Supplementary online appendix

**Table SA1. Description of the regional supply- and demand-side factor variables included in the analyses**

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable name** | **Description** | **Source** | **Period** |
| Activity rate of tertiary-educated youth | The economically active population aged 16–34 with tertiary education divided by the total population of this age group with tertiary education and multiplied by 100. | Our own calculations based on Spanish labour force survey (EPA) data | 1987–2016 |
| Activity rate of the tertiary educated population | The economically active population aged 16 or above with tertiary education divided by the total population of this age group with tertiary education and multiplied by 100. | Our own calculations based on *Instituto Valenciano de Investigaciones Económicas* (IVIE) data | 1987–2013 |
| Graduation rate | The number of university graduates divided by the total number of people aged 25–29 in the region and multiplied by 100. Although this figure more closely approximates the number of fresh graduates, it does not consider the whole active youth population with tertiary education. | Our own calculations based on total graduation figures from the Spanish Ministry of Education and figures for the number of people aged 25–29 from the National Statistical Institute (INE) | 1987–2016 |
| Unemployment rate for tertiary-educated youth | The number of unemployed people aged 16–34 with tertiary education divided by the number of active people aged 16–34 with tertiary education and multiplied by 100. | Our own calculations based on EPA data | 1987–2016 |
| Youth temporary employment rate | We include the share of youth employed on temporary contracts, as the use of this type of fixed-term contract in Spain has been strongly associated with labour market segmentation (Polavieja 2003). We use it as an indicator of labour demand for low skills and/or qualifications. Calculated as the number of people aged 16–34 employed in temporary contracts divided by the number of people employed aged 16–34 and multiplied by 100. | Our own calculations based on EPA data | 1987–2016 |
| Temporary employment rate | As above but expanded to the population aged 16–64. We use this indicator as a robustness and sensitivity check for the previous variable and confirm if (any) effects still hold when taking the employed population as a reference or restricting our analysis to employed youth. | Our own calculations based on EPA data | 1987–2016 |
| Employment in high-technology sectors | Percentage of employment in high-technology economic sectors. We use it as a proxy for the regional demand for highly qualified workers. | Eurostat | 1999–2016 |
| Employment in less knowledge-intensive sectors | The opposite to the previous indicator, showing the share of regional employment in economic sectors that require less knowledge-intensive work. We use it as a proxy for the regional demand for workers with qualifications below tertiary education. | Eurostat | 1999–2016 |
| Employment in R&D | Percentage of employment in R&D occupations. It aims to approach the availability and magnitude of employment for highly educated youth. | OECD | 1999–2013 |
| R&D expenditure per inhabitant | The amount in euros spent on R&D per inhabitant. We use it as a proxy of the potential availability of future value-added employment for highly qualified youth. | Eurostat | 1990–2014 |
| R&D expenditure in PPS | The amount in euros spent on R&D in PPS (constant 2005 prices). | Eurostat | 1994–2004 |

Source: Our own compilation.

**Table SA2. Analytical strategy by periods and supply- and demand-side variables’ availability**

|  |  |  |
| --- | --- | --- |
|  | **Supply side** | **Demand side** |
| Period 1 (1987–2016) | Demographic balance | |
| - Activity rate for tertiary-educated youth | - Unemployment rate for tertiary-educated youth |
| - Population with tertiary education | - Youth temporary employment rate |
| - Graduation rate | - Temporary employment rate |
| Period 2 (1999–2016) | Demographic balance | |
| - Activity rate for tertiary-educated youth | - Employment in high-technology sectors |
| - Population with tertiary education | - Employment in less knowledge-intensive sectors |
| - Graduation rate | - Employment in R&D |
|  | - R&D expenditure in euros/inhabitant |
|  | - R&D expenditure in PPS |

Source: Our own compilation.

**Table SA3. Chow test results**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Overeducation rate for tertiary-educated youth** | **Overeducation rate for upper secondary-educated youth** | **Unemployment rate for upper secondary-educated youth** |
| Overeducation rate for tertiary-educated youth | - | F (2, 2 637) 29.01\*\*\* | F (2, 2 647) 44.02\*\*\* |
| Demographic balance | F (2, 2 647) 1785.17\*\*\* | F (2, 2 638) 557.74\*\*\* | F (2, 2 648) 61.27\*\*\* |
| Activity rate for tertiary-educated youth | F (2, 2 647) 1671.38\*\*\* | F (2, 2 638) 529.25\*\*\* | F (2, 2 648) 93.22\*\*\* |
| Population with tertiary education | F (2, 2 511) 1093.11\*\*\* | F (2, 2 502) 305.95\*\*\* | F (2, 2 512) 81.17\*\*\* |
| Graduation rate | F (2, 2 012) 1404.41\*\*\* | F (2, 2 012) 260.00\*\*\* | F (2, 2 012) 153.10\*\*\* |
| Youth unemployment rate | F (2, 2 647) 1965.36\*\*\* | F (2, 2 638) 1241.59\*\*\* | F (2, 2 648) 57.13\*\*\* |
| Youth temporary employment rate | F (2, 1 951) 1307.74\*\*\* | F (2, 1 951) 200.10\*\*\* | F (2, 1 951) 106.19\*\*\* |
| Temporary employment rate | F (2, 1 951) 1417.81\*\*\* | F (2, 1 951) 237.15\*\*\* | F (2, 1 951) 128.94\*\*\* |
| Employment in high-technology sectors | F (2, 656) 11.45\*\*\* | F (2, 656) 1.18 | F (2, 656) 8.94\*\*\* |
| Less knowledge-intensive sectors | F (2, 676) 11.43\*\*\* | F (2, 676) 0.47 | F (2, 676) 10.37\*\*\* |
| People employed in R&D | F (2, 948) 10.54\*\*\* | F (2, 948) 2.98 | F (2, 948) 0.06 |
| Spending on R&D euro/inhabitant | F (2, 1 696) 1012.96\*\*\* | F (2, 1 696) 39.81\*\*\* | F (2, 1 696) 97.07\*\*\* |
| Spending on R&D PPS | F (2, 1 356) 516.82\*\*\* | F (2, 1 356) 28.83\*\*\* | F (2, 1 356) 36.38\*\*\* |

\*, \*\* and \*\*\* indicate statistical significance at the 10, 5 and 1 per cent level, respectively.

Source: Our own calculations – see table A for variable sources.

**Table SA4. Distribution of dependent (ln) and independent (standardized) variables by regions and periods**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Ln Overeducation for tertiary-educated youth** | | | | **Ln Overeducation for upper secondary-educated youth** | | | | **Ln Unemployment for upper secondary-educated youth** | | | | **Activity rate for tertiary-educated youth** | | | | **Population with tertiary education** | | | | **Graduation rate** | | | | | |
|  | Period 1 (1987–2016) | | Period 2 (1999–2016) | | Period 1 (1987–2016) | | Period 2 (1999–2016) | | Period 1 (1987–2016) | | Period 2 (1999–2016) | | Period 1 (1987–2016) | | Period 2 (1999–2016) | | Period 1 (1987–2016) | | Period 2 (1999–2016) | | Period 1 (1987–2016) | | Period 2 (1999–2016) | | |
| Regions – NUTS2 | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Andalucía | 3.53 | 0.35 | 3.81 | 0.09 | 2.86 | 0.45 | 3.05 | 0.09 | 3.54 | 0.33 | 3.40 | 0.33 | 0.12 | 0.75 | 0.08 | 0.58 | –0.01 | 0.62 | 0.49 | 0.30 | –0.11 | 0.48 | 0.19 | 0.32 |
| Aragón | 3.63 | 0.28 | 3.84 | 0.11 | 3.19 | 0.38 | 3.36 | 0.14 | 2.87 | 0.45 | 2.76 | 0.51 | 0.12 | 0.78 | 0.22 | 0.79 | 0.43 | 0.75 | 0.97 | 0.53 | 0.30 | 0.41 | 0.30 | 0.49 |
| Asturias | 3.66 | 0.33 | 3.90 | 0.13 | 2.99 | 0.23 | 3.04 | 0.19 | 3.33 | 0.39 | 3.15 | 0.39 | –0.16 | 0.60 | 0.01 | 0.62 | 0.11 | 0.65 | 0.58 | 0.49 | 0.26 | 0.48 | 0.43 | 0.32 |
| Baleares | 3.56 | 0.35 | 3.79 | 0.13 | 2.42 | 0.60 | 2.65 | 0.25 | 2.62 | 0.61 | 2.56 | 0.70 | 0.87 | 0.78 | 1.08 | 0.66 | –0.03 | 0.52 | 0.37 | 0.33 | –1.26 | 0.15 | –1.21 | 0.16 |
| Canarias | 3.67 | 0.33 | 3.93 | 0.12 | 2.79 | 0.54 | 3.06 | 0.14 | 3.37 | 0.38 | 3.28 | 0.43 | 0.34 | 0.67 | 0.26 | 0.56 | 0.05 | 0.59 | 0.51 | 0.33 | –0.86 | 0.27 | –0.69 | 0.19 |
| Cantabria | 3.66 | 0.44 | 3.99 | 0.09 | 3.00 | 0.31 | 3.09 | 0.17 | 3.24 | 0.48 | 2.95 | 0.38 | 0.08 | 0.98 | 0.18 | 0.89 | 0.20 | 0.71 | 0.67 | 0.63 | –0.44 | 0.42 | –0.18 | 0.30 |
| Castilla-La Mancha | 3.50 | 0.35 | 3.76 | 0.12 | 3.03 | 0.37 | 3.19 | 0.11 | 3.23 | 0.41 | 3.11 | 0.46 | 0.06 | 0.83 | 0.25 | 0.75 | –0.28 | 0.55 | 0.14 | 0.33 | –1.03 | 0.41 | –0.76 | 0.18 |
| Castilla y León | 3.70 | 0.30 | 3.94 | 0.07 | 3.10 | 0.38 | 3.26 | 0.11 | 3.25 | 0.39 | 3.06 | 0.37 | –0.08 | 0.76 | 0.05 | 0.51 | 0.20 | 0.63 | 0.69 | 0.39 | 1.26 | 1.34 | 2.05 | 1.10 |
| Cataluña | 3.55 | 0.36 | 3.84 | 0.10 | 2.92 | 0.28 | 3.05 | 0.11 | 2.90 | 0.45 | 2.83 | 0.52 | 1.01 | 0.85 | 1.12 | 0.90 | 0.57 | 0.76 | 1.17 | 0.43 | 0.11 | 0.61 | 0.44 | 0.50 |
| Comunidad Valenciana | 3.59 | 0.30 | 3.83 | 0.11 | 2.96 | 0.54 | 3.24 | 0.15 | 3.18 | 0.48 | 3.07 | 0.49 | 0.35 | 0.80 | 0.27 | 0.76 | 0.20 | 0.72 | 0.77 | 0.39 | 0.02 | 0.68 | 0.33 | 0.63 |
| Extremadura | 3.50 | 0.35 | 3.75 | 0.19 | 2.77 | 0.57 | 3.02 | 0.18 | 3.53 | 0.29 | 3.43 | 0.29 | –0.06 | 0.97 | –0.06 | 0.76 | –0.39 | 0.46 | –0.03 | 0.27 | –0.33 | 0.46 | –0.04 | 0.19 |
| Galicia | 3.56 | 0.46 | 3.92 | 0.09 | 2.87 | 0.41 | 3.05 | 0.15 | 3.32 | 0.37 | 3.15 | 0.32 | –0.13 | 0.89 | 0.17 | 0.54 | 0.00 | 0.74 | 0.57 | 0.46 | –0.05 | 0.56 | 0.30 | 0.29 |
| La Rioja | 3.67 | 0.31 | 3.89 | 0.11 | 3.17 | 0.52 | 3.35 | 0.26 | 2.72 | 0.53 | 2.60 | 0.58 | 0.11 | 0.88 | 0.38 | 0.85 | 0.30 | 0.70 | 0.80 | 0.53 | 0.28 | 1.93 | 0.72 | 2.10 |
| Madrid | 3.47 | 0.14 | 3.51 | 0.16 | 2.87 | 0.40 | 3.04 | 0.16 | 3.02 | 0.40 | 2.93 | 0.45 | 0.39 | 0.95 | 0.85 | 0.88 | 2.36 | 1.41 | 3.46 | 0.79 | 1.09 | 0.78 | 1.37 | 0.86 |
| Murcia | 3.58 | 0.39 | 3.88 | 0.14 | 3.07 | 0.48 | 3.30 | 0.14 | 3.23 | 0.46 | 3.07 | 0.52 | 0.32 | 0.76 | 0.14 | 0.73 | 0.05 | 0.63 | 0.56 | 0.27 | –0.12 | 0.68 | 0.22 | 0.69 |
| Navarra | 3.65 | 0.33 | 3.89 | 0.11 | 3.20 | 0.49 | 3.41 | 0.22 | 2.85 | 0.54 | 2.71 | 0.62 | 0.24 | 0.88 | 0.23 | 0.79 | 0.74 | 0.78 | 1.35 | 0.39 | 0.81 | 0.66 | 1.04 | 0.41 |
| País Vasco | 3.61 | 0.38 | 3.90 | 0.15 | 3.18 | 0.53 | 3.43 | 0.18 | 3.15 | 0.44 | 2.91 | 0.39 | 0.46 | 0.82 | 0.29 | 0.86 | 1.13 | 0.93 | 1.83 | 0.59 | 0.59 | 0.60 | 0.96 | 0.40 |

Source: Our own calculations based on EPA and Eurostat data.

**Table SA4. Distribution of dependent (ln) and independent (standardized) variables by regions and periods (cont.)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Unemployment rate for tertiary-educated youth** | | **Youth temporary employment rate** | | **Temporary employment rate** | | **Employment in high-technology sectors** | | **Employment in less knowledge-intensive sectors** | | **Employment in R&D** | | **Expenditure on R&D in euro per inhabitant** | | **Expenditure on R&D in PPS (2005 constant prices)** | | **Demographic balance** | | | |
|  | Period 1 (1987–2016) | | Period 1 (1987–2016) | | Period 1 (1987–2016) | | Period 2 (1999–2016) | | Period 2 (1999–2016) | | Period 2 (1999–2016) | | Period 2 (1999–2016) | | Period 2 (1999–2016) | | Period 1 (1987–2016) | | Period 2 (1999–2016) | |
| Regions - NUTS2 | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Andalucía | 0.75 | 0.79 | 1.10 | 0.95 | 1.36 | 0.75 | –0.36 | 0.13 | 0.55 | 0.20 | –0.33 | 0.36 | –0.12 | 0.34 | –0.34 | 0.264 | 0.91 | 1.54 | 1.38 | 1.84 |
| Aragón | –0.32 | 0.88 | –0.47 | 0.65 | –0.45 | 0.47 | 0.13 | 0.31 | –0.55 | 0.20 | 0.11 | 0.42 | 0.22 | 0.41 | 0.023 | 0.299 | –0.10 | 0.38 | –0.01 | 0.45 |
| Asturias | 0.78 | 0.99 | –0.18 | 0.94 | –0.61 | 0.47 | –0.08 | 0.32 | 0.21 | 0.19 | –0.10 | 0.45 | –0.07 | 0.35 | –0.28 | 0.265 | –0.27 | 0.16 | –0.22 | 0.16 |
| Baleares | –1.06 | 0.57 | –0.42 | 0.82 | –0.28 | 0.60 | –0.45 | 0.23 | 2.21 | 0.28 | –1.46 | 0.30 | –0.64 | 0.13 | –0.87 | 0.092 | 0.13 | 0.35 | 0.25 | 0.40 |
| Canarias | 0.05 | 0.79 | 0.98 | 0.70 | 0.89 | 0.69 | –0.61 | 0.22 | 2.38 | 0.42 | –1.03 | 0.11 | –0.39 | 0.15 | –0.6 | 0.114 | 0.36 | 0.51 | 0.59 | 0.52 |
| Cantabria | 0.39 | 1.17 | –0.24 | 0.92 | –0.59 | 0.66 | –0.23 | 0.37 | 0.10 | 0.16 | –0.38 | 0.55 | –0.02 | 0.50 | –0.25 | 0.426 | –0.26 | 0.12 | –0.23 | 0.14 |
| Castilla-La Mancha | 0.13 | 0.88 | 0.11 | 0.73 | 0.61 | 0.88 | –0.40 | 0.23 | –0.57 | 0.23 | –0.99 | 0.27 | –0.53 | 0.21 | –0.76 | 0.162 | 0.13 | 0.81 | 0.29 | 0.98 |
| Castilla y León | 0.60 | 1.03 | –0.32 | 0.72 | –0.30 | 0.58 | –0.27 | 0.19 | –0.42 | 0.24 | 0.33 | 0.33 | 0.19 | 0.42 | –0.01 | 0.32 | –0.19 | 0.53 | –0.03 | 0.62 |
| Cataluña | –0.93 | 0.50 | –0.29 | 0.72 | –0.52 | 0.77 | 1.05 | 0.36 | –0.39 | 0.36 | 0.54 | 0.52 | 1.26 | 0.62 | 1.104 | 0.415 | 1.07 | 2.38 | 1.66 | 2.88 |
| Comunidad Valenciana | –0.06 | 0.88 | 0.31 | 0.78 | 0.64 | 0.79 | –0.27 | 0.17 | 0.36 | 0.46 | –0.14 | 0.42 | 0.09 | 0.32 | –0.11 | 0.22 | 0.86 | 1.79 | 1.18 | 2.24 |
| Extremadura | 0.77 | 0.95 | 0.26 | 0.94 | 0.91 | 0.51 | –0.72 | 0.20 | –0.39 | 0.58 | –0.88 | 0.30 | –0.45 | 0.24 | –0.68 | 0.189 | –0.32 | 0.18 | –0.25 | 0.20 |
| Galicia | 0.33 | 0.87 | –0.05 | 1.12 | –0.05 | 0.76 | –0.31 | 0.25 | –0.41 | 0.25 | 0.02 | 0.33 | –0.08 | 0.32 | –0.29 | 0.24 | –0.05 | 0.38 | 0.08 | 0.37 |
| La Rioja | –0.43 | 0.92 | –0.74 | 0.52 | –0.48 | 0.55 | –0.47 | 0.21 | –1.14 | 0.31 | 0.08 | 0.76 | 0.18 | 0.51 | –0.04 | 0.419 | –0.30 | 0.11 | –0.28 | 0.14 |
| Madrid | –0.51 | 0.72 | –1.11 | 0.87 | –1.34 | 0.63 | 3.38 | 0.55 | 0.00 | 0.15 | 1.78 | 0.29 | 2.33 | 0.73 | 2.233 | 0.428 | 0.92 | 1.80 | 1.23 | 2.17 |
| Murcia | 0.23 | 0.97 | 0.96 | 0.71 | 1.28 | 0.68 | –0.76 | 0.13 | –0.11 | 0.26 | –0.42 | 0.34 | –0.20 | 0.25 | –0.41 | 0.176 | 0.01 | 0.45 | 0.05 | 0.57 |
| Navarra | –0.47 | 0.92 | –0.15 | 0.67 | –0.59 | 0.52 | –0.37 | 0.23 | –1.22 | 0.24 | 1.45 | 0.73 | 1.91 | 1.10 | 1.741 | 0.906 | –0.21 | 0.15 | –0.18 | 0.17 |
| País Vasco | –0.15 | 0.89 | 0.26 | 0.87 | –0.50 | 0.58 | 0.60 | 0.32 | –0.63 | 0.13 | 1.42 | 0.96 | 2.10 | 1.15 | 1.938 | 0.887 | –0.30 | 0.33 | –0.15 | 0.30 |

Source: Our own calculations based on EPA and Eurostat data.

**Table SA5. TSCS regression coefficients corresponding to table 1 results**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Period 1 (1987–2016)** | | | | | | | | | |
| Supply and demand factors | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M8 | M9 |
| Demographic balance (Y) | 0.0180 | 0.00365 | 0.0117 | 0.0145 | –0.0105 | –0.000631 | 0.0148 | –0.00618 | 0.00249 |
|  | (0.0123) | (0.0115) | (0.0120) | (0.0168) | (0.0128) | (0.0166) | (0.0170) | (0.0130) | (0.0168) |
| Activity rate of tertiary-educated youth (Q) | –0.0895\*\*\* | –0.0559\*\*\* | –0.0888\*\*\* |  |  |  |  |  |  |
|  | (0.00776) | (0.00695) | (0.00756) |  |  |  |  |  |  |
| Population with tertiary education (Y) |  |  |  | 0.0741\*\*\* | 0.0990\*\*\* | 0.0981\*\*\* |  |  |  |
|  |  |  |  | (0.0282) | (0.0225) | (0.0304) |  |  |  |
| Graduation rate (Y) |  |  |  |  |  |  | 0.0560\*\*\* | 0.0603\*\*\* | 0.0704\*\*\* |
|  |  |  |  |  |  |  | (0.0185) | (0.0152) | (0.0197) |
| Youth unemployment rate (Q) | –0.000482 |  |  | 0.0170 |  |  | 0.0149 |  |  |
|  | (0.0131) |  |  | (0.0175) |  |  | (0.0172) |  |  |
| Youth temporary employment rate (Q) |  | 0.0949\*\*\* |  |  | 0.147\*\*\* |  |  | 0.144\*\*\* |  |
|  |  | (0.0110) |  |  | (0.0120) |  |  | (0.0120) |  |
| Temporary employment rate (Q) |  |  | 0.0338\*\* |  |  | 0.0601\*\*\* |  |  | 0.0544\*\*\* |
|  |  |  | (0.0137) |  |  | (0.0188) |  |  | (0.0173) |
| Break | 0.391\*\*\* | 0.318\*\*\* | 0.386\*\*\* | 0.329\*\*\* | 0.215\*\*\* | 0.298\*\*\* | 0.395\*\*\* | 0.289\*\*\* | 0.378\*\*\* |
|  | (0.0516) | (0.0462) | (0.0499) | (0.0705) | (0.0516) | (0.0687) | (0.0674) | (0.0490) | (0.0652) |
| Constant | 3.390\*\*\* | 3.437\*\*\* | 3.400\*\*\* | 3.372\*\*\* | 3.449\*\*\* | 3.386\*\*\* | 3.369\*\*\* | 3.444\*\*\* | 3.385\*\*\* |
|  | (0.0417) | (0.0386) | (0.0411) | (0.0510) | (0.0382) | (0.0493) | (0.0522) | (0.0394) | (0.0514) |
| Observations | 1 972 | 1 955 | 1 955 | 1 836 | 1 819 | 1 819 | 1 952 | 1 936 | 1 936 |
| *R*2 | 0.543 | 0.598 | 0.564 | 0.433 | 0.576 | 0.461 | 0.433 | 0.575 | 0.457 |
| Number of regions | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |

\*, \*\* and \*\*\* indicate statistical significance at the 10, 5 and 1 per cent level, respectively.

Note: Standard errors in parentheses; Q for quarterly data, Y for yearly data.

Source: Our own calculations based on EPA and Eurostat data.

**Table SA6. TSCS regression coefficients corresponding to table 3 results**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Period 2 (1999–2016)** | | | | | | | | | | | | | | |
| Supply and demand factors | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M8 | M9 | M10 | M11 | M12 | M13 | M14 | M15 |
| Demographic balance (Y) | 0.006 | –0.003 | –0.002 | –0.001 | –0.000 | –0.007 | –0.013\* | –0.010 | –0.012 | –0.013 | –0.004 | –0.022\*\*\* | –0.010 | –0.009 | –0.007 |
|  | (0.007) | (0.006) | (0.006) | (0.006) | (0.006) | (0.008) | (0.007) | (0.009) | (0.010) | (0.009) | (0.007) | (0.007) | (0.009) | (0.009) | (0.009) |
| Activity rate for tertiary-educated youth (Q) | –0.098\*\*\* | –0.098\*\*\* | –0.100\*\*\* | –0.100\*\*\* | –0.100\*\*\* |  |  |  |  |  |  |  |  |  |  |
|  | (0.006) | (0.005) | (0.005) | (0.004) | (0.004) |  |  |  |  |  |  |  |  |  |  |
| Population with tertiary education (Y) |  |  |  |  |  | 0.000 | –0.059\*\*\* | –0.118\*\*\* | –0.075\*\*\* | –0.086\*\*\* |  |  |  |  |  |
|  |  |  |  |  |  | (0.029) | (0.014) | (0.016) | (0.022) | (0.024) |  |  |  |  |  |
| Graduation rate (Y) |  |  |  |  |  |  |  |  |  |  | 0.047\*\*\* | 0.002 | 0.038\*\* | 0.022\* | 0.022\* |
|  |  |  |  |  |  |  |  |  |  |  | (0.010) | (0.010) | (0.018) | (0.013) | (0.013) |
| Employment in high-technology sectors (Y) | –0.042\*\*\* |  |  |  |  | –0.054\*\*\* |  |  |  |  | –0.066\*\*\* |  |  |  |  |
|  | (0.009) |  |  |  |  | (0.020) |  |  |  |  | (0.009) |  |  |  |  |
| Less knowledge–intensive sectors (Y) |  | –0.006 |  |  |  |  | –0.020\*\*\* |  |  |  |  | –0.011\* |  |  |  |
|  |  | (0.008) |  |  |  |  | (0.006) |  |  |  |  | (0.006) |  |  |  |
| People employed in R&D (Y) |  |  | –0.018\* |  |  |  |  | 0.058\*\*\* |  |  |  |  | –0.050\*\*\* |  |  |
|  |  |  | (0.010) |  |  |  |  | (0.012) |  |  |  |  | (0.015) |  |  |
| Spending on R&D euro/inhabitant (Y) |  |  |  | –0.032\*\*\* |  |  |  |  | 0.010 |  |  |  |  | –0.052\*\*\* |  |
|  |  |  |  | (0.009) |  |  |  |  | (0.018) |  |  |  |  | (0.011) |  |
| Spending on R&D PPS (Y) |  |  |  |  | –0.030\*\*\* |  |  |  |  | 0.021 |  |  |  |  | –0.050\*\*\* |
|  |  |  |  |  | (0.008) |  |  |  |  | (0.017) |  |  |  |  | (0.010) |
| Break | 0.0126 | 0.015 | 0.015 | 0.030 | 0.027 | –0.066 | –0.044 | –0.039 | –0.037 | –0.035 | –0.058 | –0.063 | –0.051 | –0.044 | –0.053 |
|  | (0.036) | (0.032) | (0.050) | (0.032) | (0.032) | (0.069) | (0.065) | (0.076) | (0.072) | (0.072) | (0.063) | (0.069) | (0.074) | (0.067) | (0.068) |
| Constant | 3.851\*\*\* | 3.858\*\*\* | 3.858\*\*\* | 3.858\*\*\* | 3.854\*\*\* | 3.911\*\*\* | 3.939\*\*\* | 3.986\*\*\* | 3.945\*\*\* | 3.952\*\*\* | 3.901\*\*\* | 3.925\*\*\* | 3.884\*\*\* | 3.900\*\*\* | 3.897\*\*\* |
|  | (0.037) | (0.033) | (0.046) | (0.033) | (0.033) | (0.066) | (0.062) | (0.072) | (0.070) | (0.070) | (0.061) | (0.066) | (0.071) | (0.066) | (0.066) |
| Observations | 660 | 680 | 952 | 1 088 | 1 088 | 660 | 680 | 952 | 1 020 | 1 020 | 660 | 680 | 952 | 1 088 | 1 088 |
| *R*2 | 0.928 | 0.925 | 0.938 | 0.890 | 0.890 | 0.768 | 0.736 | 0.817 | 0.708 | 0.707 | 0.739 | 0.747 | 0.806 | 0.680 | 0.682 |
| Number of regions | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |

\*, \*\* and \*\*\* indicate statistical significance at the 10, 5 and 1 per cent level, respectively.

Note: Standard errors in parentheses; Q for quarterly data, Y for yearly data.

Source: Our own calculations based on EPA and Eurostat data.

**Table SA7. TSCS regression coefficients corresponding to table 4 results**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Period 1 (1987–2016)** | | | **Period 1 (1987–2016)** | | |
|  | Overeducation | | | Unemployment | | |
| Supply and demand factors | M1 | M2 | M3 | M4 | M5 | M6 |
| Demographic balance (Y) | 0.0366\* | 0.0263 | 0.0284 | –0.0576\*\*\* | –0.0313\*\* | –0.0239 |
|  | (0.0209) | (0.0203) | (0.0210) | (0.0151) | (0.0156) | (0.0151) |
| Overeducation rate for tertiary-educated youth (Q) | 0.250\*\*\* | 0.0582 | 0.219\*\*\* | –0.184\*\*\* | –0.0298 | –0.0667 |
|  | (0.0559) | (0.0465) | (0.0544) | (0.0492) | (0.0447) | (0.0434) |
| Youth unemployment rate (Q) | 0.00307 |  |  | 0.116\*\*\* |  |  |
|  | (0.0197) |  |  | (0.0177) |  |  |
| Youth temporary employment rate (Q) |  | 0.0948\*\*\* |  |  | –0.0403\*\*\* |  |
|  |  | (0.0170) |  |  | (0.0149) |  |
| Temporary employment rate (Q) |  |  | 0.0696\*\*\* |  |  | –0.108\*\*\* |
|  |  |  | (0.0242) |  |  | (0.0217) |
| Break | 0.0244 | 0.0920 | 0.0215 | 0.00767 | –0.0970 | –0.0866 |
|  | (0.0976) | (0.0924) | (0.0968) | (0.0724) | (0.0758) | (0.0738) |
| Constant | 2.025\*\*\* | 2.686\*\*\* | 2.144\*\*\* | 3.804\*\*\* | 3.313\*\*\* | 3.429\*\*\* |
|  | (0.203) | (0.179) | (0.204) | (0.168) | (0.168) | (0.165) |
| Observations | 1 972 | 1 955 | 1 955 | 1 972 | 1 955 | 1 955 |
| *R*2 | 0.115 | 0.147 | 0.117 | 0.360 | 0.261 | 0.264 |
| Number of regions | 17 | 17 | 17 | 17 | 17 | 17 |

\*, \*\* and \*\*\* indicate statistical significance at the 10, 5 and 1 per cent level, respectively.

Note: Standard errors in parentheses; Q for quarterly data, Y for yearly data.

Source: Our own calculations based on EPA and Eurostat data.

**Table SA8. TSCS regression coefficients corresponding to table 5 results**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Period 2 (1999–2016)** | | | | | | | | | |
|  | Overeducation | | | | | Unemployment | | | | |
| Supply and demand factors | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M8 | M9 | M10 |
| Demographic balance (Y) | 0.0133\* | 0.0126\*\* | 0.0136\* | 0.0130\* | 0.0114 | –0.0368\* | –0.0365\*\* | –0.0455\*\* | –0.0377\*\* | –0.0606\*\*\* |
|  | (0.00733) | (0.00637) | (0.00768) | (0.00737) | (0.00738) | (0.0212) | (0.0170) | (0.0201) | (0.0173) | (0.0159) |
| Overeducation rate of tertiary-educated youth (Q) | 0.380\*\*\* | 0.365\*\*\* | 0.379\*\*\* | 0.402\*\*\* | 0.401\*\*\* | –0.251\*\* | –0.241\*\* | –0.266\*\* | –0.241\*\* | –0.158\*\* |
|  | (0.0441) | (0.0403) | (0.0461) | (0.0425) | (0.0423) | (0.120) | (0.0959) | (0.104) | (0.0958) | (0.0726) |
| Employment in high-technology sectors (Y) | 0.00617 |  |  |  |  | –0.0231 |  |  |  |  |
|  | (0.0143) |  |  |  |  | (0.0372) |  |  |  |  |
| Employment in less knowledge-intensive sectors (Y) |  | –0.119\*\*\* |  |  |  |  | 0.0479 |  |  |  |
|  |  | (0.0164) |  |  |  |  | (0.0549) |  |  |  |
| People employed in R&D (Y) |  |  | 0.0604\*\*\* |  |  |  |  | 0.0164 |  |  |
|  |  |  | (0.0188) |  |  |  |  | (0.0575) |  |  |
| Spending on R&D euro/inhabitant (Y) |  |  |  | 0.0603\*\*\* |  |  |  |  | 0.0101 |  |
|  |  |  |  | (0.0163) |  |  |  |  | (0.0562) |  |
| Spending on R&D PPS (Y) |  |  |  |  | 0.0660\*\*\* |  |  |  |  | 0.0144 |
|  |  |  |  |  | (0.0162) |  |  |  |  | (0.0460) |
| Break | –0.187\*\*\* | –0.189\*\*\* | –0.226\*\*\* | –0.227\*\*\* | –0.224\*\*\* | 0.0137 | 0.0168 | –0.0658 | 0.0154 | 0.0189 |
|  | (0.0475) | (0.0436) | (0.0663) | (0.0467) | (0.0461) | (0.118) | (0.0947) | (0.177) | (0.0956) | (0.0872) |
| Constant | 1.868\*\*\* | 1.930\*\*\* | 1.918\*\*\* | 1.806\*\*\* | 1.818\*\*\* | 3.747\*\*\* | 3.698\*\*\* | 3.865\*\*\* | 3.700\*\*\* | 3.615\*\*\* |
|  | (0.155) | (0.142) | (0.166) | (0.150) | (0.149) | (0.423) | (0.340) | (0.382) | (0.340) | (0.264) |
| Observations | 1 136 | 1 156 | 952 | 1 088 | 1 088 | 660 | 680 | 612 | 680 | 1 088 |
| *R*2 | 0.574 | 0.602 | 0.751 | 0.599 | 0.600 | 0.439 | 0.413 | 0.567 | 0.408 | 0.319 |
| Number of regions | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |

\*, \*\* and \*\*\* indicate statistical significance at the 10, 5 and 1 per cent level, respectively.

Note: Standard errors in parentheses; Q for quarterly data, Y for yearly data.

Source: Our own calculations based on EPA and Eurostat data.

**References**

Polavieja, Javier G. 2003. “Temporary Contracts and Labour Market Segmentation in Spain: An Employment-Rent Approach”. *European Sociological Review* 19 (5): 501–517.