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Did Chinese Outward Activity Attenuate or Aggravate the Great Recession in Developing Countries?

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Did Chinese Outward Activity Attenuate or Aggravate the Great Recession in Developing Countries?

Abstract

Using data on Chinese large-scale overseas investment and project contracts by sector, we analyze in a quasi-experimental set-up whether Chinese outward activity (COA) before the crisis worsened or alleviated the contractionary phases in developing countries. We find that, on average, COA did not increase vulnerability to the global recession. However, both the sectoral targeting and the size of the pre-crisis engagement matter: While COA in clearly to financial markets tied sectors implied an aggravation, substantial pre-crisis investment in the energy, metals and transportation industries implied an attenuation of the slump.

JEL classification: F20, F30, F40, F63

Keywords: Global crisis, China, developing countries, sectoral transmission

1 Introduction

In theory, financial globalization and capital inflows into developing countries in the form of foreign direct investment (FDI) and project cooperations in areas such as engineering and construction bear –at least in the short run and in the absence of crowding out domestic activity– gains in efficiency and productivity (Brems 1970; Rodriguez-Clare 1996; De Mello 1997; Borensztein et al. 1998; Markusen and Venables 1999; Javorcik 2004; Campos and Kinoshita 2007; Ping and Saggi 2007). However, neither the financial market nor the productivity related empirical literature produce clear-cut evidence supporting this view (Kose et al. 2003; Alfaro et al. 2004; Görg and Greenaway 2004; Blonigen and Wang 2005; Stulz 2005; Henry 2007; Beugelsdijk et al. 2008; Herzer et al. 2008; Rodrik and Subramanian 2009; Buchanan et al. 2012).

A growing literature studies determinants of Chinese outward activity (COA) in developing, non-OECD or low and lower-middle income countries (Buckley et al. 2007; Cheung and Qian 2009; Amighini et al. 2011; Huang and Wang 2011, 2013; Cheung et al. 2012; Kang and Jiang 2012; Kolstad and Wiig 2012; Ramasamy et al. 2012; Guo et al. 2014). Analyzing the phenomenon from different perspectives, the vast majority of papers finds either trade facilitation or natural resources or both as significant determinants of COA. In few cases also a significant (and mostly negative) impact from the quality of institutions in the host country is confirmed. Overall, economic fundamentals, such as GDP growth rates, and a clear-cut short-run market-seeking motive seem not to play a significant role in the choice of a COA-host country. Some studies claim this to be due to COA being usually not aimed at expanding production overseas but foremost at strengthening industries at home (Huang and Wang 2011, 2013).

The impact of the 2008 starting to spread global economic crisis on developing countries or, in general, on emerging markets, which represent potential FDI hosts, so far has been given relatively little attention in the literature. A notable exception is the seminal study by Tong and Wei (2010). It analyzes firm-level data in the manufacturing sectors for 24 emerging markets finding that the susceptibility to the global economic

crisis crucially depends on the composition of capital inflows in terms of their liquidity. The results suggest that FDI activity generally alleviates susceptibility, while more liquid investments from outwards before the crisis increase it.

Our study contributes to the literature in several regards. It contributes to the COA literature by analyzing COA determinants taking into account the sectoral nature of Chinese large-scale FDI and contracted projects in developing countries. Following Cheung et al. (2012) we test for a sequential nature of the decision, separating the dichotomous investment decision from the invested amounts, by relying on a two-stage Heckman selection model. Confirming the independence of the selection into pre-crisis COA-treatment from short-run market-seeking motives, we proceed with an identification strategy that allows a causal interpretation of whether pre-crisis COA worsened or alleviated the contractionary phases in developing countries. We also contribute to the recent strand of literature studying the effects of pre-crisis capital inflows on economic performance at business cycle frequencies in host countries (Blanchard et al. 2010, Tong and Wei 2010, Claessens et al. 2012). To add to the literature, we thoroughly study differential effects in nine different broadly defined sectors going beyond an exclusive manufacturing industries examination. According to the central finding by Tong and Wei (2010), shocks in the course of the Great Recession have been less severe for manufacturing firms in emerging economies that have had a higher pre-crisis exposure to FDI. Our findings confirm the decreased crisis vulnerability, however, only for voluminous pre-crisis FDI in the energy, metals and transportation industries. In contrast, pre-crisis FDI in finance and real estate sectors, coined by singular high-volume investments, implies an aggravation of the recessionary phase.

The remainder of the paper is organized as follows. Section 2 describes our data and analyzes the determinants of the selection of developing countries into “COA-treatment” prior to the spread of the crisis. In Section 3 we identify the differential crisis effect and interpret our findings. Section 4 concludes.

2 Pre-crisis COA and its determinants

2.1 Data

Our data of COA is drawn from the Heritage Foundation China Global Investment Tracker (CGIT) database. It comprises information on investments with a volume of US \$100 million or more as well as on contracted engineering and construction services by Chinese firms overseas from three years before the global spread of the crisis, i.e. from 2005, to 2014. We define overall COA as the sum of FDI and these contracts. The sectoral breakdown of the dataset roughly coincides with SIC-1 industries. It identifies the following nine sectors: energy and power, metals, finance, real estate and construction, transport, agriculture, technology, chemicals, and others (Scissors 2013).

Using the World Bank’s definition of developing countries, 105 countries in the relevant period from 2005 to 2014 qualify as developing. The Heritage Foundation CGIT database identifies about half of them, i.e. 50 economies, as COA host countries. A comprehensive list of these countries is given in Table A.1 in the Appendix.

Table 1: Sectoral and regional breakdown of developing countries COA, 2005-2008 (%)

	Agriculture	Energy	Finance	Metals	Real Estate	Technology	Transport	Other	Total
Sub-Saharan Africa	0.13	10.4	4.52	0.55	1.11		7.44	0.12	24.26
South America	0.11	2.88		5.23	0.76				8.98
North America				1.06			0.24		1.30
Arab World	0.29	1.94		0.76	0.43		5.80		9.21
West Asia		32.19		2.67	1.57	0.32	1.70	0.10	38.55
East Asia	3.89	7.95		3.30		0.24	1.65		17.03
Europe					0.67				0.67
Total	4.42	55.36	4.52	13.56	4.53	0.56	16.83	0.22	100.00

Table 1 above gives a sectoral and regional breakdown of COA in developing countries. More than half of the total volume of COA occurs in Asia with the lion’s share given for the westernmost subregion of Asia (the Middle East and the Near East) followed by

Sub-Saharan Africa, the Arab World, and South America. As regards sectors, energy, transportation, and metals followed by finance and real estate draw the largest volumes in COA fostering the widely held belief of COA being dominated by a quest for natural resources; see, for instance, the discussion in Dreher and Fuchs (2015). For comparison, overall COA including developed countries in the 2005-2014 period was targeted about one half toward energy sectors, followed by metal (16.1 percent) and transport (11.5 percent), real estate (10.2 percent) and financial industries (5.5 percent). It is worth noting that the substantial finance and real estate sectors' shares (each amounting to about 5 percent) of COA in emerging markets prior to the crisis (Table 1) are due to two striking FDIs: the 20 percent stake of Standard Bank¹ purchase by the Industrial and Commercial Bank of China (ICBC) in 2007 with a volume of US \$5.6 billion and the 2006 property purchases by a group of Shanghai based state-owned enterprises in the Russian Federation amounting to US \$1.3 billion.

2.2 Selection into pre-crisis COA-treatment

In the following, we estimate a Heckman selection model for COA-target choice and amounts invested prior to the crisis using a standard set of covariates for two reasons. First, we are aware of the fact that by the nature of the Heritage Foundation data our COA variables are implicitly, as regards COA exposure, and explicitly, with regard to amounts invested, censored from below to exceed US \$100 million. Whether this circumstance represents a critical data limitation and whether the sequential nature of the decision process –consisting of the two stages COA (binary) choice and amounts to be spent– actually needs to be accounted for can be tested in a Heckman selection model. Secondly, only if we find the selection into the pre-crisis COA-treatment group to be independent of our dependent variable in the analysis of Section 3, i.e. economic performance measured by annual real GDP growth rates, we can start from the premise that the assignment into our treatment group is independent from short-run economic

¹At the time (until the present day), Standard Bank is South Africa's largest bank by assets and earnings.

motives. To some extent this ensures an a priori quasi-randomized assignment.

Using a country cross section of average data for the 2005-2008 period (for a list of the seven countries excluded due to data limitations see the first column in combination with the last column of Table A.1), we estimate the following two-stage model

$$D_i = \beta_0 + MKT'_i\beta_1 + MCR'_i\beta_2 + WGI'_i\beta_3 + NTR'_i\beta_4 + \mu_i \quad (1)$$

$$OA_i = \beta_0 + MKT'_i\beta_1 + MCR'_i\beta_2 + WGI'_i\beta_3 + NTR'_i\beta_4 + \rho \cdot Mills_i + v_i, \quad (2)$$

where OA_i represents COA amounts in country i rescaled by host population, and

$$D_i = \begin{cases} 1 & \text{if } OA_i > 0 \\ 0 & \text{otherwise} \end{cases}$$

denotes decision to invest in country i ; $Mills_i$ is the inverse Mills Ratio from the first stage, i.e. the non-selection hazard, MKT_i a vector of three market factors for every country i , i.e. GDP (in current prices), real GDP per capita, and real GDP growth rate (source: World Development Indicators, WDI, database), MCR_i a vector of four macroeconomic control variables, i.e. the inflation rate of country i , trade openness of country i , the exchange rate (in local currency units per US \$, period average) of country i , and the gross secondary school enrollement rates (in percent) of country i (source: WDI), WGI_i a vector of the six World Governance Indicators (WGI) provided by the IMF for every country i : “Political stability/no violence”, “rule of law”, “regulatory quality”, “voice and accountability”, “control of corruption”, “government effectiveness”, respectively. Finally, NTR_i denotes a vector of four variables that might reflect a resources seeking motive comprising total natural resources rents (in percent of GDP), agricultural raw materials exports (in percent of merchandise exports), fuel exports (in percent of total merchandise exports), ores and metals exports (in percent of total merchandise exports) for each country i , respectively (source: WDI).

Estimates of the first and second stage, i.e. (1) and (2), are reported in the last (*Selection*) and penultimate (*Amount*) column of Table 2, respectively. The first result to note is the insignificance of the inverse Mills Ratio coefficient. It suggests that COA binary choice and choice of volume decision need not to be treated separately.

Table 2: Heckman selection model: determinants of COA

	<i>Amount</i>	<i>Selection</i>
GDP (current million US-\$)	-0.0001	0.0000
GDP growth (annual %)	1.0545	-0.1479
GDP per capita (constant 2005 US-\$)	-0.0026	-0.0002*
Inflation (annual %)	0.0035	0.0041*
Openness: Ex/(Ex+Im)	401.8520	1.2846
Exchange rate (LCU per US-\$, period average)	-0.0014	0.0002*
School enrollment, secondary (% gross)	0.0222	-0.0128
WGI: Political stability/no violence	57.1116	-1.1741**
WGI: Rule of law	0.2499	1.4288
WGI: Regulatory quality	118.2197	-1.6375*
WGI: Voice and accountability	-59.3955	0.1101
WGI: Control of corruption	-137.9882	-1.0410
WGI: Government effectiveness	8.8831	3.3136**
Agricultural raw materials exports (% of merchandise exports)	-4.3028	0.0070
Fuel exports (% of merchandise exports)	1.4498	0.0462***
Ores and metals exports (% of merchandise exports)	3.2548*	0.0447***
Mills ratio	7.2046	
Constant	-173.8405	-0.4969
Observations	36	94
<i>p</i> -value for joint significance (LR test)	0.0088	0.0000
Implied ρ (dependence of equations)	0.0795	

Dependent variable: 2005-2008 total of Chinese outward activity (US-\$, scaled by host population)

Explanatory variables: 1992-2004 averages

* $p < .10$, ** $p < .05$, *** $p < .01$

The fact that a Heckman selection model cannot reject a joint treatment of the dichotomous decision to go outward and the decision of the amount to spend makes us confident that focusing on large-scale COA (\geq US \$100 million) does not imply a severe bias.

Additionally, in both decision stage estimates, i.e. estimates of (1) and (2), none of the market factors turns out as statistically significant at a level of significance lower than 10 percent. The binary choice stage (1) estimate generates a significant coefficient with negative sign for the “political stability/no violence” variable, while for variable “government effectiveness” it produces a significant positive coefficient. The two natural resource indicators fuel exports and ores and metal exports show the clearest positive impact in terms of statistical significance, while the two economic fundamentals inflation and exchange rate seem to play a minor role in terms of both size of coefficients and statistical significance. In stage (2) of the two-stage Heckman model estimate, we find only one weakly significant positive effect from the ores and metal exports variable.

Overall, our findings are suggestive for location and volume choice of COA in developing countries during our pre-crisis (2005-2008) period being not motivated by short-run business motives. They rather point to a combination of institutional and natural resource related considerations, which are both widely exogenous to short-run and medium-run economic fluctuations, being at work.

3 Identifying the differential crisis effect

3.1 Identification strategy

To identify the differential crisis effect for developing countries witnessing COA and developing countries that did not host COA prior to the crisis, we slightly modify the basic difference-in-differences framework by also allowing for heterogeneity in dynamic effects between treatment and control group (Figure 2). In detail, we estimate the following model

$$y_{it} = d_t + \delta_i + \sum_{\tau \in \mathcal{T}^{pre}} \alpha_{\tau} \cdot d_{\tau} \cdot TR_i + \sum_{\tau \in \mathcal{T}^{post}} \alpha_{\tau} \cdot d_{\tau} \cdot TR_i + \varepsilon_{it}, \quad (3)$$

where y_{it} denotes annual GDP growth rate of country i in year t , d_t represent year fixed effects and δ_i country fixed effects, respectively. TR_i is our treatment variable that is either defined as (a) years of total COA (i.e. FDI plus contracts) in treatment years in country i or as (b) GDP share of total COA (i.e. FDI plus contracts) in treatment years (2005-2008) in country i . \mathcal{T}^{pre} is the set of years before the crisis, \mathcal{T}^{post} the set of years since/after the crisis, respectively.

This strategy allows us to test for and quantify the differential crisis effect through $\{\alpha_\tau\}_{\tau \in \mathcal{T}^{pre}}$ and $\{\alpha_\tau\}_{\tau \in \mathcal{T}^{post}}$, which are the interaction term coefficient vectors of interest. We estimate (3) with robust standard errors clustered at the country level.

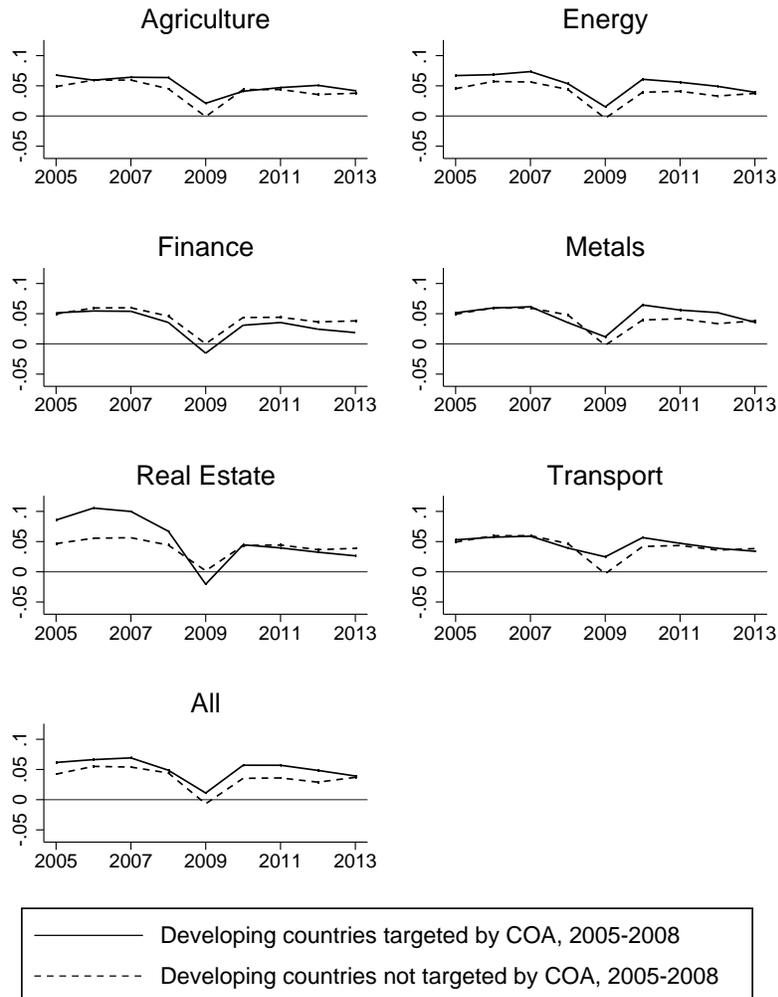


Figure 1: Average real GDP growth rates pre-crisis COA treatment vs. control group

3.2 Findings and interpretation

A summary of our estimates, averaging interaction term coefficients estimates $\{\alpha_\tau\}_{\tau \in \mathcal{T}^{pre}}$ and $\{\alpha_\tau\}_{\tau \in \mathcal{T}^{post}}$, is given in Table 3 below. Detailed estimates are given in Table A.2 to A.15 in the Appendix.

Table 3: Summary of interaction term models

	n^{TR}	Years		GDP %	
		<i>pre</i>	<i>post</i>	<i>pre</i>	<i>post</i>
COA = I + C					
All sectors	40	-0.0039	-0.0027	0.0001***	0.0007***
Agriculture	5	-0.0112***	-0.0105***	-0.0307***	0.0203***
Energy	21	-0.0038	-0.0010	0.0002***	0.0006***
Finance	1	-0.0089**	-0.0154***	-0.0169**	-0.0294***
Metals	17	-0.0032	0.0071***	0.0038**	0.0163***
Real estate	8	-0.0003	-0.0474***	-0.0310*	-0.1544***
Transport	12	-0.0044	0.0046**	-0.0117***	-0.0001*
Investment (I)					
All sectors	20	-0.0041	0.0060*	0.0003***	0.0008***
Agriculture	0				
Energy	9	-0.0054	0.0001	0.0003***	0.0006***
Finance	1	-0.0089**	-0.0154***	-0.0169**	-0.0294***
Metals	12	-0.0035	0.0125	0.0043**	0.0188**
Real estate	1	0.0033***	-0.0345***	0.0869***	-0.9113***
Transport	1	0.0190***	0.0049***	0.5032***	0.1296***
Contracts (C)					
All sectors	30	-0.0040	-0.0066	-0.0028	-0.0007
Agriculture	5	-0.0112***	-0.0105***	-0.0307***	0.0203***
Energy	16	-0.0033	-0.0005	-0.0008	0.0014
Finance	0				
Metals	6	-0.0025	-0.0048***	0.0043***	0.0154***
Real estate	7	-0.0008	-0.0484**	-0.0311*	-0.1531***
Transport	12	-0.0074	0.0053*	-0.0118***	-0.0001*

TR is either defined as years of Chinese activity (Years) or average GDP share of Chinese activity (GDP %) in treatment period (2005-2008). *pre* and *post* denote averages of interaction term coefficients in \mathcal{T}^{pre} and \mathcal{T}^{post} .

* $p < .10$, ** $p < .05$, *** $p < .01$ correspond to $H_0 : \{\alpha_\tau\}_{\tau \in \mathcal{T}^{pre}} = 0$ and $H_0 : \{\alpha_\tau\}_{\tau \in \mathcal{T}^{post}} = 0$.

Note n^{TR} denotes number of treated countries and GDP % the share of total COA (i.e. FDI plus contracts) for each treated/host country, respectively. Due to outliers and data limitations some sectors have been dropped from the analysis.

For the interpretation let us start with column “post” focusing on years of COA first, i.e. with estimates reported in the fourth column, of Table 3. Obviously, there is no substantial effect in terms of size and significance if we look at the sectors’ average coefficients (“All sectors”). On the other hand, exposure to COA clearly had a significant negative effect on the finance and real estate sectors’ performance of host countries in the course of the crisis. This holds both for FDI alone as well as for total COA. Given the nature of the crisis triggered in the US subprime mortgage market, this is a reasonable finding. The agricultural sector with no FDI but Chinese contracting activity is estimated to have been negatively affected during and after the crisis by the length of exposure to this kind of pre-crisis COA. There is also evidence for some slight cushioning effect in the transportation sector that is significant at the 5 percent level. The pre-crisis COA exposure (in years) effects for the metal sectors in developing countries is fragile. It shows a significant negative sign for contracted engineering and construction services, a positive insignificant coefficient for FDI, and a slim and significant positive coefficient for total COA comprising both contracts and FDI.

Cushioning and adverse effects from pre-crisis COA considering the size of investments and contracts are reported in the last column of Table 3. Still, although significantly positive in the case of FDI, the average effects (referring to the “All sectors” lines) are negligible in terms of size. Again, COA –now measured as a share of a host country’s GDP– had a significant negative effect on the finance and real estate sectors after the global spread of the crisis. This again holds both for FDI alone and for total COA. Considering the financial volume of COA benchmarked against domestic host standards, we now find a significant positive alleviating effect for contracts in the agricultural industry. In other words, there seems to be a trade-off. While long-term contracted exposure to COA bears aggravating effects, contracted services at large scale can cushion the adverse effects of a global slump. Considering the financial volume of COA also reveals signifi-

cant cushioning effects in the energy and metals industries, and (although for FDI figures only) also in the transportation sector. As the metal sector is part of manufacturing, this to some extent confirms the Tong and Wei (2010) result of a cushioning effect of relatively illiquid pre-crisis FDI for manufacturing firms.

4 Conclusion

In this study we analyzed sectoral data on Chinese large-scale investment and overseas project contracts by sector relying on a quasi-experimental set-up prior to and after the spread of the “Great Recession.” Examining first the pre-crisis determinants of falling into our treatment group, i.e. hosting Chinese outward activity prior to 2008, only institutional and natural resource variables turn out as significant covariates. Both factors are widely exogenous at relevant business cycle frequencies. In our second set of estimates, we find that, on average, Chinese outward activity did not increase vulnerability to the global recession. However, both the sectoral targeting and the size of the pre-crisis engagement are found to play a crucial role. While Chinese outward engagement in clearly to financial markets tied sectors implied an aggravation, substantial pre-crisis investment in the energy, metals and transportation industries implied an attenuation of the slump. Our study extends and complements the findings of Tong and Wei (2010), who focus on the manufacturing sector, in that it also finds significant cushioning effects in the non-manufacturing energy and transportation industries. For the agricultural sectors we find a trade-off. While long-term contracted exposure to Chinese outward activity implies aggravating effects, large contracted services in domestic product’s terms can cushion the adverse effects of an international crisis.

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Appendix

Table A.1: Sample of developing countries

Country	Outward activity	Investment	Contracts	Remark
Algeria	Yes		Yes	
Argentina	Yes	Yes	Yes	
Armenia				
Azerbaijan	Yes		Yes	
Bahrain				
Bangladesh	Yes		Yes	
Barbados				
Belarus	Yes		Yes	
Belize				
Benin				
Bolivia	Yes		Yes	
Bosnia and Herzegovina	Yes		Yes	
Botswana	Yes		Yes	
Brazil	Yes	Yes	Yes	
Brunei	Yes	Yes		
Bulgaria	Yes	Yes		
Cabo Verde				
Cameroon	Yes	Yes	Yes	
Chile	Yes	Yes		
Colombia	Yes	Yes	Yes	
Comoros				
Costa Rica	Yes		Yes	
Croatia				
Cuba	Yes	Yes	Yes	
Cte d'Ivoire	Yes		Yes	
Dem. People's Rep. Korea	Yes	Yes		Not used
Dominica				
Dominican Republic				
Ecuador	Yes	Yes	Yes	
Egypt	Yes	Yes	Yes	
El Salvador				
Equatorial Guinea	Yes		Yes	Not in Heckman model
Fiji				
Gabon	Yes		Yes	
Georgia	Yes	Yes	Yes	
Ghana	Yes	Yes	Yes	

Table A.1: Sample of developing countries (cont'ed)

Country	Outward activity	Investment	Contracts	Remark
Grenada				
Guinea	Yes	Yes	Yes	
Guinea-Bissau				
Guyana	Yes	Yes	Yes	
Honduras				
Hungary	Yes	Yes	Yes	
India	Yes	Yes	Yes	
Indonesia	Yes	Yes	Yes	
Iran	Yes	Yes	Yes	
Jamaica	Yes	Yes	Yes	Not used
Jordan	Yes		Yes	
Kazakhstan	Yes	Yes	Yes	
Kenya	Yes	Yes	Yes	
Kosovo				Not in Heckman model
Kyrgyz Republic	Yes		Yes	
Lebanon				
Lithuania				
Macedonia	Yes		Yes	
Malaysia	Yes	Yes	Yes	
Maldives				
Mauritius	Yes	Yes	Yes	
Mexico	Yes	Yes	Yes	
Moldova				
Mongolia	Yes	Yes		
Montenegro	Yes		Yes	Not in Heckman model
Morocco	Yes		Yes	
Mozambique	Yes	Yes	Yes	
Nicaragua	Yes	Yes	Yes	
Niger	Yes	Yes	Yes	
Nigeria	Yes	Yes	Yes	
Oman	Yes		Yes	
Palau				Not in Heckman model
Panama				
Papua New Guinea	Yes	Yes	Yes	
Paraguay				
Peru	Yes	Yes		
Philippines	Yes	Yes	Yes	
Poland	Yes	Yes	Yes	
Romania	Yes		Yes	
Russia	Yes	Yes	Yes	

Table A.1: Sample of developing countries (cont'ed)

Country	Outward activity	Investment	Contracts	Remark
Samoa				
Senegal	Yes		Yes	
Serbia	Yes		Yes	
Seychelles				
Sierra Leone	Yes	Yes	Yes	Not in Heckman model
Solomon Islands				Not in Heckman model
South Africa	Yes	Yes		
St. Lucia				
St. Vincent and the Grenadines				
Suriname				
So Tom and Principe	Yes	Yes		
Tajikistan	Yes	Yes	Yes	
Tanzania	Yes	Yes	Yes	
Thailand	Yes	Yes	Yes	
The Bahamas	Yes	Yes	Yes	
The Gambia				
Togo	Yes	Yes	Yes	
Tonga				
Trinidad and Tobago	Yes	Yes	Yes	
Tunisia	Yes		Yes	
Turkey	Yes	Yes	Yes	
Turkmenistan	Yes		Yes	
Uganda	Yes	Yes	Yes	
Ukraine	Yes	Yes	Yes	
Uruguay				
Uzbekistan	Yes	Yes	Yes	Not in Heckman model
Vanuatu				
Venezuela	Yes	Yes	Yes	
Vietnam	Yes	Yes	Yes	
Zimbabwe	Yes	Yes	Yes	

Table A.2: Sector(s): **All**; Treatment variable (2005-2008): **Years**

	(1)	(2)	(3)
	<i>Outward activity</i>	<i>Investment</i>	<i>Contracts</i>
Year=2006	0.011**	0.010**	0.011**
Year=2007	0.011***	0.011***	0.011***
Year=2008	0.001	-0.001	-0.001
Year=2009	-0.050***	-0.051***	-0.050***
Year=2010	-0.006	-0.009*	-0.004
Year=2011	-0.003	-0.007	-0.002
Year=2012	-0.012**	-0.015***	-0.010**
Year=2013	-0.006	-0.012**	-0.006
Year=2006 × Treatment (2005-2008)	-0.003	-0.001	-0.004
Year=2007 × Treatment (2005-2008)	-0.002	-0.002	-0.002
Year=2008 × Treatment (2005-2008)	-0.007	-0.009	-0.007
Year=2009 × Treatment (2005-2008)	0.001	0.007	0.001
Year=2010 × Treatment (2005-2008)	0.001	0.012*	-0.004
Year=2011 × Treatment (2005-2008)	-0.003	0.007	-0.009
Year=2012 × Treatment (2005-2008)	-0.002	0.007	-0.007
Year=2013 × Treatment (2005-2008)	-0.010**	-0.003	-0.014**
Constant	0.050***	0.050***	0.050***
Number of observations ($N \times T$)	941	941	941
Treated countries	40	20	30
Non-treated countries	65	85	75
Average of interaction coefficients: 2006-2008	-0.004	-0.004	-0.004
Average of interaction coefficients: 2009-2013	-0.003	0.006	-0.007
p -value for joint significance: 2006-2008	0.483	0.588	0.435
p -value for joint significance: 2009-2013	0.104	0.087	0.160

* $p < .10$, ** $p < .05$, *** $p < .01$ Table A.3: Sector(s): **All**; Treatment variable (2005-2008): **GDP %**

	(1)	(2)	(3)
	<i>Outward activity</i>	<i>Investment</i>	<i>Contracts</i>
Year=2006	0.010**	0.010**	0.012**
Year=2007	0.011***	0.010***	0.011***
Year=2008	-0.005	-0.004	-0.004
Year=2009	-0.050***	-0.050***	-0.050***
Year=2010	-0.007	-0.007	-0.005
Year=2011	-0.006	-0.006	-0.006
Year=2012	-0.015***	-0.014***	-0.013***
Year=2013	-0.012**	-0.012**	-0.011**
Year=2006 × Treatment (2005-2008)	-0.000	0.000	-0.007
Year=2007 × Treatment (2005-2008)	-0.001***	-0.001***	-0.002
Year=2008 × Treatment (2005-2008)	0.001***	0.001***	-0.000
Year=2009 × Treatment (2005-2008)	0.000	0.000	0.001
Year=2010 × Treatment (2005-2008)	0.001***	0.001***	-0.002
Year=2011 × Treatment (2005-2008)	-0.000	-0.000	0.000
Year=2012 × Treatment (2005-2008)	0.002***	0.002***	0.001
Year=2013 × Treatment (2005-2008)	0.000	0.000	-0.004
Constant	0.050***	0.050***	0.050***
Number of observations ($N \times T$)	941	941	941
Treated countries	40	20	30
Non-treated countries	65	85	75
Average of interaction coefficients: 2006-2008	0.000	0.000	-0.003
Average of interaction coefficients: 2009-2013	0.001	0.001	-0.001
p -value for joint significance: 2006-2008	0.000	0.000	0.341
p -value for joint significance: 2009-2013	0.000	0.000	0.209

* $p < .10$, ** $p < .05$, *** $p < .01$

Table A.4: Sector(s): **Agriculture**; Treatment variable (2005-2008): **Years**

	(1)	(2)	(3)
	<i>Outward activity</i>	<i>Investment</i>	<i>Contracts</i>
Year=2006	0.011**	0.010**	0.011**
Year=2007	0.011***	0.010***	0.011***
Year=2008	-0.004	-0.004	-0.004
Year=2009	-0.050***	-0.050***	-0.050***
Year=2010	-0.005	-0.006	-0.005
Year=2011	-0.005	-0.006	-0.005
Year=2012	-0.013***	-0.013***	-0.013***
Year=2013	-0.012**	-0.012***	-0.012**
Year=2006 × Treatment (2005-2008)	-0.019**	0.000	-0.019**
Year=2007 × Treatment (2005-2008)	-0.014*	0.000	-0.014*
Year=2008 × Treatment (2005-2008)	-0.000	0.000	-0.000
Year=2009 × Treatment (2005-2008)	0.003	0.000	0.003
Year=2010 × Treatment (2005-2008)	-0.022	0.000	-0.022
Year=2011 × Treatment (2005-2008)	-0.016	0.000	-0.016
Year=2012 × Treatment (2005-2008)	-0.004	0.000	-0.004
Year=2013 × Treatment (2005-2008)	-0.014	0.000	-0.014
Constant	0.050***	0.050***	0.050***
Number of observations ($N \times T$)	941	941	941
Treated countries	5	0	5
Non-treated countries	100	105	100
Average of interaction coefficients: 2006-2008	-0.011	0.000	-0.011
Average of interaction coefficients: 2009-2013	-0.010	0.000	-0.010
p -value for joint significance: 2006-2008	0.001	.	0.001
p -value for joint significance: 2009-2013	0.004	.	0.004

* $p < .10$, ** $p < .05$, *** $p < .01$ Table A.5: Sector(s): **Agriculture**; Treatment variable (2005-2008): **GDP %**

	(1)	(2)	(3)
	<i>Outward activity</i>	<i>Investment</i>	<i>Contracts</i>
Year=2006	0.010**	0.010**	0.010**
Year=2007	0.010***	0.010***	0.010***
Year=2008	-0.004	-0.004	-0.004
Year=2009	-0.050***	-0.050***	-0.050***
Year=2010	-0.006	-0.006	-0.006
Year=2011	-0.005	-0.006	-0.005
Year=2012	-0.013***	-0.013***	-0.013***
Year=2013	-0.012**	-0.012***	-0.012**
Year=2006 × Treatment (2005-2008)	-0.070***	0.000	-0.070***
Year=2007 × Treatment (2005-2008)	-0.049**	0.000	-0.049**
Year=2008 × Treatment (2005-2008)	0.027	0.000	0.027
Year=2009 × Treatment (2005-2008)	0.124***	0.000	0.124***
Year=2010 × Treatment (2005-2008)	-0.008	0.000	-0.008
Year=2011 × Treatment (2005-2008)	-0.025	0.000	-0.025
Year=2012 × Treatment (2005-2008)	0.009	0.000	0.009
Year=2013 × Treatment (2005-2008)	0.001	0.000	0.001
Constant	0.050***	0.050***	0.050***
Number of observations ($N \times T$)	941	941	941
Treated countries	5	0	5
Non-treated countries	100	105	100
Average of interaction coefficients: 2006-2008	-0.031	0.000	-0.031
Average of interaction coefficients: 2009-2013	0.020	0.000	0.020
p -value for joint significance: 2006-2008	0.008	.	0.008
p -value for joint significance: 2009-2013	0.000	.	0.000

* $p < .10$, ** $p < .05$, *** $p < .01$

Table A.6: Sector(s): **Energy**; Treatment variable (2005-2008): **Years**

	(1) <i>Outward activity</i>	(2) <i>Investment</i>	(3) <i>Contracts</i>
Year=2006	0.011**	0.010**	0.011**
Year=2007	0.011***	0.011***	0.010***
Year=2008	-0.002	-0.003	-0.002
Year=2009	-0.051***	-0.050***	-0.052***
Year=2010	-0.007	-0.007	-0.007
Year=2011	-0.005	-0.006	-0.005
Year=2012	-0.013***	-0.013***	-0.013***
Year=2013	-0.010**	-0.011**	-0.010**
Year=2006 × Treatment (2005-2008)	-0.004	-0.001	-0.005
Year=2007 × Treatment (2005-2008)	-0.001	-0.006	0.001
Year=2008 × Treatment (2005-2008)	-0.006	-0.009	-0.005
Year=2009 × Treatment (2005-2008)	0.004	-0.001	0.009
Year=2010 × Treatment (2005-2008)	0.003	0.006	0.002
Year=2011 × Treatment (2005-2008)	-0.002	0.003	-0.003
Year=2012 × Treatment (2005-2008)	-0.002	0.002	-0.002
Year=2013 × Treatment (2005-2008)	-0.008	-0.009	-0.009
Constant	0.050***	0.050***	0.050***
Number of observations ($N \times T$)	941	941	941
Treated countries	21	9	16
Non-treated countries	84	96	89
Average of interaction coefficients: 2006-2008	-0.004	-0.005	-0.003
Average of interaction coefficients: 2009-2013	-0.001	0.000	-0.001
p -value for joint significance: 2006-2008	0.482	0.524	0.305
p -value for joint significance: 2009-2013	0.476	0.640	0.311

* $p < .10$, ** $p < .05$, *** $p < .01$ Table A.7: Sector(s): **Energy**; Treatment variable (2005-2008): **GDP %**

	(1) <i>Outward activity</i>	(2) <i>Investment</i>	(3) <i>Contracts</i>
Year=2006	0.010**	0.010**	0.011**
Year=2007	0.010***	0.010***	0.010***
Year=2008	-0.004	-0.004	-0.004
Year=2009	-0.050***	-0.050***	-0.050***
Year=2010	-0.007	-0.006	-0.006
Year=2011	-0.006	-0.005	-0.006
Year=2012	-0.014***	-0.014***	-0.014***
Year=2013	-0.012**	-0.012**	-0.012**
Year=2006 × Treatment (2005-2008)	-0.000	0.000	-0.005
Year=2007 × Treatment (2005-2008)	-0.001***	-0.001***	0.001
Year=2008 × Treatment (2005-2008)	0.001***	0.001***	0.003
Year=2009 × Treatment (2005-2008)	0.000	-0.000	0.002
Year=2010 × Treatment (2005-2008)	0.001***	0.001***	-0.001
Year=2011 × Treatment (2005-2008)	-0.000	-0.000***	0.005
Year=2012 × Treatment (2005-2008)	0.002***	0.002***	0.003
Year=2013 × Treatment (2005-2008)	0.000	0.000	-0.002
Constant	0.050***	0.050***	0.050***
Number of observations ($N \times T$)	941	941	941
Treated countries	21	9	16
Non-treated countries	84	96	89
Average of interaction coefficients: 2006-2008	0.000	0.000	-0.001
Average of interaction coefficients: 2009-2013	0.001	0.001	0.001
p -value for joint significance: 2006-2008	0.000	0.000	0.326
p -value for joint significance: 2009-2013	0.000	0.000	0.089

* $p < .10$, ** $p < .05$, *** $p < .01$

Table A.8: Sector(s): **Finance**; Treatment variable (2005-2008): **Years**

	(1)	(2)	(3)
	<i>Outward activity</i>	<i>Investment</i>	<i>Contracts</i>
Year=2006	0.010**	0.010**	0.010**
Year=2007	0.010***	0.010***	0.010***
Year=2008	-0.004	-0.004	-0.004
Year=2009	-0.049***	-0.049***	-0.050***
Year=2010	-0.006	-0.006	-0.006
Year=2011	-0.006	-0.006	-0.006
Year=2012	-0.013***	-0.013***	-0.013***
Year=2013	-0.012**	-0.012**	-0.012***
Year=2006 × Treatment (2005-2008)	-0.007	-0.007	0.000
Year=2007 × Treatment (2005-2008)	-0.008**	-0.008**	0.000
Year=2008 × Treatment (2005-2008)	-0.012***	-0.012***	0.000
Year=2009 × Treatment (2005-2008)	-0.017***	-0.017***	0.000
Year=2010 × Treatment (2005-2008)	-0.015***	-0.015***	0.000
Year=2011 × Treatment (2005-2008)	-0.011**	-0.011**	0.000
Year=2012 × Treatment (2005-2008)	-0.014***	-0.014***	0.000
Year=2013 × Treatment (2005-2008)	-0.021***	-0.021***	0.000
Constant	0.050***	0.050***	0.050***
Number of observations ($N \times T$)	941	941	941
Treated countries	1	1	0
Non-treated countries	104	104	105
Average of interaction coefficients: 2006-2008	-0.009	-0.009	0.000
Average of interaction coefficients: 2009-2013	-0.015	-0.015	0.000
p -value for joint significance: 2006-2008	0.044	0.044	.
p -value for joint significance: 2009-2013	0.002	0.002	.

* $p < .10$, ** $p < .05$, *** $p < .01$

Table A.9: Sector(s): **Finance**; Treatment variable (2005-2008): **GDP %**

	(1)	(2)	(3)
	<i>Outward activity</i>	<i>Investment</i>	<i>Contracts</i>
Year=2006	0.010**	0.010**	0.010**
Year=2007	0.010***	0.010***	0.010***
Year=2008	-0.004	-0.004	-0.004
Year=2009	-0.049***	-0.049***	-0.050***
Year=2010	-0.006	-0.006	-0.006
Year=2011	-0.006	-0.006	-0.006
Year=2012	-0.013***	-0.013***	-0.013***
Year=2013	-0.012**	-0.012**	-0.012***
Year=2006 × Treatment (2005-2008)	-0.013	-0.013	0.000
Year=2007 × Treatment (2005-2008)	-0.015**	-0.015**	0.000
Year=2008 × Treatment (2005-2008)	-0.023***	-0.023***	0.000
Year=2009 × Treatment (2005-2008)	-0.033***	-0.033***	0.000
Year=2010 × Treatment (2005-2008)	-0.028***	-0.028***	0.000
Year=2011 × Treatment (2005-2008)	-0.020**	-0.020**	0.000
Year=2012 × Treatment (2005-2008)	-0.027***	-0.027***	0.000
Year=2013 × Treatment (2005-2008)	-0.039***	-0.039***	0.000
Constant	0.050***	0.050***	0.050***
Number of observations ($N \times T$)	941	941	941
Treated countries	1	1	0
Non-treated countries	104	104	105
Average of interaction coefficients: 2006-2008	-0.017	-0.017	0.000
Average of interaction coefficients: 2009-2013	-0.029	-0.029	0.000
p -value for joint significance: 2006-2008	0.044	0.044	.
p -value for joint significance: 2009-2013	0.002	0.002	.

* $p < .10$, ** $p < .05$, *** $p < .01$

Table A.10: Sector(s): **Metals**; Treatment variable (2005-2008): **Years**

	(1) <i>Outward activity</i>	(2) <i>Investment</i>	(3) <i>Contracts</i>
Year=2006	0.010**	0.010**	0.010**
Year=2007	0.010***	0.010***	0.010***
Year=2008	-0.002	-0.003	-0.003
Year=2009	-0.051***	-0.051***	-0.050***
Year=2010	-0.009*	-0.009*	-0.007
Year=2011	-0.007	-0.007	-0.005
Year=2012	-0.015***	-0.015***	-0.013***
Year=2013	-0.011**	-0.013**	-0.010**
Year=2006 × Treatment (2005-2008)	-0.001	-0.001	-0.000
Year=2007 × Treatment (2005-2008)	-0.000	-0.001	0.002
Year=2008 × Treatment (2005-2008)	-0.008	-0.008	-0.009
Year=2009 × Treatment (2005-2008)	0.008	0.012	0.001
Year=2010 × Treatment (2005-2008)	0.016**	0.019*	0.011
Year=2011 × Treatment (2005-2008)	0.006	0.012	-0.008*
Year=2012 × Treatment (2005-2008)	0.011	0.016	0.001
Year=2013 × Treatment (2005-2008)	-0.006	0.004	-0.028**
Constant	0.050***	0.050***	0.050***
Number of observations ($N \times T$)	941	941	941
Treated countries	17	12	6
Non-treated countries	88	93	99
Average of interaction coefficients: 2006-2008	-0.003	-0.003	-0.003
Average of interaction coefficients: 2009-2013	0.007	0.013	-0.005
p -value for joint significance: 2006-2008	0.797	0.874	0.878
p -value for joint significance: 2009-2013	0.004	0.121	0.000

* $p < .10$, ** $p < .05$, *** $p < .01$

Table A.11: Sector(s): **Metals**; Treatment variable (2005-2008): **GDP %**

	(1) <i>Outward activity</i>	(2) <i>Investment</i>	(3) <i>Contracts</i>
Year=2006	0.010**	0.010**	0.010**
Year=2007	0.010***	0.010***	0.010***
Year=2008	-0.005	-0.005	-0.004
Year=2009	-0.051***	-0.051***	-0.050***
Year=2010	-0.008*	-0.008*	-0.007
Year=2011	-0.007	-0.007*	-0.005
Year=2012	-0.016***	-0.015***	-0.014***
Year=2013	-0.013***	-0.013***	-0.012**
Year=2006 × Treatment (2005-2008)	-0.002	-0.003	0.000
Year=2007 × Treatment (2005-2008)	0.003	0.005	-0.022***
Year=2008 × Treatment (2005-2008)	0.011**	0.011**	0.035**
Year=2009 × Treatment (2005-2008)	0.013	0.015*	0.004
Year=2010 × Treatment (2005-2008)	0.018***	0.020***	0.038***
Year=2011 × Treatment (2005-2008)	0.016*	0.021**	-0.017***
Year=2012 × Treatment (2005-2008)	0.024***	0.025***	0.060***
Year=2013 × Treatment (2005-2008)	0.010**	0.013**	-0.007
Constant	0.050***	0.050***	0.050***
Number of observations ($N \times T$)	941	941	941
Treated countries	17	12	6
Non-treated countries	88	93	99
Average of interaction coefficients: 2006-2008	0.004	0.004	0.004
Average of interaction coefficients: 2009-2013	0.016	0.019	0.015
p -value for joint significance: 2006-2008	0.024	0.018	0.000
p -value for joint significance: 2009-2013	0.000	0.011	0.000

* $p < .10$, ** $p < .05$, *** $p < .01$

Table A.12: Sector(s): **Real estate**; Treatment variable (2005-2008): **Years**

	(1)	(2)	(3)
	<i>Outward activity</i>	<i>Investment</i>	<i>Contracts</i>
Year=2006	0.009**	0.010**	0.009**
Year=2007	0.010***	0.010***	0.010***
Year=2008	-0.002	-0.004	-0.003
Year=2009	-0.045***	-0.049***	-0.046***
Year=2010	-0.003	-0.006	-0.003
Year=2011	-0.002	-0.006	-0.002
Year=2012	-0.010**	-0.013***	-0.010**
Year=2013	-0.008*	-0.012**	-0.009*
Year=2006 × Treatment (2005-2008)	0.011	0.007	0.011
Year=2007 × Treatment (2005-2008)	0.004	0.010***	0.003
Year=2008 × Treatment (2005-2008)	-0.016	-0.007	-0.017
Year=2009 × Treatment (2005-2008)	-0.061***	-0.095***	-0.055**
Year=2010 × Treatment (2005-2008)	-0.038	-0.012**	-0.041
Year=2011 × Treatment (2005-2008)	-0.044	-0.015***	-0.047
Year=2012 × Treatment (2005-2008)	-0.043*	-0.015***	-0.047*
Year=2013 × Treatment (2005-2008)	-0.051**	-0.037***	-0.052**
Constant	0.050***	0.050***	0.050***
Number of observations ($N \times T$)	941	941	941
Treated countries	8	1	7
Non-treated countries	97	104	98
Average of interaction coefficients: 2006-2008	-0.000	0.003	-0.001
Average of interaction coefficients: 2009-2013	-0.047	-0.035	-0.048
p -value for joint significance: 2006-2008	0.558	0.000	0.647
p -value for joint significance: 2009-2013	0.003	0.000	0.011

* $p < .10$, ** $p < .05$, *** $p < .01$ Table A.13: Sector(s): **Real estate**; Treatment variable (2005-2008): **GDP %**

	(1)	(2)	(3)
	<i>Outward activity</i>	<i>Investment</i>	<i>Contracts</i>
Year=2006	0.009**	0.010**	0.009**
Year=2007	0.010***	0.010***	0.010***
Year=2008	-0.001	-0.004	-0.002
Year=2009	-0.047***	-0.049***	-0.047***
Year=2010	-0.003	-0.006	-0.003
Year=2011	-0.002	-0.006	-0.002
Year=2012	-0.010**	-0.013***	-0.010**
Year=2013	-0.009*	-0.012**	-0.009**
Year=2006 × Treatment (2005-2008)	0.022	0.181	0.022
Year=2007 × Treatment (2005-2008)	-0.007	0.266***	-0.008
Year=2008 × Treatment (2005-2008)	-0.108**	-0.186	-0.107**
Year=2009 × Treatment (2005-2008)	-0.143***	-2.495***	-0.139***
Year=2010 × Treatment (2005-2008)	-0.137*	-0.313**	-0.136*
Year=2011 × Treatment (2005-2008)	-0.165	-0.384***	-0.165
Year=2012 × Treatment (2005-2008)	-0.158*	-0.395***	-0.158*
Year=2013 × Treatment (2005-2008)	-0.169***	-0.970***	-0.168***
Constant	0.050***	0.050***	0.050***
Number of observations ($N \times T$)	941	941	941
Treated countries	8	1	7
Non-treated countries	97	104	98
Average of interaction coefficients: 2006-2008	-0.031	0.087	-0.031
Average of interaction coefficients: 2009-2013	-0.154	-0.911	-0.153
p -value for joint significance: 2006-2008	0.095	0.000	0.093
p -value for joint significance: 2009-2013	0.000	0.000	0.000

* $p < .10$, ** $p < .05$, *** $p < .01$

Table A.14: Sector(s): **Transport**; Treatment variable (2005-2008): **Years**

	(1) <i>Outward activity</i>	(2) <i>Investment</i>	(3) <i>Contracts</i>
Year=2006	0.010**	0.010**	0.010**
Year=2007	0.010***	0.010***	0.011***
Year=2008	-0.003	-0.004	-0.002
Year=2009	-0.052***	-0.050***	-0.052***
Year=2010	-0.007	-0.006	-0.007
Year=2011	-0.005	-0.005	-0.006
Year=2012	-0.013***	-0.013***	-0.013**
Year=2013	-0.011**	-0.012**	-0.011**
Year=2006 × Treatment (2005-2008)	-0.004	0.013***	-0.006
Year=2007 × Treatment (2005-2008)	-0.003	0.015***	-0.005
Year=2008 × Treatment (2005-2008)	-0.007	0.029***	-0.011
Year=2009 × Treatment (2005-2008)	0.023**	0.052***	0.024*
Year=2010 × Treatment (2005-2008)	0.010	0.013***	0.011
Year=2011 × Treatment (2005-2008)	-0.002	-0.021***	-0.000
Year=2012 × Treatment (2005-2008)	-0.002	-0.009*	-0.001
Year=2013 × Treatment (2005-2008)	-0.007	-0.011**	-0.007
Constant	0.050***	0.050***	0.050***
Number of observations ($N \times T$)	941	941	941
Treated countries	12	1	12
Non-treated countries	93	104	93
Average of interaction coefficients: 2006-2008	-0.004	0.019	-0.007
Average of interaction coefficients: 2009-2013	0.005	0.005	0.005
p -value for joint significance: 2006-2008	0.922	0.000	0.740
p -value for joint significance: 2009-2013	0.014	0.000	0.078

* $p < .10$, ** $p < .05$, *** $p < .01$ Table A.15: Sector(s): **Transport**; Treatment variable (2005-2008): **GDP %**

	(1) <i>Outward activity</i>	(2) <i>Investment</i>	(3) <i>Contracts</i>
Year=2006	0.011**	0.010**	0.011**
Year=2007	0.011***	0.010***	0.011***
Year=2008	-0.003	-0.004	-0.003
Year=2009	-0.050***	-0.050***	-0.050***
Year=2010	-0.006	-0.006	-0.006
Year=2011	-0.005	-0.005	-0.005
Year=2012	-0.013***	-0.013***	-0.013***
Year=2013	-0.012**	-0.012**	-0.012**
Year=2006 × Treatment (2005-2008)	-0.015***	0.340***	-0.015***
Year=2007 × Treatment (2005-2008)	-0.009***	0.392***	-0.009***
Year=2008 × Treatment (2005-2008)	-0.011***	0.778***	-0.011***
Year=2009 × Treatment (2005-2008)	0.009	1.385***	0.009
Year=2010 × Treatment (2005-2008)	0.000	0.334***	0.000
Year=2011 × Treatment (2005-2008)	-0.005	-0.553***	-0.005
Year=2012 × Treatment (2005-2008)	-0.001	-0.232*	-0.001
Year=2013 × Treatment (2005-2008)	-0.003	-0.286**	-0.003
Constant	0.050***	0.050***	0.050***
Number of observations ($N \times T$)	941	941	941
Treated countries	12	1	12
Non-treated countries	93	104	93
Average of interaction coefficients: 2006-2008	-0.012	0.503	-0.012
Average of interaction coefficients: 2009-2013	-0.000	0.130	-0.000
p -value for joint significance: 2006-2008	0.001	0.000	0.001
p -value for joint significance: 2009-2013	0.096	0.000	0.097

* $p < .10$, ** $p < .05$, *** $p < .01$