

## C Explanatory variables included in the growth model

The explanatory variables included in the basic and augmented empirical models reported in chapter 4 are outlined in table C.1 together with a rationale for the inclusion of each.

Table C.1 Explanatory variables included in the growth models

<i>Explanatory variable<sup>a</sup></i>	<i>Study</i>	<i>Rationale</i>	<i>Expected sign</i>
<b>Basic model variables</b>			
Log lag labour productivity ( $\log(y_{t-1})$ defined as $\log(\text{LABPROD}_{t-1})$ )	Barro and Sala-i-Martin (1995) and Mankiw, Romer and Weil (1992), Baldwin and Sabourin (2001)	Allow for transitional dynamics of firm's growth path. Firms with low levels of capital stock will have a higher marginal product of capital and hence for similar rate of capital accumulation, grow faster than those which already have higher levels of capital. A coefficient value of around -0.3 would indicate most of the gap between low and high productivity firms is eliminated after ten years (Bartlesman and Doms 2000)	negative
Logarithmic change in capital intensity ( $\dot{k}$ defined as $DKINTENS$ )	Broersma, McGuckin and Timmer (2002), Baldwin and Sabourin (2001)	Allow for the growth in the total value of capital employed per person in the production process. It is measured as the total book value of assets per person	positive
Size (represented by full time equivalent employment defined as $\_TOTFTE$ )	Atrostic and Nguyen (2001), Broersma, McGuckin and Timmer (2002), Baldwin and Sabourin (2001)	Allow for networking externalities within firms. Firm size is proxied through the number of full time equivalent (FTE) employees. A negative coefficient would suggest that size creates coordination problems for firms in the introduction of productivity improving innovations. A positive coefficient would suggest that the absolute size gives firms a productivity advantage, such as could occur when a firm can spread the benefits of a fixed cost innovation over a larger base	positive/ negative
ICT variables ICT_d1 (COMDUM1) ICT_d2 (COMDUM2) ICT_d3 (COMDUM3) ICT_d4 (COMDUM4) _netacc	Atrostic and Nguyen (2001), Broersma, McGuckin and Timmer (2002), McGuckin <i>et al</i> (1998), Greenan and Mairesse (1996), Brynjolfsson and Hitt (2000)	Allow for multifactor productivity effects arising from the adoption of the new general purpose technology (see chapter 3 for definition of variables).	positive

(Continued on next page)

Table C.1 (continued)

<i>Explanatory variable</i>	<i>Study</i>	<i>Rationale</i>	<i>Expected sign</i>
<b>Augmented model variables</b>			
<b><i>Variables interacted with each computer use dummy variable</i></b>			
<i>ICT &amp; human capital</i>			
ICT_d1*WAGERATE^2 ICT_d2*WAGERATE^2 ICT_d3*WAGERATE^2 ICT_d4*WAGERATE^2	Bartlesman and Doms (2000)	Allow for skill and experience related labour productivity.	positive
<i>ICT &amp; product innovation</i>			
ICT_d1*_INNOVAT ICT_d2*_INNOVAT ICT_d3*_INNOVAT ICT_d4*_INNOVAT ICT_d1*L1INNOVAT ICT_d2*L1INNOVAT ICT_d3*L1INNOVAT ICT_d4*L1INNOVAT	Hempell (2002)	Allow for innovation that has a long lag effect on productivity. Since the panel is relatively short, in order to avoid losing observations, only a one year lag is included.	positive/ negative
<i>ICT &amp; organisation</i>			
<i>Information and knowledge</i>			
ICT_d1*_BUSPRAC ICT_d2*_BUSPRAC ICT_d3*_BUSPRAC ICT_d4*_BUSPRAC ICT_d1*L1BUSPRA ICT_d2*L1BUSPRA ICT_d3*L1BUSPRA ICT_d4*L1BUSPRA	Milgrom and Roberts (1990), Ichniowski, Shaw & Prennushi (1997), Falk (2001), Baldwin and Sabourin (2001)	Control for firm's business restructuring and improved business practices.	positive/ negative
<i>Organisational change and process efficiency</i>			
ICT_d1*BUSREBI ICT_d2*BUSREBI ICT_d3*BUSREBI ICT_d4*BUSREBI ICT_d1*L1BUSRE ICT_d2*L1BUSRE ICT_d3*L1BUSRE ICT_d4*L1BUSRE			
<b>Other firm-specific variables</b>			
<i>Absorptive capacity</i>			
Multilocations (_BUSLOCS)	Atrostic and Nguyen (2002), Bosworth and Loundes (2002)	Allow for firm's geographical diversity and hub-spoke effects	positive/ negative

(Continued on next page)

Table C.1 (continued)

<i>Explanatory variable</i>	<i>Study</i>	<i>Rationale</i>	<i>Expected sign</i>
Firm age (_AGE) and / or New business (L1NEWBUS)	Doms, Dunne and Roberts (1995), Harris, Tang and Tseng (2002)	Allow for underestimation of assets. Using book value of assets will in general lead to the under estimation of the true value of capital due to the treatment of depreciation. As firms get older, the book value of capital is generally depreciated at a rate greater than the diminution in the true value of the services provided by the capital stock. This can be controlled for at least partly thorough including the age of the firm. Age also controls for industry specific knowledge.	positive/ negative
<i>Corporate structure</i>			
Type of legal operation (TOLO)	Harris, Tang and Tseng (2002)	Allows for greater complexity in accounting requirements of legally incorporated firms compared to unincorporated firms.	positive
<i>Labour market and industrial relations</i>			
Union membership (_UNIONME)	Tseng and Wooden (2001),	Allows for easier dissemination of information about the productivity enhancing workplace changes that have been implemented. In other words, controlling for high unionised firms to 'catch-up' to their less unionised counterparts.	positive/ negative
Contracting out (_CONOUT)	Motohashi (2001), Brynjolfsson and Hitt (2000), Girma and Gorg (2002), Bosworth and Loundes (2002)	Controlling for effect of out sourcing on labour productivity	positive/ negative
Employee coverage of agreements - Awards (_ARRAWAR) - Individual contracts (_ARRCONT) - Unregistered (_ARRUNRE) - Registered (_ARRREG)	Tseng and Wooden (2001)	Control for employee coverage effect of labour productivity	positive
<i>Openness</i>			
Export status (_EXPBI)	Bernard and Jensen (1995), Roberts and Tybout (1996), Bosworth and Loundes (2002)	Control for high productive export firms as these firms are more likely to survive in highly competitive international markets or trade may prompt faster absorption of new foreign technology.	positive

<sup>a</sup> The mnemonics listed refer to the variable mnemonic listed in appendix B where each variable is defined.