

The decline of rents, and the rise and fall of European unemployment.

Olivier Blanchard and Thomas Philippon*

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Abstract

Our paper develops three propositions:

Higher product market and capital market competition and integration since the 1970s have led to a steady decline of rents and to smaller and shorter lasting quasi-rents.

These changes are likely to increase efficiency and output in the long run, but it may take time for economic actors to fully understand them and adapt. In the presence of collective bargaining and slow learning by unions, these changes can generate first a rise, then a decline in unemployment. This fits the general evolution of unemployment in Europe since the 1970s.

The speed of learning by unions is likely to depend on the degree of trust between labor and capital. The empirical evidence suggests that differences in trust can explain much of the differences in the evolution of unemployment across countries. Countries where trust was lower have had more of an increase, and a later turnaround, in unemployment.

Introduction

The motivation for our paper comes from listening to the rhetoric of labor unions both within and across European countries:

Some unions speak of the need for a “partnership between labor and capital.” While fighting for labor, they nevertheless insist on the need to maintain an adequate rate of return for capital, lest capital move away and employment suffer.¹

Some unions instead have a view much closer to the old “class struggle” view of relations between capital and labor. They speak as if the fight over the distribution of income between wages and profits were a fight for rents, with few implications for employment.

It seems a priori plausible that, in economies where collective bargaining plays an important role in wage determination, such attitudes on the part of unions might have a bearing on the evolution of unemployment. With this motivation, we explore, in this paper, the following hypothesis:

The last 30–40 years in Europe have seen a steady increase in both product market competition and capital mobility, and thus to a steady decline in rents. These developments are eventually for the better, leading to higher efficiency, higher output, and perhaps also lower unemployment. But, to the extent that unions are slow to learn and adjust, this structural change may lead to a hump-shaped response of unemployment: First a rise, then, as learning takes place, a fall. This may explain the general evolution of unemployment in Europe during the period. And, to the extent that learning has

¹Perhaps the best-known early statement along these lines is by Helmut Schmidt, then the Social Democratic Chancellor of Germany, in 1976: “The profits of enterprises today are the investments of tomorrow, and the investments of tomorrow are the jobs of the day after”.

taken place at different speeds across unions and across countries, it may also explain cross-country differences in the evolution of unemployment.

We start by looking, in Section 1, at the panel data evidence on goods market competition and capital mobility in Europe over the last 30–40 years. Obviously, neither is directly observable. But we can look at the evolution of variables which are likely to affect either competition or mobility, for example the extent of product market regulation, of the share of the business sector owned by the state. We can also look at variables which are likely to be correlated with competition or mobility, for example the volume of trade or the size of cross-country financial positions. The empirical evidence suggests that the process of capital market integration has been a steady one since at least the 1970s. Deregulation of the goods market appears more recent, becoming more important in the 1990s.

We turn, in Section 2, to the logic of the hypothesis itself. We construct a model with both monopolistic competition and imperfect capital mobility. Monopolistic competition generates rents; imperfect capital mobility generates quasi-rents.

We assume that wages are set by unions in collective bargaining. We then look at the effects of either higher product market competition or higher capital mobility on wages and unemployment, depending in particular on whether these changes are understood by unions as they take place. The model implies that one must make a distinction between higher competition and higher capital mobility:

Higher competition, coming for example from product market deregulation, is unlikely to generate an increase in unemployment, even if unions do not understand the change.

Higher capital mobility, on the other hand, is likely to lead to lower unemployment if unions understand the change, but to higher unemployment if they do not. So, if unions learn only over time, higher capital mobility

leads first to an increase in unemployment, then to a decrease to a lower level.

Thus, the model implies, if we want to explain the evolution of European unemployment—its increase in the 1970s and 1980s, and its more recent turnaround—the crucial factor must be increasing capital mobility, not increasing product market competition. If anything, product market deregulation, which has come late, is likely to be contributing to the recent decrease in unemployment.

With the model as a guide, we return to the evidence. We look, in Section 3, at the evolution of European unemployment and wages since the early 1970s. If we think of the increase in capital mobility as the underlying source of change, and of unions as learning and adapting to the change only over time, our model predicts a hump-shaped response of unemployment, together with (positive, but insufficient) wage moderation. We show that this is indeed the pattern in the data. The real wage (per efficiency unit) decreases from the early 1980s on. Unemployment steadily increases from the early 1970s on, and only turns around in the mid to late 1990s.

The focus on European unemployment as a whole hides however important cross country differences. While some countries, most notably the large European continental countries, have had increasing unemployment up to the mid-1990s and are still at high levels today, other countries turned around much earlier, and have very low unemployment today. The most interesting case may be the Netherlands, where, after increasing sharply, unemployment turned around in the early 1980s, and is below 3% today. We show that countries which have experienced the largest decrease in unemployment are also the countries where wage moderation has been the strongest. And that wage moderation can often be traced to an explicit change in the attitude of unions, for example the 1982 Wassenaar agreement in the Netherlands.

This finding raises however the question of why some countries have been more successful than others. We explore, in Section 4, the idea that this may be due to different speeds of learning of unions across countries. This leads us to look at the role of “trust” between labor and capital. It is plausible that in countries where there is more trust between social partners, unions will take firms’ warnings more seriously, and thus will learn faster about changes in the economic environment. To explore this idea, we construct an (inverse) measure of trust based on the intensity of strike activity during the 1960s—that is, before the increase in unemployment. We then regress unemployment on a set of time effects interacted with this measure of trust, and show that, indeed, countries with lower measures of trust (low strike intensity) have had a much larger increase, and a later decrease, in unemployment. Indeed, differences in trust do a very good job of explaining differences in unemployment evolutions across European countries.

We believe that our hypothesis, with its focus on structural change, collective bargaining, and the attitudes of unions, is an important component of the European unemployment story. But it is surely not the only one. Section 5 relates our explanation to the body of research on European unemployment, and concludes.

1 Some empirical evidence

From the point of view of labor, there are two types of potentially appropriate rents. First, “pure rents”, returns in excess of the required rate of return to capital, coming from monopoly power of firms in the goods market. Second, “quasi-rents”, returns in excess of the required rate of return to capital, coming from inelastic capital supply in the short run, and possibly also—but to a lesser degree—in the long run. The distinction between the two will be important when we look at the effects of product market and capital market integration and deregulation on unemployment later on.

Neither pure nor quasi-rents are easily observable. The main reason is indeed one of the themes of this paper, which is that they may be partly appropriated by workers. Large monopoly rents may not show up as profits, but as higher wages for the workers in the firm. What is more easily observable however is the evolution of a number of variables which are either likely to affect these rents, such as measures of barriers to entry, public ownership in the business sector, or likely to be correlated with the degree of domestic or international competition, such as gross flows of goods or of financial capital across countries.

These are the variables we look at in this section. Our contribution here is only to put together measures constructed by others. We rely in particular on both published and unpublished data from the large OECD project on product market regulation.² Whenever feasible, we construct and present average measures for four sets of countries:

- The four large continental countries, France, Germany, Spain, and Italy (E4 in the figures below).
- Nine smaller continental countries, Austria, Belgium, Denmark, Finland, Ireland, the Netherlands, Norway, Portugal, and Sweden (S9).
- Four “Anglo-saxon” countries, Canada, New Zealand, Australia, the United Kingdom, plus the United States (A4+US)
- All countries together (T18).

The differences in the unemployment experiences of these 18 countries motivate our classification: Unemployment rose more and has declined least in the first group. Unemployment turned around earlier and has declined

²We are very grateful in particular to Giuseppe Nicoletti for making available these data to us.

more in the second group. Anglo-saxon countries and the United States have a substantially different unemployment record than continental European countries.³

The rest of the section presents various measures of integration/deregulation, first for product markets and then for capital markets. The trend towards deregulation and higher integration will come as no surprise. What is more interesting for our purposes are the timing, and the differences across groups of countries.

1.1 Product market deregulation

The OECD International Regulation Database Project constructed a detailed cross section of many dimensions of goods market regulation as of the late 1990s for each OECD country. This database has been extended by Nicoletti et al. [2001] to a panel data base for a number of countries, based on information from seven sectors (Electricity, Gas, Rail, Road Freight, Air transport, Post, and Telecoms), for the period 1975-1998.

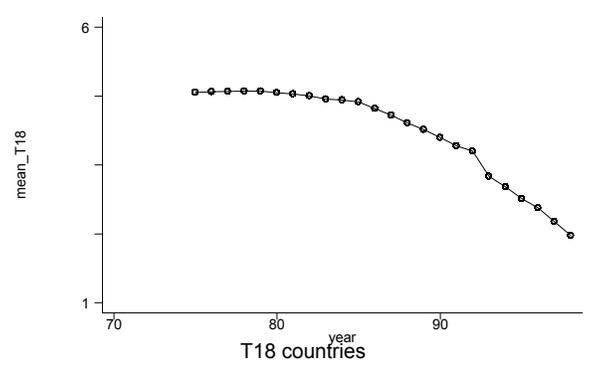
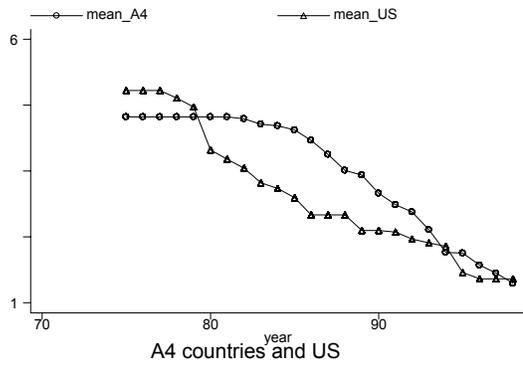
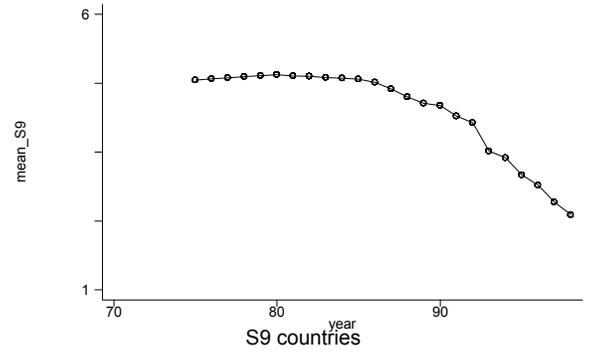
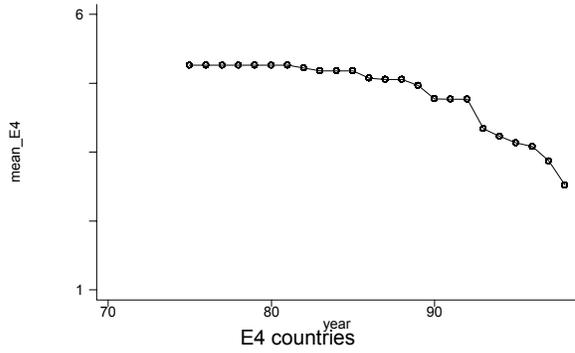
Figure 1 shows the evolution of the index of “barriers to entrepreneurship ” constructed by Nicoletti et al. The index is a composite of various dimensions of product market regulation, from legal barriers to entry, to antitrust exemptions given to some public enterprises.⁴ The index varies from 0 (no barriers) to 6. The index for each group of countries is an unweighted average of the indexes for each country in the group. We draw the following conclusions from the figure:

- There has been a clear decline in barriers to entrepreneurship since 1975.

³For more on these differences, see Blanchard [2000].

⁴The description of the index is given in Nicoletti et al. [2000], p.18

Figure 1. Barriers to entrepreneurship, 1970-1998



- Deregulation started in the mid 1980s in Anglo-saxon countries, and the index is now very low.
- In both large and small continental European countries, deregulation started in earnest only in the early 1990s, clearly under the influence of Bruxelles and the “One Market” initiative of the European Union, and the index has decreased less.

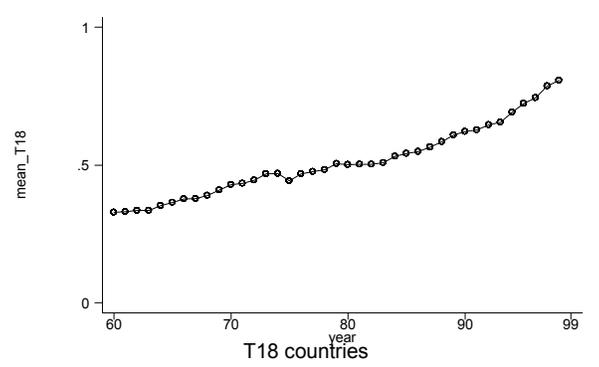
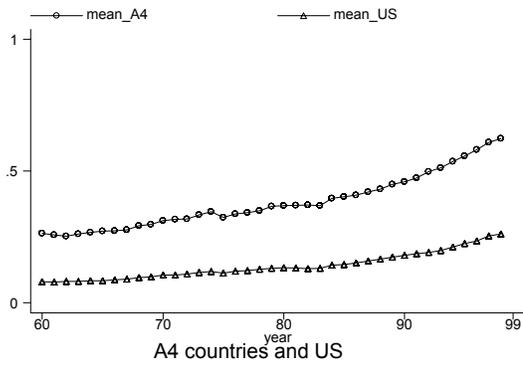
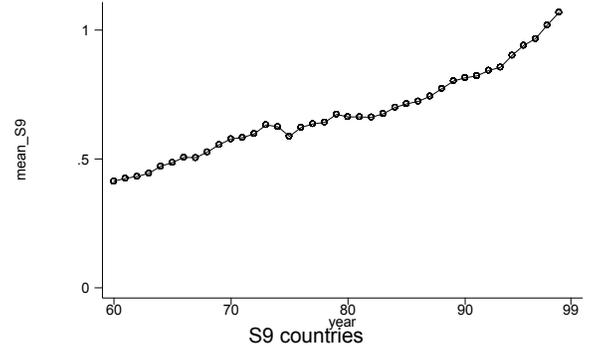
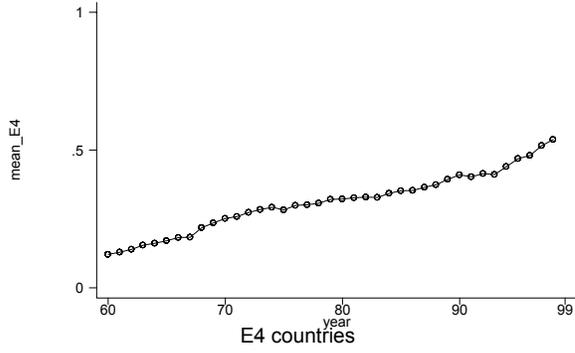
1.2 Product market integration

Another measure which is likely to be correlated with the degree of goods market competition is the level of foreign trade. Figure 2 plots the ratio of the sum of exports and imports to GDP, from 1960 to 1998, for each group of countries. We draw the following conclusions:

- Product markets have become steadily more integrated over time.
- The rate of growth of trade was high in the 1960s—3.2%, for the 18 countries taken together. It was then much lower in the 1970s and the 1980s—2.2% and 1.9% respectively. It increased again in the 1990s, when it has reached 3.2%.⁵
- For the larger continental European countries, the ratio has increased from 0.12 to 0.60. For the smaller and so naturally more open continental countries, the ratio has increased from 0.41 to 1.06. For the Anglo-saxon countries, the ratio has increased from 0.26 to 0.41.

⁵As is well known, over a longer time span, the evolution of the volume of trade is not a steady trend. The volume of trade relative to GDP increased sharply in the 19th century, and was high at the start of the 20th century (Williamson [2002]). An interesting question is whether some of the mechanisms we focus on here were at work at that time. The main difference is probably in the nature of collective bargaining and the strength of unions, then and now.

Figure 2. Openness $(X+Q)/Y$, 1960-1998



1.3 *Private versus public ownership*

Turning now to quasi-rents, one relevant measure is the degree of state ownership of firms in the business sector. There is much evidence that state-owned firms do not respond in the same way as privately-owned firms to an increase in wages. Even if the rate of return on capital becomes very low, the state is more likely to continue investing, and maintain employment than would a private firm. (Think of state-owned mining firms, which, in nearly all countries, continue operating long after they have become major loss makers.)

With this in mind, we show in Figure 3 the evolution of an index of state ownership, constructed by Nicoletti (private communication), for the period 1975 to 1998. The index varies from 0 (no state ownership) to 10, based on the percentage of the value added in the business sector produced by state owned firms.

Figure 3 looks in many ways similar to Figure 1:

- There has been a clear decline in state ownership over time. Much of the decline has happened relatively late in the sample.
- State ownership was lower in Anglo-saxon countries to start, started declining in the mid 1980s on, and has now reached a level similar to that of the United States.
- The decline in continental Europe has happened mostly in the 1990s, and has been more limited. There is no clear difference between large and small countries.

1.4 *Capital market integration*

A measure which is likely to be correlated with capital market integration, and thus with the size and the duration of quasi-rents is the size of gross financial flows between countries.

Figure 3. State ownership index, 1970-1998

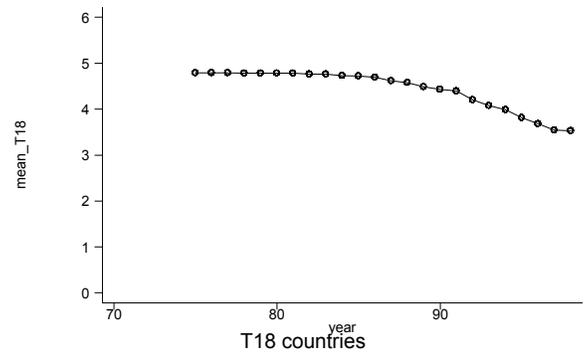
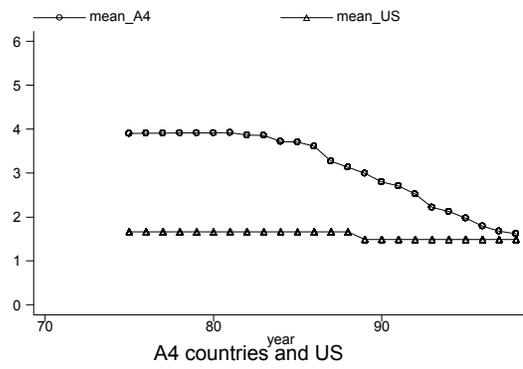
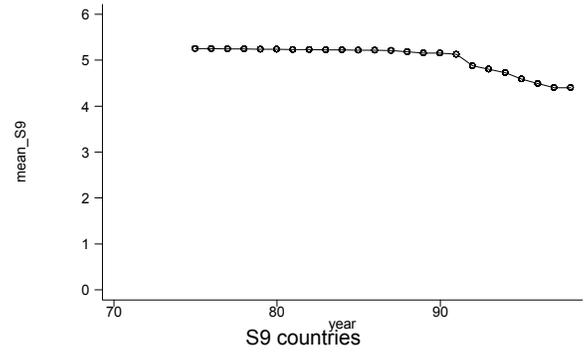
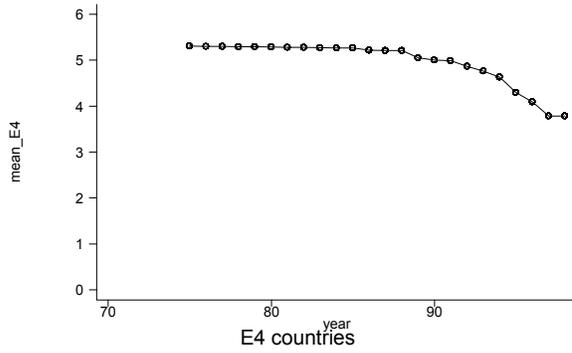


Figure 4 reports the evolution of an index of capital mobility. It is constructed for each country as the sum of the stock of FDI and equity assets held by a country plus the stock of its FDI and equity liabilities, divided by GDP, from 1980 to 1998, using the numbers constructed by Lane and Milesi-Ferretti [2001]. Because of missing data for the early years, data for the E4 includes only Germany, data for S9 includes only the Netherlands and Austria, data for A4 includes only the United Kingdom and Canada.⁶

We draw the following conclusions from Figure 4.

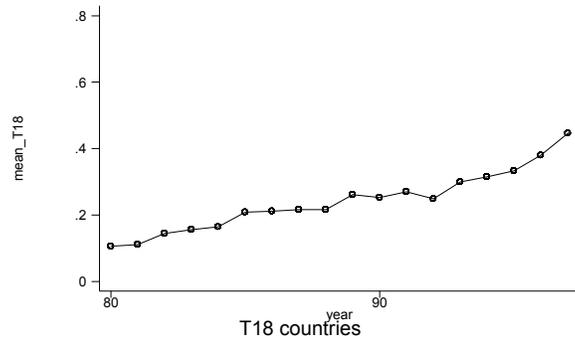
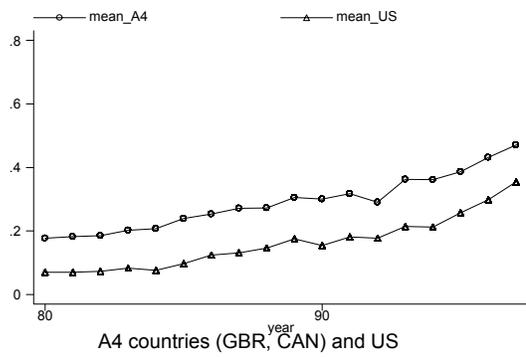
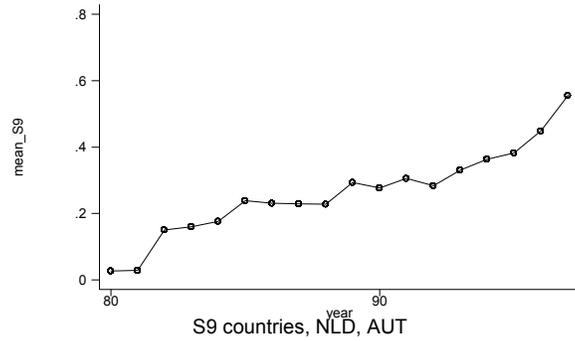
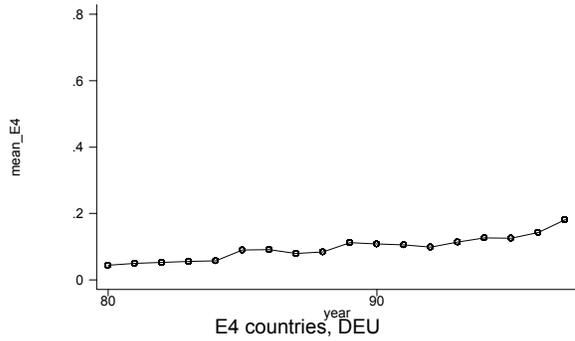
- There has been a steady increase in capital mobility at least from 1980 on. For the five countries we look at here, the average ratio increased from a low 0.10 in 1980 to 0.45 in 1998. (Given the initially low level of the ratio in 1980 in most countries, the increase must have been limited before 1980.)⁷
- Anglo-saxon countries were more integrated to start with, and the relative increase has been more limited.
- The increase has been larger, both absolutely and relatively, in the small than in the large continental European countries.

The overall picture which comes out from looking at the evolution of these admittedly imperfect measures is a complex one. Simplifying a bit, we draw three main conclusions:

⁶We constructed another, wider, index, which includes the stock of all foreign assets held by the country and all domestic assets held by foreigners. Its evolution is similar to that reported here.

⁷The earlier remark about the evolution of trade over a much longer time span applies to capital flows as well. The volume of capital flows was very high early in the 20th century, only to decline sharply later. Obstfeld and Taylor [2003]

Figure 4. Capital mobility index, 1970-1998
 (FDI and equity assets plus liabilities) divided by GDP



First, and foremost, there clearly has been an increase in both product and capital market competition since the early 1970s.⁸

Second, the increase in capital market competition appears to predate the increase in goods market competition. Clearly, for continental Europe, product market deregulation is largely a story of the 1990s, not earlier.

Third, except perhaps for the scope of capital market integration, there is no obvious difference between large and small European countries.

2 A minimalist model

In constructing a model, we have in mind the following questions: What are the likely dynamic effects of higher competition in the goods market, and of higher capital mobility in financial markets? If wages are set in collective bargaining, how do these effects depend on how fast unions learn about these structural changes? What is likely to happen to unemployment?

To answer these questions, we construct the following minimalist model.⁹

⁸We constructed another potential measure of internal capital market integration, the standard deviation of profit rates across sectors. Using the OECD sectoral data base, we computed this standard deviation for each country and for each year, and then looked at the evolution of the average standard deviation for the group of countries taken together. This measure shows a sharp decrease over time, a finding consistent with increased internal capital mobility. But we suspect that the result may come also from incorrect measures of the initial capital stock, giving incorrect measured profit rates early on. As time passes, and the initial guess for the capital stock matters less, measured profit rates will then converge, even if true ones do not. For this reason, we do not show these results here.

⁹Blanchard and Giavazzi [2002] looked at the dynamic effects of deregulation in the product and labor markets. This model can be seen as extending the analysis to explore the effects of deregulation in financial markets as well.

Consider an economy with a continuum of firms on $[0, 1]$.

- The goods market is monopolistically competitive, and each firm faces demand given by:

$$\frac{Y}{\bar{Y}} = p^{-\sigma}, \quad \sigma > 1$$

where bars denote aggregates, Y denotes the output of the firm, and p denotes the relative price of the firm. The parameter σ is the first important parameter here: The higher σ , the smaller the monopoly power, the lower the rents.

- The production function for each firm is given by:

$$Y = \min(K, N)$$

This Leontief assumption implies a simple (trivial) link between capital accumulation and movements in employment—a central link in our story. It eliminates however movements in employment due to changes in the desired capital-labor ratio, which are probably an important part of the actual story of European unemployment.¹⁰

- The profit rate of each firm is therefore given by:

$$\pi \equiv \frac{pY - wN}{K} = (p - w) = \left(\frac{K}{\bar{K}}\right)^{-\sigma} - w$$

The profit rate is decreasing in the capital stock of the firm relative to the aggregate capital stock, and in the wage.

- The supply of capital to the firm is given by:

$$K = \left(\frac{\pi}{r}\right)^{\theta}$$

¹⁰For more on the evolution of the capital-labor ratio, see Blanchard [2000], Lecture 1.

where r is the world interest rate. The parameter θ is the second important parameter, capturing the extent of quasi-rents. A value of 0 implies that capital is stuck in the firm (a caricature of state-owned firms). A value of ∞ implies no quasi-rents.¹¹

Collective bargaining takes place at the level of the firm. Unions choose w to maximize the wage bill, wN , so:

$$w \operatorname{argmax} (wN)$$

where, from above, the relation between w and N is given by:

$$w = \left(\frac{N}{\bar{N}}\right)^{-1/\hat{\sigma}} - rN^{-1/\hat{\theta}}$$

where we now introduce a hat to denote the unions' beliefs about the parameters σ and θ , which may or may not be the same as the actual parameters (We assume firms and suppliers of capital know the true parameters).

The assumption that the union maximizes the wage bill is for simplicity.

¹¹Our model does not have other dynamics than the learning dynamics introduced later. Once the wage has been set, capital adjusts instantaneously. Thus, the model does not capture the notion that quasi-rents are higher in the short than in the long run. We explored specifications allowing for dynamics in the supply of capital. In particular we explored a specification where a given change in the profit rate leads to a decrease in capital by a given amount each period, but for a random number of periods (according to a Poisson parameter which determines whether the process stops each period, and thus determines the average long run elasticity of capital to profit.) In this world, it may take a long time for unions to realize that the Poisson parameter has changed; by then, capital, and by implication, employment, may have already decreased substantially. We leave these dynamics out here, as they do not change the basic conclusions below.

The assumption of unilateral wage setting by the union is obviously too strong empirically. We make it to avoid a more complex issue, the nature of bargaining when the two sides do not have the same model of the economy (if σ and $\hat{\sigma}$, or θ and $\hat{\theta}$, are not identical.) Under our assumption, only what the unions believe matters for wage setting.

In short, our model has two central parameters, σ and θ , which capture the degree of goods market competition and capital mobility respectively. It takes (at least) four shortcuts. It is static; production is Leontief; it is symmetric, with no idiosyncratic shocks to firms; wage setting is unilateral. None of these shortcuts, we believe, is central to the basic results.

Solving for the wage chosen by a union in a given firm, and then imposing symmetry (i.e. $\bar{N} = N$, or equivalently, $p = 1$), the general equilibrium level of employment is given by:

$$N = K = \left(\frac{1-w}{r}\right)^\theta$$

where the wage is given by:

$$w = \frac{\hat{\sigma} + \hat{\theta}}{\hat{\sigma}(1 + \hat{\theta})}$$

So, replacing in the employment equation:

$$N = \left[\left(\frac{1}{r}\right) \left(\frac{\hat{\sigma}}{\hat{\sigma} - 1}\right) \left(\frac{\hat{\theta}}{1 + \hat{\theta}}\right) \right]^\theta$$

Note the special case of a “pure rents economy”: Assume that the actual parameters are known by unions so we can ignore the hats. Then, consider an economy where both σ is close to one (high monopoly power), and θ is close to zero (low capital mobility). In such a “high rents” economy, the wage w will be close to one, and so will N , the level of employment. In

words, labor will want to appropriate all the rents, and will be able to do so at no cost in employment. Under our (too strong) assumption that the wage is set unilaterally, the unions will drive profit to zero, while employment will remain nearly the same. In a more realistic Nash bargaining framework, the unions would push the wage as far as their bargaining power allows them to, again with nearly no implication for employment.

This is obviously an unrealistic configuration of parameters. But it may have been less so in the past when goods markets were less competitive, and capital less mobile. And it is still prevalent in the rhetoric of some of unions and political parties in Europe.¹²

We now turn to the effects of higher product market competition, then to the effects of higher capital mobility.

2.1 Higher product market competition

Consider an increase in σ , coming for example from product market deregulation. Then the equations above have the following implications.

- If unions understand that σ has increased, so $\hat{\sigma} = \sigma$ (and $\hat{\theta} = \theta$), then the increase in σ leads to a decrease in the wage, and (only) through this decrease in the wage, to an increase in employment.
- If unions do not understand that σ has increased so $\hat{\sigma}$ remains constant, the wage does not change, nor does employment.

Thus, if understood by unions, product market deregulation leads to a decrease in unemployment. If not, it has no effect on unemployment.

¹²In the last French Presidential election, one of the candidates, Olivier Bezacenot, argued in favor of what he saw as an obvious solution to the problem of income inequality in France: redistributing the profits of firms to the poor.

These results, especially the second, may be surprising—and they are surely of little help if our goal is to explain the increase in unemployment in Europe as a result of product market deregulation... But they are in fact quite robust to variations in our assumptions. Indeed, in a more general model, product market deregulation is likely to *decrease* unemployment even if unions do not understand the change in the product market competition. The intuition is as follows:

In general, product market deregulation has two effects on employment.¹³

First, a direct effect through the decrease in the markup chosen by firms. Higher competition leads to a lower markup of price over marginal cost, or equivalently to a higher real wage at any given level of employment. Turning this around, it leads to a higher level of employment *for a given real wage*. Thus, even if unions do not understand the change in the goods market, and so do not change the wage, employment will increase. This effect is not present in our model, because of the Leontief assumption for the production function: Given capital, the marginal cost curve is vertical, the decrease in the markup irrelevant.

Second, an indirect effect through wage moderation. To the extent that workers perceive a more elastic demand curve for labor, they are likely to choose a lower wage, leading to higher employment. This is the effect present in our model: Higher product market competition leads unions to choose *a lower wage*, leading in turn to higher profit, higher capital accumulation, and so higher employment.¹⁴

¹³For a more formal discussion, see Blanchard and Giavazzi [2002].

¹⁴This discussion looks at symmetric, across the board, product market deregulation. If deregulation applies only to some sectors, then, if unions do not take this change into account, employment may well decrease in those sectors. Barring however unlikely asymmetric adjustment effects, implications for aggregate unemployment are likely to be the

2.2 Higher capital mobility

Consider now an increase in increase in θ , coming for example from capital market deregulation/integration. Then, from the equations above:

- If unions understand the change, so $\hat{\theta} = \theta$ (and $\hat{\sigma} = \sigma$), then they decrease the wage and increase profit. But the elasticity of capital, and thus of employment, with respect to profit increases. Thus the effect on employment is ambiguous:

For values of θ close to zero (so a wage close to 1, and a profit rate close to zero), employment decreases. This is because the trade-off between lower wages and higher employment is sufficiently unattractive that workers prefer a decrease in employment to the decrease in the wage which would be needed to maintain employment. As θ increases however, the trade-off becomes more attractive, and employment eventually increases. The relation between w , N and θ is drawn in Figure 5.

Thus, subject to the caveat above, if unions understand the change, capital market deregulation will lead to lower unemployment.

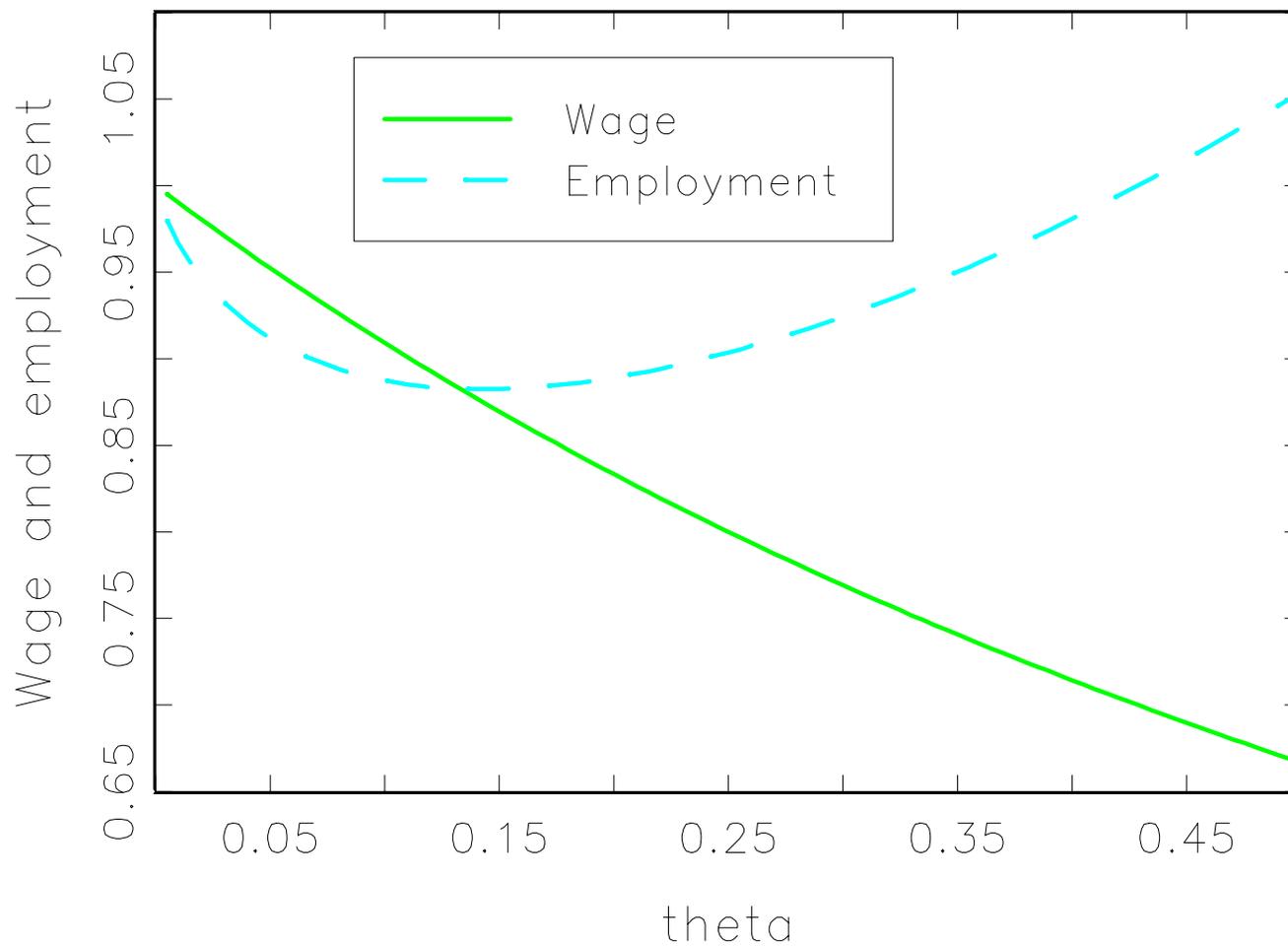
- If however unions do not understand the change, then increased capital mobility will be associated with an increase in unemployment. The wage does not change, and so profit does not change. The low profit rate leads to a larger response of capital, and thus a larger decrease in employment.¹⁵

Put simply, higher capital mobility increases the elasticity of the derived demand for labor with respect to the wage. If unions do not

same as in the text.

¹⁵This assumes that the economy starts from a profit rate below the relevant world interest rate, as will be the case if θ or σ are low enough to start with.

Figure 5. Increase in theta from 0.01 to 0.5



take this into account, and do not moderate their wage demands, then capital, and by implication, employment will decrease, unemployment will increase.

To summarize: It is important to distinguish between the decline in rents, and the decline in quasi-rents. A decline in rents, coming from increased product market competition, is unlikely to generate an increase in unemployment, whether or not unions understand what is happening. A decline in quasi-rents, coming from increased capital mobility, if understood by unions, is likely also to lead to a decrease in unemployment. However, if it is not understood, it will lead to an increase in unemployment.

This suggests that, if unions learn about the change over time, higher capital mobility may lead first to an increase, then to a decrease in unemployment. This is what we explore next.

2.3 Learning and unemployment

To look at the implications of learning for unemployment dynamics, we focus on changes in θ (the reason is clear from above: increases in σ cannot generate an increase in unemployment, whether unions learn or not). For notational simplicity, we assume $\sigma = \infty$.

- To make learning non trivial, we introduce shocks to the labor demand schedule:

$$N_t = \left(\frac{1 - w_t}{r} \right)^{\theta_t} \times \epsilon_t$$

where ϵ_t is a log-normal disturbance. Taking logs:

$$n_t = \theta_t \log\left(\frac{1 - w_t}{r}\right) + \varepsilon_t$$

where ε_t is *iid* normally distributed with mean 0 and standard deviation s .

- Uncertainty about θ is formalized as follows: θ is either low, equal to $\underline{\theta}$ or high, equal to $\bar{\theta}$. At $t = 0$, the workers have the prior: $p_0 = \Pr(\theta = \bar{\theta})$, where p_0 is initially small.
- Given their beliefs, unions set the wage period by period so as to maximize:

$$\max E_t[\log(w_t N_t)]$$

The assumption that they maximize the expected value of the log of the wage bill rather than the wage bill itself is for simplicity. The more important assumption is that of period-by-period maximization. This assumption eliminates strategic learning by wage setters. Under the assumptions we have made, it may sometimes be optimal for a long-lived union with a low discount rate to move widely the wage in order to learn θ with more precision. We do not believe this is empirically relevant for many reasons. One is the standard free riding problem: workers who lose their jobs in the experiment are not sure to find them afterwards while others benefit from the fast learning. The other is that adjustment costs are likely to make this strategy less appealing.

Under our assumptions, the wage chosen by the union in period t is given by:

$$\frac{1}{w_t} = \frac{\hat{\theta}_t}{1 - w_t}$$

where

$$\hat{\theta}_t = E_t[\theta] = p_t \bar{\theta} + (1 - p_t) \underline{\theta}$$

Define $x_t \equiv -\log(1 - w_t) + \log(r)$. The updating rule for p_t is in turn given by:

$$p_{t+1} = \left[1 + \frac{1 - p_t}{p_t} \times \exp\left(-\frac{1}{2s^2} [(n_t + x_t \underline{\theta})^2 - (n_t + x_t \bar{\theta})^2]\right) \right]^{-1}$$

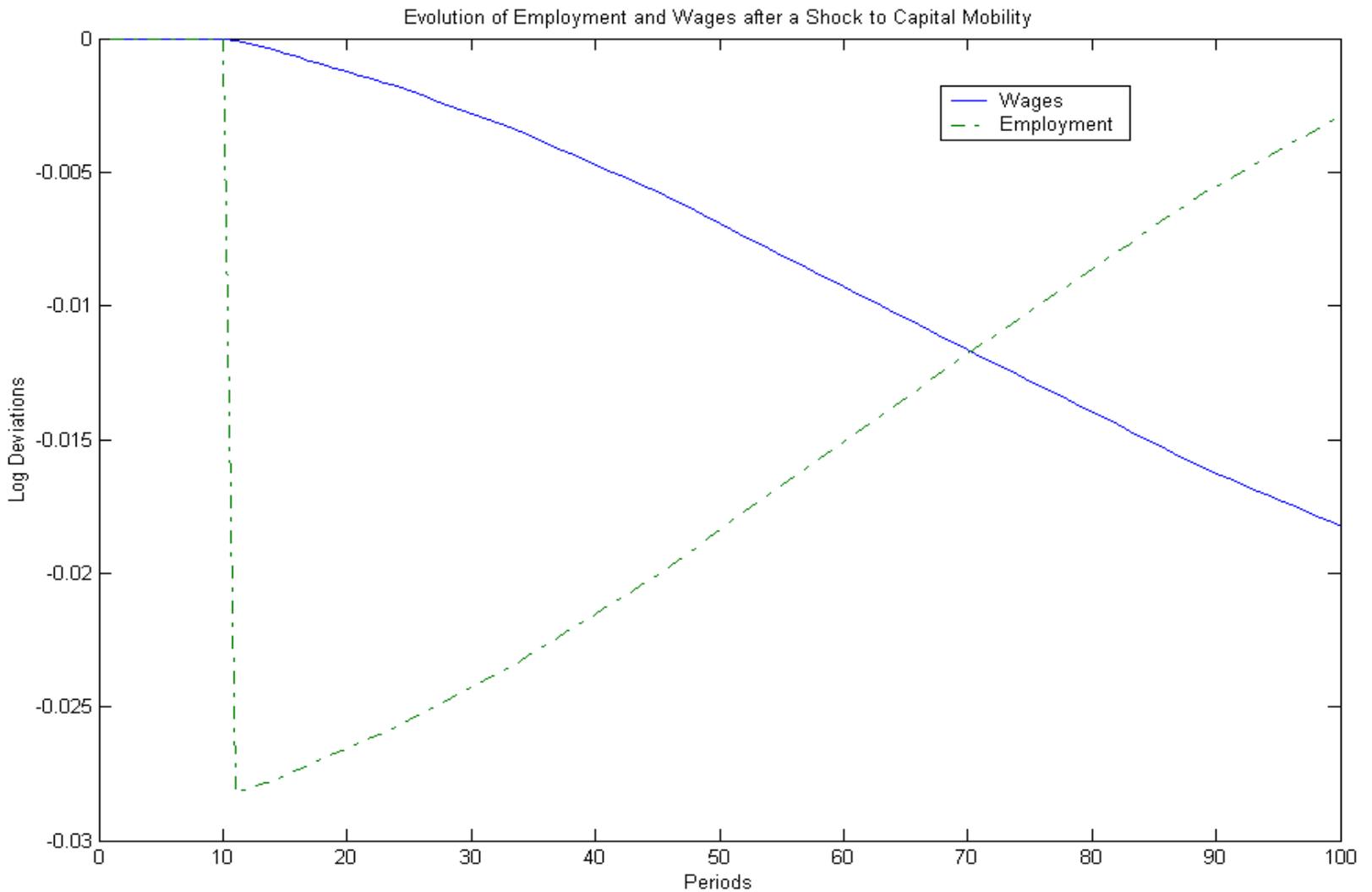
This is an almost standard Bayesian inference problem, except for the fact that the gain depends on the wage which itself depends on the initial beliefs (which is why there could be room for strategic learning).

Of course, given that the shocks are random, there are many possible learning paths. The simplest paths to look at are those where the shocks to ε_t are zero all along. Define $\Delta_\theta = \bar{\theta} - \underline{\theta}$. The dynamics of employment are then given by:

$$\begin{aligned} p_{t+1} &= \left[1 + \frac{1-p_t}{p_t} \times \exp\left(-\frac{\Delta_\theta^2}{2s^2} x_t^2\right) \right]^{-1} \\ x_t &= -\log\left(1 - \frac{1}{1 + p_t\bar{\theta} + (1-p_t)\underline{\theta}}\right) + \log(r) \\ n_t &= -\theta_t x_t \end{aligned}$$

Figure 6 shows the adjustment of employment and wages to an increase in θ from $\underline{\theta}$ to $\bar{\theta}$. (The values of the parameters used for the simulation are $\underline{\theta} = 0.2$, $\bar{\theta} = 0.25$, $p_0 = 0.1$, $r = 0.3$, $s = 0.1$). As θ increases, capital and employment decrease. Workers see that employment has fallen but initially, if p_0 is small, they believe that it is likely to be due to adverse transitory shocks. As employment stays low, they begin to update their beliefs about the true elasticity of the long run labor demand and they turn to wage moderation. This brings back capital and employment up over time. (In the long run, under these parameter values, employment ends up slightly higher—increasing from 0.89 in the initial steady state to 0.90 in the new steady state.)¹⁶

¹⁶The priors are very important in determining the dynamics, just like in any Bayesian model. With tight priors, learning is slow and non-linear.



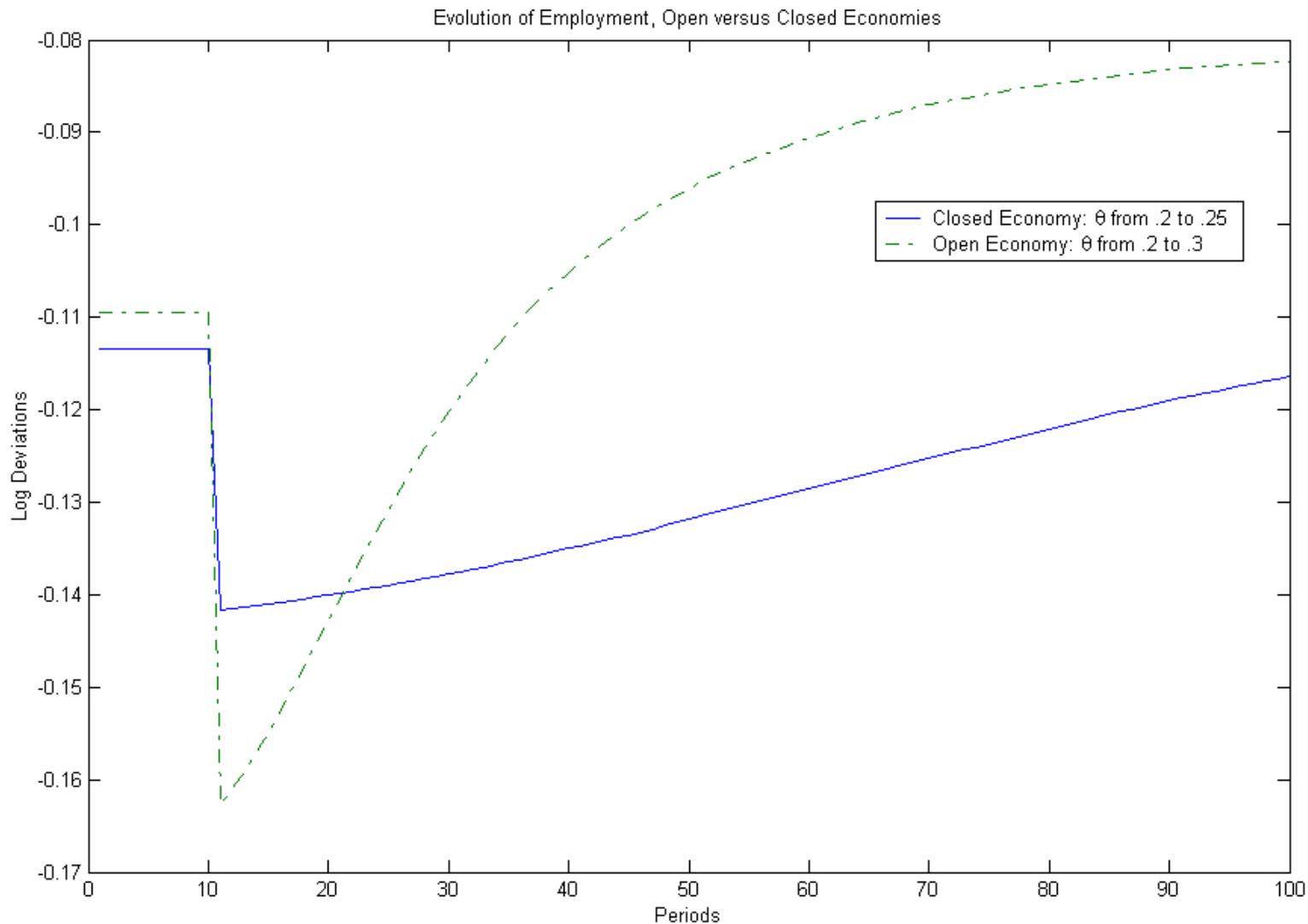
The shock to θ happens at $t=10$: θ jumps from .2 to .25. The parameters are $r=.3$, $s=.1$ and the prior that $\theta=.25$ is $p_\theta=.1$.

One important characteristic of the figure is the combination of higher unemployment and wage moderation; wage moderation is present, but insufficient to prevent the increase in unemployment. As we shall see in the next section, this fits the European experience quite well.

The sudden initial drop in employment is however not realistic. It is the consequence of two simplifying assumptions: That the drop in θ happens from one period to the next, and that there is no adjustment cost to investment. Removing any of these would smooth out the drop and produce a simple U-shaped path for employment (but substantially complicate the Bayesian learning computations.)

Figure 7 shows the trade-off between the size of the employment drop and its persistence. It is motivated by the fact that the drop of unemployment happened faster in small, more open, economies—the Netherlands and Ireland as primary examples. The figure shows the effect of an increase in θ for two different values of $\Delta\theta$. (The values of the parameters used for the simulation are $\underline{\theta} = 0.2$, $\bar{\theta} = 0.25$ for the first case, $\bar{\theta} = 0.3$ for the second case, $p_0 = 0.1$, $r = 0.3$, $s = 0.1$.) For the larger value of $\Delta\theta$, i.e. for the case where θ increases by a large amount, the initial drop in employment is large but learning is fast, leading to stronger wage moderation and a stronger return to high employment. For the smaller value of $\Delta\theta$, i.e. for the case where θ increases by a small amount, the initial drop in employment is smaller but learning is slower, leading to milder wage moderation and a slower return to high employment. Again, as we shall see later, this appears to capture differences in wage moderation and unemployment between larger and smaller continental European countries.

Integrating the results from the model and the evidence from the previous section suggests the following story. Both capital mobility and product market competition have substantially increased in the last 30–40 years. But it is important to distinguish between the two. Increased capital mobility,



The dotted line ("Open Economy") is the path of the log of employment for a jump in θ from .2 to .3. The plain line is the path for a smaller jump from .2 to .25.

together with slow learning by unions, may well explain both the rise, and the more recent fall in European unemployment. Increased product market competition is more likely to work the other way, to decrease unemployment. In that light, the product market deregulation, which has taken place in Europe mostly in the 1990s, is more likely to have been one of the causes of the recent decrease in unemployment rather than a cause of the earlier increase.

Having refined the initial hypothesis, we can now return to the empirical evidence on unemployment and wages, first for Europe as a whole, and then with a focus on cross country differences.

3 Back to unemployment and wages

Our hypothesis has a number of straightforward implications for the joint behavior of unemployment and wages. First it predicts a hump-shaped evolution of unemployment; we already know this is true, and this was one of the motivations for this paper. Second, it predicts that unemployment will increase for some time in spite of wage moderation: If unions take time to learn, they will moderate wage demands, but not by enough to avoid an increase in unemployment for some time. Third, it predicts that, everything else equal, countries in which learning takes place faster will have both stronger wage moderation and a faster and stronger decline in unemployment. We now look at how these implications fit the data.

The main empirical issue here is how to look at wages, so as to see whether there was or not wage moderation. Clearly real wages went up during the period, but this obviously reflects for the most part productivity growth. To adjust wages for technological progress, we use the following benchmark. We assume that technological progress is Harrod neutral. Under that assumption, the economy has a balanced growth path, along which the wage per efficiency unit, that is the wage divided by the index of tech-

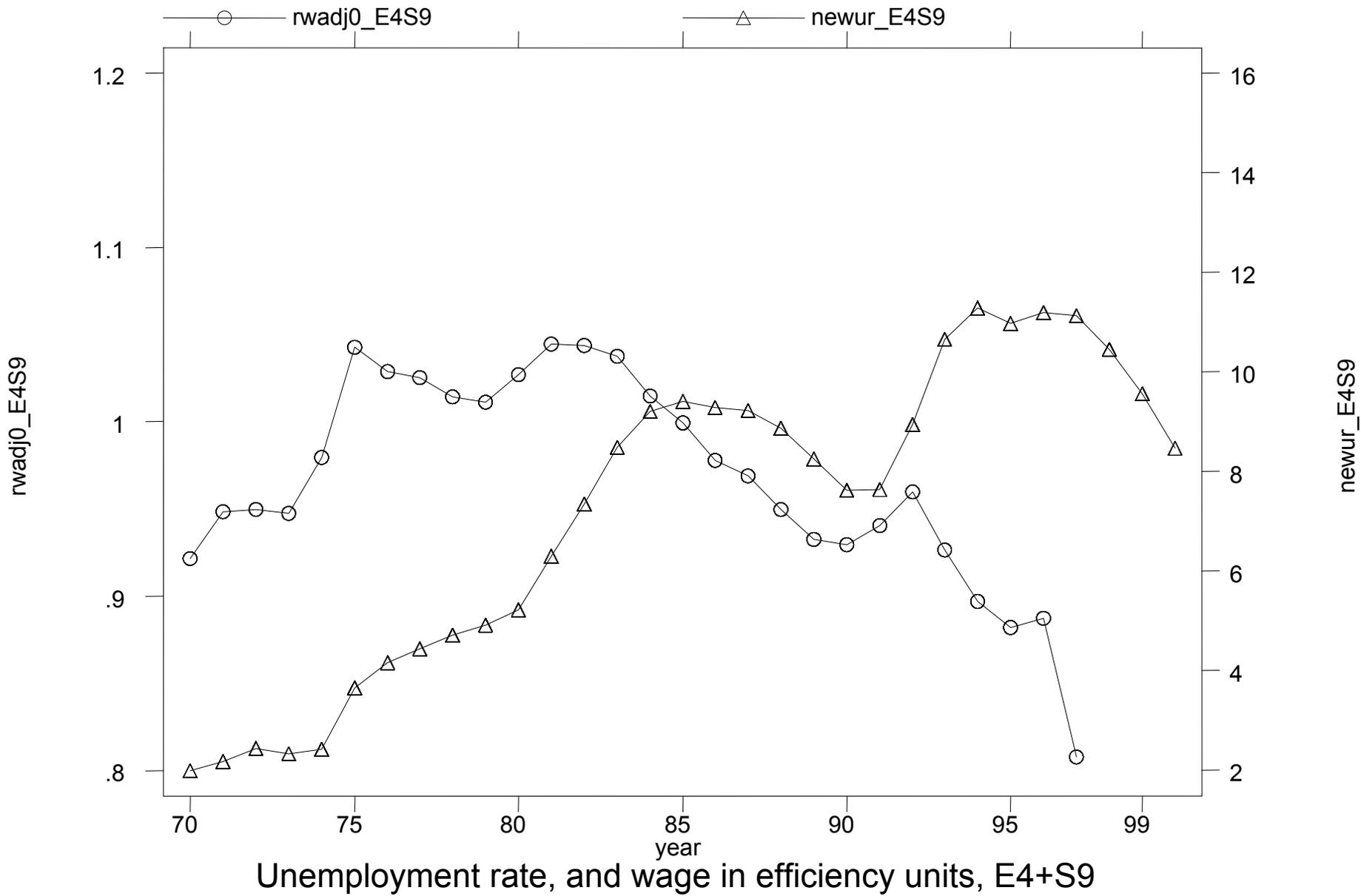
nology is constant. Thus, under that assumption, we can think of decreases in the wage per efficiency unit as reflecting wage moderation.

To construct the series for wage in efficiency units, we first construct the Solow residual for the business sector for each year for each country, divide it by the current share of labor to obtain the rate of change of the index of technology, integrate it over time, and take the exponential to get the index of technology. We then divide the wage by this index to get the real wage in efficiency units. We use the OECD business sector data base (which, unfortunately, has been discontinued, so our data ends in the late 1990s, at different years for different countries). The wage represents the cost of labor to firms, and so includes not only the wage, but also benefits and other labor taxes paid by firms.

The limits of the exercise are clear. The construction of the Solow residual using factor shares as weights is only correct if prices of factors reflect marginal cost. This is not the case under monopolistic competition, the assumption we made in writing down our model; rough corrections for the presence of positive markups do not however make a substantial difference to the picture. The assumption of Harrod neutral technological progress may not be correct, in which case even a constant constructed real wage may not be consistent with a constant profit rate, and thus with maintained capital accumulation and maintained employment (more on this later). Nevertheless, the exercise is a useful first pass.¹⁷

Figure 8 shows the evolution of unemployment and the real wage per efficiency unit for the group of continental European countries in our sample,

¹⁷The easier and often used alternative of looking at the wage divided by labor productivity—equivalently looking at unit labor costs, or the labor share, or the “real wage gap”—makes little sense if the goal is to detect wage moderation. Labor productivity depends on the labor–capital ratio, which, over time, is very much endogenous: Higher wages lead to a decrease in the labor–capital ratio, and an increase in labor productivity.



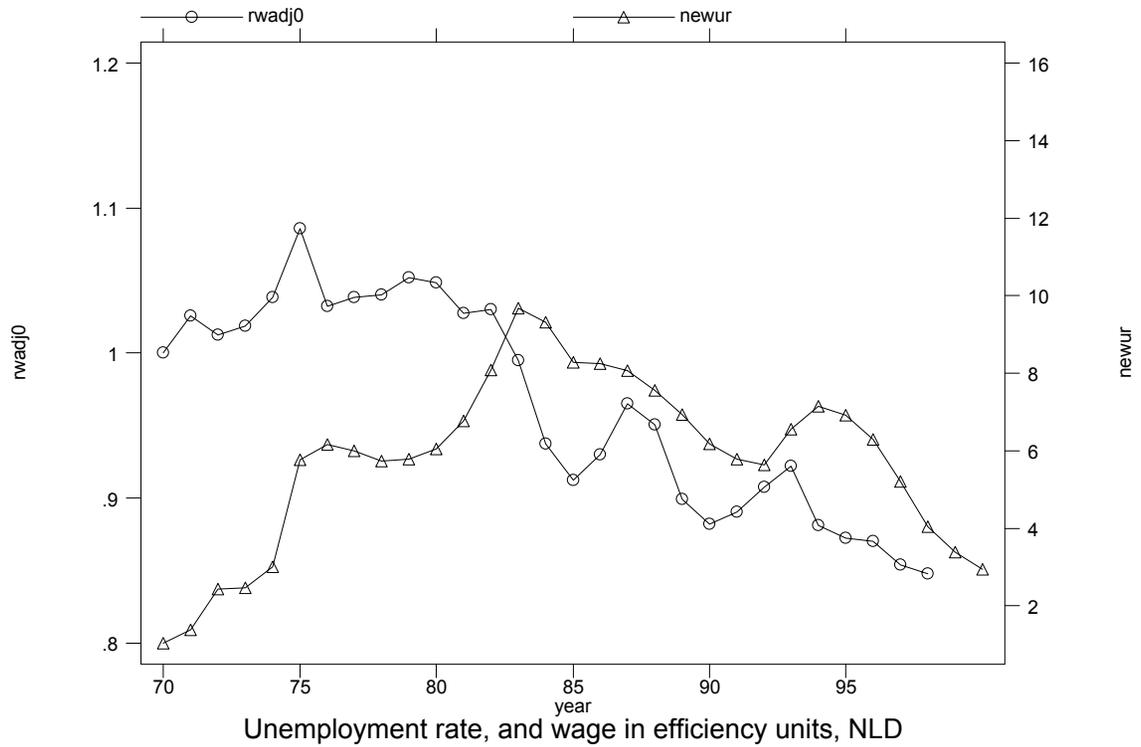
the large E4 countries and the smaller S9 countries. The unemployment rate is a weighted average of the unemployment rates of the different countries, using relative labor forces as weights. The real wage per efficiency unit is a weighted average of the real wage per efficiency units in each country, using relative business sector employment as weights. (For reasons indicated above, 1997 is the last year for which the real wage series exists for all countries, and thus for which the average real wage can be constructed.)

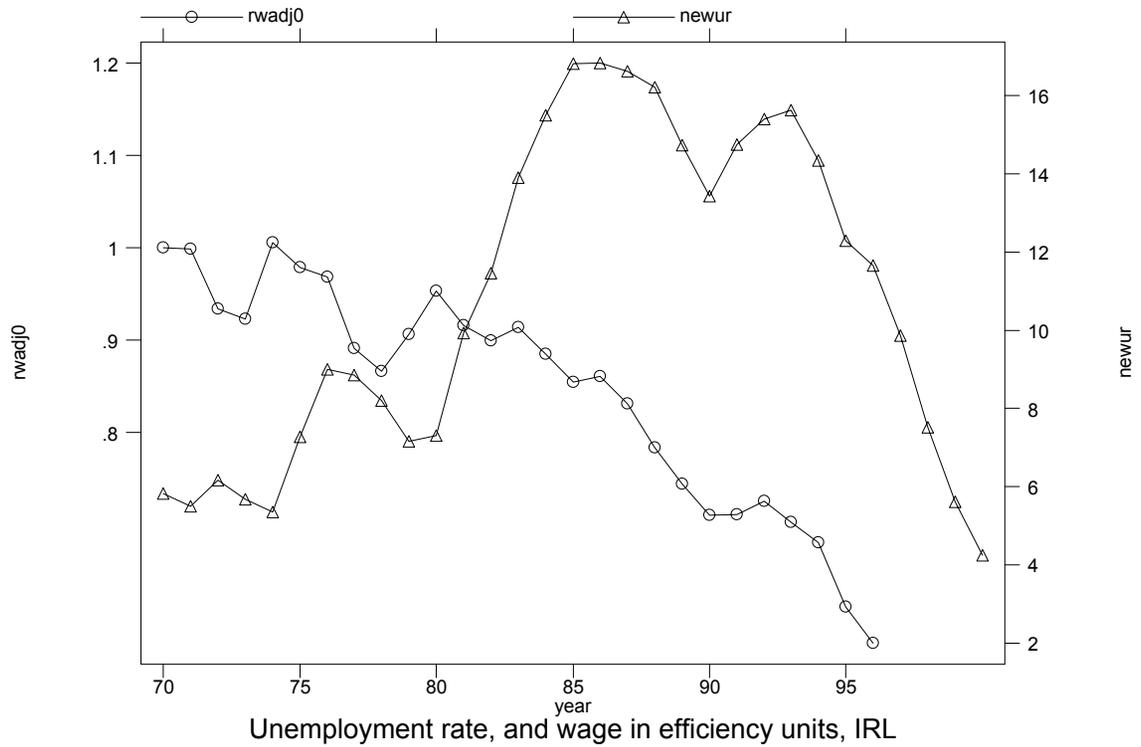
The figure shows the hump shape of unemployment—a steady increase from the early 1970s on, a peak in 1997, and a limited decline since then. It also shows an initial increase in the real wage per efficiency unit from 1970 to 1975, followed by a steady decline since then.¹⁸ By the mid 1980s, the real wage is back to its 1970 level, while the unemployment rate remains very high. Our model does not predict the initial increase in the real wage, but that increase is no great mystery: The presence of other shocks have been well documented, from the first oil price shock, to the decrease in productivity growth from the early 1970s on. What fits our story well is the steady decrease in wages from 1975 on, in parallel with the continuing increase in unemployment.¹⁹

Figures 9 and 10 turn to the two “miracle” countries, Ireland and the Netherlands. In both countries, the evolutions are striking: In Ireland, a sharp increase in unemployment to a peak of 17% in 1985 has been followed by an even sharper decline since then. In the Netherlands, an increase to

¹⁸Available evidence from a number of individual countries’ sources indicates that the decline has continued since 1997.

¹⁹Even leaving aside the “miracle countries”, those countries where unemployment has declined to very low levels, this aggregate picture hides a lot of heterogeneity across countries. Nearly all countries show however a pattern of wage moderation, and a hump-shaped, delayed, response of unemployment.





a peak of 10% in 1983 has also been followed by a steady decline.²⁰ And, in both cases, there has been strong wage moderation from the early 1980s on.²¹ These two unemployment miracles have clearly come with substantial wage moderation.

The patterns in Figures 8 to 10 are consistent with our hypothesis. They are obviously consistent with other hypotheses as well:

Take for example the coexistence of wage moderation and high unemployment. An increase in the cost of capital could generate the same pattern: If the cost of capital increases, the wage will have to decline just to maintain employment. If the wage declines, but by less than needed, unemployment will increase. The empirical evidence is that, indeed, the cost of capital moved substantially over the period in Europe, although not in a way which would, by itself, explain the joint evolution of wages and unemployment over the period.

Or take wage moderation itself. We have emphasized the role of learning

²⁰It is sometimes argued that this decline is a statistical illusion, reflecting a shift to part-time work, and hiding a high proportion of people on disability insurance. It is not. The increase in part-time work has come with an even larger increase in labor participation. And, while the proportion of people on disability insurance is indeed high, it has come down with unemployment. For more discussion, see Blanchard [2000], Lecture 1, and references therein. For a general description of the evolution of unemployment in the Netherlands, see Nickell and van Ours [2000] or Visser and Hemerijck [1997].

²¹The constructed wage series for Ireland overstates the degree of wage moderation in Ireland. The reason: Multinational companies have a strong tax incentive to shift profits to Ireland. The share of these (paper) profits in GDP has steadily increased through time, leading to an overestimate of output and productivity growth. However, even after eliminating these profits from output, the data still show strong wage moderation Blanchard [2002]. For more on this and on the Irish case in general, see Honohan and Walsh [2002].

by unions. But it could reflect in part weaker rather than smarter unions. Surely the effect of the Thatcher reforms on the U.K. labor market was to make the unions weaker, not necessarily smarter. Or wage moderation could reflect the effect of high unemployment itself on wage demands, rather than any change in attitudes. High unemployment surely has played a role, although this does not explain why, for example, the Netherlands still exhibits strong wage moderation despite a very low unemployment rate today. Indeed, in the case of the Netherlands, much informal evidence points to a change in the attitudes of unions as the main factor behind wage moderation: By the early 1980s, the large increase in unemployment led to a national agreement, known as the Wassenaar agreement, in which the unions recognized the need for wage moderation, and accepted wage moderation in exchange for a number of concessions from both firms and the state (in particular more generous early retirements and a shorter workweek.) Most observers agree that this agreement played a major role in the reduction of unemployment.²² Some researchers have argued for the importance of collective bargaining in achieving wage moderation in Ireland as well. The evidence is actually less convincing in that case: Labor mobility between Ireland and the United Kingdom, together with high productivity growth in Ireland and lower productivity and wage growth in the UK, seems to have been a more important factor in generating the fall in the real wage per efficiency unit over the period.²³

²²Lipset [2000] gives other examples of similar conversions either by unions or by social democratic and socialist parties: Australia in 1983, New Zealand in 1984, the United Kingdom in 1995, Spain in 1996, Portugal in 1996.

²³See Blanchard [2000]. In other words, this may be a case of weak unions, not necessarily smart unions.

4 Trust, learning, and the evolution of unemployment

Why did some countries have stronger wage moderation than others? Or, within the logic of our hypothesis, why did unions in some countries learn and adjust faster than in others?

One potential explanation is different paces of structural change. The logic behind this explanation was shown in the second simulation presented in the learning model in Section 2: A stronger adverse shock led to a larger initial increase in unemployment, but also to faster learning, and thus to a faster decline later. For lack of an obvious metric, the evidence in Section 1 on the pace of capital market integration does not speak clearly on this issue. Small countries experienced a smaller increase, but from a much higher level to start with. But it is not implausible that even a similar across-the-board increase in capital market integration might have a larger effect on small open economies. If so, this might explain in part the different evolutions of unemployment in small and large continental European countries.

Another potential explanation is differences in “trust” between labor and capital. It is again plausible that the higher the level of trust, the faster unions might learn and adapt to changes affecting firms. In the logic of our learning model, to the extent that firms can send additional signals, the more these signals are believed by workers, the faster learning will take place.²⁴

²⁴This assumes non strategic behavior on the part of firms. Strategic behavior has interesting implications as well: Think of a standard signalling model where firms want to convince workers that an adverse change has taken place, requiring wage moderation. To do so convincingly, they may need to cut employment (for example shift operations to another country) more than they would otherwise. The reason this convinces workers is the standard one in signalling models: Such an action only makes sense for firms if the adverse change has indeed taken place. Otherwise it would be too costly for firms to take

To explore this idea further, we construct a measure of trust, and look at its effect on unemployment, across time and countries. We proceed as follows.

First, we take as an (inverse) measure of initial trust the average level of strikes in the 1960s in each country. In general, the level of strikes is likely to depend on many factors beyond trust, from the level of unemployment, to the size of rents, to union power. For strikes to be a valid proxy for trust, we must assume that other factors were largely similar across European countries in the 1960s. This does seem plausible for the size of rents. And we shall show that our results are largely unaffected when controlling for initial union power (proxied by union coverage) and for initial unemployment rates.

Two measures of strike activity are available by country for each year for the 1960s. The first is the number of workers involved in strikes (WI), the second is the number of days lost to strikes (DL). They are highly but not perfectly correlated. Both give roughly similar results in the regressions below. In the results presented below, we use the following variable:

$$strike_i = \max\left(\frac{DL_i}{std(DL)}, \frac{WI_i}{std(WI)}\right)$$

This specification is motivated by the notion that recorded strikes happened for sure, but not all strikes are recorded, so that both measures are lower bounds on strike activity. Two more issues come up in the construction of the strike variable. The first is that two of the countries in the sample were dictatorships in the 1960s, Portugal and Spain. The wage explosion that took place in the two countries upon the end of the dictatorship suggests that the true measure of trust was in fact quite low in the 1960s. But we have no way to take this into account and drop both countries from the sample. The other is how to treat the years 1968 and 1969, where, in a

such an action.

number of countries, most notably France, Germany and Italy, there was high labor unrest, and unusually high levels of strikes. On the argument that these episodes reflected other factors than the one we want to capture, we construct our measure of strikes by using the mean only for the period 1960 to 1967 (Given that France, Germany and Italy are high unemployment countries, our results below would actually be stronger, were we to use the whole decade to construct the mean.)

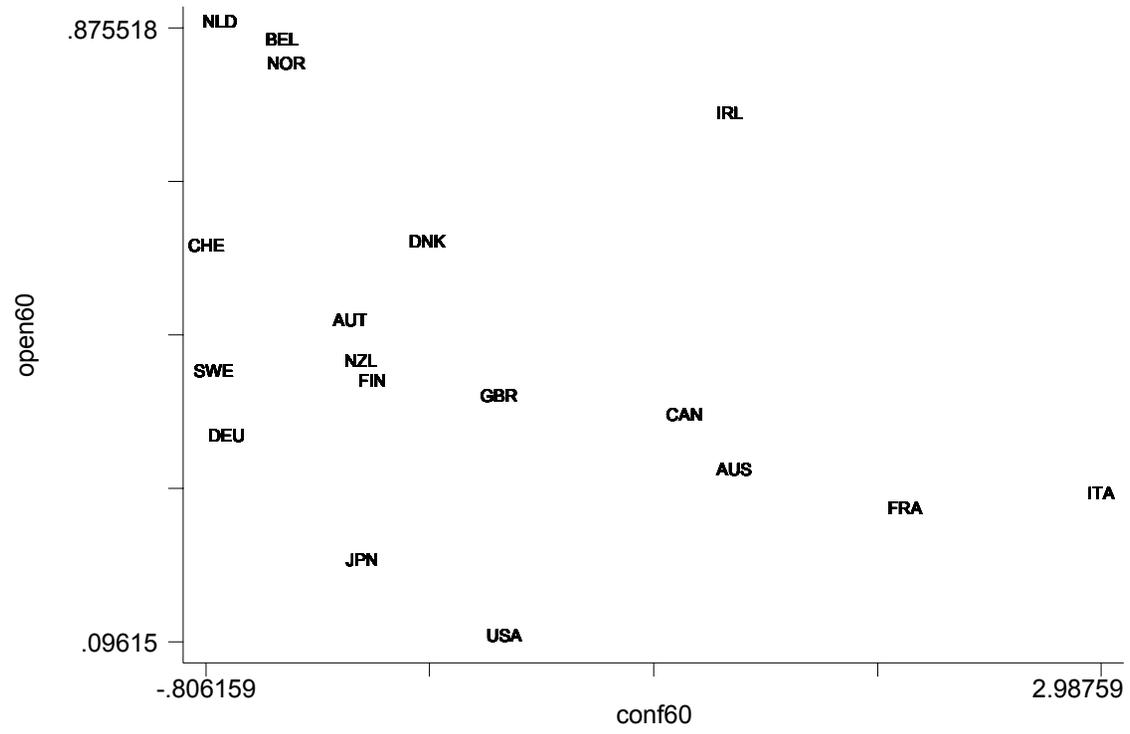
We then run the following panel data regression for the period 1965 to 1999:

$$u_{it} = \alpha_t + \beta_t \times strike_i + \gamma_t \times open_i + \varepsilon_{it}$$

In words: we regress the unemployment rate in country i in year t on a set of time fixed effects, a set of time fixed effects interacted with our trust variable, and a set of time fixed effects interacted with an openness variable, measured as the mean ratio of exports plus imports to GDP for the period 1960 to 1967 (these dates being chosen for symmetry with the dates used in the construction of the trust variable). Equivalently, one can think of this regression as a set of regressions, regressing in each year the unemployment rate across countries on a constant, trust and openness. The values of $strike$ and $open$ are plotted in the scatter diagram in Figure 11.

As a way of summarizing the results, we plot in Figure 12 the typical impact of our “trust” variable, $\beta_t \times std(strike_i)$ and our openness variable $\gamma_t \times std(open_i)$ on the unemployment rate.

- Openness is uncorrelated with unemployment until the mid-1970s. From then on however, more open countries tend to experience higher levels of unemployment and the impact becomes significant in the 80s and the early 90s. At the end of our sample period (1999), the effect turns negative. This is consistent with the outcome of the simulation



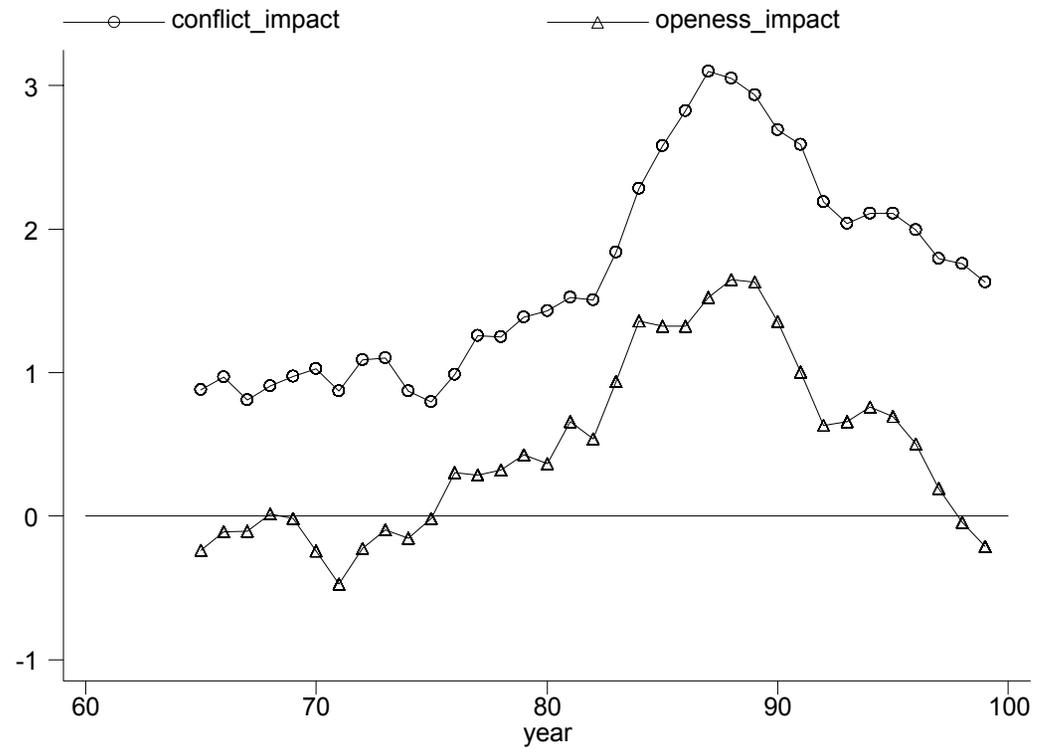
reported in Figure 7. Other things equal, it appears that more open economies had more of an increase in unemployment early on, and more of a decrease in unemployment later on.

- Turning to trust, countries with higher levels of strikes (a lower level of trust under our interpretation) have slightly higher unemployment rates in the 1960s, but the effect is not statistically significant. From the mid-1970s on however, the impact becomes very large and very significant (each of the t-statistics for the 1980s is between 2.6 and 4). At its peak in 1987, our proxy for trust can explain a difference of up to 9 points in the unemployment rates: $\beta_{1987} \times [\max_i(\text{strike}_i) - \min_i(\text{strike}_i)] = 9$.

The trust variable indeed has especially strong power in explaining differences across countries in the late 1980s. A cross country regression of unemployment rates in 1989 on the strike variable has an R^2 of 42%. Interestingly, openness by itself has no explanatory power ($R^2 = 1\%$ in a regression of unemployment on openness alone), but when combined with trust the R^2 (for 1989) jumps to 68%.

We have made a number of robustness checks of our results. We used *DL* and *WI* separately and together; this makes little difference to the results. We replaced openness by country size, interacted with time effects. Size is correlated with openness, but the data indicate that openness is what matters. We allowed for union coverage interacted with time effects (as the strike variable may reflect union power in addition to trust); When introduced in addition to the trust variable, it turned out not to be significant. Indeed, openness and trust are the only variables that we have found to be consistently significant.

We have also explored another measure of trust, the proportion of votes going to the communist party in the 1960s. The motivation comes again



from the current rhetoric of labor unions. Even today, the rhetoric of communist unions often resembles the “class struggle” view of relations between labor and capital presented in the introduction. In contrast, socialist and social democratic unions increasingly speak of the need for “partnership between labor and capital.” The contrast is striking for example in France, where the CFDT—the main socialist union—has established a working relation with the MEDEF—the business organization—while the CGT, the communist union, has largely kept its traditional positions. The relation between the strike proxy and this measure is shown in the scatter diagram in Figure 13. In effect, only three countries have a relatively high percentage of communist votes in the 1960s, France, Italy, and Greece. All the others have low percentages.²⁵ As France, Italy, and Greece have suffered from high and persistent unemployment, a regression using this measure of trust (interacted with time effects) gives roughly similar results to those described earlier. But the partition of countries is too rough to provide a satisfactory explanation of the cross country differences in the evolution of unemployment.

Our results that initial trust between labor and capital appears to explain a good part of the subsequent evolution of unemployment come with many caveats. Nevertheless, we believe they capture something important, about the attitude of unions, and the way in which they determine the effects of shocks on the economy.²⁶

²⁵In many countries, the percentage was relatively high in the aftermath of World War II, but had declined substantially by the early 1960s.

²⁶Pierre Fortin has suggested to us another fascinating example, the difference between the evolution of unemployment in Ontario and Quebec. The comparison is interesting as both provinces share many of the same institutions. Unemployment in Quebec increased much more than in Ontario, and turned around later. Fortin suggests that the fact that

5 Relation to the literature, and conclusions

In Blanchard and Wolfers [2000], one of the authors suggested that the only way to understand both the time series and cross-country evolutions of unemployment in Europe was by focusing on the interaction of shocks and institutions. The hypothesis we have developed in this paper fits well under this (admittedly rather generous) umbrella:

- Past research has focused on a number of shocks, from the slowdown in productivity growth from the early 1970s on, to movements in the price of oil in the mid and late 1970s, to movements in the cost of capital (Phelps [1994]) (low in the 1970s, higher in the 1980s, high in the 1990s), to increases in the pace in reallocation (Ljungqvist and Sargent [1998]).

We add to this list what we see as another important shock: structural changes in product and financial markets, in particular increases in capital mobility, both within and across countries. And the type of learning dynamics we focus on here clearly applies to other shocks as well: For example, it surely took some time for European economies to realize that the 30-year post-war period of high productivity growth had come to an end.

Indeed, our argument extends straightforwardly to another type of shock, namely biased technological progress. A number of authors have argued that, either for exogenous reasons (reasons having to do with the nature of technological progress itself), or endogenous reasons

labor in Quebec is typically French speaking and Catholic, whereas capital is often Anglo and Protestant led to worse labor relations and is an important part of the explanation (In Ontario, both capital and labor are Anglo and Protestant). For more on the evolution of unemployment in Quebec, see Fortin [2001].

(decisions by firms to develop new technologies in order to use or save on a specific factor; see Acemoglu [2002]), technological progress may have become increasingly labor saving during that period (see for example Piketty [1998]). One can think of such endogenous technological progress as leading, in effect, to an increase in the long run elasticity of labor demand. So, to the extent that such technological change was at work, the argument we developed in our paper applies directly: If unions were slow to understand the change, this can plausibly explain first the increase, and then the more recent decline in unemployment.

- Past research has focused on a number of institutions, and their interactions with shocks: Ljungqvist and Sargent [1998] have looked, for example, at the interaction between the structure of unemployment benefits and higher turbulence; Blanchard [2000] (Lecture 3) has looked at how institutions such as employment protection which generate long individual unemployment duration, affect the dynamic effects of adverse shocks to labor demand.

The crucial institution in our paper is collective bargaining. But so are the attitudes of the unions, and the role of learning and trust: We have no doubt that most of the decrease in unemployment in the Netherlands for example must be traced to a change in attitudes, rather than to specific labor market reforms. This suggests a broader definition of “institutions” than is standard.

Indeed, even our definition may still not be broad enough. While we focused on unions, it is clear that the same process of learning has taken place in the larger political sphere—again with clear differences across countries. Some communist parties have retained much of the old rhetoric, some have evolved. Some socialist parties have become social–democratic parties, and now talk of partnership. Some are more schizophrenic. Thus, at some level, what is relevant is societal atti-

tudes, not just union attitudes. And this points to a more complex political game than the simpler model of bargaining we focused on in our paper, a game in which not only unions, but also the median voter, determine the outcome: In 1979, voters in the UK elected Margaret Thatcher, over the strong opposition of unions. She then proceeded to drastically reduce the power of unions. At roughly the same time, in 1981, voters in France elected a socialist President, Francois Mitterand, who initially pursued traditional socialist policies, until being forced two years later to change and adopt more capital-friendly policies.

- The line of research most closely related to ours is that of Caballero and Hammour (in particular Caballero and Hammour [1998b], Caballero and Hammour [1998a]). Under our hypothesis, unemployment dynamics come from the attempts from unions to preserve rents in the face of structural change. Under their hypothesis, unemployment dynamics come from the attempts by unions to appropriate more of the rents, starting in the late 1960s. Those attempts, Caballero and Hammour argue, are what led to the decrease in capital accumulation and employment over time.

The complete story surely has an element of both: The labor unrest in the late 1960s, and the increase in the real wage per efficiency unit in the early 1970s we documented earlier, suggests that part of the initial increase in unemployment was indeed due to a “wage push” rather than to insufficient wage moderation in the face of structural change. And there is also no question that some of the institutional changes which took place in the 1970s and 1980s, from higher unemployment benefits, to stronger employment protection, had the effect of decreasing profit, capital accumulation, and employment. Indeed, this suggests an important extension to our hypothesis. As unions

learned of the structural change, this did not necessarily lead them to accept more wage moderation. Instead, in many cases, their reaction was to try to limit the decrease in employment, at least in the short run, for example through the passage of stronger employment protection legislation. The current legacy of these actions may therefore be a combination of wage moderation, but worse labor market institutions.

This takes us to the implications of our hypothesis for the future. Our analysis leads us to be relatively optimistic. As learning takes place, increased capital mobility, and higher product market competition, are likely to lead to a continuing decline in unemployment. Achieving low unemployment however will also require reforms of some labor market institutions; these are also—slowly—taking place.

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