Intertemporal Effects of Deregulation

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A seminar work for Dynamische Makrotheorie based on Blanchard and Giavazzi's *Macroeconomic Effects of Regulation and Deregulation in Goods and Labor Market*.

Contents

1 Motivation

High unemployment figures are pressing for political reform all over Europe. A look in the Economist [1] quickly shows the current agenda of economic policy.

> At each of their recent gatherings, the world's finance ministers have repeated a *to-do* list: raise savings in America, particularly by cutting the budget deficit; *boost Europe's growth potential through structural reforms*; and shift East Asia away from its addiction to exports through exchange-rate adjustment, particularly in China.

Structural reform, in this context, is all about market regulations or deregulation. Looking for growth potentials, in regulated Europe, someone can hardly mean something else then deregulation.

But are people ready for deregulation? From the same issue:

> "The German government said it would introduce a federal minimum wage to combat low-cost competition, especially from its eastern neighbours."

Surely the Economist questions "how a minimum wage can help Germany's 5m unemployed." Reading about France [2] supports the same picture.

> "The French came to see [the European constitution] as a means for the EUs bureaucrats and other member countries to impose Anglo-Saxon free-market policies on France. So, voting *non* supposedly came to mean voting to protect French jobs, employment rights and social benefits against competition from low-cost, low-tax, deregulated countries, including the EUs new eastern members."

The public opinion, and therefore politics, is still in favor of regulation instead of deregulation. At least when the topic reaches there own employment. This pressure for *fairness*keeps the most developed countries increasingly regulated.

Milton Friedman was not the last to remind that frequently, regulation brought in with fairness in mind, leads to the opposite result.

He summed up the issue of regulation in this ironic but true sentence from [Fried62].

> "The government solution to a problem is usually as bad as the problem."

Intertemporal tradeoff is the core issue at stake. It's natural to assume people preferring consumption, wage and employment today over tomorrow. As every politician can attest, people want employment and higher wages today, not in the next legislation period.

Unfortunately the model developed by Blanchard and Giavazzi [BlGi03] and reviewed in this seminar work confronts people with exactly this tradeoff.

2 The Model

Utility is based on consumption. Consumption is based on wages and wages are bargained in the labor market. Wages determine a firms profits and, due to competition, in the long run those profits must cover *entry costs*[1].

The key exogenous variables or (de)regulation are *entry costs* c and the *bargaining power of workers* β.

Prices and the unemployment rate are endogenous explained by the model.

In a Nutshell: Deregulation in the labor market, i.e. a decreasing β yields lower wages and possible higher unemployment in the short run. Truly a negative effect for workers. However, in the long run those higher profits for firms (possibly together with a deregulated c) will attract new firms to enter the market.

Increased competition will drive the number of products up, prices and unemployment down and should bring real wages back to the level before deregulation.

Indeed a strong intertemporal tradeoff!

Key Assumptions of Blanchard and Giavazzi's model:

- Monopolistic competition in the good market, which determines the size of rents going to firms and their workers.
- Bargaining in the labor market, which determines how much of the rents go to firms, and how much to their workers.
- Time is divided in two periods: The *short run*, defined as the time over which the number of firms is taken as given. And the *long run*, defined as the time over which the number of firms is endogenous, determined by entry condition.

[1] The cost to enter a market. Determined among other things by administrative restrictions on entry.

2.1 The Short Run

There are L workers/consumers, indexed by j. In each period, worker j has a utility function given by:

$$V_j = (m^{\frac{-1}{\sigma}} \sum_{i=1}^{m} C_{ij}^{\frac{\sigma-1}{\sigma}})^{\frac{\sigma}{\sigma-1}} \tag{1}$$

Elasticity of substitution σ, first assumed constant in the short run as in [DixitStiglitz77], is in the long run increasing in m (the number of products).

Note that this utility function does not include a negative related influence of work. Which means that everybody truly wants to work, as long as his wage is higher than his non-labor income (i.e. unemployment benefits). To make this work, the model limits the choice to being employed or unemployed (no part time jobs).

The budget constraint of worker j makes this explicit:

$$\sum_{i=1}^{m} P_i C_{ij} = W_j N_j + P f(u)(1 - N_j) \tag{2}$$

Spending on consumption, left side of (2), is equal to labor income W_i if the worker works ($N_i = 1$), and to non-labor income $Pf(u)$ if he does not ($N_i = 0$).

The wage equivalent being of unemployed is taken to be a decreasing function of the unemployment rate, $f(u)$ i.e. $f'(.) < 0$.

As Blanchard and Giavazzi put it: *The wage equivalent of being unemployed is taken to be a decreasing function of the unemployment rate, $f(u)$. This simple shortcut captures the notion that higher unemployment makes it more painful to be employed.* Another interpretation could be that the more people are unemployed the harder it is for the government to support them.

The price index P is in matching form given by:

$$P = (\frac{1}{m} \sum_{i=1}^{m} P_i^{1-\sigma})^{\frac{1}{1-\sigma}} \tag{3}$$

Each period, firms bargain with L/m workers. The bargaining in the labor market determines the distribution of surpluses for the workers and surpluses for the entrepreneurs as shown in Figure 1.

Assuming symmetric consumption ($C_{ij} = C_j/m$), equation (1) and (2) can be simplified to the *surplus of working* for worker j:

$$(W_j - P f(u)) N_j \tag{4}$$

While the entrepreneur of firm j makes a surplus equal to

$$P_j Y_j - W_j N_j \tag{5}$$

For selling the output Y_j at a price P_j and paying wages W_j for employment N_j. The production function of firm j is simply

$$N_j = Y_j \tag{6}$$

Which allows simplification of equation (5) to $(P_j - W_j)N_j$.

2.2 Nash bargaining

Blanchard and Giavazzi assume Nash bargaining as in [Nash50] and [McSo81].

Firm i and worker i bargain about wage and employment so as to maximize the (log) utility of their combined surpluses.

$$\beta \log((W_i - Pf(u))N_i) + (1 - \beta)\log((P_i - W_i)N_i) \tag{7}$$

As found in [Myer91], a *Nash bargaining solution* requires Pareto efficiency i.e. that neither worker nor firm should get less in the bargaining solution than he could get in disagreement.

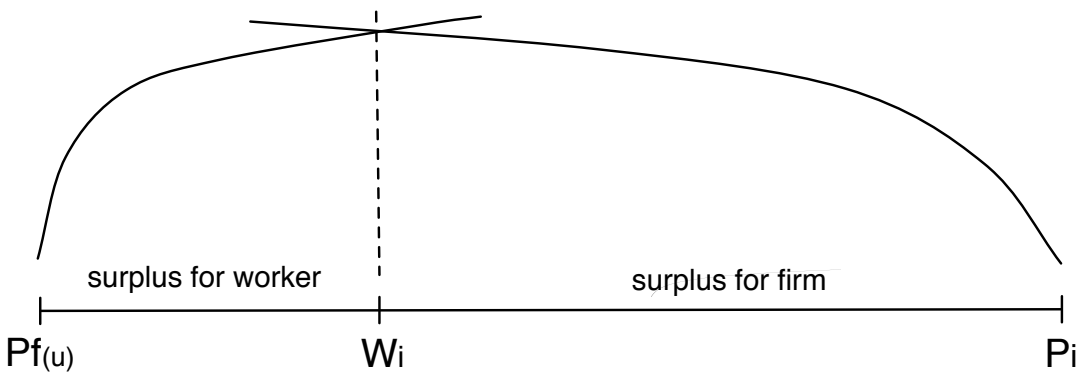

Figure 1: Distribution of surplus between worker and firm with $\beta = 0.3$

The wage W_i moves between $Pf(u)$ and P_i based on workers bargaining power β.

At the left side of Figure 1, $W_i = Pf(u)$, we see the reservation wage of the worker. I.e. the lowest wage which makes him better of then not working at all. Equivalently on the right side, $W_i = P_i$, we find the reservation wage of the firm. The highest possible wage it could offer without losing money.

The bargaining outcome of wage W_i depends on the bargaining power β. If firms are better bargainers than workers, $\beta = 0.3$ as in Figure 1, there surplus would be higher.

With this assumption known as (privately) "efficient bargaining" Blanchard and Giavazzi make room for the fact that, stronger workers (a higher β) may be able to obtain higher wages without suffering a decrease in employment (at least in the short run).

An important part is the relaxed link between the wage and the marginal revenue product of labor(MRP).

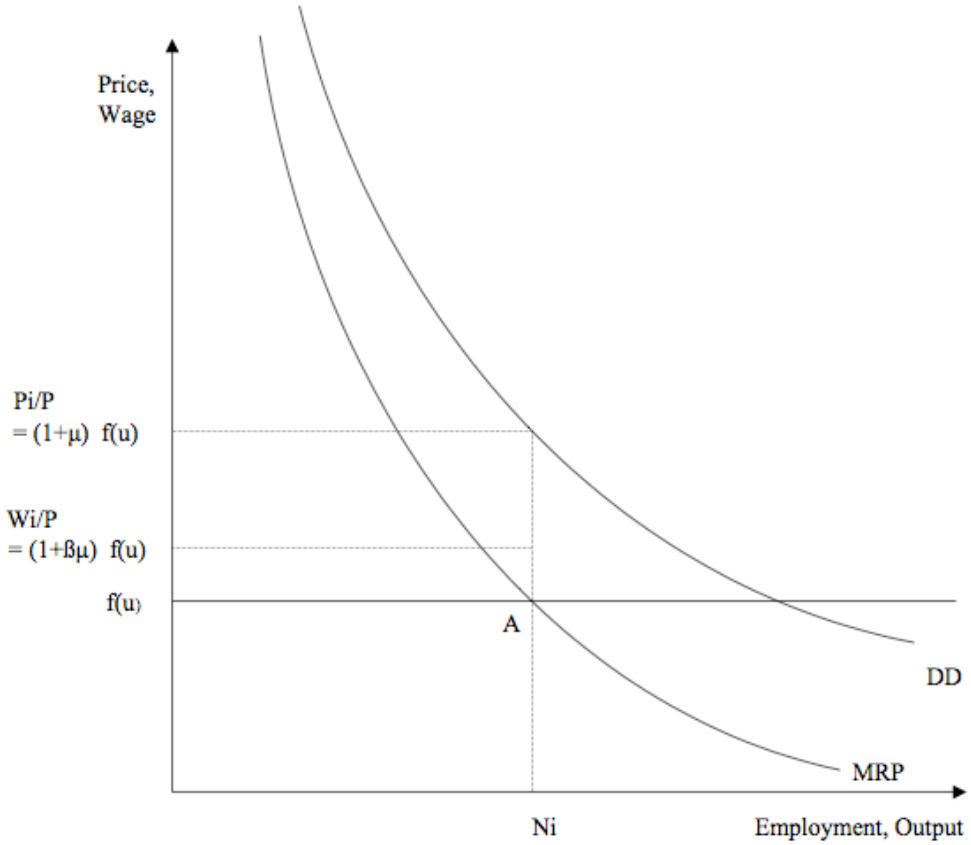

Figure 2: Partial Equilibrium from [BlGi03]

Ad Figure 2: Starting with the reservation wage, drawn as the horizontal line at $f(u)$, we find the efficient level of employment at the intersection with the marginal revenue product curve, at Point A. With the associated level of employment N_i.

The demand curve DD is given by

$$Y_i = \frac{Y}{m}(\frac{P_i}{P})^{-\sigma} \tag{8}$$

Using the production function $Y_i = N_i$ and setting N_i from Point A we can derive the price P_i/P for good i in the demand curve.

The same results we found graphically can be found from the formal derivation.

Maximizing the Bargaining function: Taking Y, P and the unemployment rate u as given, firm i and the workers associated with firm i choose employment N_i, the price P_i and the wage W_i.

This is done by maximizing equation (7).

$$max : \beta \log((W_i - Pf(u))N_i) + (1-\beta)\log((P_i - W_i)N_i)$$

Inserting (8) and (6) gives

$$max : \beta \log\left[(W_i - Pf(u))\frac{Y}{m}\Big(\frac{P_i}{P}\Big)^{-\sigma}\right] + (1-\beta)\log\left[(P_i - W_i)\frac{Y}{m}\Big(\frac{P_i}{P}\Big)^{-\sigma}\right]$$

After differentiation and solving for W_i and P_i we get:

$$W_i = -\frac{f(u)P - f(u)P\beta - f(u)P\sigma}{-1+\sigma}$$

$$P_i = \frac{f(u)P\sigma}{-1+\sigma}$$

Choosing $\mu(m) = \frac{1}{\sigma - 1}$, the markup of the relative price over the reservation wage, leads to the same result as given by Blanchard and Giavazzi and shown in Figure 2.

The relative price P_i/P and the wage in terms of the consumption basket W_i/P.

$$\frac{P_i}{P} = (1 + \mu(m))f(u) \tag{9}$$

$$\frac{W_i}{P} = (1 + \beta\mu(m))f(u) \tag{10}$$

Summarizing (9) and (10) (as in [BlGi03]):

- The higher β, the higher the proportion of rents going to workers. And because the reservation wage is unaffected, the increase in the wage has no effect on employment.
- The higher $\mu(m)$, the higher the real wage. The firm receives larger rents, of which some proportion goes to the workers in the form of a higher real wage.

Finding the general Equilibrium: Under the symmetric assumption, all prices must be equal in general equilibrium. Setting $P_i/P = 1$ in equation (9) implies:

$$1 = (1 + \mu(m))f(u) \tag{11}$$

In the short run, the number of firms m is given, so is $\mu(m)$. Reforming (11) yields $f(u) = 1/(1 + \mu(m))$. Which inserted in (10) gives:

$$\frac{W_i}{P} = \frac{1 + \beta\mu(m)}{1 + \mu(m)} \tag{12}$$

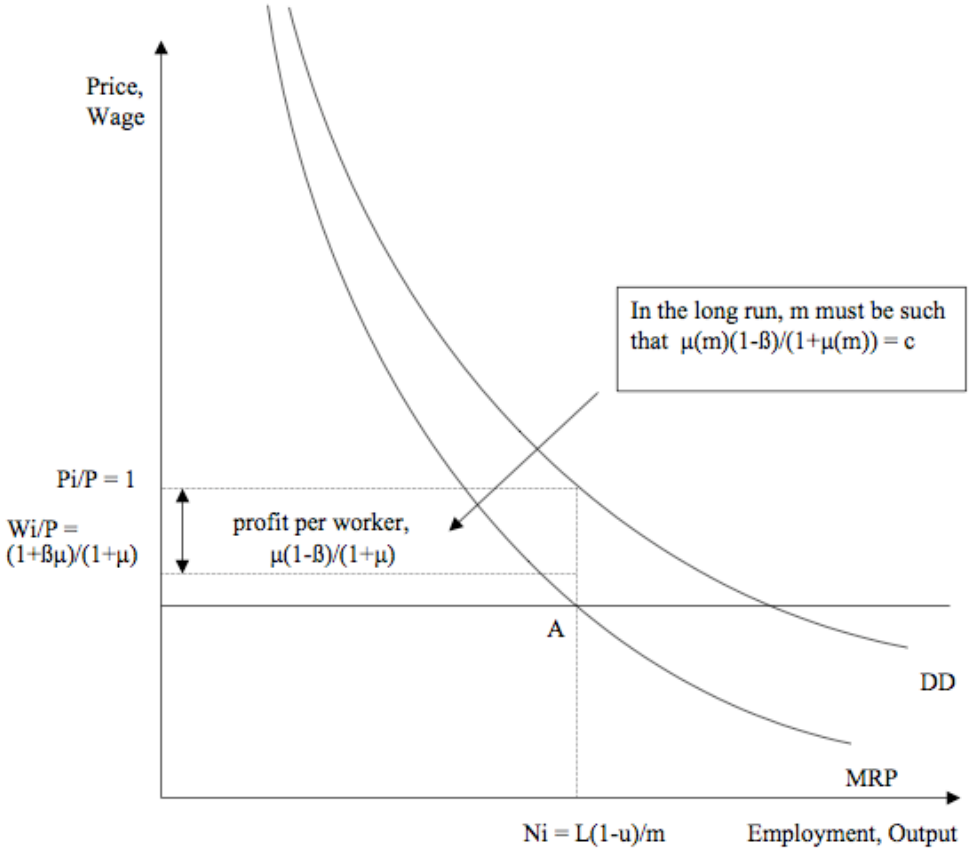

Figure 3: General Equilibrium from [BlGi03]

The general equilibrium is shown in Figure 3. It is basically a replication of Figure 2. Equilibrium is still at point A. But now, the relative price must be equal to 1. Given that the relative price is a markup over the reservation wage, and given that the markup is fixed in the short run, this

condition determines the reservation wage, and in turn the equilibrium level of unemployment.

The real wage has now changed to be a *decreasing* function of $\mu(m)$. Because there is now an additional effect from the general equilibrium. Namely the effect of increasing prices on the real wage (the term in the denominator in the right side of equation (12)).

In Blanchard and Giavazzi's words: *workers gain as workers, but lose as consumers*. Because, as workers, they only get a proportion β of the rents, but as consumers they lose the full value of $\mu(m)$.

$$\beta \downarrow \Rightarrow W_i \downarrow$$

2.3 The Long Run

In the long run rents of firms, $P_i/P - W_i/P$ and c determine entry or exit of firms. In the long run entry costs[2] must equal rents.

$$c = \frac{P_i}{P} - \frac{W_i}{P} = 1 - \frac{1 + \beta\mu(m)}{1 + \mu(m)} = \frac{(1-\beta)\mu(m)}{1 + \mu(m)} \tag{13}$$

Transform yields

$$c = \mu(m) - \beta\mu(m) - c\mu(m)$$

$$\mu(m) = \frac{c}{1 - \beta - c} \tag{14}$$

Inserting $\mu(m)$ in (11) yields

$$1 = (1 + \mu(m))f(u) = (1 + \frac{c}{1 - \beta - c})f(u) \tag{15}$$

Unemployment in the Long Run from (15)

$$f(u) = \frac{1}{1 + \frac{c}{1-\beta-c}} = 1 - \frac{c}{1-\beta} \tag{16}$$

As introduced at the beginning of section 2.1, $f(u)$ has a negative relation to unemployment. In other words deregulation, i.e. a decrease in β and/or in c, will decrease the unemployment rate.

$$\beta \downarrow \Rightarrow f(u) \uparrow \Rightarrow u \downarrow$$

$$c \downarrow \Rightarrow f(u) \uparrow \Rightarrow u \downarrow$$

[2]The market should take care of this.

Wages in the Long Run are derived by inserting $\mu(m)$ from (14) in (12):

$$\frac{W_i}{P} = \frac{1+\beta\mu(m)}{1+\mu(m)} = \frac{1+\beta\frac{c}{1-\beta-c}}{1+\frac{c}{1-\beta-c}} = 1-c \tag{17}$$

Productivity is equal to one. Firms must receive c per unit in order to cover entry costs. The real wage therefore must be equal to $1-c$.

$$c \downarrow \Rightarrow \frac{W_i}{P} \uparrow$$

As promised at the beginning, in the long run real wages will not decrease with β.

3 Political Economy: Or why people oppose deregulation

This model presents two critical results in regard to political economy. The first is the intertemporal tradeoff in the labor market and the second is sector dependencies in the market for goods.

Deregulation in the labor-market ($\beta \downarrow$) leads to lower wages in the short run and increases the possibility of unemployment in the long run (for people already employed in the short run).

The higher risk for people already employed losing there job, comes from the assumption that firms are more likely to keep workers already employed than *higher and fire* in every period. Deregulation, especially with a decrease in entry costs ($c \downarrow$), leads to more competition. Facing "old" firms with lower profits and pressure on reducing jobs.

Only, people already unemployed truly gain from higher chances of finding jobs and higher unemployment wages in the long run.

Deregulation in the market for goods should result in clear advantages to the consumers (=workers). True, they lose some of there wage surplus, due to less surplus to share between worker and firm. But this should be more than compensated by cheaper (and better) goods as a result from higher competition. But there is a risk of sector dependencies. Like with neighboring effects, one sector wins from deregulating the other. But loses from deregulating his own. Quickly everyone will point to the next. Stopping deregulation at all.

Pressure for still higher regulation frequently comes from within a sector. Accountants remind government about the high risk of bad accounting and ask for better (higher) regulation. Pressing the government to pass a new law, say the *Sarbanes-Oxley Act* ($c \uparrow$), which leads to windfall profits for accountants. Surely those enormous costs for firms will fall back to workers (and consumers). An even "better" deal comes from regulating directly who can do business in a sector (again $c \uparrow$). Those entrance requirements are frequently set and checked by the very group of people facing the competition in the next period. After all, who knows more about accounting than accountants?

4 Conclusion

Blanchard and Giavazzi show the intertemporal tradeoff in deregulation. Positive long run effects on employment are beaten by a short run negative effect on wages. But it misses the intertemporality in the consumer preference. People prefer consumption today over tomorrow, there opposing to deregulation may indeed be very rational. Blanchard and Giavazzi hint to this shortcoming but successfully focus on the most simple but critical elements on this issue.

A Definition of Deregulation from *The Economist*:

> Cutting red tape. The process of removing legal or quasi-legal restrictions on the amount of competition, the sorts of business done, or the prices charged within a particular industry. During the last two decades of the 20th century, many governments committed to the free market pursued policies of liberalisation based on substantial amounts of deregulation hand-in-hand with the privatisation of industries owned by the state. The aim was to decrease the role of government in the economy and to increase competition. Even so, red tape is alive and well. In the United States, with some 60 federal agencies issuing more than 1,800 rules a year, in 1998 the Code of Federal Regulations was more than 130,000 pages thick. However, not all regulation is necessarily bad. According to estimates by the American Office of Management and Budget, the annual cost of these rules was $289 billion, but the annual benefits were $298 billion.

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