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October 26, 2007

The Economic Response to Business Environment Reforms, 2003-06

Outline of talk

- I. Background
- II. Patterns in reform incidence and timing
- III. Measuring impacts of reform
- IV. Conclusions

Preview of conclusions

- Encouraging patterns in reform incidence
- Using tighter estimation methods (within-country variance only), no systematic evidence of strong macroeconomic responses to business environment reforms
- Large standard errors → no precision to detect modest effects. Insufficient time series for medium-run impacts.
- Work in progress. Look for stronger conclusions in another year or two as data keeps coming in.

I. Background and motivation

Doing Business dataset (Djankov et al)

- **Business registration**: number of procedures; days to complete procedures; cost (% of GDP per capita)
- **Closing a business**: number of procedures; days to complete procedures; cost (% of business value)
- **Contract enforcement**: number of procedures; days to complete procedures; cost (% of contract value)
- **Labor laws**: indices of the rigidity of hiring laws, firing laws and hours regulations.
- **Property registration** time and cost (only three years of data)

Background

Two broad categories of regulations and procedures

- 1. Those which directly increase costs of complying with government policies – e.g. business and property registration costs and delays
- 2. Those which create transactions costs or adjustment costs for factors of production (labor) or services (contract enforcement)

Theoretical background

- Dynamic models of firm behavior
 - entry & exit: Joyanovic (*Econometrica* 1982); Hopenhayn (*Econometrica* 1992); Pakes & Ericson (JET 1998)
 - investment: Cooper & Haltiwanger (*Rev Econ Studies* 2006) ; Bloom and Van Reenen (*Rev Econ Studies* 2007)
 - employment: Cooper & Willis (Reserve Bank of Kansas City 2003); Bentolila & Bertola (*Rev Econ Studies* 1990)
- Basic empirical predictions and results:
 - regulations which raise costs potentially lower factor demand. Important difference between increased variable versus fixed costs.
 - regulations which increase frictions and adjustment costs, especially in uncertain environments, potentially lower factor demand and reduce response to improved external conditions
 - lots of potential interactions & nonlinearities (→ hard with small datasets)

Empirical Literature

- Entry regulations: Djankov et al (QJE 2002), Viviano (Bank of Italy 2006), Whinston (JEP 1998), Messina (ECB 2002), Jayaratne & Strahan (J Law Econ 1998)
- Labor regulations: Djankov et al (QJE 2004), Bertrand & Kramarz (QJE 2002), Nickell (JEP 1997); Bentolila & Bertola (RE Stud 1990)
- Labor regulations in developing countries: Besley & Burgess (QJE 2004), Fallon & Lucas (JDE 1993), MacIsaac & Rama (J Labor Econ 1997), Hasan Mitra & Ramaswamy (NBER 2003)
- Judiciary: Djankov et al (QJE 2003)
- Laffont (2005, *Regulation and Development*)

Problems and partial remedies

- Country economic performance is correlated with a vast array of policies, institutions and country characteristics
- Omitted variables make macro effects of institutions and policies very hard to estimate
- Partial solution: look for economic responses to reforms of regulations and procedures; exploit timing of reforms over multiple-year period to rule out confounding factors

Problems with this approach

- **Precision:** only four years of data. No power to detect modest effects or medium-run impacts.
 - Try to offset : look at lower-variance outcomes (investment, unemployment), trim outliers aggressively, minimize multicollinearity
- **Aggregate approach:** regulations and procedures which increase fixed costs will mostly affect small firms and their choice between formality and informality. Reforms may have distributional effects that don't show up in aggregates.
- *Need industrial census (or representative large-sample) data for a broader set of countries over time to really answer the questions we'd like to answer.*

II. Patterns in reform incidence & timing

Table 1. Reformers, Reversals

Regulation	Median (initial)	# reformers	# reversals	# non-reformers
Days to start a business	42	79	3	88
Years to close a business	3.0	12	7	151
Cost of closing a business	15	4	1	165
Days to enforce a contract	478	31	0	139
Cost of enforcing a contract	17.6	12	5	153
Employment rigidity index	38	24	23	123
Hiring rigidity index	33	21	19	130
Firing rigidity index	33	4	4	162
Hours rigidity index	40	3	3	164
Days to register property	50	22	6	142
Cost of registering property	5.1	81	29	60

Table 2. Reform Timing

Regulation	Reforms			Reversals		
	2003-04	2004-05	2005-06	2003-04	2004-05	2005-06
Days to start a business	27	33	41	1	5	2
Years to close a business	5	7	6	2	7	3
Cost of closing a business	0	3	7	1	4	2
Days to enforce a contract	11	16	9	0	0	0
Cost of enforcing a contract	0	9	3	0	3	2
Employment rigidity index	1	13	14	4	9	12
Hiring rigidity index	1	12	11	4	9	10
Firing rigidity index	0	2	2	1	1	2
Hours rigidity index	0	0	3	1	0	2
Days to register property		6	16		2	4
Cost of registering property		63	54		17	18

Table 3. Who reforms?

	Days to start a business	Days to close a business	Days to enforce a contract	Employment rigidity index	Days to register property	Cost of registering property
Initial level of regulation	0.0001 (0.001)	0.032 (0.020)	0.0002* (0.000)	0.0007 (0.002)	0.0002 (0.000)	0.0072 (0.007)
Voice and accountability	-0.18 (0.191)	-0.148 (0.228)	0.094 (0.142)	-0.124 (0.199)	0.057 (0.186)	-0.051 (0.175)
Political stability	-0.015 (0.055)	-0.038 (0.071)	-0.056 (0.040)	-0.002 (0.060)	-0.067 (0.043)	0.05 (0.052)
Government effectiveness	-0.017 (0.137)	0.185 (0.156)	-0.009 (0.069)	0.058 (0.111)	-0.206* (0.103)	0.029 (0.123)
Regulatory quality	-0.02 (0.106)	-0.138 (0.149)	0.066 (0.107)	-0.056 (0.117)	0.194* (0.105)	0.091 (0.090)
Rule of law	-0.045 (0.151)	0.000 (0.184)	-0.226* (0.123)	-0.051 (0.149)	-0.063 (0.134)	-0.123 (0.151)
Control of corruption	0.052 (0.117)	-0.009 (0.142)	0.105 (0.092)	0.051 (0.128)	-0.081 (0.098)	0.002 (0.111)
Political rights , level	-0.009 (0.054)	-0.065 (0.065)	0.003 (0.033)	-0.034 (0.060)	0.042 (0.046)	-0.068 (0.049)
Civil liberties , level	-0.059 (0.069)	-0.022 (0.075)	0.002 (0.046)	-0.02 (0.061)	-0.044 (0.055)	0.081 (0.060)
Comprehensive risk index, level	0.004 (0.006)	0.004 (0.007)	0.002 (0.004)	0.003 (0.006)	0.017** (0.005)	0.003 (0.006)
Political rights, change 2003-06	-0.053 (0.035)	-0.037 (0.040)	0.021 (0.026)	-0.014 (0.027)	-0.058** (0.025)	-0.025 (0.030)
Civil liberties, change 2003-06	0.039 (0.036)	0.018 (0.048)	0.006 (0.034)	0.039 (0.044)	-0.032 (0.027)	-0.03 (0.036)
Comprehensive risk index, chg 03-06	-0.001 (0.008)	-0.019 (0.009)	-0.007 (0.005)	-0.005 (0.008)	-0.003 (0.006)	-0.008 (0.006)
Middle income country	0.022 (0.102)	-0.106 (0.087)	0.04 (0.070)	-0.094 (0.078)	-0.06 (0.079)	-0.055 (0.105)
High income country	0.032 (0.138)	-0.079 (0.130)	0.02 (0.078)	-0.132 (0.113)	0.073 (0.104)	-0.021 (0.121)
observations	163	106	120	171	121	121
R²	0.037	0.11	0.116	0.012	0.12	0.048
F	0.74	0.77	1.278	0.33	2.62	0.83

Table 4. When do they reform?

	(1)	(2)	(3)	(4)	(5)	(6)
	Days to start a business	Years to close a business	Days to enforce a contract	Rigidity of employment	Days to register property	Cost of registering property
Output gap	-68.4	-0.189	-53.9	1.560	-39.3	-5.77
	(5.03)**	(0.51)	(2.69)**	(0.86)	(1.07)	(2.86)**
Political rights	2.291	0.009	-12.43	0.292	3.441	0.405
	(1.36)	(0.19)	(1.43)**	(0.60)	(1.46)	(2.22)*
Civil liberties	5.33	0.140	4.38	0.004	-4.22	-0.158
	(2.36)*	(0.95)	(1.10)	(0.01)	(1.40)	(0.77)
ICRG - economic	0.051	0.004	-1.078	0.017	-0.517	-0.034
	(0.15)	(0.55)	(1.69)	(0.21)	(0.71)	(0.46)
ICRG - financial	0.393	-0.017	-0.312	0.002	-1.508	-0.003
	(1.25)	(0.78)	(0.23)	(0.02)	(0.97)	(0.05)
ICRG -political	-0.176	0.016	-0.360	-0.081	-0.479	-0.010
	(0.64)	(1.34)	(0.78)	(1.15)	(0.93)	(0.30)
Observations	448	440	448	448	339	339
Countries	117	114	117	117	117	117
R-squared	0.22	0.04	0.06	0.01	0.02	0.10

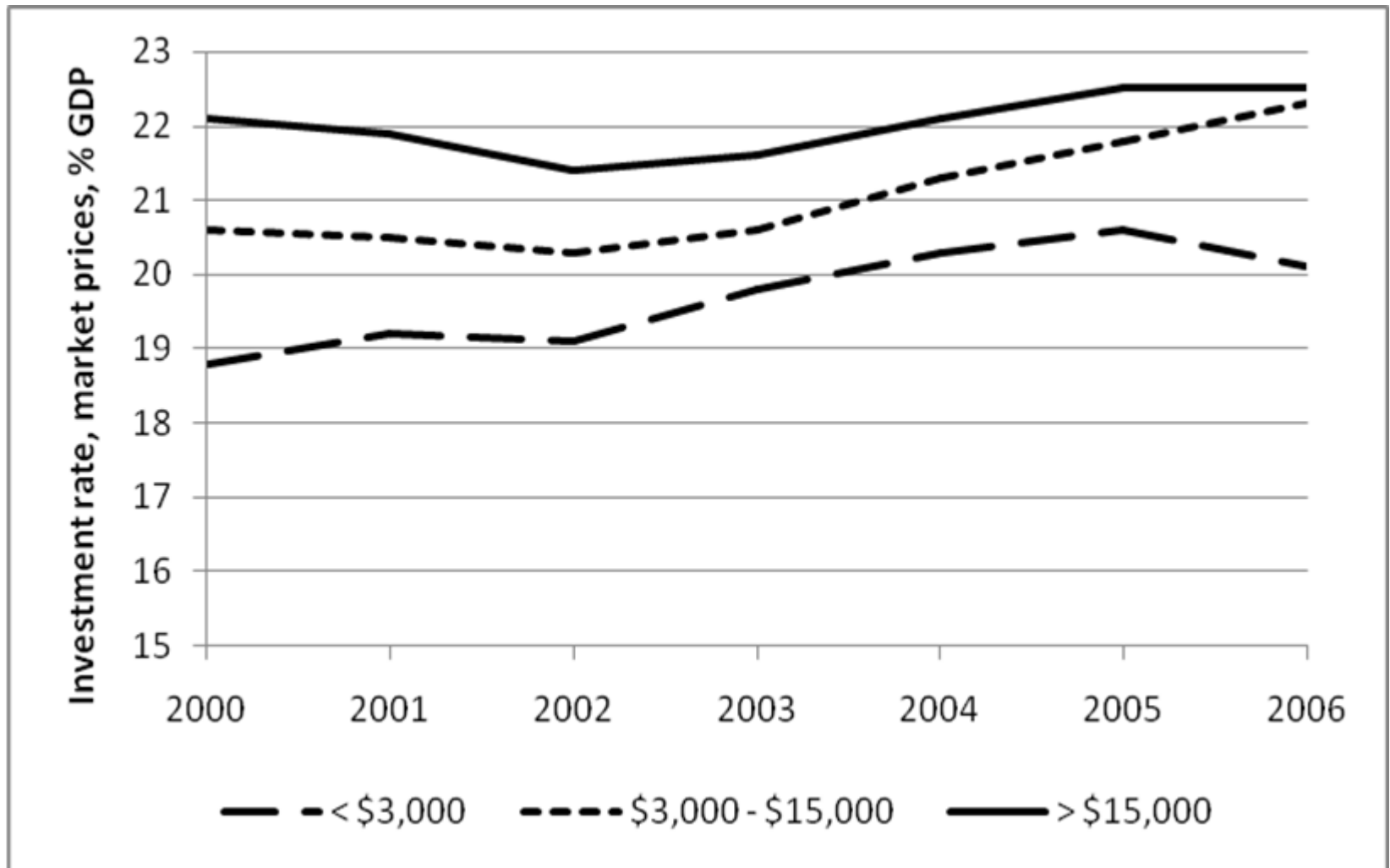
Table 5. Reformist countries?

	Days to start a business	Years to close a business	Days to enforce a contract	Employment rigidity index	Days to register property	Cost of registering property
Days to start a business		-0.079	0.136	-0.115	-0.019	-0.071
		(1.49)	(2.44)*	(1.84)*	(0.33)	(0.92)
Years to close a business	-0.191		0.179	0.023	0.022	-0.084
	(1.49)		(2.05)*	(0.24)	(0.24)	(0.71)
Days to enforce a contract	0.288	0.157		0.111	0.011	-0.096
	(2.44)*	(2.05)*		(1.21)	(0.13)	(0.86)
Employment rigidity index	-0.198	0.017	0.090		-0.017	0.182
	(1.84)*	(0.24)	(1.21)		(0.21)	(1.77)*
Days to register property					0.183	
					(2.96)**	
Cost of registering property						0.320
						(2.96)**
R2	0.354	0.106	0.043	0.170	0.079	0.245
F-statistic	(8.01)**	(3.21)**	(1.18)	(4.50)**	(1.91)	(4.76)**
Observations	150	150	150	150	147	147

Table 6. Correlations in reform timing

	(1)	(2)	(3)	(4)	(5)	(6)
	Days to start a business	Years to close a business	Days to enforce a contract	Rigidity of employment laws	Days to register property	Cost to register property
Years to close a business	2.60 (1.60)		17.54 (1.19)	-0.272 (0.82)	-0.583 (1.07)	0.155 (0.92)
Days to enforce a contract	0.052 (3.31)**	0.002 (1.11)		0.001 (0.19)	0.147 (1.85)*	0.003 (1.24)
Rigidity of employment laws	-0.022 (0.21)	-0.004 (0.84)	0.177 (0.20)		0.183 (1.06)	0.029 (2.03)*
Days to start a business		0.003 (2.78)**	0.599 (3.04)**	-0.002 (0.21)	0.048 (0.54)	0.014 (1.77)*
Cost of registering property					2.05 (1.32)	
Days to register property						0.003 (0.93)
Observations	567	567	567	567	430	430
Countries	151	151	151	151	148	148
R-squared	0.05	0.04	0.07	0.00	0.04	0.05

Figure 1. Trends in investment rates (by income level)



III. **Macroeconomic responses**

Table 7. Reforms & outcomes (pooled OLS)

	Investment (% GDP)		Unemployment (%)	
	(1)	(2)	(3)	(4)
Days to start a business	0.012 (0.010)	0.007 (0.010)	-0.015 (0.009)	-0.023 (0.009)*
Years to close a business	0.161 (0.145)	0.243 (0.168)	-0.119 (0.127)	0.215 (0.143)
Days to enforce a contract	0.001 (0.001)	0.001 (0.001)	0.004 (0.001)**	0.007 (0.002)**
Rigidity of employment laws	-0.000 (0.015)	0.007 (0.016)	0.057 (0.014)**	0.041 (0.015)**
Days to register property		0.007 (0.002)**		-0.004 (0.005)
Cost of registering property		0.064 (0.050)		0.543 (0.174)**
ICRG - economic risk	-0.287 (0.115)*	-0.085 (0.137)	0.208 (0.113)	0.218 (0.124)*
ICRG - financial risk	0.225 (0.067)**	0.167 (0.087)*	-0.253 (0.062)**	-0.169 (0.085)*
ICRG - political risk	0.144 (0.038)**	0.143 (0.044)**	-0.162 (0.069)*	-0.068 (0.061)
Political rights	0.773 (0.422)	0.346 (0.503)	-0.864 (0.601)	-1.065 (0.731)
Civil liberties	-0.975 (0.519)*	-0.612 (0.606)	0.814 (0.641)	1.307 (0.841)
Output gap	10.964 (2.309)**	12.491 (2.793)**	-1.697 (3.622)	6.085 (4.817)
Observations	360	258	218	152
R-squared	0.14	0.20	0.29	0.41

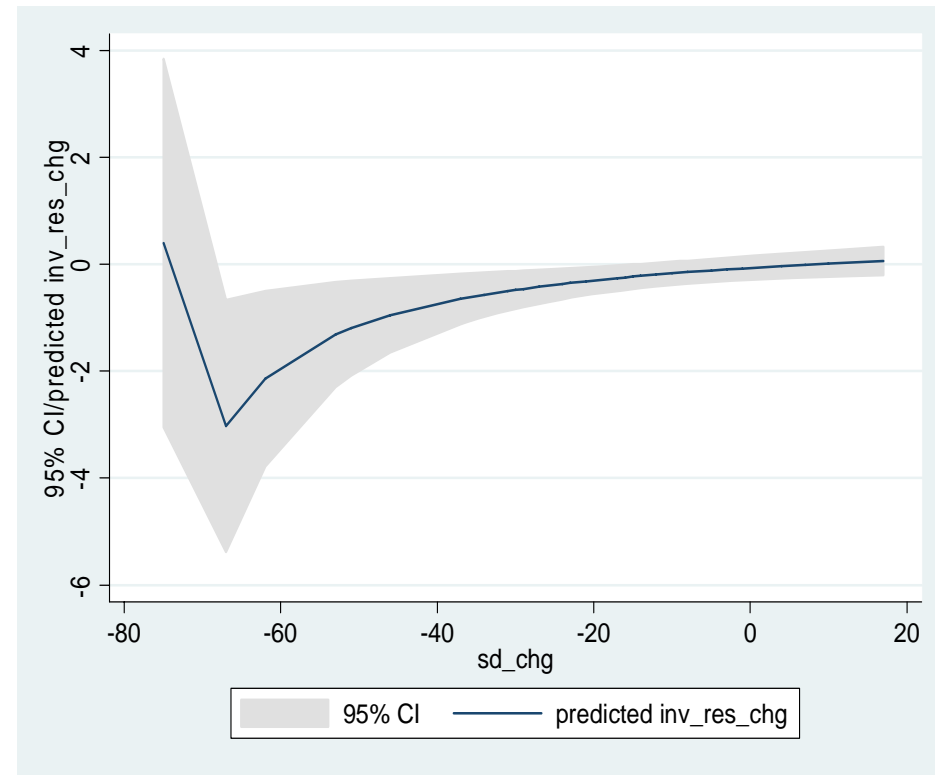
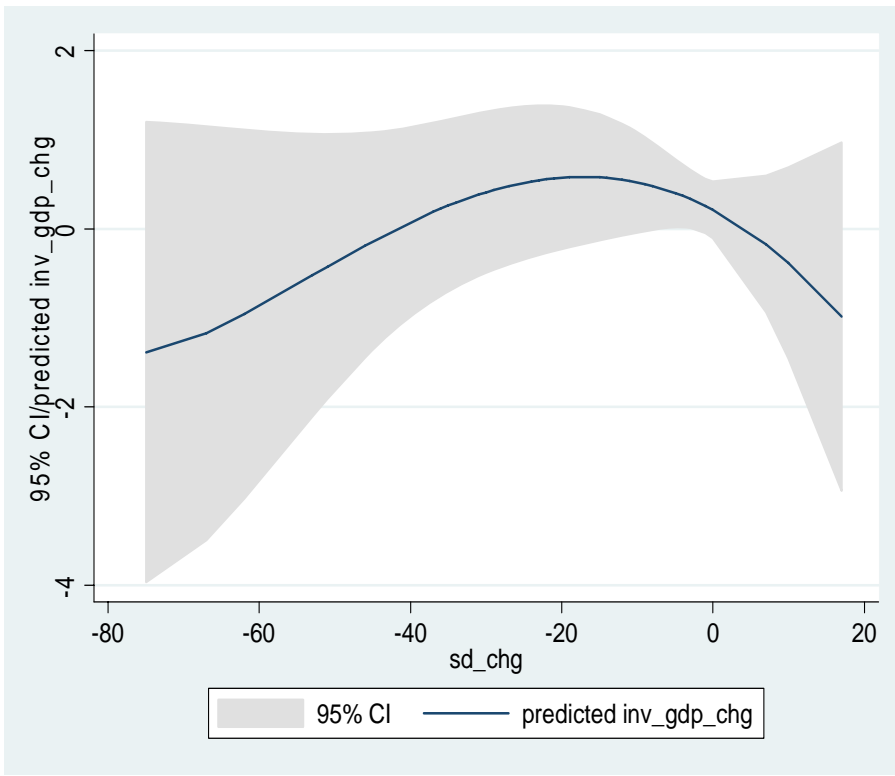
Table 8. Fixed effects, one reform at a time

	Investment				Unemployment			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Days to start a business	-0.003				-0.006			
	(0.008)				(0.012)			
Years to close a business		-0.157				-0.028		
		(0.160)				(0.162)		
Days to enforce a contract			-0.000				0.002	
			(0.004)				(0.004)	
Rigidity of employment				0.029				0.001
				(0.036)				(0.029)
Output gap	2.993	3.165	2.935	2.739	-6.054	-6.290	-6.412	-6.390
	(4.288)	(4.261)	(4.255)	(4.289)	(3.832)	(3.948)	(3.826)	(3.857)
ICRG - economic	-0.008	-0.034	-0.008	-0.011	-0.066	-0.064	-0.063	-0.063
	(0.064)	(0.062)	(0.064)	(0.063)	(0.105)	(0.107)	(0.106)	(0.107)
ICRG - financial	-0.032	-0.007	-0.033	-0.032	0.105	0.101	0.098	0.103
	(0.065)	(0.063)	(0.065)	(0.066)	(0.079)	(0.082)	(0.080)	(0.078)
ICRG - political	0.038	0.039	0.038	0.042	-0.279	-0.276	-0.275	-0.277
	(0.050)	(0.051)	(0.051)	(0.051)	(0.079)**	(0.079)**	(0.080)**	(0.080)**
Political rights	0.918	0.862	0.915	0.909	-0.940	-0.930	-0.901	-0.927
	(0.427)*	(0.438)	(0.427)*	(0.424)*	(0.466)*	(0.451)*	(0.464)	(0.456)*
Civil liberties	-1.306	-1.127	-1.319	-1.317	0.785	0.747	0.727	0.736
	(0.409)**	(0.408)**	(0.410)**	(0.410)**	(0.429)	(0.428)	(0.414)	(0.416)
Observations	365	360	365	365	218	218	218	218
Countries	110	107	110	110	67	67	67	67
R-squared	0.25	0.25	0.25	0.25	0.43	0.43	0.43	0.43

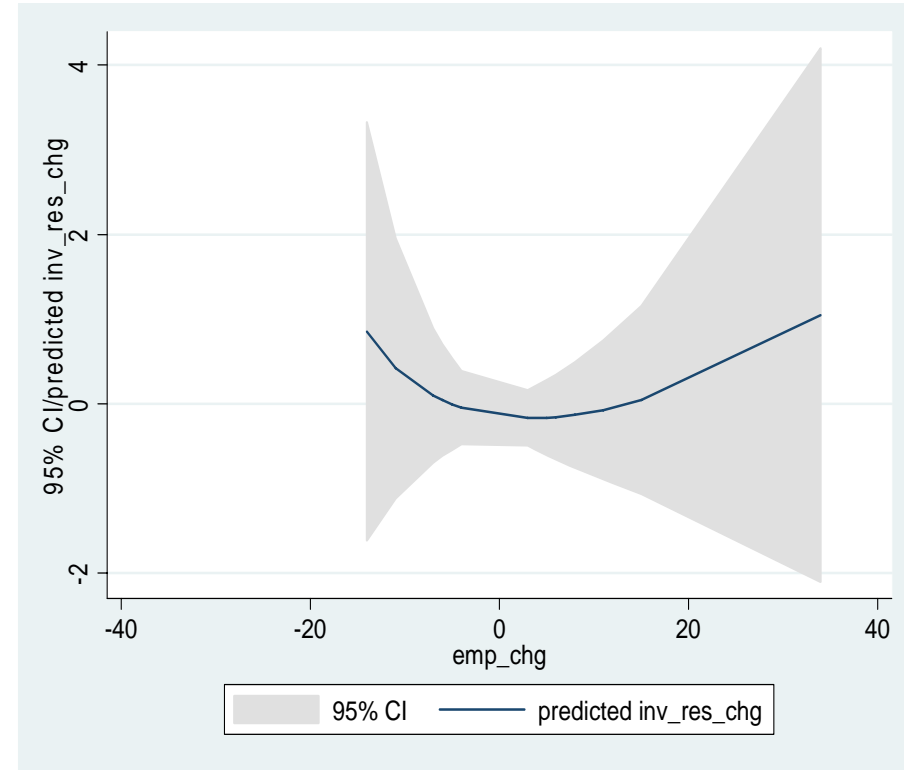
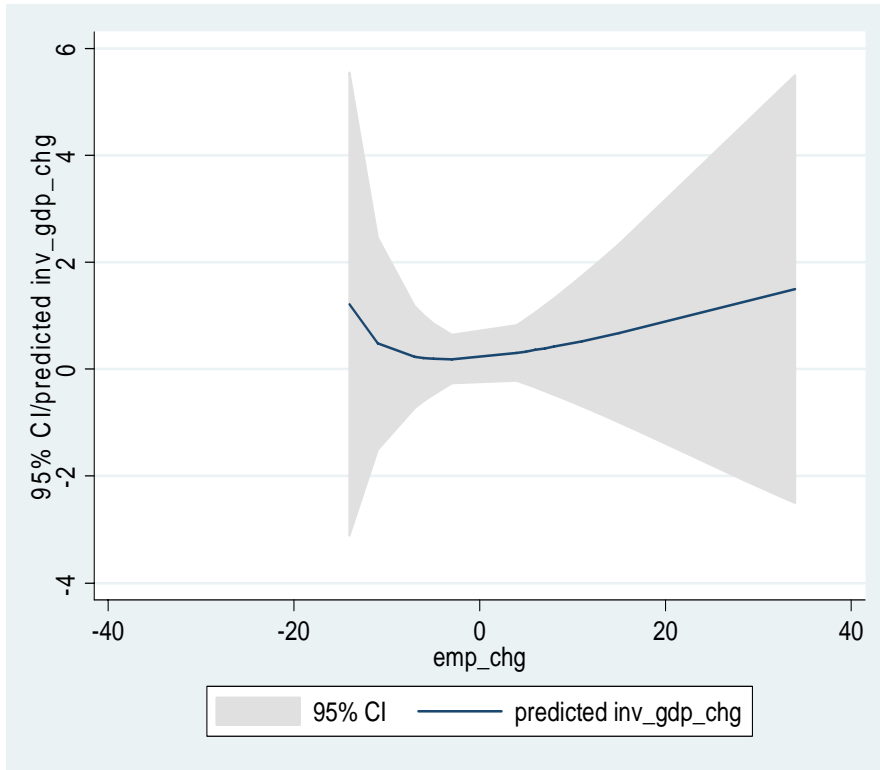
Table 9. Fixed effects, multiple reforms & lags

	Investment				Unemployment			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Days to start a business	-0.001	-0.000	0.006	0.003	-0.007	-0.022	-0.014	0.006
	(0.008)	(0.009)	(0.009)	(0.011)	(0.011)	(0.017)	(0.015)	(0.020)
Years to close a business	-0.160	0.051	0.021	0.013	-0.041	-0.167	-0.015	-0.439
	(0.161)	(0.108)	(0.109)	(0.086)	(0.164)	(0.205)	(0.208)	(0.156)**
Days to enforce a contract	-0.000	-0.004	-0.002	-0.000	0.003	0.002	0.002	0.008
	(0.004)	(0.004)	(0.003)	(0.001)	(0.004)	(0.003)	(0.003)	(0.004)
Rigidity of employment laws	0.031	0.014	0.018	0.022	0.003	0.019	-0.013	-0.076
	(0.036)	(0.037)	(0.035)	(0.011)*	(0.029)	(0.031)	(0.030)	(0.059)
Days to register property			-0.002	-0.002			0.019	0.042
			(0.001)*	(0.000)**			(0.028)	(0.089)
Cost of registering property			-0.162	-0.105			0.139	0.125
			(0.136)	(0.064)			(0.203)	(0.195)
Days to start a business (lag)		-0.001		0.004		-0.008		0.004
		(0.007)		(0.006)		(0.013)		(0.010)
Years to close a business (lag)		0.270		0.391		1.691		0.368
		(0.404)		(0.187)*		(0.926)		(0.301)
Days to enforce a contract (lag)		-0.005		-0.023		0.034		-0.001
		(0.011)		(0.023)		(0.012)**		(0.031)
Rigidity of employment laws (lag)		0.000		0.005		-0.019		-0.084
		(0.055)		(0.048)		(0.042)		(0.155)
Days to register property (lag)				0.031				0.438
				(0.018)				(0.154)**
Cost of registering property (lag)				0.113				-0.093
				(0.086)				(0.255)

Investment & business registration



Investment & labor laws



Unemployment and labor laws

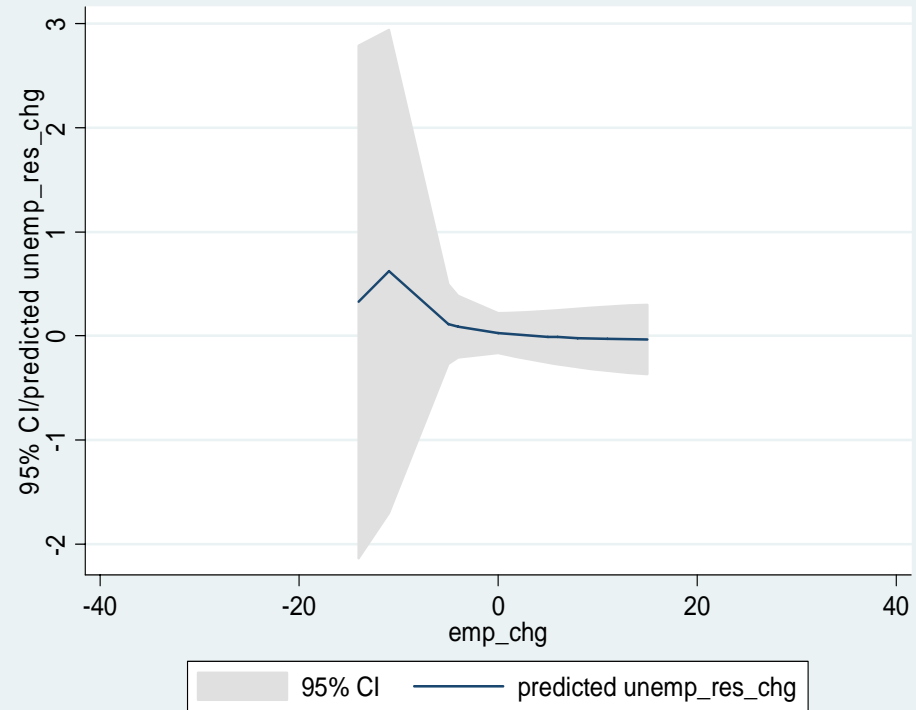
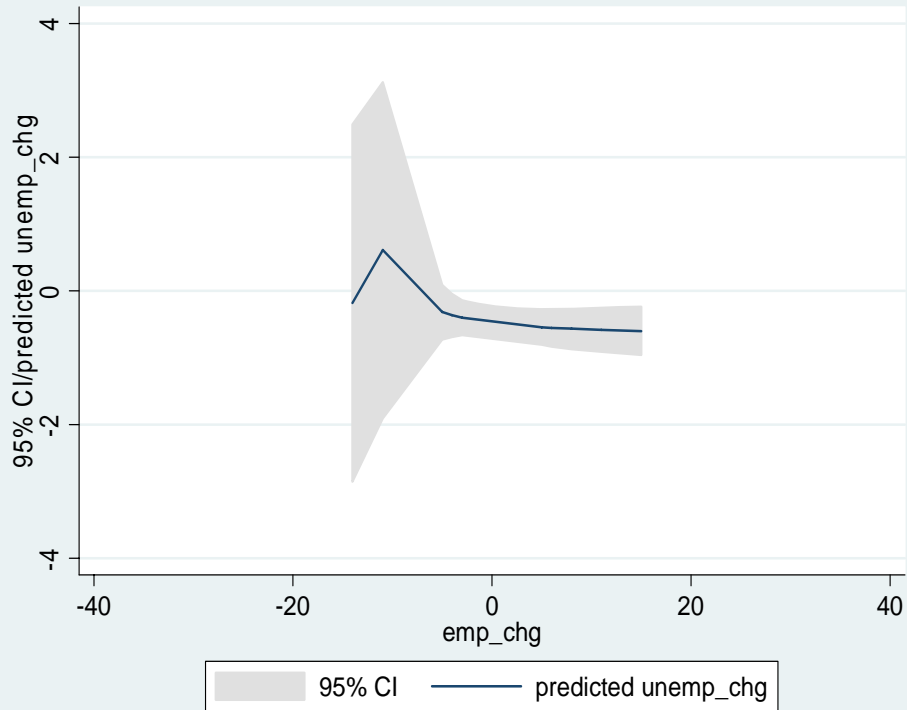


Table 10. Interactions with income & governance

	Investment				Unemployment			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Days to start a business	Years to close a business	Days to enforce a contract	Employment rigidity index	Days to start a business	Years to close a business	Days to enforce a contract	Employment rigidity index
Regulatory indicator	0.051	-0.864	0.159	0.474	-0.885	31.63	0.046	0.213
	(0.22)	(0.16)	(0.67)	(0.84)	(2.44)*	(0.38)	(0.73)	(0.60)
* government effectiveness	-0.054	-0.438	-0.022	-0.020	-0.041	-0.318	-0.008	0.246
	(1.76)*	(0.24)	(1.11)	(0.13)	(1.03)	(0.04)	(0.38)	(1.93)*
* regulatory quality	0.092	0.213	0.044	0.015	-0.023	4.056	0.023	-0.282
	(3.25)**	(0.11)	(1.06)	(0.09)	(0.98)	(1.07)	(0.96)	(1.61)
* log per capita income	-0.009	0.069	-0.018	-0.053	0.097	-3.661	-0.006	-0.018
	(0.35)	(0.11)	(0.67)	(0.79)	(2.43)*	(0.39)	(0.81)	(0.44)
Output gap	2.367	3.778	3.398	3.362	-6.954	-7.626	-7.378	-5.990
	(0.54)	(0.84)	(0.76)	(0.74)	(1.75)	(1.74)	(1.78)	(1.50)
ICRG - economic risk	-0.012	-0.031	-0.010	-0.008	0.002	-0.081	-0.068	-0.075
	(0.19)	(0.50)	(0.15)	(0.13)	(0.02)	(0.76)	(0.62)	(0.70)
ICRG - financial risk	-0.067	-0.007	-0.043	-0.034	0.092	0.111	0.098	0.111
	(1.01)	(0.11)	(0.63)	(0.51)	(1.37)	(1.23)	(1.16)	(1.36)
ICRG - political risk	0.030	0.034	0.033	0.036	-0.275	-0.233	-0.274	-0.272
	(0.59)	(0.62)	(0.63)	(0.69)	(3.68)**	(2.76)**	(3.31)**	(3.40)**
Political rights	1.092	0.848	0.885	0.881	-1.137	-0.778	-0.975	-0.899
	(2.46)*	(1.91)	(2.09)*	(2.00)*	(2.71)**	(1.75)	(2.05)*	(1.95)
Civil liberties	-1.252	-1.134	-1.323	-1.333	0.867	0.793	0.689	0.775
	(3.14)**	(2.73)**	(3.18)**	(3.25)**	(1.98)*	(1.84)	(1.64)	(1.85)
Observations	355	352	355	355	213	213	213	213
Countries	107	105	107	107	65	65	65	65
R-squared	0.29	0.24	0.26	0.26	0.48	0.45	0.44	0.44

IV. Conclusions

- Rate of reform generally accelerating; countries which reform in one area are likely to reform in others as well
- No systematic evidence of strong macroeconomic responses to business environment reforms
- Large standard errors → insufficient statistical power to detect modest effects
- Insufficient time series to find medium-run impacts
- Look for stronger conclusions in another year or two.