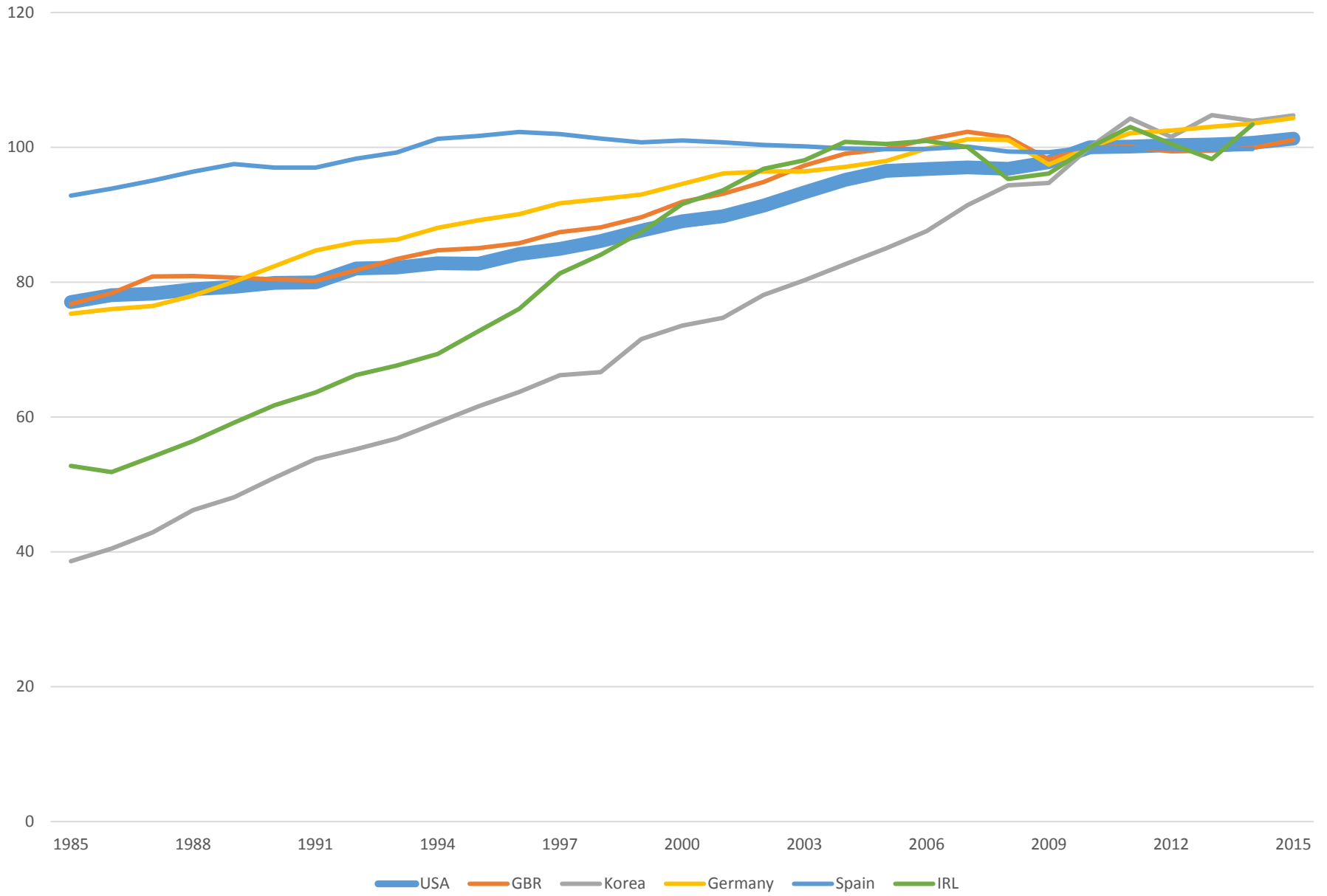


The drivers of productivity growth over the last 15 years

Diego Comin
Dartmouth College

TFP level



Pre-2000s

- Failure to converge in some countries
- Tied to difficulties to adopt new technologies
- However, TFP growth in Germany, UK and US similar

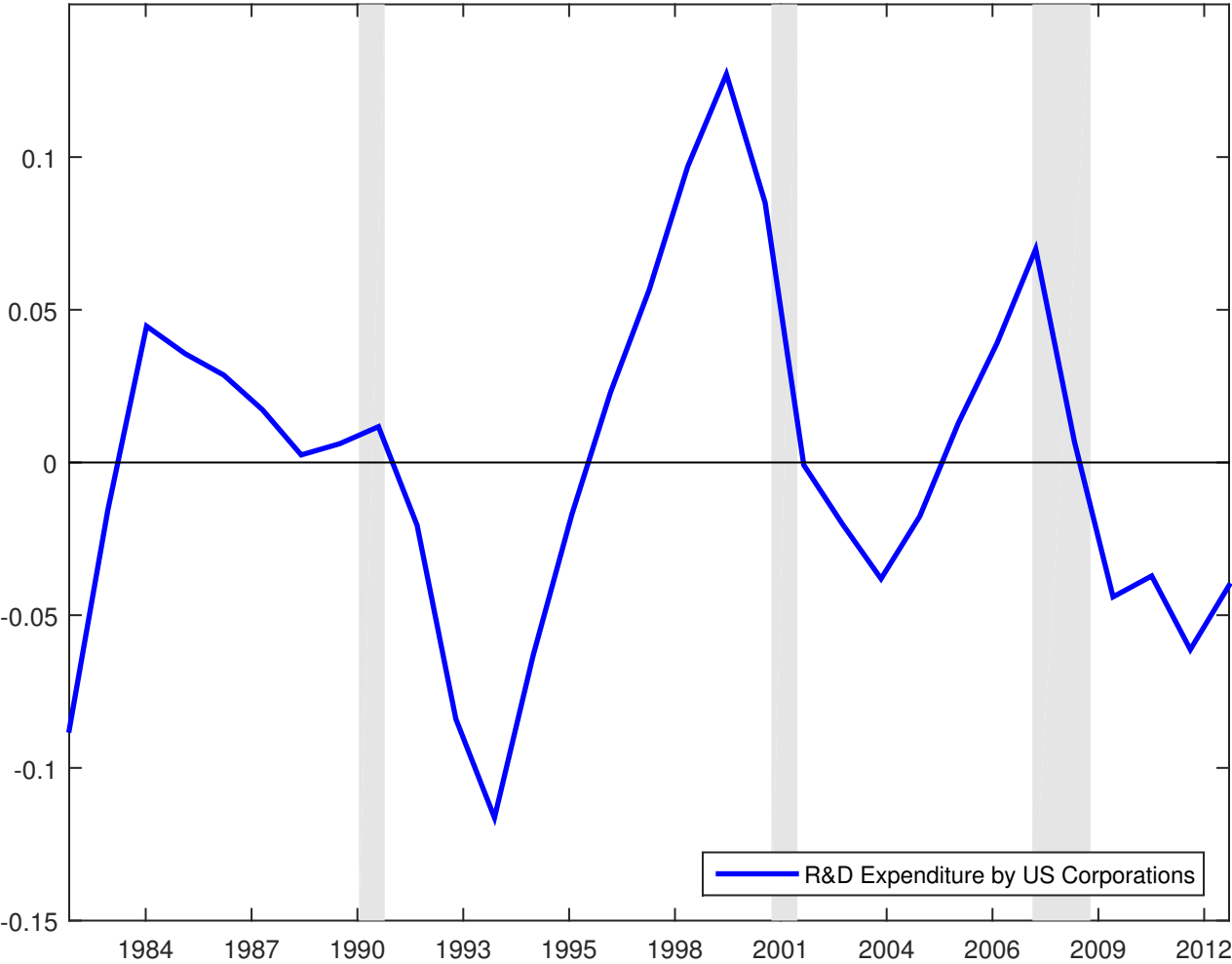
Why is there a slowdown in productivity post-2000s?

- Two hypotheses:
 - Bad luck: Slowdown in productivity for reasons others than the financial crisis
 - Endogenous response to business cycle conditions:
 - Reduction in innovation activity and in investments to bring in new technologies

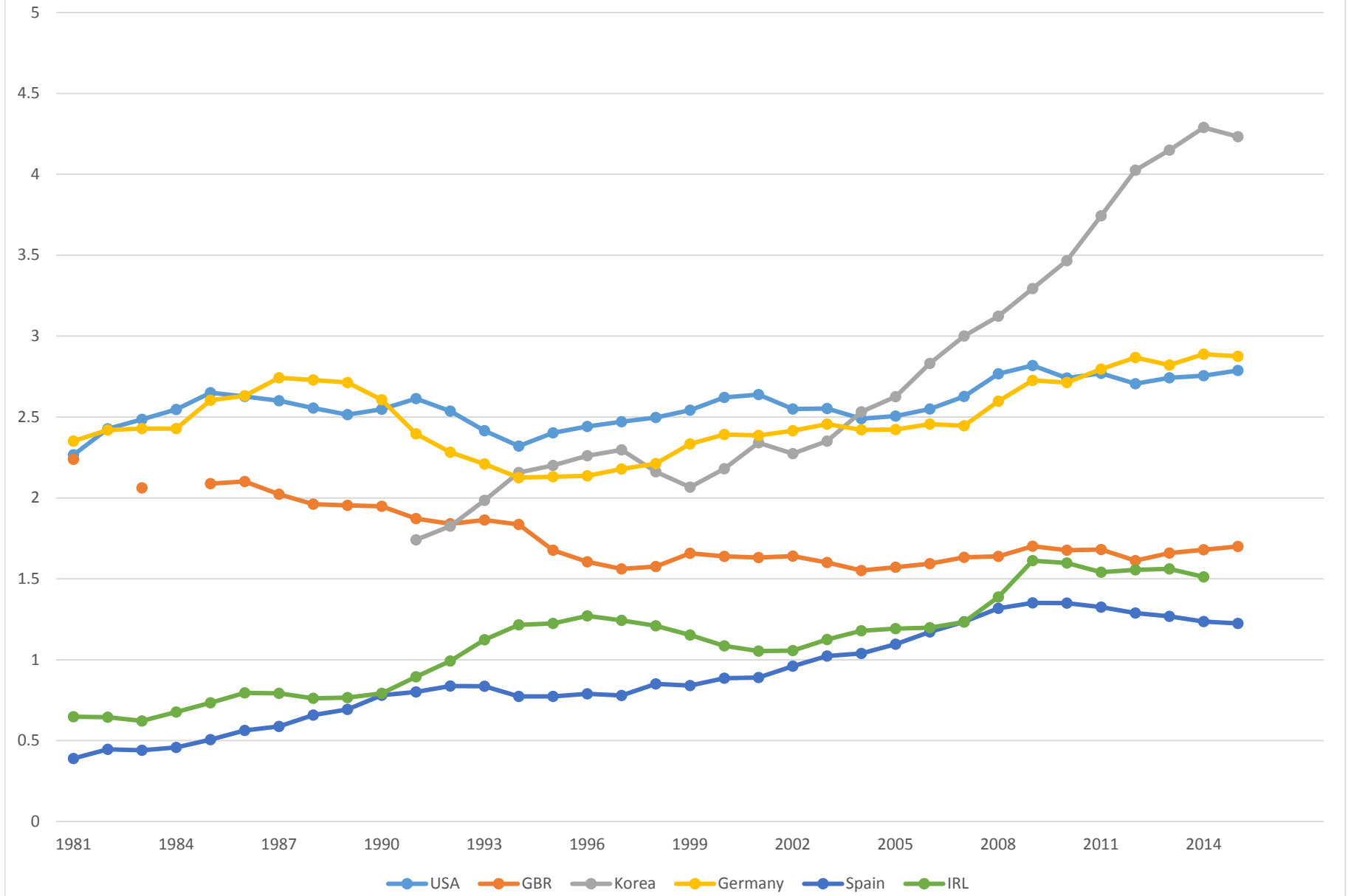
Evidence

- R&D cyclicality
- Cyclicalities of speed of diffusion
- Particularly during the GR

Figure 2: R&D Expenditures by US Corporations, 1983-2013



R&D/GDP



Share of sales from new or improved products



Weighted by yearly share of sales

Table 1: Cyclicity of the Speed of Technology Diffusion

	I	II	III	IV
\hat{y}_t	3.73 (3.59)	3.7 (2.81)	3.64 (3.94)	4.12 (3.17)
\hat{y}_t * US		0.07 (0.04)		-0.74 (0.53)
lag_{it}	-0.057 (5.22)	-0.057 (4.76)		
lag_{it}^2	0.001 (2.52)	0.001 (2.12)		
$\ln(lag_{it})$			-0.29 (6.68)	-0.29 (6.65)
R2 (within)	0.11	0.11	0.13	0.13
N technologies	26	26	26	26
N observations	327	327	327	327

Notes: (1) dependent variable is the speed of diffusion of 26 technologies, (2) all regressions include technology specific fixed effects. (3) t-statistics in parenthesis, (4) \hat{y}_t denotes the cycle of GDP per capita in the country and represents the high and medium term components of output fluctuations, (5) \hat{y}_t *US is the medium term cycle of GDP per capita times

Figure 3: Speed of Diffusion

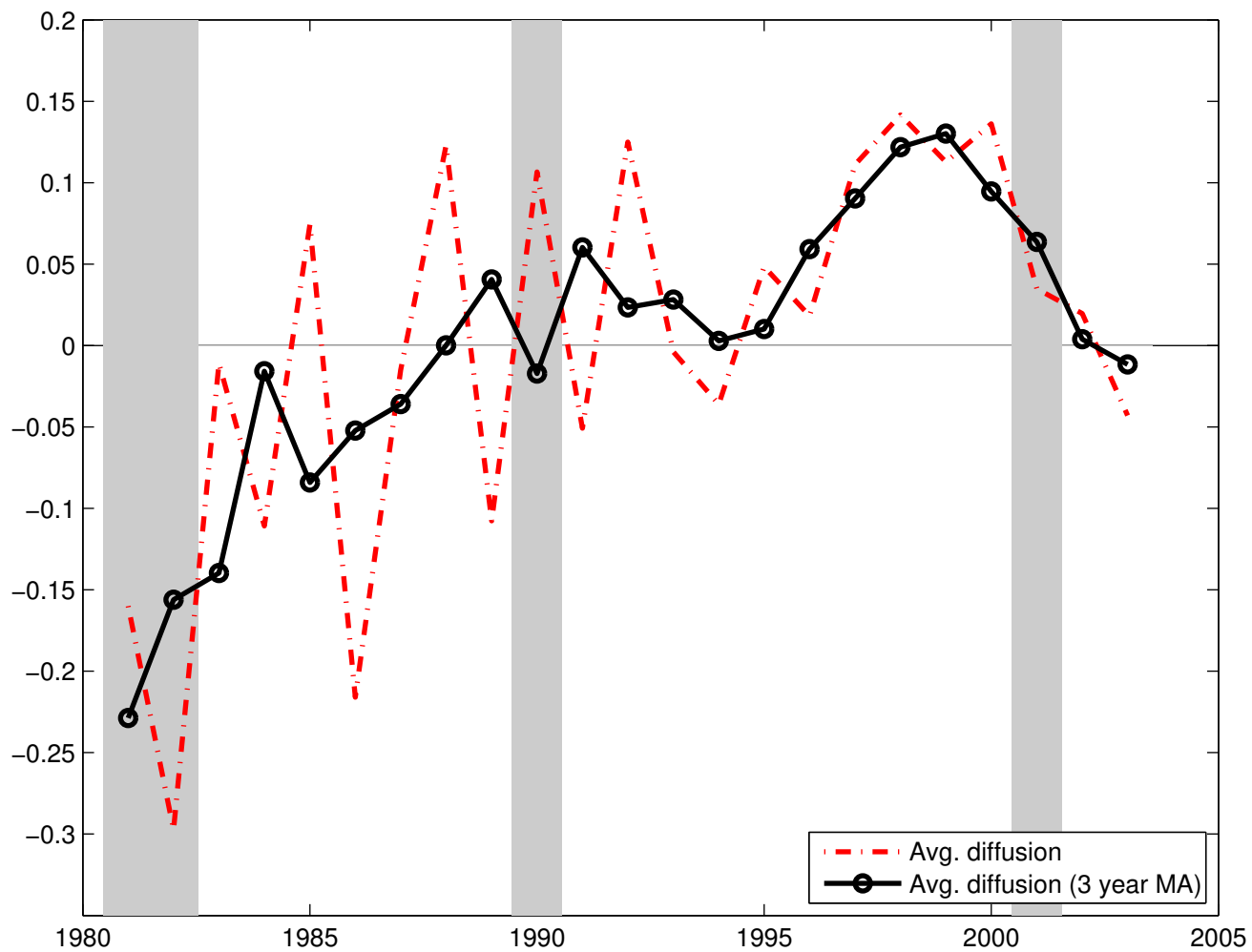
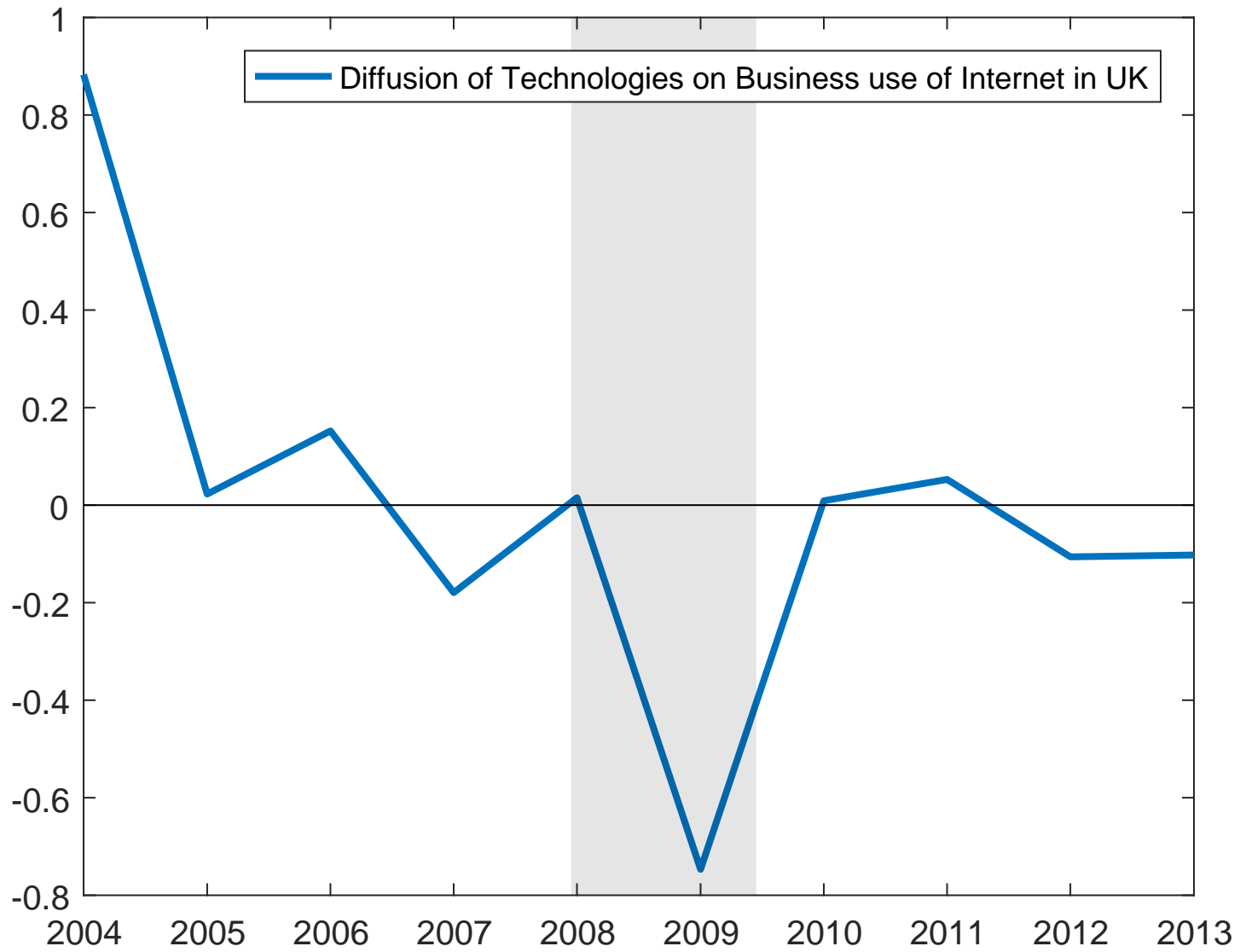


Figure 4: Diffusion of Technologies on Business use of Internet in UK, 2004-2013



TFP decomposition

- Decompose TFP between exogenous and endogenous components
- How? Combine:
 - A DSGE model with endogenous technology
 - observations on cyclical adoption
 - actual R&D series

Figure 8: Endogenous TFP, TFP and Labor Productivity

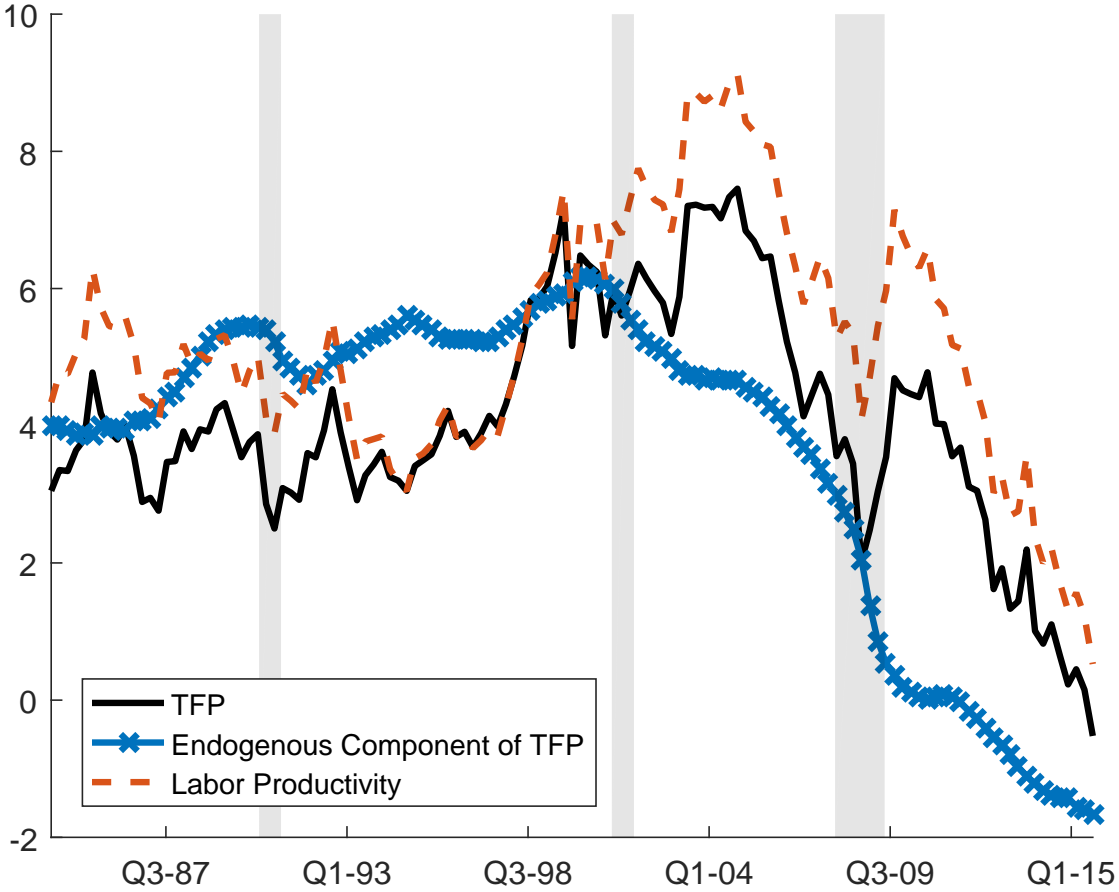


Figure 9: Endogenous TFP Decomposition

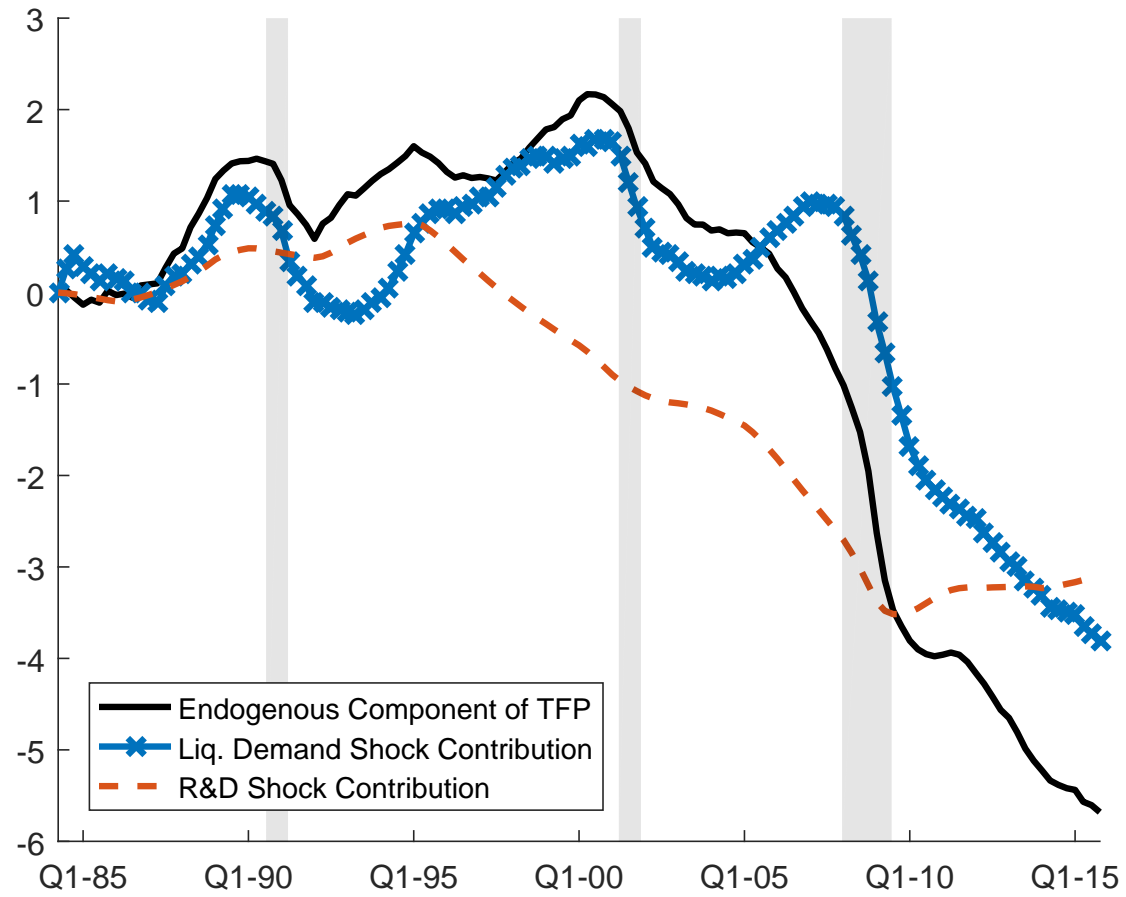
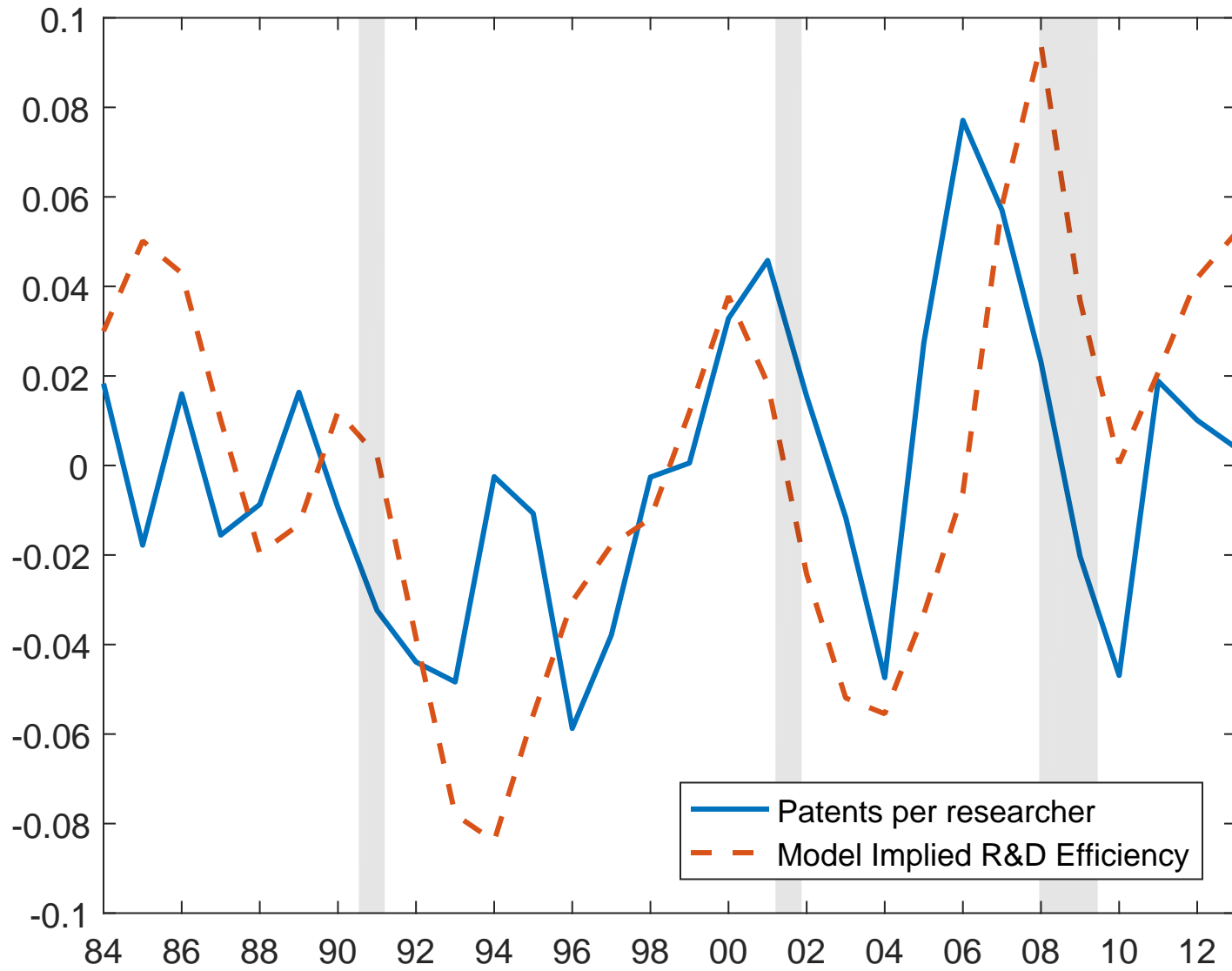


Figure 12: R&D efficiency in data versus model



Conclusions

- The decline in productivity during and after the GR is due to an endogenous response of companies to financial and business cycle conditions.
- The pre-GR decline in TFP growth is surely a reflection of the lower productivity in R&D