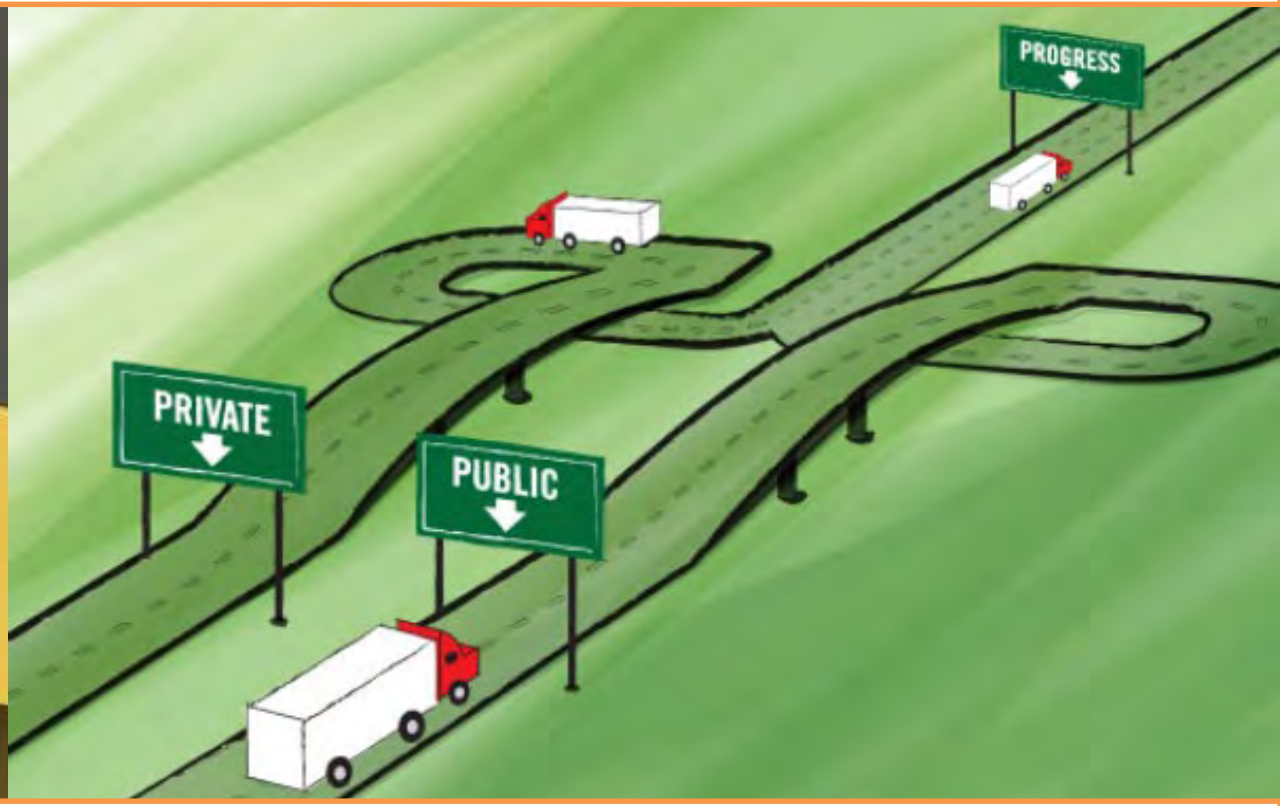
Case of Tashguzar-Baysun-Kumkurgan Railway



Umid Abidhadjaev, Ph.D

Head, Infrastructure Projects Analysis Group

Ministry of Economy and Industry of the Republic of Uzbekistan

Agenda

- PPP reforms in Uzbekistan
  - PPP Law of Uzbekistan
  - PPP Development Agency
  - Infrastructure Projects Analysis Group
- Case study of Tashguzar-Baysun-Kumkurgan (TBK) Rail connection in Uzbekistan
- Case study of Preschool Education Project in Uzbekistan

Problems prior to establishment of Public Private Partnership Development Agency

State monopoly in the social and communal spheres, urban planning and improvement, road facilities, and energy

Absence of the legal and institutional framework that defines the principles, conditions and directions for the development of public-private partnerships

No special body providing interaction between the state and business in the implementation of infrastructure and social projects through the use of public-private partnership mechanisms

Public Private Partnership Law of Uzbekistan

Adopted 10th of May, 2019

Main principles of public-private partnership

- **Provision of equal rights to both sides**
- **Transparency of PPP projects' implementation**
- **Competitiveness & objective selection of Private partner**
- **Prevention of corruption**

PPPDA

PPP Development Agency

Public Private Partnership Development Agency of Uzbekistan

Established on October 20th, 2018 with the Presidential Decree

- **Implement single state policy in the field of PPP**
- **Review and appraise PPP projects**
- **Monitor PPP projects**
- **Provide methodological support**

SCHEME of the tender for the conclusion of the PPP agreement

Stages	Subjects and activities	Deadlines
1st stage	**Municipalities** • Consideration of the request of a legal or natural person who has expressed a desire to finance the project on PPP terms as a private partner, and sending an application to the public partner to initiate tender	Within 5 days
2nd stage	**Public partner (Ministry of Construction of Uzbekistan)** • Announcement of tender	As needed
3rd stage	**Applicant** • Submission of an application to the public partner	Within 30 days
4th stage	**Public partner** • Screening Application for compliance with the requirements of PPP partnership. In case of non-compliance, the application will be returned to the applicant	Within 1 day
5th stage	**Tender commission** • 1. In the case of applications from at least two participants, the competition, decision-making on the basis of the competition and the determination of the winner. • 2. In the case of applications from only one participant, consideration of the application and decision.	1. Within 7 days 2. Within 5 days
6th stage	**Public partner** • Notification of the applicants about the decision by posting information on the official website of the Ministry of Construction of the Republic of Uzbekistan, as well as municipalities	On the day of decision
7th stage	**Public and private partners** • Conclusion of PPP agreement	Within 10 days

Ongoing PPP Projects in Uzbekistan

- Construction of 4 bus terminals all over Uzbekistan
- Construction of Tashkent-Andijan and Tashkent-Samarkand toll roads
- Construction of solar photoelectric station with a capacity of 100 MW in Navoi region
- Modernization of water supply and sewerage systems in Tashkent, Qarshi, Bukhara and Namangan
- Granting 4 preschools in Tashkent to trust management
- Modernization of Tashkent International Airport
- Paving of 27 km highway in Navoi district

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Case study of Tashguzar-Baysun-Kumkurgan (TBK) Rail connection

Concept:	infrastructure impact evaluation
Objective:	examine the nature and magnitude of economic returns from railway connection as observed by regional GDP, Agriculture, Industry and Services value added
Context:	TBK railway connection in Uzbekistan, 2005-2012
Methodology:	difference-in-difference approach
Point of novelty and findings:	empirical strategy allowed mapping out differential impact of infrastructure provision across economic segments, geographical locations and time frames. Study showed that newly provided TBK rail line connection generated positive impact far beyond the actual regions of the rail line, reinforcing the hypothesis of spillover effects

*Note: Infrastructure (n): The basic physical and organizational structures and facilities (e.g. buildings, roads, railways, power supplies) needed for the operation of a society or enterprise

Empirical literature on infrastructure: revealed patterns and gaps

Aggregate level analysis	Arslanalp et al. (2010) Abdih and Joutz (2008)	Demetriades and Mamuneas (2000) Vijverberg et al. (1997)	Pina and St. Aubyn (2006) Belloc and Vertova (2006)
Regional level analysis	Seung and Kraybill (2010) Stephan (2003)	Cohen and Paul (2004) Moreno et al. (2003)	Pereira and Andraz (2010) Everaert (2003)
Sectoral level analysis	Yoshino and Nakahigashi (2000) Fernald (1999)	Mamatzakis (1999) Nadiri and Mamuneas (1996)	Pereira and Andraz (2007) Pereira and Andraz (2003)

Source: Alfredo M. Pereira & Jorge M. Andraz, 2013. "On the Economic Effects of Public Infrastructure Investment: A Survey of International Evidence," Journal of Economic Development, Chung-Ang University, Department of Economics, vol. 38(4), pages 1-37, December

Empirical literature on infrastructure: revealed patterns and gaps

- Aggregate level analysis
  - <u>Positive and significant effects</u>
    - Belloc and Vertova (2006)
      - VECM
    - Pina and St. Aubyn (2006)
      - VAR
    - Kamps (2005)
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- Regional level analysis
  - <u>Negative or insignificant effects</u>
    - Holtz-Eakin (1994)
      - Cobb-Douglas
    - Holtz-Eakin and Schwartz (1995)
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- No consensus on which region benefits from infrastructure provision

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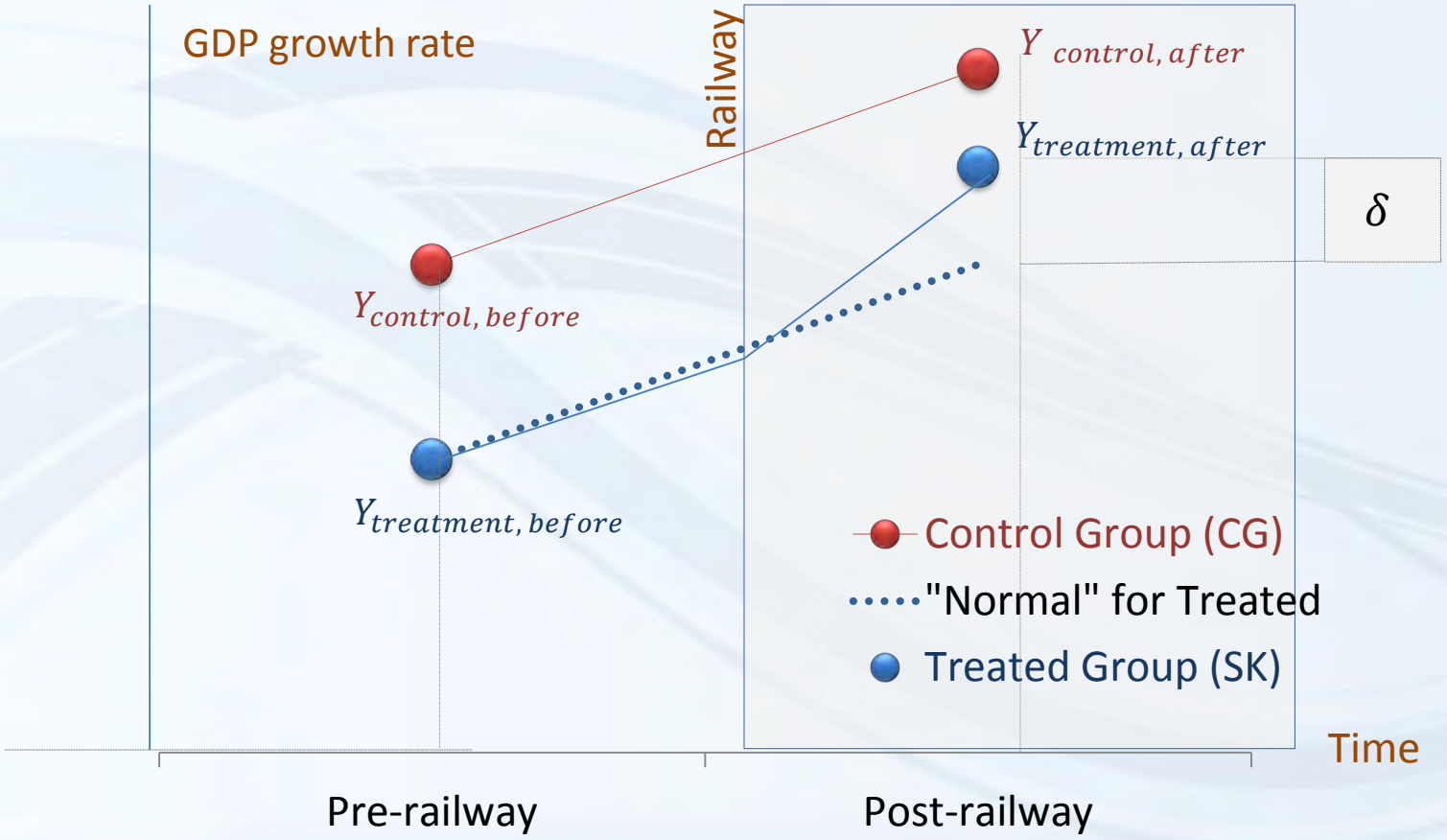
Methodology: difference-in-difference



Measure “outcomes” for both groups before and after introduction of railway

Difference-in-difference: regression

- incorporating time varying covariates

  Control group $E[\Delta Y_{0it} \mid i, t, X_{it}] = \alpha + \gamma_i + \varphi_t + X'_{it}\beta$

  Treated group $E[\Delta Y_{1it} \mid i, t, X_{it}] = E[Y_{0it} \mid i, t, X_{it}] + \delta$

- $$\frac{Y_{it} - Y_{it-1}}{Y_{it-1}} * 100 = \alpha_i + \varphi_t + X'_{it}\beta + \delta\left(D_{rail} \times D_{post}\right)_{it} + \epsilon_{it}$$

  $\frac{Y_{it} - Y_{it-1}}{Y_{it-1}} * 100$ - GDP growth rate

  α_i - sum of autonomous (α) and region specific(γ_i) rate of growth

  φ_t- year specific growth effect

  X_{it}-time varying covariates

  $\left(D_{rail} \times D_{post}\right)_{it}$-dummy variable indicating that observation belong to treated group after treatment period

  δ- difference in difference coefficient

  ϵ_{it}- error term

Difference-in-difference: regression

- $\frac{\mathrm{Y_{it}}-\mathrm{Y_{it-1}}}{\mathrm{Y_{it-1}}} * 100 = \alpha_i + \varphi_t + X'_{it}\beta + \delta\left(D_{rail} \times D_{post}\right) + \epsilon_{it}$

  X_{it}-time varying covariates

  - Percentage of working population (ratio of labor force(age from 16 to 64) to total population)
  - Investment share:
    - Public (by State)
    - Private (by Population and Enterprises, Commercial Banks, Foreign investors, Off budget funds)
  - Ratio of export to import
  - Government spending (Education, Healthcare, R&D)

assumption about common trend

assumption about geographical focus

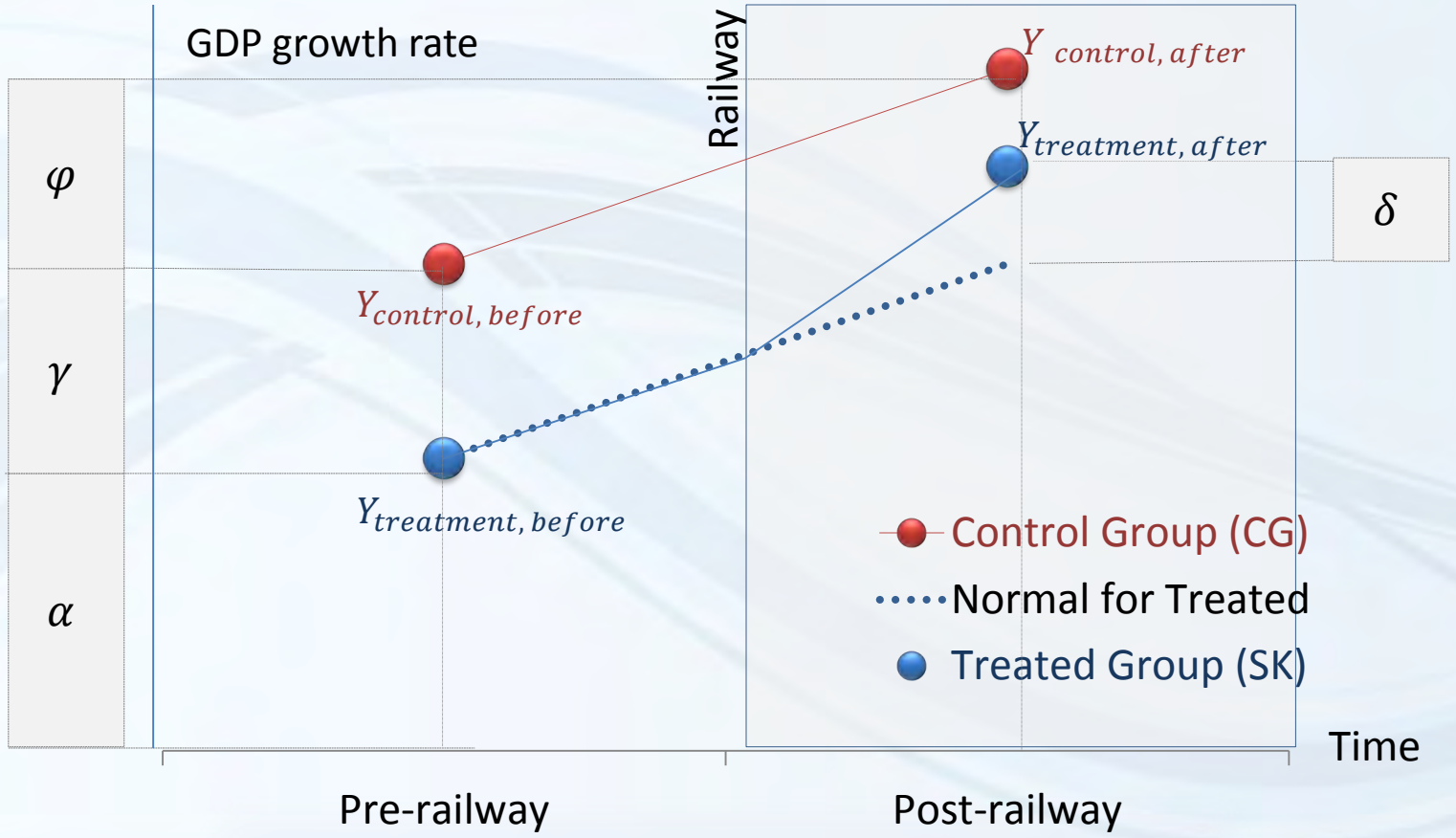
assumption about timing

assumption about common trend

assumption about geographical focus

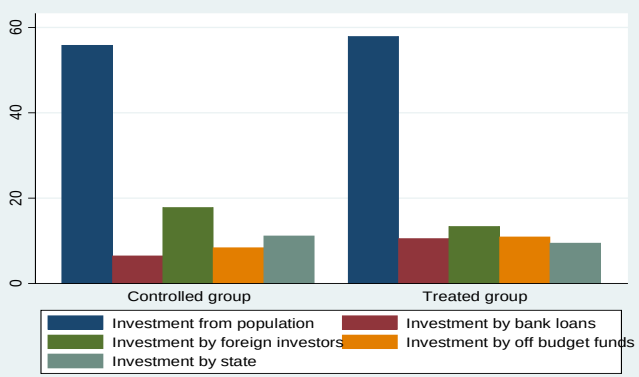
assumption about timing

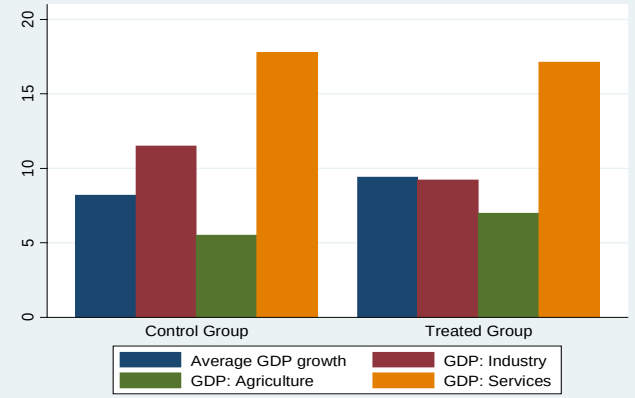
Assumption: common trend



$$\Delta Y_{it} = \alpha + \gamma_i + \varphi_t + X'_{it}\beta + \delta\left(D_{rail} \times D_{post}\right)_{it} + \epsilon_{it}$$

Assumption: common trend





Variable/Group	Control group				Treated group (connectivity)			
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
GDP growth rate	8	3.	0.6	18.6	7	1.9	3	10.5
Industry, value added	13	10	-2.9	36.8	13	7.9	0.3	28.6
Services, value added	21	6	8.4	35.4	18	5.1	11.1	26.8
Agriculture, value added	5	3	0	13.7	5	3.6	0.1	12.8
Retail trade volume growth rate	15	7	-1.4	33.7	14	7.7	-0.1	24.3
External trade volume growth rate	18	26	-34	96.2	15	21.	-17	41.9

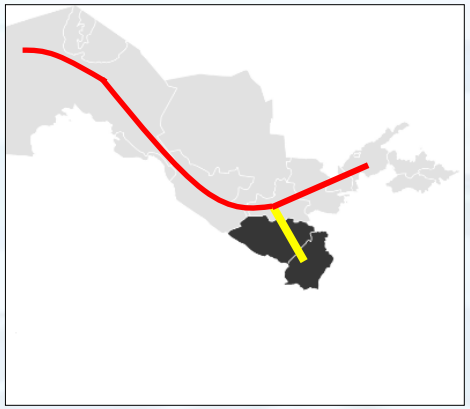
Source: Statistics Committee of the Republic of Uzbekistan

assumption about common trend

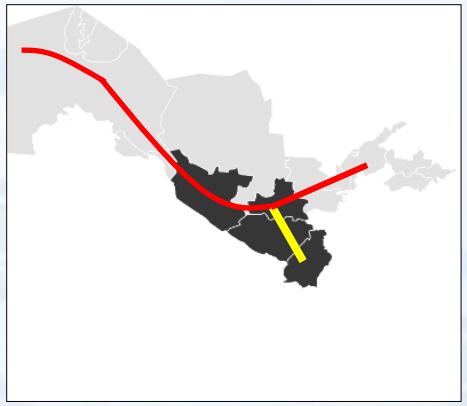
assumption about geographical focus

assumption about timing

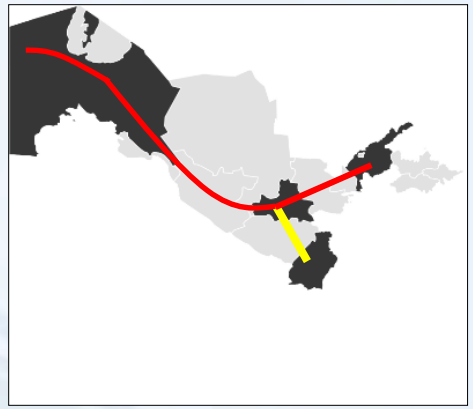
Assumption about geographical focus



Regional effect (by region of infrastructure)



Spillover effect (by neighboring regions)



Connectivity effect (by terminal regions of the rail system)

assumption about common trend

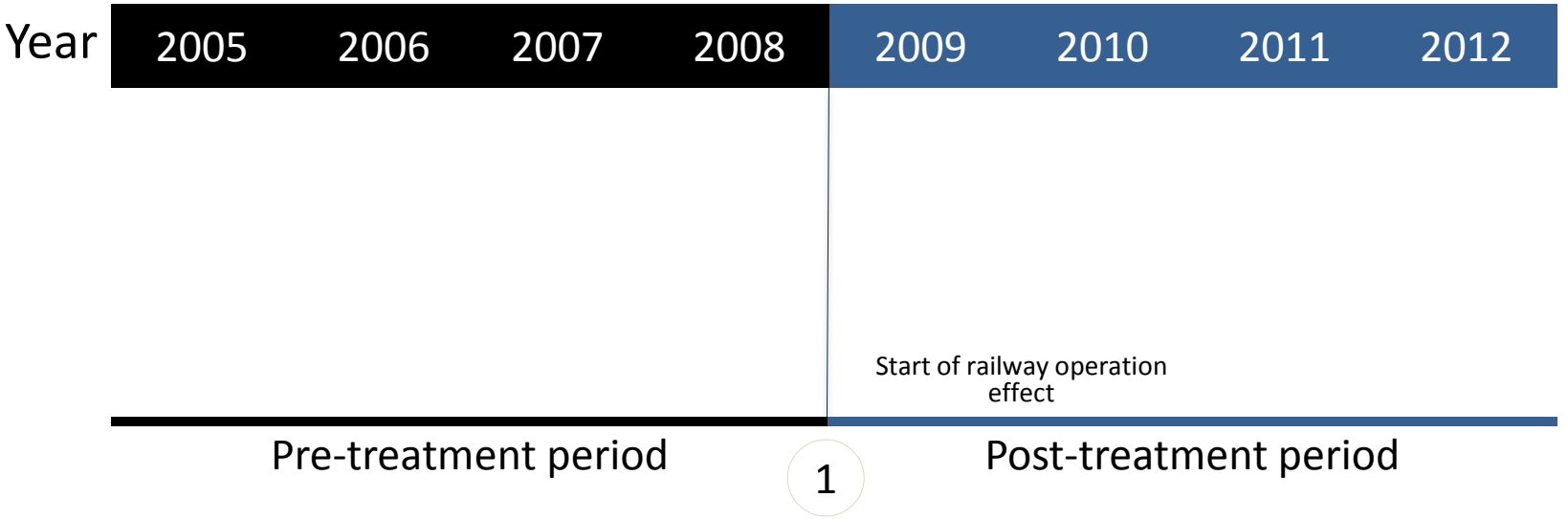
assumption about geographical focus

assumption about timing

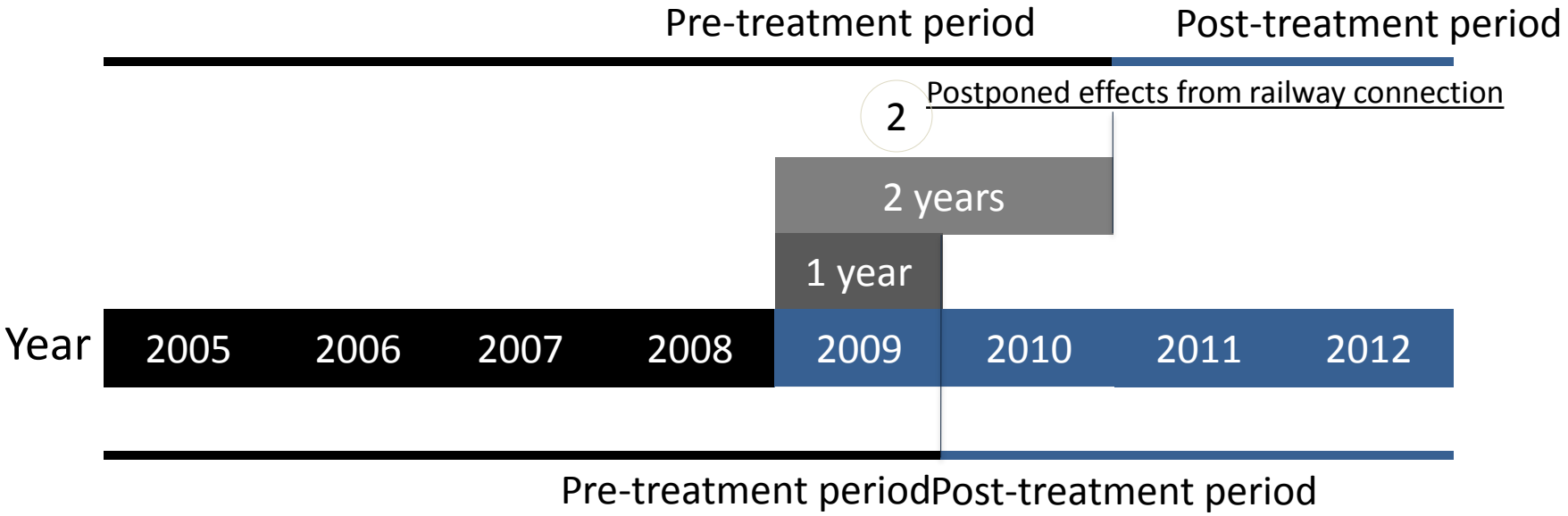
Timing

Launching effects

$$\frac{\mathrm{Y_{it}} - \mathrm{Y_{it-1}}}{\mathrm{Y_{it-1}}} * 100 = \alpha_i + \varphi_t + X'_{it}\beta + (D_i \times D_{t>2008}) + \epsilon_{it}$$



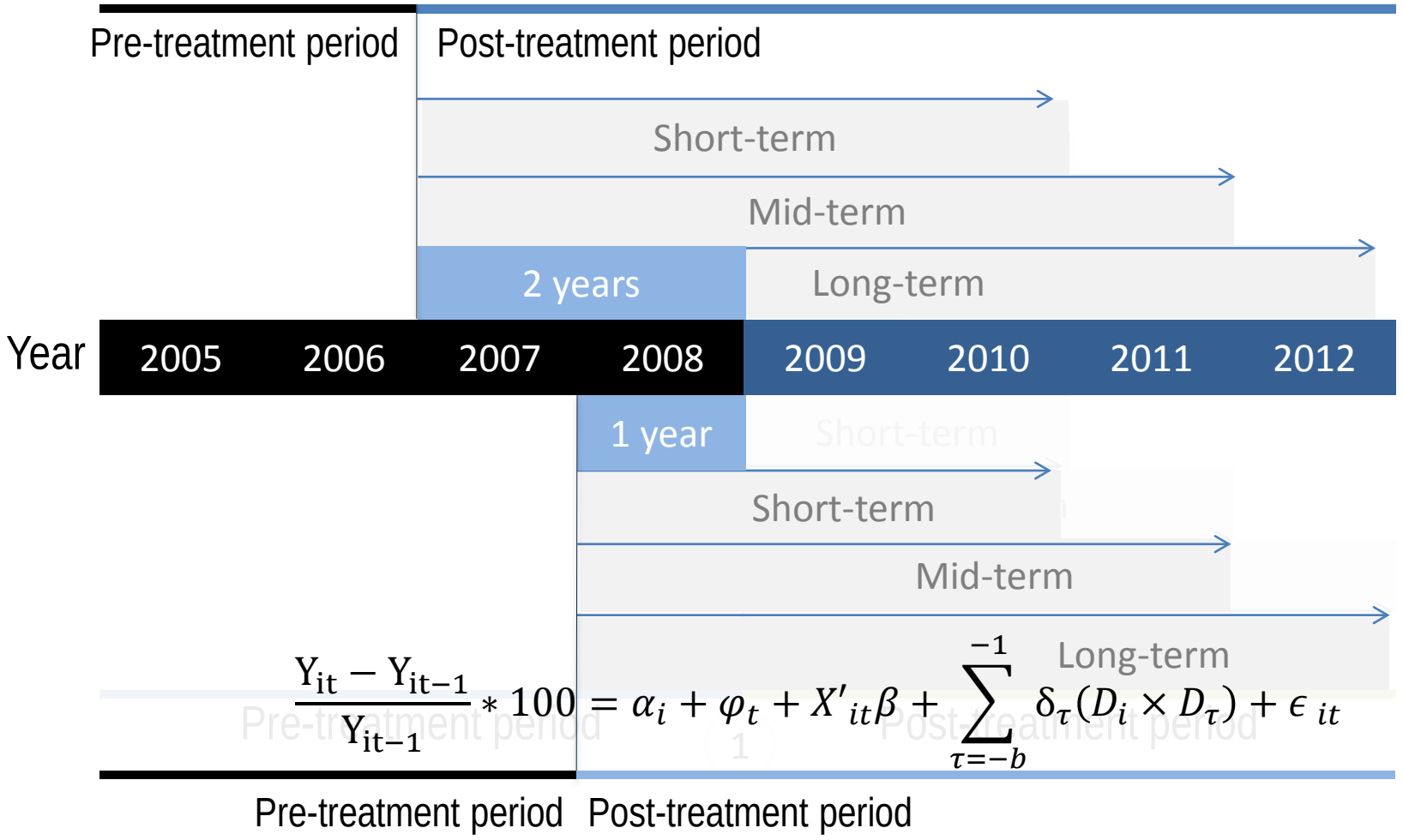
Postponed effects



$$\frac{Y_{it} - Y_{it-1}}{Y_{it-1}} * 100 = \alpha_i + \varphi_t + X'_{it}\beta + (D_i \times D_{2012>t>2010}) + \epsilon_{it}$$

$$\frac{Y_{it} - Y_{it-1}}{Y_{it-1}} * 100 = \alpha_i + \varphi_t + X'_{it}\beta + (D_i \times D_{2012>t>2009}) + \epsilon_{it}$$

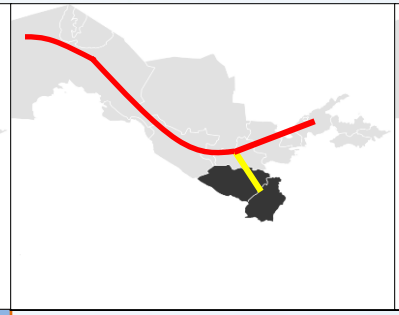
Anticipation effects

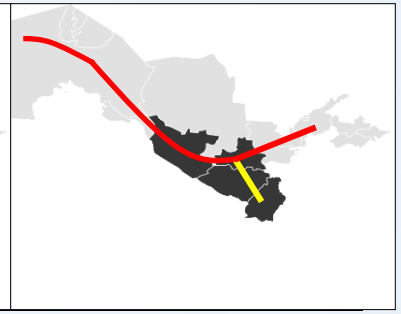


3 Anticipation effects of railway connection

	Regression 1	Regression 2	Regression 3	Regression 4	Regression 5	Regression 6	Regression 7	Regression 8	Regression 9
Time period	2005–2012	2005–2012	2005–2012	2005–2012	2005–2012	2005–2012	2005–2012	2005–2012	2005–2012
State effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time effects	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Clustered standard errors	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant term	-12.65	10.96	10.96	13.47	14.56	-39.09	-39.56	-31.80	-34.85
	[-1.4]	[0.65]	[0.91]	[1.17]	[1.24]	[-0.97]	[-0.97]	[-0.79]	[-0.84]
$D_{i=connectivity} \times D_{t=\{2012:2009\}}$	1.42*	1.89**	1.90***	1.73***	1.67***	1.82**	1.83**	2.05***	2.06***
	[1.78]	[2.39]	[3.52]	[3.13]	[3.07]	[2.39]	[2.22]	[3.12]	[3.04]
Percentage of working population	.36**	-0.07	-0.08	-0.06	-0.07	-0.02	-0.04	-0.01	0.05
	[2.26]	[-0.26]	[-0.37]	[-0.3]	[-0.34]	[-0.07]	[-0.14]	[-0.04]	[0.02]
Total Investment	-0.01	-0.01	-0.01	-0.01	-0.01	0.01	0.01	0.01	0.01
	[-0.25]	[-0.71]	[-0.92]	[-0.87]	[-0.59]	[1.3]	[1.38]	[1.61]	[1.48]
Tax revenue from mineral resources				-0.01	-0.01	0.05*	0.04	0.04	0.04
				[-1.64]	[-1.63]	[2.04]	[1.71]	[1.71]	[1.67]
Terms of trade (ratio of export and import)					-0.05	-0.08	-0.07	-0.06	-0.05
					[-0.89]	[-1.23]	[-1.22]	[-1.09]	[-0.81]
Investment by Population						0.05*	0.05*	0.05**	0.07**
						[2.05]	[1.94]	[2.31]	[2.21]
Investment from Bank Loans						0.05	0.06	0.10333667	0.12
						[0.41]	[0.48]	[0.79]	[0.89]
Investment by Foreign Investors						0.04	0.03	0.05*	0.06**
						[1.14]	[1.15]	[1.84]	[2.58]
Investment from Bank Loans x Treat_dummy						0.16	0.15	0.13	0.12
						[1.05]	[0.94]	[0.89]	[0.81]
Government expenditure: Education						0.03	0.03	0.03	0.03
						[0.73]	[0.79]	[0.64]	[0.62]
Government expenditure: Health care						-0.02	-0.02	-0.02	-0.02
						[-0.35]	[-0.29]	[-0.37]	[-0.33]
Government expenditure: R&D						-2.29	-2.45	-1.86	-1.92
						[-1.38]	[-1.5]	[-1.23]	[-1.23]
Initial Services per capita						-0.01	-0.01	-0.01	-0.01
						[-1.03]	[-1.24]	[-1.01]	[-1.01]
Investment by State							-0.03	-0.03	-0.02
							[-1.5]	[-1.23]	[-1.16]
Investment by State_reciprocal								-3.76**	-3.42*
								[-2.54]	[-1.96]
Investment by State^2									0.01
									[0.68]
Number of observations	112	112	112	112	112	112	112	112	112
R-squared	0.14	0.36	0.36	0.36	0.36	0.45	0.45	0.46	0.47

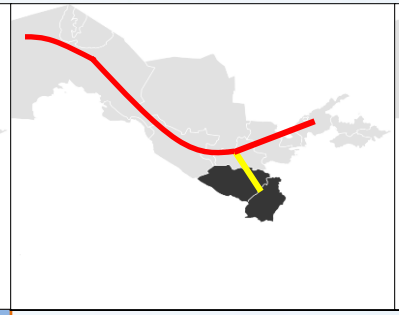
GDP

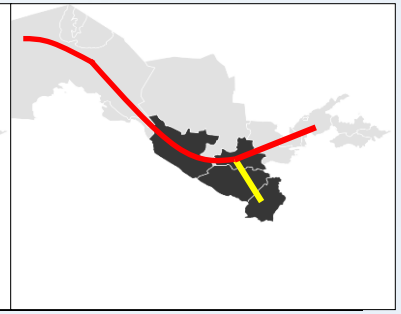




		D_i / D_t	Connectivity effect $D_{g = connectivity}$	Regional effect $D_{g = regional}$	Spillover effect $D_{g = spillover}$
Launch effects					
	Short-term	$D_{t=2010:2009}$	**2.83***[4.48]**	0.70[0.45]	1.33[1.14]
	Mid-term	$D_{t=2011:2009}$	**2.5***[6.88]**	0.36[0.29]	1.27[1.46]
	Long-term	$D_{t=2012:2009}$	**2.06***[3.04]**	-0.42[-0.29]	2.29**[2.94]
1 year	**Anticipation effects**				
	Short-term	$D_{t=2010:2008}$	0.19[0.33]	0.85[1.75]	-0.18[-0.20]
	Mid-term	$D_{t=2011:2008}$	0.31[0.51]	0.64[1.30]	-0.02[-0.03]
	Long-term	$D_{t=2012:2008}$	0.07[0.13]	-0.006[-0.01]	0.50[0.67]
	Postponed effects	$D_{t=2012:2010}$	1.76*[1.95]	-1.49[-0.72]	2.58*[2.03]
2 years	**Anticipation effects**				
	Short-term	$D_{t=2010:2007}$	-1.54[-1.66]	1.42[0.78]	-1.32[-0.92]
	Mid-term	$D_{t=2011:2007}$	0.32[0.44]	0.84[1.42]	0.13[0.13]
	Long-term	$D_{t=2012:2007}$	0.11[0.15]	0.10[0.16]	0.87[1.19]
	Postponed effects	$D_{t=2012:2011}$	-0.14[-0.20]	-1.71[-1.35]	1.05[1.44]

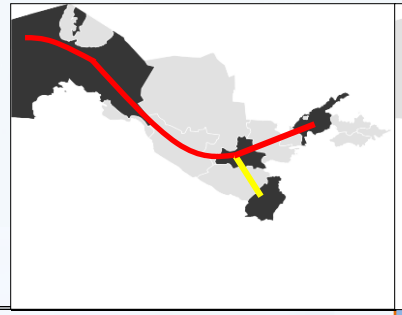
Agriculture





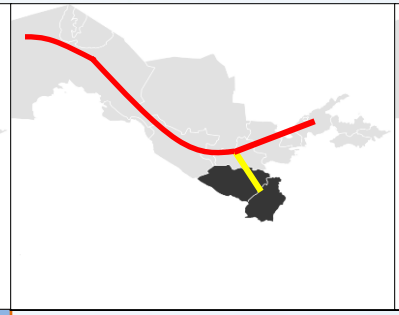
		D_i / D_t	Connectivity effect $D_{g = connectivity}$	Regional effect $D_{g = regional}$	Spillover effect $D_{g = spillover}$
Launch effects					
	Short-term	$D_{t=2010:2009}$	**2.95*[1.91]**	1.35[0.70]	0.69[0.53]
	Mid-term	$D_{t=2011:2009}$	**2.06*[2.09]**	0.14[0.07]	0.43[0.33]
	Long-term	$D_{t=2012:2009}$	**0.98[1.48]**	-0.68[-0.65]	-0.11[-0.11]
1 year	**Anticipation effects**				
	Short-term	$D_{t=2010:2008}$	0.66[0.60]	0.35[0.49]	-1.05[-1.29]
	Mid-term	$D_{t=2011:2008}$	0.32[0.35]	-0.39[-0.56]	-1.05[-1.32]
	Long-term	$D_{t=2012:2008}$	-0.56[-0.81]	-1.25*[-1.82]	-1.98**[-2.79]
	Postponed effects	$D_{t=2012:2010}$	-1.11[-0.99]	-0.98[-1.30]	0.28[0.29]
	Anticipation effects				
	Short-term	$D_{t=2010:2007}$	-1.03[-0.85]	-0.26[-0.14]	-1.95[-1.40]
	Mid-term	$D_{t=2011:2007}$	-1.18[-1.41]	-0.20[-0.27]	-0.87[-1.11]
	Long-term	$D_{t=2012:2007}$	-2.48***[-3.79]	-1.16[-0.60]	-1.97[-1.66]
2 years	**Postponed effects**	$D_{t=2012:2011}$	-1.71[-1.25]	-3.19**[-2.23]	-1.14[-1.07]

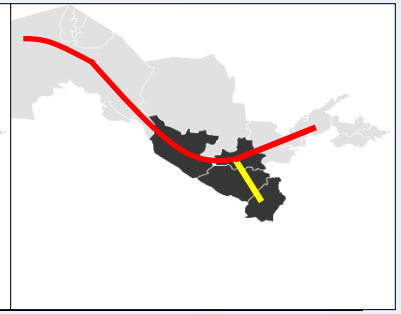
Industry



		D_i / D_t	Connectivity effect $D_{g = connectivity}$	Regional effect $D_{g = regional}$	Spillover effect $D_{g = spillover}$
Launch effects					
	Short-term	$D_{t=2010:2009}$	5.27*[1.94]	3.14[0.68]	2.82[0.99]
	Mid-term	$D_{t=2011:2009}$	4.5[1.61]	2.56[0.80]	2.13[0.83]
	Long-term	$D_{t=2012:2009}$	5.23[1.51]	3.16[0.67]	3.54[0.92]
1 year	**Anticipation effects**				
	Short-term	$D_{t=2010:2008}$	2.47[1.74]	**3.89**[2.60]**	**4.03**[2.58]**
	Mid-term	$D_{t=2011:2008}$	2.53[1.50]	**3.69*[2.02]**	**3.43*[2.02]**
	Long-term	$D_{t=2012:2008}$	3.79[1.68]	**4.62[1.51]**	**5.13*[1.85]**
	Postponed effects	$D_{t=2012:2010}$	6.12[1.65]	-0.21[-0.03]	3.92[0.95]
	Anticipation effects				
2 years	Short-term	$D_{t=2010:2007}$	-0.85[-0.25]	4.81[0.71]	4.01[1.07]
	Mid-term	$D_{t=2011:2007}$	3.90*[1.93]	3.68[1.23]	5.21**[2.33]
	Long-term	$D_{t=2012:2007}$	5.83**[2.72]	4.60[1.37]	8.14[2.45]
	Postponed effects	$D_{t=2012:2011}$	1.61[0.46]	1.15[0.27]	0.61[0.19]

Services





		D_i / D_t	Connectivity effect $D_{g = connectivity}$	Regional effect $D_{g = regional}$	Spillover effect $D_{g = spillover}$
Launch effects					
	Short-term	$D_{t=2010:2009}$	**7.76***[3.07]**	-3.90[-0.53]	0.03[0.01]
	Mid-term	$D_{t=2011:2009}$	**6.48**[2.41]**	-1.83[-0.22]	0.37[0.09]
	Long-term	$D_{t=2012:2009}$	**6.92***[2.72]**	-1.45[-0.17]	3.08[0.71]
1 year	**Anticipation effects**				
	Short-term	$D_{t=2010:2008}$	4.20[1.67]	-3.58[-0.70]	-2.95[-0.83]
	Mid-term	$D_{t=2011:2008}$	4.07[1.39]	-2.31[-0.35]	-2.34[-0.59]
	Long-term	$D_{t=2012:2008}$	5.41[1.69]	-2.17[-0.31]	-0.85[-0.20]
	Postponed effects	$D_{t=2012:2010}$	0.88[0.29]	-0.02[-0.01]	3.05[0.80]
2 years	**Anticipation effects**				
	Short-term	$D_{t=2010:2007}$	4.70**[2.19]	0.40[0.10]	-3.23[-0.82]
	Mid-term	$D_{t=2011:2007}$	4.62[1.72]	-0.24[-0.05]	-2.63[-0.78]
	Long-term	$D_{t=2012:2007}$	6.61**[2.27]	0.38[0.07]	-0.90[-0.26]
	Postponed effects	$D_{t=2012:2011}$	1.33[0.47]	3.03[0.57]	4.02[1.53]

Thank you very much.