

# Data Appendix to “Transatlantic Technologies: The Role of ICT In the Ascent and Descent of U.S. and European Productivity Growth”

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Table 1: Summary of ICT Variables and Indicators for the U.S. and EU-10

| United States                |            |              |                     |           |           |                                  |           |           |                   |
|------------------------------|------------|--------------|---------------------|-----------|-----------|----------------------------------|-----------|-----------|-------------------|
| Industry                     | ICT Values |              | Productivity Growth |           |           | Total Factor Productivity Growth |           |           | Value-Added Share |
|                              | Share      | Contribution | 1977-1995           | 1995-2005 | 2005-2015 | 1977-1995                        | 1995-2005 | 2005-2015 | 1977-2015         |
| Agriculture                  | 0.03       | 0.03         | 2.57                | 7.27      | 1.05      | 2.77                             | 5.62      | -0.42     | 0.01              |
| Mining                       | 0.05       | 0.06         | 2.66                | -1.87     | 2.98      | -0.02                            | -2.04     | 4.54      | 0.02              |
| Manufacturing                | 0.12       | 0.15         | 2.85                | 5.53      | 1.90      | 1.52                             | 3.18      | 0.28      | 0.16              |
| Utilities                    | 0.10       | 0.13         | 1.22                | 1.20      | -0.03     | -0.15                            | -1.18     | -1.14     | 0.02              |
| Construction                 | 0.15*      | 0.09         | -0.97               | -1.02     | -0.92     | -1.09                            | -1.79     | -1.69     | 0.04              |
| Wholesale & Retail           |            |              | -                   | -         | -         | -                                | -         | -         | -                 |
| Wholesale                    | 0.28*      | 1.02*        | 3.32                | 6.13      | 0.81      | 1.65                             | 4.57      | -0.08     | 0.06              |
| Retail                       | 0.16*      | 0.52*        | 2.37                | 5.38      | 0.66      | 1.46                             | 3.05      | 0.30      | 0.07              |
| Transportation               | 0.21*      | 0.12         | 2.45                | 1.48      | -0.69     | 1.95                             | 0.51      | -1.10     | 0.04              |
| Hotels & Restaurants         | 0.06       | 0.09         | 0.13                | 1.81      | -0.67     | -0.06                            | 1.21      | -0.71     | 0.03              |
| Information & Communications | 0.37*      | 2.31*        | 2.22                | 4.04      | 3.05      | 1.77                             | 1.02      | 1.66      | 0.06              |
| Finance & Insurance          | 0.42*      | 1.36*        | 0.94                | 3.77      | 0.80      | -3.05                            | 1.03      | -0.22     | 0.06              |
| Real Estate                  | 0.00       | 0.05         | 0.96                | 0.96      | 1.91      | -0.20                            | -0.04     | 1.34      | 0.11              |
| Professions & Administrative | 0.32*      | 1.05*        | -0.76               | 1.20      | 1.07      | -1.72                            | -1.30     | 0.43      | 0.08              |
| Public Sector                | 0.08       | 0.18*        | 0.21                | 0.55      | 0.33      | -1.08                            | -0.30     | -0.39     | 0.14              |
| Education                    | 0.14*      | 0.56*        | -0.46               | 0.87      | 0.99      | -1.30                            | -0.16     | 0.29      | 0.01              |
| Health                       | 0.13*      | 0.14*        | -1.38               | -0.25     | 0.34      | -1.92                            | -0.89     | -0.22     | 0.06              |
| Arts & Entertainment         | 0.09       | 0.25*        | 0.94                | -0.05     | -0.10     | 0.89                             | -0.70     | -0.36     | 0.03              |
| Manufacturing Sub-Industries |            |              |                     |           |           |                                  |           |           |                   |
| Food                         | 0.10       | 0.13         | 3.14                | 0.05      | -0.43     | 1.74                             | -1.18     | -1.10     | 0.02              |
| Textiles & Apparel           | 0.08       | 0.04         | 3.64                | 3.63      | 1.20      | 2.44                             | 1.28      | -0.41     | 0.01              |
| Wood & Paper                 | 0.09       | 0.13*        | 0.26                | 2.15      | 1.46      | -0.85                            | 1.13      | 0.38      | 0.01              |
| Petroleum                    | 0.10       | 0.13         | 4.81                | 10.99     | -1.08     | 2.94                             | 9.84      | -5.00     | 0.01              |
| Chemicals                    | 0.10       | 0.07         | 2.12                | 3.22      | 1.37      | 0.22                             | -0.77     | -2.07     | 0.02              |
| Rubber & Plastics            | 0.07       | 0.14*        | 2.63                | 3.19      | -0.78     | 1.84                             | 1.69      | -1.55     | 0.01              |
| Metals                       | 0.14*      | 0.00         | 2.07                | 2.25      | 0.50      | 1.18                             | 1.47      | -0.21     | 0.02              |
| Electrical Machinery         | 0.16*      | 0.53*        | 10.01               | 17.57     | 7.07      | 8.32                             | 14.23     | 5.53      | 0.02              |
| Machinery NEC                | 0.21 *     | -0.09        | 0.14                | 3.02      | 0.64      | -1.36                            | 0.55      | -0.19     | 0.01              |
| Transportation Equipment     | 0.10       | -0.03        | 0.50                | 4.63      | 2.26      | -0.21                            | 2.43      | 1.48      | 0.02              |
| Other Manufacturing          | 0.12*      | 0.27*        | 1.06                | 3.32      | 1.79      | 0.14                             | 1.32      | 0.63      | 0.01              |
| EU-10                        |            |              |                     |           |           |                                  |           |           |                   |
| Agriculture                  | 0.01       | -0.02        | 4.46                | 3.47      | 1.37      | 4.46                             | 2.78      | 0.59      | 0.02              |
| Mining                       | 0.06       | -0.42        | 4.71                | -0.72     | -0.29     | 0.71                             | -0.47     | -1.72     | 0.01              |
| Manufacturing                | 0.14       | 0.14         | 3.38                | 2.87      | 1.84      | 1.72                             | 1.46      | 0.89      | 0.20              |
| Utilities                    | 0.06       | 0.27*        | 2.64                | 3.21      | -1.38     | 0.47                             | 0.69      | -2.17     | 0.03              |
| Construction                 | 0.07       | 0.10         | 1.34                | -0.10     | -0.30     | 0.87                             | -0.32     | -1.06     | 0.06              |
| Wholesale & Retail           | 0.20*      | 0.28*        | 2.29                | 1.81      | 1.29      | 1.09                             | 0.74      | 0.58      | 0.11              |
| Transportation               | 0.07       | 0.25*        | 3.61                | 2.46      | 0.42      | 2.38                             | 0.94      | -0.41     | 0.05              |
| Hotels & Restaurants         | 0.10       | 0.12         | -0.60               | -0.52     | -0.58     | -1.21                            | -1.06     | -0.51     | 0.03              |
| Information & Communications | 0.44*      | 1.18*        | 1.98                | 3.84      | 2.26      | 0.09                             | 2.87      | 1.63      | 0.04              |
| Finance & Insurance          | 0.40*      | 0.61*        | 1.35                | 2.14      | 1.14      | 0.01                             | 0.49      | 0.31      | 0.05              |
| Real Estate                  | 0.00       | 0.03         | -1.24               | -0.21     | 0.58      | 0.57                             | 0.14      | 0.04      | 0.09              |
| Professions & Administrative | 0.21*      | 0.79*        | 0.59                | -1.03     | -0.24     | -1.23                            | -1.96     | -0.71     | 0.09              |
| Public Sector                | 0.06       | 0.29*        | 1.43                | 1.26      | 1.11      | 0.51                             | 0.00      | 0.33      | 0.07              |
| Education                    | 0.11       | 0.05         | 0.59                | -0.19     | -0.70     | -0.10                            | -1.07     | -0.97     | 0.05              |
| Health                       | 0.10       | 0.18*        | 0.13                | 0.36      | 0.22      | -0.45                            | -0.32     | -0.10     | 0.06              |
| Arts & Entertainment         | 0.14*      | 0.37*        | 0.58                | 0.40      | -0.51     | -0.67                            | -0.70     | -0.86     | 0.03              |
| Manufacturing Sub-Industries |            |              |                     |           |           |                                  |           |           |                   |
| Food                         | 0.12*      | 0.13         | 2.17                | 0.92      | 0.42      | 0.72                             | -0.01     | -0.13     | 0.03              |
| Textiles & Apparel           | 0.17*      | 0.02         | 3.30                | 2.99      | 2.11      | 1.76                             | 1.61      | 1.27      | 0.01              |
| Wood & Paper                 | 0.15*      | 0.20*        | 2.48                | 2.38      | 2.02      | 1.14                             | 1.27      | 1.51      | 0.01              |
| Petroleum                    | 0.07       | 0.22*        | -0.84               | -0.39     | -3.53     | -3.72                            | -1.62     | -6.01     | 0.00              |
| Chemicals                    | 0.11*      | 0.16*        | 5.40                | 4.05      | 1.94      | 3.64                             | 1.92      | 0.88      | 0.02              |
| Rubber & Plastics            | 0.10       | 0.10         | 3.32                | 2.42      | 1.42      | 1.89                             | 1.92      | 0.41      | 0.02              |
| Metals                       | 0.09       | 0.10         | 2.85                | 2.01      | 1.62      | 2.19                             | 1.19      | 0.90      | 0.03              |
| Electrical Machinery         | 0.23*      | 0.12         | 5.49                | 4.78      | 2.95      | 2.73                             | 2.91      | 2.09      | 0.02              |
| Machinery NEC                | 0.17*      | 0.16         | 2.58                | 2.86      | 0.97      | 1.26                             | 1.70      | 0.04      | 0.02              |
| Transportation Equipment     | 0.12*      | 0.24*        | 3.81                | 2.58      | 3.15      | 1.70                             | 1.11      | 1.71      | 0.02              |
| Other Manufacturing          | 0.18*      | 0.12         | 1.09                | 2.82      | 1.12      | 0.33                             | 2.17      | 0.57      | 0.02              |

Source: KLEMS Database. A "\*" next to a nominal variable indicates that the dummy variable for that industry is equal to one; the dummy is zero otherwise. The "Share" variable is the nominal share of ICT investment in total investment of an industry from 1991-1995. The "Contribution" variable is the 1999-2005 contribution of ICT-capital to real value-added. Dummies are marked as one for these nominal variables if an industry's nominal ICT variable is above the median, and zero otherwise.

**Table 2: Labour Productivity Equations with ICT Dummies for Contribution Indicator, U.S. vs. EU-10, 1977-2015**

|                         | United States |         |       | EU-10   |         |        |
|-------------------------|---------------|---------|-------|---------|---------|--------|
|                         | (A)           | (B)     | (C)   | (D)     | (E)     | (F)    |
| (1) Post-1995           | 0.35          | 0.74    | -0.19 | -0.65** | -0.95** | -0.20  |
| (2) Post-2005           | -1.04         | -1.55*  | -0.33 | -0.74** | -0.88*  | -0.53  |
| (3) Post-1995 X ICT Use | 1.35*         | 0.78    | 1.91* | 0.28    | 0.42    | -0.12  |
| (4) Post-2005 X ICT Use | -0.96         | -0.44   | -1.67 | 0.15    | -0.93   | 0.30   |
| (5) Post-1995 X EM      | 5.86**        | 6.05*   |       | -0.06   | 0.23    |        |
| (6) Post-2005 X EM      | -8.50***      | -8.50** |       | -1.08   | -0.94   |        |
| (7) Post-1995 X I&C     | 0.11          |         | 0.10  | 2.23*   |         | 2.18** |
| (8) Post-2005 X I&C     | 1.02          |         | 1.02  | -0.98   |         | -1.35  |
| Commodities Only        | Yes           |         |       | Yes     |         |        |
| Services Only           |               |         | Yes   |         |         | Yes    |
| Number of Observations  | 1026          | 570     | 456   | 988     | 570     | 418    |
| Number of Industries    | 27            | 15      | 12    | 26      | 15      | 11     |

Source: KLEMS Database.

Note: \* indicates statistical significance at the 10 per cent level, \*\* at the 5 per cent level, and \*\*\* at the 1 per cent level. "ICT Use" is a dummy variable equal to unity if the ICT indicator (either share or contribution as defined in the text) is above the median when industries are ranked by the value of that indicator. "EM" is a dummy equal to one for the Electrical Machinery industry, while "I&C" is a dummy equal to one for the "Information & Communications" industry. All regressions include industry fixed effects and are estimated by Weighted Least Squares, where WLS weights are taken as an industry's nominal value-added share for 1976. The "Services" category includes the four non-market-economy services-producing industries.

**Table 3: Labour Productivity and Total Factor Productivity Equations with Continuous Measure of ICT, U.S. vs. EU-10, 1977-2015**

|                         | United States       |           |                           |           | EU-10               |         |                           |          |
|-------------------------|---------------------|-----------|---------------------------|-----------|---------------------|---------|---------------------------|----------|
|                         | Labour Productivity |           | Total Factor Productivity |           | Labour Productivity |         | Total Factor Productivity |          |
|                         | (A)                 | (B)       | (C)                       | (D)       | (E)                 | (F)     | (G)                       | (H)      |
| (1) Post-1995           | 0.11                | 0.43      | -0.18                     | 0.07      | -0.75**             | -0.67** | -0.99***                  | -0.68**  |
| (2) Post-2005           | -0.36               | -0.85     | -0.11                     | -0.41     | -0.74*              | -0.81** | -0.83**                   | -0.86*** |
| (3) Post-1995 X ICT Use | 6.55*               | 1.92*     | 6.51*                     | 2.11**    | 1.88                | 0.69    | 3.86*                     | 0.80     |
| (4) Post-2005 X ICT Use | -8.33*              | -2.17*    | -4.97                     | -1.26     | 0.54                | 0.62    | 3.29                      | 2.04*    |
| (5) Post-1995 X EM      | 39.10**             | 11.60**   | 30.90**                   | 8.99*     | -1.72               | -1.07   | 1.23                      | 6.48     |
| (6) Post-2005 X EM      | -53.90***           | -16.20*** | -47.70***                 | -14.50*** | -5.27               | -9.21   | -3.23                     | -1.65    |
| (7) Post-1995 X I&C     | -1.91               | -1.32     | -8.05                     | -2.46 **  | 4.10                | 1.45    | 4.76                      | 2.13*    |
| (8) Post-2005 X I&C     | 6.62                | 2.10      | 6.99                      | 1.71      | -2.46               | -1.27   | -4.23                     | -2.35*   |
| Share Indicator         | Yes                 |           | Yes                       |           | Yes                 |         | Yes                       |          |
| Contribution Indicator  |                     | Yes       |                           | Yes       |                     | Yes     |                           | Yes      |
| Number of Observations  | 1026                | 1026      | 1026                      | 1026      | 988                 | 988     | 988                       | 988      |
| Number of Industries    | 27                  | 27        | 27                        | 27        | 26                  | 26      | 26                        | 26       |

Source: KLEMS Database.

Note: \* indicates statistical significance at the 10 per cent level, \*\* at the 5 per cent level, and \*\*\* at the 1 per cent level. "ICT Use" is a dummy variable equal to unity if the ICT indicator (either share or contribution as defined in the text) is above the median when industries are ranked by the value of that indicator. "EM" is a dummy equal to one for the Electrical Machinery industry multiplied by its ICT value, while "I&C" is a dummy equal to one for the "Information & Communications" industry multiplied by its ICT value. All regressions include industry fixed effects and are estimated by Weighted Least Squares, where WLS weights are taken as an industry's nominal value-added share for 1976. The "Services" category includes the four non-market-economy services-producing industries.

**Table 4: Chart 1 Data**

| Industry | US Share | EU-10 Share | 45degree |   |
|----------|----------|-------------|----------|---|
| Ag       | 0.03     | 0.01        | 0        | 0 |
| Mining   | 0.05     | 0.06        | 1        | 1 |
| Mfg      | 0.12     | 0.14        |          |   |
| Util     | 0.10     | 0.06        |          |   |
| Constr   | 0.15     | 0.07        |          |   |
| Trade    | 0.21     | 0.20        |          |   |
| Trans    | 0.21     | 0.07        |          |   |
| HotRest  | 0.06     | 0.10        |          |   |
| InfComm  | 0.37     | 0.44        |          |   |
| FinIns   | 0.42     | 0.40        |          |   |
| RealEst  | 0.00     | 0.00        |          |   |
| ProfAd   | 0.32     | 0.21        |          |   |
| Pub      | 0.08     | 0.06        |          |   |
| Educ     | 0.14     | 0.11        |          |   |
| Health   | 0.13     | 0.10        |          |   |
| A&E      | 0.09     | 0.14        |          |   |

**Table 5: Chart 2 Data**

| Industry | US Share | EU-10 Share | 45degree |   |
|----------|----------|-------------|----------|---|
| Ag       | 0.03     | -0.02       | 0        | 0 |
| Mining   | 0.06     | -0.42       | 1        | 1 |
| Mfg      | 0.15     | 0.14        |          |   |
| Util     | 0.13     | 0.27        |          |   |
| Constr   | 0.09     | 0.10        |          |   |
| Trade    | 0.76     | 0.28        |          |   |
| Trans    | 0.12     | 0.25        |          |   |
| HotRest  | 0.09     | 0.12        |          |   |
| InfComm  | 2.31     | 1.18        |          |   |
| FinIns   | 1.36     | 0.61        |          |   |
| RealEst  | 0.05     | 0.03        |          |   |
| ProfAd   | 1.05     | 0.79        |          |   |
| Pub      | 0.18     | 0.29        |          |   |
| Educ     | 0.56     | 0.05        |          |   |
| Health   | 0.14     | 0.18        |          |   |
| A&E      | 0.25     | 0.37        |          |   |