

Appendix

The most important issue with dynamic panel estimators is choice of instruments. The validity of instruments can be examined with Sargan/Hansen tests for over identifying restrictions. The null hypothesis in Hansen test is that the over identifying restrictions are valid. As it can be seen from tables below both tests support selection of instruments and allow us to proceed with further testing.

Further important diagnostic is m1/m2 test for autocorrelation in residuals (Arellano and Bond, 1991). This test checks for existence of autocorrelation of 2nd order in disturbances where null hypothesis is that there is no autocorrelation. Test procedure also reports 1st order diagnostics for which reason it is known as m1/m2 test. In case of absence of 2nd order autocorrelation, levels of potentially endogenous variables lagged two or more periods in the past can be considered valid instruments. Null hypothesis of non-existence of autocorrelation of 2nd order cannot be rejected providing further support to our approach.

Important diagnostic in estimation of dynamic panel models is number of instruments used in estimation. Although there is no exact rule, it is taken as rule of thumb that this number should not exceed number of cross-sectional units (countries in our case). As it can be seen from tables below number of used instruments does not exceed in any specification the number of cross-sectional units (countries).

We also present additional tests to check whether the steady state assumption is satisfied and whether any pattern of cross-sectional dependence is identified. With respect to former tables provide difference-in-Sargan test for levels equation. There is not sufficient evidence to reject the null hypothesis of valid instruments for levels which implies that the steady-state assumption can be accepted and system estimator can be preferred over the difference one. In addition we examine the difference-in-Sargan test statistic for the lagged dependent variable. The corresponding p-values suggest that there is not sufficient evidence to reject the null hypothesis that the instruments on lagged dependent variable are valid, implying that our model is unlikely to suffer from cross-sectional dependence.

Table A1

Model Diagnostics – Direct Effects of Decentralization

Diagnostics/specification	FDREV (1)	REVGDP (2)	FDEXP (3)	EXPGDP (4)	VFI (5)
Number of observations	168	168	168	168	168
Number of groups (countries)	24	24	24	24	24
Number of instruments	23	24	19	20	18
Wald test	716***	1 174***	358***	861***	678***
Hansen J test	14.86	8.97	3.60	5.73	1.25
Probability > chi2	0.14	0.94	0.61	0.45	0.87
Sargan test	4.41	3.51	10.12	9.31	3.50
Probability > chi2	0.11	0.32	0.08	0.16	0.48
Difference in Sargan test for levels	3.73	0.23	2.72	2.97	0.49
Probability > chi2	0.29	0.89	0.44	0.40	0.92
Difference in Sargan test for lagged dependent variable	2.16	0.23	0.88	0.42	0.83
Probability > chi2	0.54	0.89	0.64	0.81	0.66
Arellano-Bond 1 st order autocorrelation	-2.22	-1.96	-2.66	-2.90	-2.98
Probability > chi2	0.03	0.05	0.00	0.00	0.00
Arellano-Bond 2 nd order autocorrelation	-1.48	-1.25	-1.38	-1.25	-1.30
Probability > chi2	0.14	0.21	0.17	0.21	0.19

Source: Authors' calculations.

Table A2

Model Diagnostics – Effects of Decentralization on Corruption Control

Diagnostics/specification	FDREV (1)	REVGDP P (2)	FDEXP (3)	EXPGDP (4)	VFI (5)
Number of observations	168	168	168	168	168
Number of groups (countries)	24	24	24	24	24
Number of instruments	22	22	21	19	22
Wald test	3 088***	4 348***	3 909***	27 228***	10 386***
Hansen J test	6.60	8.12	5.92	3.89	7.93
Probability > chi2	0.36	0.23	0.31	0.27	0.54
Sargan test	4.92	5.00	5.84	9.00	14.84
Probability > chi2	0.55	0.54	0.32	0.03	0.10
Difference in Sargan test for levels	1.59	3.07	1.74	3.26	1.97
Probability > chi2	0.45	0.22	0.42	0.20	0.37
Difference in Sargan test for lagged dependent variable	2.92	5.08	0.85	3.89	7.72
Probability > chi2	0.23	0.17	0.66	0.27	0.36
Arellano-Bond 1 st order autocorrelation	-1.77	-2.03	-2.19	-1.98	-2.79
Probability > chi2	0.07	0.04	0.03	0.05	0.01
Arellano-Bond 2 nd order autocorrelation	-0.08	-0.07	-0.24	-0.47	-0.48
Probability > chi2	0.94	0.95	0.81	0.64	0.63

Source: Authors' calculations.

Table A3

Model Diagnostics – Effects of Decentralization on Government Efficiency

Diagnostics/specification	FDREV (1)	REVGDP (2)	FDEXP (3)	EXPGDP (4)	VFI (5)
Number of observations	168	168	168	168	168
Number of groups (countries)	24	24	24	24	24
Number of instruments	24	19	18	18	19
Wald test	1 204***	6 910***	583***	1 401***	974***
Hansen J test	10.19	0.55	0.62	3.25	2.63
Probability > chi2	0.25	0.91	0.73	0.20	0.45
Sargan test	10.11	0.33	1.59	1.77	3.31
Probability > chi2	0.23	0.95	0.45	0.41	0.35
Difference in Sargan test for levels	2.47	0.53	0.62	3.25	2.62
Probability > chi2	0.29	0.77	0.73	0.20	0.27
Difference in Sargan test for lagged dependent variable	9.71	0.52	0.62	3.25	1.65
Probability > chi2	0.21	0.77	0.73	0.20	0.44
Arellano-Bond 1 st order autocorrelation	-2.38	-2.27	-3.20	-3.60	-3.56
Probability > chi2	0.02	0.02	0.00	0.00	0.00
Arellano-Bond 2 nd order autocorrelation	0.47	1.32	1.29	1.16	0.69
Probability > chi2	0.64	0.19	0.20	0.25	0.49

Source: Authors' calculations.

Table A4

Model Diagnostics – Effects of Decentralization on Government Sector Size

Diagnostics/specification	FDREV (1)	REVGDP (2)	FDEXP (3)	EXPGDP (4)	VFI (5)
Number of observations	168	168	168	168	168
Number of groups (countries)	24	24	24	24	24
Number of instruments	24	24	23	24	24
Wald test	3 248***	776***	490***	1 393***	665***
Hansen J test	4.69	6.37	5.30	9.35	7.29
Probability > chi2	0.97	0.78	0.95	0.31	0.51
Sargan test	4.91	14.83	23.71	17.22	16.64
Probability > chi2	0.96	0.14	0.05	0.28	0.34
Difference in Sargan test for levels	1.63	3.05	3.34	4.90	5.63
Probability > chi2	0.98	0.88	0.85	0.43	0.47
Difference in Sargan test for lagged dependent variable	1.93	0.38	0.45	3.99	3.95
Probability > chi2	0.99	0.99	0.99	0.13	0.27
Arellano-Bond 1 st order autocorrelation	-1.51	-1.57	-1.58	-1.45	-1.45
Probability > chi2	0.13	0.12	0.11	0.15	0.15
Arellano-Bond 2 nd order autocorrelation	1.25	1.31	1.28	1.23	1.18
Probability > chi2	0.21	0.19	0.20	0.22	0.24

Source: Authors' calculations.

Table A5

Model Diagnostics – Effects of Decentralization on Living Standard

Diagnostics/specification	FDREV (1)	REVGDP (2)	FDEXP (3)	EXPGDP (4)	VFI (5)
Number of observations	168	168	168	168	168
Number of groups (countries)	24	24	24	24	24
Number of instruments	24	20	21	23	24
Wald test	2 816***	27 449***	20 782***	15 353***	1 880***
Hansen J test	8.33	5.87	3.32	7.10	6.56
Probability > chi2	0.40	0.21	0.65	0.42	0.59
Sargan test	9.83	1.53	1.78	10.35	4.19
Probability > chi2	0.28	0.82	0.88	0.17	0.84
Difference in Sargan test for levels	0.23	1.67	2.42	0.74	4.32
Probability > chi2	0.89	0.43	0.30	0.69	0.12
Difference in Sargan test for lagged dependent variable	5.41	4.52	1.94	6.36	5.48
Probability > chi2	0.37	0.21	0.59	0.27	0.36
Arellano-Bond 1 st order autocorrelation	-2.07	-2.47	-2.47	-2.34	-2.22
Probability > chi2	0.04	0.01	0.01	0.02	0.03
Arellano-Bond 2 nd order autocorrelation	-1.92	-0.97	-1.25	-0.82	0.12
Probability > chi2	0.06	0.33	0.21	0.41	0.91

Source: Authors' calculations.

Table A6

Model Diagnostics – Effects of Development Objectives on Growth

Diagnostics/specification	GE (1)	CORUP (2)	SIZEEXP (3)	NI-HDI (4)
Number of observations	168	168	168	168
Number of groups (countries)	24	24	24	24
Number of instruments	23	24	20	20
Wald test	456***	659***	2 291***	789***
Hansen J test	12.80	13.21	7.02	6.68
Probability > chi2	0.24	0.28	0.43	0.46
Sargan test	5.27	7.49	9.34	7.94
Probability > chi2	0.51	0.30	0.25	0.43
Difference in Sargan test for levels	3.08	1.69	2.16	1.69
Probability > chi2	0.38	0.64	0.54	0.64
Difference in Sargan test for lagged dependent variable	12.47	3.32	1.89	6.68
Probability > chi2	0.09	0.85	0.60	0.46
Arellano-Bond 1 st order autocorrelation	-2.97	-2.67	-2.81	-2.62
Probability > chi2	0.00	0.00	0.00	0.00
Arellano-Bond 2 nd order autocorrelation	-1.45	-1.37	-0.98	-1.47
Probability > chi2	0.15	0.17	0.33	0.14

Source: Authors' calculations.

Table A7

Variable Description

Variable(s)	Description	Source
GDPpc	GDP per capita growth	World Development Indicators, World Bank
FDREV	Share of revenues of local units in total government revenues	OECD Fiscal Decentralization database
REVGDP	Share of local units revenues in GDP	OECD Fiscal Decentralization database
VFI	Share of intergovernmental transfers in expenditures of local units	OECD Fiscal Decentralization database
FDEXP	Share of local units expenditure in total government expenditure	OECD Fiscal Decentralization database
EXPGDP	Share of local units expenditure in GDP	OECD Fiscal Decentralization database
CORUP	Corruption control perception	Worldwide governance indicators, World Bank
GE	Government efficiency perception	Worldwide governance indicators, World Bank
SIZEEXP	Government sector size (government expenditure/GDP)	OECD Fiscal Decentralization database
NI-HDI	Living standard index – non-income HDI	United Nations Development Programme (UNDP)
Areakm2	Country surface area in km2	World Development Indicators, World Bank
Averagepop	Population/number of local units	Own calculation
Fedunit	Constitutional form – 1 if federal	CIA Factbook
Botelect	Local authorities elected or appointed 1 if elected	Treisman (2008)
Rlaw	Rule of law index	Worldwide governance indicators, World Bank
Unemp	Share of workforce unemployed	World Development Indicators, World Bank
Open	Exports + Imports/GDP	World Bank
TAI	Technological progress index (includes creation of new technologies, adoption of new technologies and use of mature key enabling technologies)	Own calculations based on World Development Indicators, World Bank
INVEST	Share of investment in GDP	World Economic Outlook Database, IMF

Source: Authors'.