



BANK OF ENGLAND

# Speech

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## **Comments on a paper by Rachel Griffith and Rupert Harrison “The Link between Product Market Reforms and Macro- Economic Performance”**

Comments given by

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[Accompanying slides](#)

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## **1. Introduction**

There is now a large literature on the issue of product market regulation and macroeconomic performance and this paper by Rachel Griffith and Rupert Harrison (GH) makes a significant contribution (for a survey, see Schiantaralli, 2005). The strategy used by GH is first to relate product market reforms to a measure of the mark-up of price over marginal cost and second, to relate this to various performance measures. At some points, the two steps merge and, for a variety of reasons, measures of product market regulation are allowed to impact directly on performance.

The results are quite complicated but by and large, product market reforms which reduce rents are associated with increased levels of employment and investment but are associated with lower levels of labour productivity and TFP. Furthermore, reductions in rents tend to be associated with reductions in R and D and productivity growth rates. These are based on time series correlations. However, the cross-section correlations tend to tell the opposite story with regard to the latter results, although these are liable to be corrupted by omitted variable bias. On the other hand, as the authors note, some of the time-series results must also be treated with caution because identifying changes in trend productivity growth rates from 15 years of data is always going to be problematic. Some more specific points follow.

## **2. The Basic Model**

The underlying model used by GH has the following structure. Omitting the time and country subscripts, as well as intangible capital, we have

$$Y = Af(K, L) \quad (1)$$

where we also suppose neutral technical progress. With imperfect competition, profit maximisation implies

$$Af_L(K, L) = \mu W / P \quad (2)$$

where  $\mu$  is the price mark-up on marginal cost. So, given a static model and assuming constant returns, labour demand will satisfy

$$L = Kg(\mu W / PA), g' < 0 \quad (3)$$

So how might one specify a “reduced form” employment equation which can be used to analyse the impact of  $\mu$  on  $L$ ? We may use a long-run wage equation (or labour supply function) which has the form

$$\frac{L}{\Pi} = g_1(W / P, Z_w) \quad (4)$$

where  $Z_w$  are all the wage pressure factors (eg. benefits, unions, labour taxes etc.) and  $\Pi$  is the population of working age or the labour force. Eliminating  $W/P$  gives a function of the form.

$$L = \Pi h(A / \mu, K / \Pi, Z_w) \quad (5)$$

The key points revealed by this analysis are first, employment in each country is driven by the population of working age and second, it is

essential to control for all the  $Z_w$  variables. An example of such an equation may be found in Haffner et al. (2000).

I go through all this, because it is now plain that the employment equations estimated in Table 10 omit numerous variables, since they only contain the mark-up,  $\mu$ , the output gap and country and year dummies.

Turning to investment, the model implies that in the long run, the capital stock satisfies

$$K = g_2(C\mu/AP)Y \quad (6)$$

where  $g_2' < 0$ ,  $C$  is the cost of capital. This kind of model suggests an investment equation of the form

$$I = \alpha_0 - \alpha_1 \ln(C/P) - \alpha_2 \ln(\mu/A) + \alpha_3 \Delta \ln Y^e$$

with plenty of dynamics to be added. The expected growth of output would depend on monetary and fiscal policy as well as trend terms such as  $\Delta \ln \Pi$ . Again, it is not clear that the equation estimated in Table 11 will capture all the relevant variables.

Turning to the productivity models, it is best to start from the production function. In logs we might have

$$y - \ell = \beta(k - \ell) + a + \text{skill mix, hours, cycle, dynamics} \quad (7)$$

Then we might specify  $a$  as  $(\beta_0 + \beta_1\mu) + (\beta_2 + \beta_3\mu)t$ ,  $a$  now being trend TFP. Taking differences gives

$$\Delta(y - \ell) = \beta\Delta(k - \ell) + \Delta a + \Delta\text{skillmix}, \Delta\text{hours}, \Delta\text{cycle}, \Delta\text{dynamics} \quad (8)$$

where  $\Delta a$  is  $\beta_1\Delta\mu + \beta_2 + \beta_3\Delta(\mu t)$ .

Several points are worth noting. First, it is a good idea to make the levels equation, (7), consistent with the growth equation, (8). This is not the case with the equations estimated in Tables 15, 16, 17, 18, for example. Second, some estimates of skill mix would be helpful. Data on the education composition of the working population or population of working age are available. This might help with both the cross-section and the time series models. Third, annual hours worked per worker are crucial and have differing trends across countries. Thus, from 1983 to 2000, in France, Germany, Italy, Netherlands, average hours worked per annum by workers fell by around 0.5% per annum, by around 0.2% per annum in Scandinavia, by around 0.1% per annum in the UK and by even less in the US. Finally, how might  $\mu$  be specified in the equations determining  $a$  and  $\Delta a$ ? Since they should capture the impact of  $\mu$  on trend TFP, a long distributed lag will probably be required given the length of time trend productivity growth rates would take to adjust. Indeed, it seems quite implausible that we can detect significant changes in trend TFP growth over a short time series. Personally, I would be extremely sceptical about detecting the impact of changes in  $\mu$  on changes in trend TFP growth in 15 time periods.

### **3. Other Points**

- i) My guess is that the demand boom and collapse in the early 90s in Finland will tend to dominate Finnish data, making it very difficult to identify non-cyclical relationships.
- ii) Across the OECD, there has been a substantial fall in long-term real interest rates from the 1980s to the late 1990s, with a concomitant effect on the cost of capital. Given that rents are defined in GH using a constant cost of capital, this implies that the true mark up will tend to fall relative to the measured mark-up over this period.
- iii) Better to replace unemployment rates in Fig. 6 by employment rates since these are what generates the differences between GDP per capita and GDP per worker.
- iv) On pp.8-9, best to distinguish carefully between productivity and productivity growth.
- v) The  $R^2$  values in Table 9 are significantly affected by the country and year dummies. They do not necessarily imply that the variables make good instruments (p.66).
- vi) The Alesina et al. (2003) paper is not in the references.

### **4. Summary**

The GH paper makes a significant contribution to the expanding literature on product market regulation and macroeconomic performance. Points

include first, the employment and investment equations in GH are not really consistent with the underlying theoretical framework, so it is not clear how the estimated equations can be interpreted. Second, the productivity equations are not really consistent with the underlying production function. Third, lack of control for the substantial time series and cross-section variations in hours worked per worker per annum and the education mix may undermine some of the results. Finally, the rents are calculated using a constant cost of capital despite the substantial falls in long-term real interest rates over the sample period.

## References

- Haffner, R. C. G., Nickell, S. J., Nicoletti, G., Scarpetta, S. and Zoega, G. (2000), "European Integration, Liberalisation and Labour Market Performance" in G. Bertola, T. Boeri, and G. Nicoletti (eds.), Welfare and Employment in a United Europe, (Cambridge MA: MIT Press).
- Schiantarelli, F. (2005) "Product Market Regulation and Macroeconomic Performance: A Review of Cross-Country Evidence" IZA Discussion Paper No.1791, October.