $P(X > 0)$, i.e. the probabilities of finding (leaving) a positive amount of jobs. Hence

$$P(X > 0) = 1 - P(X = 0) = 1 - \frac{e^{-\lambda} \lambda^0}{0!} \rightarrow 1 - P(0) = 1 - e^{-\lambda}$$

$$\rightarrow P(0) = e^{-\lambda} \rightarrow 1 - P(X > 0) = e^{-\lambda} \rightarrow \lambda = -\log(1 - P(X > 0))$$

The flow rates f, s are the parameter λ in the Poisson distribution, measuring the average (or expected) number of jobs found (left) in the period.

hence

$$f = -\log(1 - F)$$

and

$$s = -\log(1 - S)$$

Finally we decompose unemployment fluctuations to those attributed to changes in the job finding rate and those attributed to changes in the separation rate and quantify their relative contributions. Following Elsby, Michaels and Solon (2009) we log-differentiate the steady state unemployment rate in equation (3) above to obtain

$$du^{ss} = u^{ss} (1 - u^{ss}) (d \log s - d \log f) \quad (4)$$

Equation (4) decomposes the change of the (steady state) unemployment rate into the respective logarithmic changes of the flow rates with an equal weight.

Let us denote by $du_t^f = -u_t^{ss}(1-u_t^{ss})d \log f_t$ and $du_t^s = u_t^{ss}(1-u_t^{ss})d \log s_t$ the respective contributions of the job finding rate and the separation rate to the variation of the unemployment rate, i.e. $du_t^{ss} = du_t^f + du_t^s$

To quantify the contributions of each flow rate, we follow Fujita and Ramey (2009) who calculate the proportion of the variance of du_t^{ss} that is explained by its covariance with du_t^f and du_t^s :

$$\beta^f = \frac{\text{Cov}(du_t^{ss}, du_t^f)}{\text{Var}(du_t^{ss})} \quad (5)$$

$$\beta^s = \frac{\text{Cov}(du_t^{ss}, du_t^s)}{\text{Var}(du_t^{ss})} \quad (6)$$

In the above expressions, β^f is the proportion of unemployment fluctuations deriving from fluctuations of the job finding rate, and β^s is the proportion deriving from fluctuations of the separation rate. The sum $\beta^f + \beta^s$ should equal to unity; this holds approximately in our results.