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# Task 1

Table 1. Pooled OLS regression estimation results

Dependent Variable: Independent Variables

*Securities/TotalNetWealth*

Coefficient p-value

|  |  |  |
| --- | --- | --- |
| *FinancialWealth* | 2.18e-07 | 0.000\*\*\* |
| *RealEstate* | -6.00e-08 | 0.000\*\*\* |
| *Business* | -1.33e-08 | 0.421 |
| *Liability* | -1.03e-07 | 0.032\*\* |
| *Gender* | 0.019 | 0.003\*\*\* |
| *Constant* | 0.050 | 0.000\*\*\* |

F(5, 3802) = 27.39

Prob > F = 0.0000\*\*\* R-squared = 0.0348

Note: \*denotes significant at 10%, \*\*denotes significant at 5%, \*\*\*denotes significant at 1%

# Task 2

Table 2. Individual-Fixed Effects regression estimation results

Dependent Variable: Independent Variables

*Securities/TotalNetWealth*

Coefficient p-value

|  |  |  |
| --- | --- | --- |
| *FinancialWealth* | 1.08e-07 | 0.000\*\*\* |
| *RealEstate* | -5.98e-08 | 0.000\*\*\* |
| *Business* | -3.60e-08 | 0.096\* |
| *Liability* | -4.01e-08 | 0.391 |
| *Gender* | (omitted) | |
| *Constant* | 0.067 | 0.000\*\*\* |

F(4, 3328) = 10.45

Prob > F = 0.0000\*\*\* Overall R-squared = 0.0229

Note: \*denotes significant at 10%, \*\*denotes significant at 5%, \*\*\*denotes significant at 1%

The variable *Gender* is omitted to avoid collinearity with the individual fixed effects. Given that gender is a characteristic that does not change over time, as the individual fixed effect, having both time invariant variables would produce perfect collinearity.

If we compare qualitatively the coefficients of the individual fixed effect regression with the ones estimated with the pooled OLS model, it can be noticed that in terms of signs all the variables have the same, with the exception of *Gender* that is not estimated in the fixed effect case. The statistical significance, on the other hand, is the same only for the *FinancialWealth* and *RealEstate* variables, with a significance at the 1% level for both the models. The variable *Business* is statistically significant only for the individual fixed effect estimation while, instead, the variable *Liability* is significant only for the pooled OLS estimation.

# Task 3

Table 3. F-test Results to determine if individual-fixed effects are necessary

F(475, 3328) = 3.07

Prob > F = 0.0000

The table above shows the F-test results where the null hypothesis is if all individual-fixed effects *ui* are equal to 0. The H0 is rejected, with a p-value that is basically equal to 0.

Individual-fixed effects are necessary.

# Task 4

Table 4. Individual-Random Effects regression estimation results

Dependent Variable: Independent Variables

*Securities/TotalNetWealth*

Coefficient p-value

|  |  |  |
| --- | --- | --- |
| *FinancialWealth* | 1.59e-07 | 0.000\*\*\* |
| *RealEstate* | -5.44e-08 | 0.000\*\*\* |
| *Business* | -2.15e-08 | 0.232 |
| *Liability* | -6.57e-08 | 0.148 |
| *Gender* | 0.020 | 0.039\*\* |
| *Constant* | 0.051 | 0.000\*\*\* |

Chi2(5) = 77.91

Prob > Chi2 = 0.0000\*\*\* Overall R-squared = 0.0337

Note: \*denotes significant at 10%, \*\*denotes significant at 5%, \*\*\*denotes significant at 1%

# Task 5

Looking at the Hausman test results, in this case we reject the null hypothesis of a non systematic difference between the coefficients of the individual-fixed effect and random effect estimated models. Finding ourselves in the alternative hypothesis, where the random effect model’s coefficient are not consistent, we prefer the individual-fixed effect model.

# Task 6

Concerning the consistency and efficiency of the models estimated, we can affirm that:

1. The pooled OLS estimated model, in this case, may be inconsistent and is inefficient. Inefficiency is given by rejecting that individual fixed effects are not necessary.
2. The individual-fixed effects estimated model, in this case, is consistent and efficient. The consistency is given by the independent variables that we can argue are exogenous, while the consistency is given by rejecting the F-test that all individual- fixed effects are equal to 0.
3. The random effects estimated model, in this case, is efficient but not consistent. It’s efficient, given its lower standard errors compared to the individual-fixed effect, but it’s not consistent, as the Hausman test has determined.

The model that we prefer among these three is the individual-fixed effect model.

# Task 7

Table 5. Two-way Fixed Effects regression estimation results

Dependent Variable: Independent Variables

*Securities/TotalNetWealth*

Coefficient p-value

|  |  |  |
| --- | --- | --- |
| *FinancialWealth* | 1.12e-07 | 0.000\*\*\* |
| *RealEstate* | -4.31e-08 | 0.005\*\*\* |
| *Business* | -3.39e-08 | 0.117 |
| *Liability* | -4.96e-08 | 0.290 |
| *Gender* | (omitted) | |
| *2002* | -0.028 | 0.011\*\* |
| *2004* | -0.022 | 0.047\*\* |
| *2006* | -0.034 | 0.002\*\*\* |
| *2008* | -0.039 | 0.001\*\*\* |
| *2010* | -0.034 | 0.002\*\*\* |
| *2012* | -0.035 | 0.002\*\*\* |
| *2014* | -0.038 | 0.001\*\*\* |
| *Constant* | 0.091 | 0.000\*\*\* |

F(11, 3321) = 5.45

Prob > F = 0.0000\*\*\* Overall R-squared = 0.0299

Note: \*denotes significant at 10%, \*\*denotes significant at 5%, \*\*\*denotes significant at 1%