Trade Openness and Domestic Institutions
Multiple Regression

Questions

1. Does a state's level of trade (variable name: "openc") depend upon the percentage of cabinet posts held by members of left-leaning parties ("gov_left1")?

H0: State's level of trade depends upon percentage of cabinet posts held by members of left-leaning parties.
H1: State's level of trade does not depend upon percentage of cabinet posts held by members of left-leaning parties.

Table 1: State's Level of Trade's Dependency Left-Leaning Parties Cabinet Seats

	(1) State Level of Trade
Left-Leaning Parties Cabinet Seats (LLPCS)	0.0670^{+} (0.0370)
_cons	80.55^{*} (1.800)
N	1673
adj. R^2	0.001

Standard errors in parentheses
$^{+} p < 0.10$, $^{*} p < 0.05$

The state level of trade does not seem to depend on the "percent of cabinet posts held by the members of left-leaning parties". In the above regression model, the adjusted R-squared indicates that changes in state's level of trade cannot be significantly affected by the cabinet seats of left-leaning parties. Also, the p-value is above the threshold of 0.0.5 and as the standard error of the independent variable is less than half of coefficient, we cannot reject the null hypothesis which states that the slope is zero and there is no significant relationship.

2. Does a state's level of trade (variable name: "openc") depend upon the percentage of cabinet posts held by members of left-leaning parties ("gov_left1") when controlling for population (pop)? What does this reflect about the power of omitted variable bias?

H0: State's level of trade depends upon percentage of cabinet posts held by members of left-leaning parties when controlling for population.

H1: State's level of trade does not depend upon percentage of cabinet posts held by members of left-leaning parties when controlling for population.

Table 2: State's Level of Trade's Dependency on Left-Leaning Parties Cabinet Seat Controlling for Population.

	(1) State Level of Trade (SLT)
Left-Leaning Parties Cabinet Seats (LLPCS)	-0.0610[+] (0.0344)
Population	-0.000455[*] (0.0000243)
_cons	97.67[*] (1.878)
N	1670
adj. R^2	0.174

Standard errors in parentheses
[+] $p < 0.10$, [*] $p < 0.05$

Like the regression model in question one, the state level of trade does not seem to depend on the "percent of cabinet posts held by the members of left-leaning parties" if we control the regression model for the population. However, contrary to previous regression, the slope for LLPCS is negative. Still, it cannot indicate a significant impact on the SLT as the p-value remains more than 0.05 and LLPCS's coefficient is not equal or more than twice its standard error. So, the null hypothesis cannot be rejected. The 0.17 adjusted R-squared also show a weak relation of the independent variables and dependent variable.

Although the conclusion is similar to when the population variable is omitted when it comes to dependency of State' Level of Trade on LLPCS, considering population did impacted the direction of slope. Therefore, omitting variables increases the chance of falling into biases and could undermine the result and conclusion.

3. Does a state's level of trade depend upon the percentage of cabinet posts held by members of left-leaning parties, when controlling population and for whether the state has a presidential system ("pres"), a federal system ("fed"), and the strength of its bicameralism ("bic")?

H0: State's level of trade depends upon percentage of cabinet posts held by members of left-leaning parties when controlling for population and for whether the state has a presidential system, a federal system, and the strength of its bicameralism.

H1: State's level of trade does not depend upon percentage of cabinet posts held by members of left-leaning parties when controlling for population and for whether the state has a presidential system, a federal system, and the strength of its bicameralism.

Table 3: State's Level of Trade's Dependency on Left-Leaning Parties Cabinet Seat Controlling for Population and Governance System

	(1)
	State Level of Trade (SLT)
Left-Leaning Parties Cabinet Seats (LLPCS)	-0.0561^{+}
	(0.0336)
Population	-0.000357^{*}
	(0.0000304)
Presidential System	3.915^{*}
	(1.228)
Federal System	4.513^{*}
	(2.055)
Bicameralism Strength	-13.57^{*}
	(1.556)
_cons	119.5^{*}
	(3.259)
N	1661
adj. R^2	0.222

Standard errors in parentheses
$^{+} p < 0.10, ^{*} p < 0.05$

Similar to previous models, null hypothesis cannot be rejected here as p-value is greater than 0.05 and there is possibility for slope to be zero. Hence, state level of trade does not seem to depend on LLPCS here too, with governance system and strength of its bicameralism in control.

However, state's level of trade does seem to depend upon all other independent variables to different degrees.

4. Does the state's level of trade depend upon the factors in questions 1 through 3, when controlling for three economic factors: (a) the annual change in gross domestic product ("realgdpgr"); (b) restrictions on the international movement of capital ("kaopen"); and (c) the level of public funding for unemployment programs ("unemp-pmp")?

H0: State's level of trade depends upon percentage of cabinet posts held by members of left-leaning parties when controlling for population and for whether the state has a presidential system, a federal system, and the strength of its bicameralism along GDP, unemployment programs and restrictions on int. movement of capital.

H1: State's level of trade does not depend upon percentage of cabinet posts held by members of left-leaning parties when controlling for population and for whether the state has a presidential system, a federal system, and the strength of its bicameralism along GDP, unemployment programs and restrictions on int. movement of capital.

Table 4: State's Level of Trade's Dependency on Left-Leaning Parties Cabinet Seat Controlling for Population and Governance System along GDP, Unemployment Programs and Restrictions on Int. Movement of Capital

	(1) State Level of Trade (SLT)
Left-Leaning Parties Cabinet Seats (LLPCS)	-0.144[*] (0.0355)
Population	0.000454[*] (0.0000331)
Presidential System	8.089[*] (1.450)
Federal System	1.464 (2.184)
Bicameralism Strength	-3.939[*] (1.705)
GDP	1.797[*] (0.435)
Restriction on Int. Movement of Capital	22.25[*] (5.031)

Unemployment Program	-1.383
	(1.414)
_cons	82.60*
	(5.701)
N	955
adj. R^2	0.277

Standard errors in parentheses
$^+ p < 0.10$, $^* p < 0.05$

Contrary to other regressions models, here, state's level of trade depends on the LLPCS as the latter's p-value is smaller than 0.05 and coefficient is more than twice standard error. Therefore, we can reject the null hypothesis which states slope can be zero and there is no relationship. However, the adjusted r-squared is indicative of a weak dependency.

5. Is there any remaining unexplained change in the levels of trade over time? While controlling for the factors in questions 1, through 4, test for temporal variation by adding the "year" variable to the multiple regression. Try adding "year" in two ways: by adding "year" as a variable to capture a linear trend and by adding "i.year" as a variable to add a dummy variable for each year. How does this addition change your interpretation of the theoretical variables, if it all?

H0: State's level of trade depends upon percentage of cabinet posts held by members of left-leaning parties when controlling for population and for whether the state has a presidential system, a federal system, and the strength of its bicameralism along GDP, unemployment programs and restrictions on int. movement of capital over time.

H1: State's level of trade does not depend upon percentage of cabinet posts held by members of left-leaning parties when controlling for population and for whether the state has a presidential system, a federal system, and the strength of its bicameralism along GDP, unemployment programs and restrictions on int. movement of capital over time.

Table 5: State's Level of Trade's Dependency on Left-Leaning Parties Cabinet Seat Controlling for Population and Governance System along with GDP, Unemployment Programs and Restrictions on Int. Movement of Capital in the Year

	(3)
	State Level of Trade (SLT)
Left-Leaning Parties Cabinet Seats (LLPCS)	-0.142*
	(0.0323)
Population	-0.000352*
	(0.0000311)

Presidential System	4.015[*] (1.355)
Federal System	1.092 (1.993)
Bicameralism Strength	-2.940[+] (1.557)
GDP	2.769[*] (0.403)
Restriction on Int. Movement of Capital	-10.06[+] (5.147)
Unemployment Program	4.604[*] (1.360)
Year	1.969[*] (0.142)
_cons	82.60[*] (5.701)
N	955
adj. R^2	0.398

Standard errors in parentheses
[+] $p < 0.10$, [*] $p < 0.05$

As can be seen in the table above, adding "year" variable to the regression does not bring any significant changes in the relationship. The same is true with adding it as "i.year". *(I did not insert the second table due to its length)*

6. Are there other variables in the dataset that may affect the state's level of trade? Choose any other variable and add it to the model you used to answer question 5. Does your variable substantially alter the model, or your theoretical conclusions? If so, how?

H0: State's level of trade depends upon percentage of cabinet posts held by members of left-leaning parties when controlling for population and for whether the state has a presidential system, a federal system, and the strength of its bicameralism along GDP, unemployment programs and restrictions on int. movement of capital over time and Population Above 65.

H1: State's level of trade does not depend upon percentage of cabinet posts held by members of left-leaning parties when controlling for population and for whether the state has a presidential system, a federal system, and the strength of its bicameralism along GDP, unemployment programs and restrictions on int. movement of capital over time and Population Above 65.

Table 5: State's Level of Trade's Dependency on Left-Leaning Parties Cabinet Seat Controlling for Population and Governance System along with GDP, Unemployment Programs and Restrictions on Int. Movement of Capital over the Years and Population Above 65

	(3) State Level of Trade (SLT)
Left-Leaning Parties Cabinet Seats (LLPCS)	-0.129* (0.0324)
Population	-0.000332* (0.0000314)
Presidential System	2.475+ (1.423)
Federal System	0.830 (1.983)
Bicameralism Strength	-3.291* (1.552)
GDP	2.481* (0.410)
Restriction on Int. Movement of Capital	-6.763 (5.212)
Unemployment Program	4.916* (1.356)
Year	2.242* (0.163)
Elderly (over 65 % of population)	-1.945* (0.578)
_cons	-4359.5* (321.1)
N	955
adj. R^2	0.405

Standard errors in parentheses
$^+ p < 0.10$, $^* p < 0.05$

Here, I added "elderly" variable to examine whether controlling for the population who are above the 65 years old would affect the dependency of state's trade level on LLPCS. However, adding the new variable did not cause any significant changes to the regression model.

Appendix 02: DoFile

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reg openc gov_left1 pop pres fed bic
eststo
esttab using Ass04_Q3.rtf, star(+ 0.10 * 0.05) se ar2 onecell
reg openc gov_left1 pop pres fed bic realgdpgr kaopen unemp_pmp
eststo
esttab using Ass04_Q4.rtf, star(+ 0.10 * 0.05) se ar2 onecell
reg openc gov_left1 pop pres fed bic realgdpgr kaopen unemp_pmp year
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esttab using Ass04_Q5.rtf, star(+ 0.10 * 0.05) se ar2 onecell
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