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Does bilateral investment treaty arbitration have any value for multinational corporations?

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Josef C. Brada, Chunda Chen, Jingyi Jia and Ali M. Kutan

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Abstract

Using event study methodology, we investigate whether bilateral investment protection treaties afford protection to foreign investors. Examining arbitral decisions for firms from six countries shows that firms that received awards from arbitrators gained in market value by as much as 3%. Per dollar awarded, firms gained over \$20 in market value. Thus, we conclude that the system of arbitration does afford significant benefits to firms that can demonstrate that they have been injured by host governments who violated the terms of the relevant investor protection treaty. We also find some evidence that arbitral decisions are anticipated by stock markets.

JEL classification: F23, G14, K12, K33

Key words: bilateral investment treaties, international investment arbitration, foreign direct investment, event studies, host country – investor disputes

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1 Introduction

Since the end of World War II, foreign direct investment (FDI) has been a major agent of globalization. FDI has enabled multinational corporations (MNCs) to expand sales in foreign markets, to exploit firm-specific competitive advantages abroad, and to access foreign resources in order to create cross-country supply chains that reduce costs at multiple stages of the production and distribution process (Baldwin and Lopez-Gonzales, 2015). For host countries, FDI accelerates economic growth through increases in the capital stock, better access to advanced technology, and improved skills of host-country workers and managers and by promoting higher productivity through spillovers in productivity to upstream and downstream host-country firms (Wooster and Diebel, 2010, Newman *et al.*, 2015).

Engaging in FDI also carries risk for the investor, including expropriation (Hajzler, 2012), host-country restrictions on FDI, the imposition of local sourcing and corporate governance requirements, regulatory interference with the MNC's activities by host-country authorities, discrimination in favor of local firms, limits on profit repatriation, etc. (Vandervelde, 2009). These risks deter FDI inflows unless host countries can credibly commit to restrain the discriminatory exercise of their sovereign power while balancing this commitment against their legitimate sovereign regulatory and oversight responsibilities. To reduce the risks to foreign investors, home and host countries have developed arrangements for protecting foreign investors. The most numerous of such arrangements are bilateral investment treaties (BITs) of which more than 3000 have been negotiated. Under the terms of these treaties, foreign investors who believe that they have been treated by the host country in a way that is contrary to the provisions of the BIT can file for arbitration by a neutral arbitral body.

The literature on whether and to what extent BITs increase FDI inflows is quite controversial. Some studies find large positive effects of BITs on FDI inflows, others insignificant effects and yet others negative effects.¹ Nevertheless, the nearly exclusive thrust of this research focuses on estimating models of the relationship between FDI and the correlates that researchers believe determine FDI and then adding to the model a variable that indicates the presence or absence of BITs. The sign and significance of the latter variable are interpreted as a measure of the ability of BITs to promote FDI.

In this paper we take a different approach to evaluating the effect of BITs on FDI by investigating the stock market's reaction to arbitral rulings under the BIT regime. To our knowledge, our study is the first to use this event study approach and thus provides new and different evidence on

¹ Compare, for example, Hallward-Dreimeier (2003) and Neumeyer and Spess (2005).

the effectiveness of BITs. We find that BIT arbitration does offer foreign investors significant protection against economic damage caused by host-country violations of investor protection treaties and that these wealth effects on the firm are of a magnitude comparable to, or greater than, wealth effects uncovered by studies of other types of litigation on the value of firms. Firms that receive arbitral awards experience significant increases in their market value when measured by the change in their stock price and these changes in firm value are larger than the amount of the arbitral awards, meaning that firms benefit from such awards not only in terms of the money received from the respondent host country but also in terms of investors' expectations that the firm will be able to resume profitable operations in the host country. While we cannot judge whether arbitral awards compensate the firm for all the losses suffered as the result of investor protection treaty breaches by the host country, the effects of the awards on firm value are significant and thus likely to provide important protection to firms contemplating foreign investments.

We evaluate the effect on an MNC's stock price of an arbitral ruling initiated under the terms of a BIT. If positive arbitral awards increase an MNC's stock price, and consequently its value, then the protection afforded by BITs does yield a tangible benefit to the firm's owners, and, thus, it encourages FDI. On the other hand, if positive awards do not affect the firm's value, then they offer no real protection to investors against the acts of the host government, and BITs can be seen as ineffective in promoting FDI. We examine the effects of arbitral decisions for 32 MNCs from the United States, Canada and Europe. We find that, in cases where the arbitrators rule in favor of the MNC and award it damages, the stock price and the value of the firm increase by 3% over the ten-day period following the announcement of the arbitrators' decision. As an alternative measure of the impact of an award, we find that the firm's value increases by more than twenty times the amount of the award. In cases where the arbitration tribunal rules against the MNC and awards no monetary damages, the stock price of the firm declines by as much as 2% following the announcement.

In the next section, we briefly explain how arbitration under BITs is carried out, review the literature on the effect of BITs on FDI and summarize the literature on the relationship between litigation and share prices to provide some context for our work. In Section 3 we describe the data used in our study and set out the statistical procedures we use to identify the effects of arbitral decisions. Section 4 reports our findings on how an arbitral decision influences a firm's value. Section 5 presents our conclusions, the policy implications of our study and suggestions for further research.

2 Background and literature survey

A Bilateral investment treaties and the arbitration of disputes

The first BIT was negotiated between the Federal Republic of Germany and Pakistan in 1956. Since then, over 3000 BITs have been negotiated. While BITs may differ in their specific provisions, they broadly seek to provide foreign investors with four types of protection. The first of these is against expropriation. Second, they provide the foreign investor with the right to domestic treatment by the host country and to most-favored-nation treatment of their investments. Third, they provide the investor with the right to transfer profits and invested capital abroad. Fourth, they require the host government to provide protection and security for the investor against actions by the state, by sub-national government units, by host-country courts and by host-country regulatory agencies.² In addition to BITs, which involve two countries, there are also multilateral treaties that extend similar protections to investors from several signatory countries. One such example is NAFTA, which provides BIT-like protection to investors from the three member countries under the terms of Chapter 11 of the NAFTA treaty.

If investors believe that the host government has violated the terms of the applicable BIT, they have recourse to international arbitration. Most arbitral proceedings are held under the auspices of the World Bank Group's International Center for the Settlement of Investment Disputes (ICSID) often following the rules of ICISD or the United Nations Commission on International Trade Law (UNCITRAL).³ The process is asymmetrical since, by design, it is always the investor who brings the action against the host or respondent state and indicates the damages sought; states are not able to bring actions against investors. Thus, the state is always the respondent, and, unless the arbitrators assign all the legal costs to the investor, the best result it can obtain is that its share of the costs of the arbitration process would have to be paid by the plaintiff firm.⁴ The foreign investor, on the other hand, is awarded all or some part of the damages it has claimed if the arbitral tribunal rules in its favor.

The arbitral tribunal consists of three arbitrators, one chosen by the investor, the other by the respondent state and the third, the chair of the tribunal, is selected by mutual agreement or, lacking that, by ICSID. At the end of the proceeding, the tribunal publishes its decision, which is

² BIT's negotiated by the United States also prohibit so-called performance requirements such as local content requirements, the mandatory transfer of technology to the host country, etc.

³ A small number of cases uses other rules, such as those of the Stockholm Chamber of Commerce or of the International Chamber of Commerce.

⁴ Arbitration can be expensive for the litigants. Franck (2014) notes that the two parties bear the costs of the creation and operation of the arbitral panel, about \$1 million in total, and she estimates that each party spends about \$5 million on legal fees.

appealable neither in the investor's home country nor in the courts of the respondent state, but only within the ICSID framework. While awards vary in size, some awards have been quite large, such as a judgment against Ecuador of \$1.8 billion plus interest in favor of Occidental Petroleum and one against the Czech Republic of over \$300 million.

B Effects of bilateral investment treaties on FDI

There is a large literature produced by legal scholars, economists and political scientists that seeks to quantify the effects of BITs on FDI. A search of the scholarly literature throws up 74 such studies published in books or journals or as working papers. These studies have one commonality and many differences. The commonality is that their authors measure the effect of BITs by constructing a model of FDI, either bilateral FDI between pairs of countries or FDI inflows to one host country from many home countries, and then estimate the model while including as a covariate some measure of the presence of BITs, such as a zero-one dummy of whether a BIT exists between two countries or the aggregate number of BITs a country has signed. The differences between these studies lies in the sample of countries selected for analysis, the measures of FDI and the choice of relevant covariates and model specification. Given these differences, it is not surprising that the studies are noteworthy for their disagreement over whether BITs increase FDI or not.

Rather than attempting to survey this extensive literature, we point the interested reader to comprehensive reviews of it by Ehandi *et al.* (2015) and Pohl (2018). Pohl contends that that FDI data are an important problem because they do not give an accurate picture of actual FDI activity. Also, BITs differ from one country pair to another in terms of the specific protections they offer to the foreign investor. Thus Pohl (2018) concludes that:

“...the vast majority of the existing studies do not offer a satisfying answer... due to conceptual problems regarding the notions of FDI on the one hand, and IIA [international investment agreement]-based investment protection on the other.... thus leading to important bias and invalid results for the research question.” (p.19)

Ehandi *et al.* (2015), in contrast, argue that over time researchers had come to address many of the methodological shortcomings of the early research on the topic, concluding that this “new evidence tries to address one or more of these (methodological) concerns and suggests that IIAs can be important mechanisms in attracting investors.” (p. 21).

In addition to these potentially subjective readings of the literature, researchers have also attempted more dispassionate meta-analyses of the literature, but also without achieving consensus. Bellak (2015) undertakes a meta-analysis of 40 papers dealing with the relationship between BITs and FDI. He concludes that “... the empirical evidence on the basis of a meta-analysis suggests that

the FDI promotion effect of BITs seems to be economically and statistically negligible” (Bellak, 2015, p. 76).

Given the methodological problems with existing research as well as the differences in conclusions about what the existing literature shows, it seems clear that the strategy of using models of FDI to measure the effect of BITs on FDI has reached something of a methodological *cul de sac* and exploring different approaches to the subject is in order.

C Litigation and the value of the firm

Since we intend to study the effect of arbitral decisions on the value of the plaintiff firms, it is worthwhile to consider evidence on the effects of other types of litigation on firm value. As Arena and Ferris (2017) report in their survey of the effects of litigation on firm value, the bulk of studies focuses on litigation in US courts involving US firms. The studies address whether the filing of suits affects the defendant firm’s share price and thus its value and, if the party filing the suit is also a publicly traded company, then whether there is an effect on its share price as well.

The general premise of many studies is that there are joint wealth losses for the plaintiff and the defendant corporations but that the biggest change in value is experienced by the firm being sued (Bhagat *et al.*, 1994; Bizjak and Coles, 1995; Bhagat, et al., 1998). For example, Bhagat *et al.* (1998) examine law suits where at least one of the parties is a corporation, and they calculate the cumulative abnormal return for the stock prices of the plaintiff or defendant firm, as appropriate, around the dates of the initiation and of the settlement of the dispute. They find that on average, defendant firms suffer a statistically significant wealth loss of 0.97% of their market value, which translates to a \$15.96 million loss in shareholder value, when the suit is filed. Plaintiff firms experience no significant wealth effects either at the time of the filing of the suit or at the time of its settlement. Bizjak and Coles (1995) find that, in private anti-trust suits, the plaintiff firm increases in value by about 1.2% upon the filing of the suit and the loss in value to the defendant is greater than the plaintiff’s gain. The claims in these lawsuits average \$1.8 million and the maximum claim in their sample was \$36.4 million, much smaller than the claims in our sample of arbitration claims under BITs, which average \$1,218 million. Awards in domestic litigation are also commensurately smaller and Bhagat et al. (1998) find no significant wealth effects for plaintiff firms when suits are settled. Only Karpoff *et al.* (2008) find litigation losses for defendants that are significantly greater than those reported above, and this is mainly because they examine firms that were alleged to have engaged in fraudulent activities and thus can be expected to suffer, in addition to the financial penalties imposed by the court, significant reputational losses and increased costs of doing business. Thus, the literature on litigation and firm value shows that there are statistically significant effects

of litigation on firm value, but the claims, awards of damages and changes in the value of the firms involved in the litigation are relatively small. Moreover, the emphasis of these studies is on the firm that is the defendant in the lawsuit, while in arbitration the defendant is the host country and so there is no loss in defendant value to consider.

There are important differences between litigation and arbitration under the terms of a BIT which may lead to differences in changes in firm value caused by litigation in national courts and by international arbitration. These differences suggest that arbitration under a BIT carries less risk and possibly greater rewards for the plaintiff than does inter-firm litigation in national courts. One important difference between the two procedures is that, in an arbitration proceeding, there are only two possible outcomes. Either the plaintiff firm is awarded part or all of the damages it claims, or the arbitrators rule in favor of the respondent country, in which case the firm receives no award. It is not possible for the state to bring counterclaims for damages from the firm involved in an arbitration proceeding. Thus, the plaintiffs' risk of loss is limited to its share of the costs of the arbitration procedure itself. In litigation, there is the possibility that the firm being sued will bring counterclaims against the plaintiff, thus exposing the plaintiff to greater risk. Moreover, unlike in litigation, where there is ample opportunity for appeals of the original verdict, in arbitration, the possibility of appeal is strictly circumscribed.

A second reason why awards by arbitrators may increase the value of plaintiff firms more than awards obtained through litigation in national courts is the possible, and perhaps unconscious, bias on the part of arbitrators in favor of firms. In litigation at the national level, the decision on the award of damages to the plaintiff is made either by randomly selected jurors or by an impartial judge. In arbitration, both the plaintiff and the respondent select one arbitrator while the third is chosen by mutual agreement or by ICSID. The pool of arbitrators is made up mostly of individuals from developed countries, which are likely to be the homes of many MNCs, while respondents are frequently developing countries. If there is some arbitrator bias in favor of the legal systems of developed countries or of the rights of investors from developed countries, there is the possibility that plaintiffs are likely to obtain more favorable awards due to such bias on the part of the arbitrators.⁵

Such arbitrator bias may be important because, in many arbitrations, the plaintiff does not receive the full amount of the claim. Rather, if arbitrators rule in favor of the plaintiff, they often reduce the amount of the award. Franck (2014) reports that of 53 awards in favor of investors in ICSID arbitrations, foreign investors' claims averaged \$171.3 million while the awards averaged

⁵ Posner and de Figueiredo (2005) demonstrate such bias in international courts, albeit in a different institutional setting.

\$45.6 million.⁶ Of course, the fact that arbitrators may reduce awards below the amounts claimed by plaintiffs does not disprove that they may favor foreign investors in their decisions because plaintiff investors have strong incentives to overstate their claims, both to get large judgments and to encourage respondent states to settle claims rather than to risk large losses in arbitration. Thus, even if arbitrators do reject some of the damages claimed by the plaintiffs, their awards may still be more favorable to plaintiffs than the law and the facts of the case warrant.

Investors who engage in arbitration under the terms of a BIT benefit not only from the arbitrators' monetary award for past damages, which reflects losses that the investor has already experienced. For example, if the arbitrators find some action or policy of the host country contrary to its obligations under the relevant BIT, this may force the government to change its policy going forward, which should increase the future profits of the investor, in some cases by much more than the arbitrators' award for past losses. Moreover, the arbitral award in effect strengthens the security of the foreign investor's property rights in the host country. Stronger property rights and the arbitral tribunal's upholding of the protections provided by the BIT should reduce the investor's cost of doing business in the host country, as Berkowitz *et al.* (2015) and Fotak *et al.* (2019) show. Finally, the capacity of governments to pay large awards may be greater than the capacity of a private firm, since the latter may be bankrupted by a large judgment against it while the state cannot declare bankruptcy, has recourse to increasing taxes on its citizens, and cannot ignore the tribunal's decisions without incurring costly international sanctions. Thus, the payment of the award may be surer in the case of arbitration, which then increases the award's value to the plaintiff.

The foreign investor may also receive benefits beyond the payment of the arbitral award. Investors who undertake arbitration signal to other host countries in which they have invested that they will actively defend their rights under applicable BITs, thus possibly forestalling these other host countries from taking actions unfavorable to the investor. Moreover, by actively defending its rights under the BIT, the firm may send a signal to its shareholders that is proactive in defending its foreign assets, which may also positively affect its share price. Thus, it seems *ex ante* plausible that arbitral awards should have greater effects on firm value than does litigation in domestic courts and that much of the action should be seen in cases where firms win arbitration awards.

⁶ Franck (2014) warns that these figures should be interpreted with caution.

3 Data and methodology

A Data

We obtained a sample of 32 firms whose shares were listed on a stock exchange in their home country, that had filed for arbitration and that had received a decision on the merits of their claim.⁷ To avoid securities markets with high price volatility, which would hamper the identification of excess returns in stock prices, we selected firms from countries that had relatively liquid stock markets and whose firms were active investors abroad. These countries are Canada, France, Germany, Spain, the United Kingdom and the United States. These countries are also among the top 10 sources of FDI in the world, so these firms should provide representative experiences of investors with arbitration. In view of the number of arbitral proceedings that have been initiated, it may be surprising that our sample consists of only 32 firms. There are several reasons for this. First, many arbitral proceedings have not as yet been concluded. Other arbitral proceedings were resolved by the two parties before the arbitrators rendered an award, or the arbitrators declined jurisdiction over the dispute. In numerous cases, the plaintiffs were either individuals or firms that were not listed on any stock exchange, so excess returns could not be calculated. Finally, many MNCs used affiliates, often in third countries, to serve as the vehicle for FDI projects, and these affiliates are not listed on stock exchanges. If there were more than two plaintiff firms in a case, we used case material to apportion claims and awards.

The 32 firms in our sample are listed in Table 1. Nineteen firms received an award from the arbitrators, usually less than their initial claim, and in 13 cases the arbitrators ruled in favor of the host country and the plaintiff firm received nothing. Most actions were based on bilateral investment treaties between the home and host country, but claims brought under NAFTA and the Energy Charter Treaty are also included.

Data on arbitral decisions were collected from the ICSID web site supplemented by data from the Investor-State Law Guide (ISLG) web site. Stock price data for the firms selected for analysis were obtained from the Center for Research in Security Prices (CRSP). Because the estimation of excess returns in stock prices of individual firms requires standardization by the movements of the stock market itself, we used the following stock market indices for this purpose: Canada, the Toronto Stock Exchange S&P/TSX Composite Index; France, the CAC 40; Germany, the

⁷ To be clear, by sample we mean the firms included in our study. We do not mean to imply that the firms in our study are a sample of all firms in these countries that entered into arbitration, received an arbitral decision and met our criteria for inclusion. In that sense, the 32 firms comprise the universe of firms from the selected home countries that are suitable for our analysis.

DAX 30; Spain, the Madrid Stock Exchange General Index; UK, the FTSE All-Share Index; US, the S&P 500. Additional firm-specific data was obtained from company annual reports.

Table 1 Arbitral cases analysed

Year initiated	Announcement date of arbitral decision	Plaintiff	Applicable IIA	Outcome of proceedings in favor of	Respondent state	Home state of investor	Amount claimed million US\$	Amount awarded million US\$
2009	April 18, 2013	Abengoa, S.A.	Mexico - Spain BIT (2006)	Investor	Mexico	Spain	70.00	40.30
2010	November 1, 2013	AES Corporation	Kazakhstan - USA BIT	State	Kazakhstan	USA	1,290.00	0
2004	November 21, 2007	Archer Daniels Midland	NAFTA	Investor	Mexico	USA	100.00	33.50
2014	November 30, 2017	Bear Creek Mining Corporation	Canada-Peru FTA	Investor	Peru	Canada	522.20	18.20
2014	August 18, 2017	Belmont Resources Inc.	Canada - Slovakia BIT	State	Slovakia	Canada	655.00	0
2008	October 25, 2012	Bosh International, Inc. and B&P, LTD Foreign Investments Enterprise	Ukraine - USA BIT	State	Ukraine	USA	10.00	0
2002	July 19, 2007	Canfor Corporation	NAFTA	State	USA	Canada	250.00	0
2006	December 1, 2008	Chevron Corporation	Ecuador - USA BIT	Investor	Ecuador	USA	649.00	77.70
2009	October 31, 2012	Deutsche Bank AG	Germany - Sri Lanka BIT	Investor	Sri Lanka	Germany	60.00	60.00
2009	June 11, 2012	Electricite de France (EDF) International S.A.	The Energy Charter Treaty	Investor	Hungary	France	100.00	132.60
2013	March 16, 2017	Eli Lilly and Company	NAFTA	State	Canada	USA	483.40	0
2002	February 22, 2005	France Telecom	France - Lebanon BIT	Investor	Lebanon	France	952.00	266.00
2011	August 16, 2007	Fraport AG Frankfurt Airport Services Worldwide	Germany - Philippines BIT	State	Philippines	Germany	425.00	0
2008	March 31, 2011	GEA Group Aktiengesellschaft	Germany - Ukraine BIT	State	Ukraine	Germany	30.60	0
2009	September 22, 2014	Gold Reserve Inc.	Canada - Venezuela BIT	Investor	Venezuela, Bolivarian Republic of	Canada	1,735.00	713.00
2007	December 21, 2016	HOCHTIEF Aktiengesellschaft	Argentina - Germany BIT	Investor	Argentina	Germany	157.20	13.40
2009	August 17, 2012	Iberdrola Energía S.A.	Guatemala - Spain BIT	State	Guatemala	Spain	188.00	0
2015	February 6, 2017	JKX Oil & Gas plc	Ukraine - United Kingdom BIT	Investor	Ukraine	United Kingdom	270.00	11.80
2013	April 30, 2015	KBR, Inc.	NAFTA	State	Mexico	USA	465.00	0
1999	August 3, 2005	Methanex Corporation	NAFTA	State	USA	Canada	970.00	0

Year initiated	Announcement date of arbitral decision	Plaintiff	Applicable IIA	Outcome of proceedings in favor of	Respondent state	Home state of investor	Amount claimed million US\$	Amount awarded million US\$
2007	October 9, 2014	ExxonMobil	Netherlands - Venezuela BIT	Investor	Venezuela	USA	14679.00	1,600.00
2007	February 20, 2015	Murphy Oil Corporation	NAFTA	investor	Canada	USA	59.10	13.90
2003	November 3, 2008	National Grid PLC	Argentina - United Kingdom BIT	Investor	Argentina	United Kingdom	59.00	53.50
2006	October 5, 2012	Occidental Petroleum Corporation	Ecuador - USA BIT	Investor	Ecuador	USA	1,000.00	1,769.00
2012	November 3, 2017	Saint-Gobain Performance Plastics Europe	France - Venezuela BIT	Investor	Venezuela, Bolivarian Republic of	France	115.10	34.4
2002	February 6, 2007	Siemens A.G	Argentina - Germany BIT	Investor	Argentina	Germany	462.50	237.80
2004	November 27, 2013	Total S.A.	Argentina - France BIT	Investor	Argentina	France	940.00	269.90
1998	June 2, 2000	Waste Management, Inc.	NAFTA	State	Mexico	USA	36.00	0
2000	May 24, 2007	United Parcel Service	NAFTA	State	Canada	USA	160.00	0
2003	February 3, 2006	EnCana Corporation	Canada-Ecuador BIT	State	Ecuador	Canada	80.00	0
2013	August 21, 2019	Stans Energy Corp.	Canada-Kyrgyzstan BIT	Investor	Kyrgyzstan	Canada	210.00 ^a	24.00 ^a
2004	August 18, 2009	Corn Products International	NAFTA	Investor	Mexico	USA	250.00 ^b	33.50 ^b

Sources: All data are from <https://icsid.worldbank.org/en/> and <https://www.italaw.com/> and ^a <https://finance.yahoo.com/news/stans-energy-won-arbitration-170600839.html> and ^b authors' estimate.

There are two features of the above firms that are worth mentioning. The first is the large number of disputes involving firms engaged in the extraction of natural resources. This, of course, is a reflection of Vernon's (1991) obsolescing bargain hypothesis that it is in this sector that there are the greatest shifts in leverage between the foreign investor and the host country prior to, and after, the investment is made and begins operation, leading to investor-host country conflicts. A second feature is that for the events we analyze, the announcements of arbitral decisions take place at different times over a span of years and that these events trigger responses on a number of different stock markets. Event studies consider short-term market reactions to news. The parsimony of the event-study statistical procedure is an advantage in cases such as ours where sample size is constrained. A major concern of event studies is that the effects of the events considered, arbitral announcements, are not contaminated by some common but unobserved events that also affect firms' share prices, such as major stock market movements, announcements of tax or monetary policy changes or reports of earnings, mergers, etc. In our case, the decision dates range from 2005 to 2019 and effects

are measured in 6 different countries. Thus, it is highly unlikely that some common influences other than the arbitral decision affect share prices around the date of the arbitral decision. Moreover, since the typical arbitration process runs for three to four years, it is unlikely that whatever effect the filing of the claim had on the firm's share price would influence the share price movements around the time of the arbitral decision.

B Methodology

In an efficient stock market, the effect of the announcement of an arbitral decision should be reflected in the MNC's stock price following the announcement of the award. Customarily, the market reaction is measured by analyzing the residuals around the event date (Fama *et al.*, 1969). Many studies show that stock returns exhibit clusters of outliers, implying that the volatility series evolves over time in a non-linear fashion.⁸ We therefore use an event study that assumes that returns follow an EGARCH (1, 1) process in order to examine the effects of arbitral decisions on the stock returns of MNCs.⁹ The abnormal returns are calculated around the announcement date of the arbitral decision (hereafter AD) and thus $t=0$ is the announcement day.

The abnormal return (AR) for stock i on day t is defined as:

$$AR_{i,t} = R_{i,t} - (\hat{\alpha}_i + \hat{\beta}_i R_{m,t}) = \varepsilon_{i,t}, \quad (1)$$

where $R_{i,t}$ is the return on stock i on day t , and $R_{m,t}$ is the return on the benchmark index on day t . $\varepsilon_{i,t} | \Psi_{t-1} \sim (0, h_{i,t})$, and Ψ_{t-1} denotes all information available at time $t-1$. The conditional variance in the EGARCH (1, 1) case is:

$$\log h_{i,t} = \omega_i + \delta_i \log h_{i,t-1} + \gamma_i |z_{i,t-1}| + \phi_i z_{i,t-1}, \quad (2)$$

where $z_{i,t} = \varepsilon_{i,t} / \sqrt{h_{i,t}}$. The coefficients $\hat{\alpha}_i$, $\hat{\beta}_i$, and the parameters ω_i , δ_i , γ_i , and ϕ_i are estimated based on the market model by using the maximum likelihood EGARCH process and by modeling

⁸ The application of the classical event study methodology without checking the behavior of security returns for stochastic beta and GARCH (Generalized Autoregressive Conditional Heteroscedasticity) effects may yield inappropriate conclusions, as pointed out by Brockett *et al.*, (1999). Cao and Tsay (1992) and Corhay and Tourani Rad (1996) find that GARCH-family models are superior to OLS.

⁹ As a robustness check, we compared the fit of the EGRACH estimates to those produced by GARCH and OLS. The results showed that the EGARCH model does provide a better fit than the other two methods.

$R_{i,t}$ for the 250-day period $(-281, -31)$, that is, the 250 trading days prior to 30 trading days before the arbitral decision is announced.¹⁰

We also calculate the cumulative abnormal return ($CAR_{i,t}$) for each individual firm i for day t covering starting 30 trading days ($t = -30$) before the announcement day and continuing to 10 days post-announcement day ($t = 10$).

$$CAR_{i,t} = \sum_{-30}^t AR_{i,t} \quad (3)$$

where $t = -30, \dots, 10$.

The cross-sectional average of abnormal returns ($AAR_{i,t}$ s) and cross-sectional cumulative average abnormal returns ($CAAR_{i,t}$ s) calculated over all firms are then estimated and tested for their statistical significance. $AAR_{i,t}$ s for each trading day within the event window are calculated by:

$$AAR_{i,t} = \frac{1}{N} \sum_{i=1}^N AR_{i,t} \quad (4)$$

where N is the number of stocks. The $CAAR_{i,t}$ s, the cross-sectional cumulative average abnormal returns over the event window from day -30 until day 10, are calculated by:

$$CAAR_{i,t} = \frac{1}{N} \sum_{i=1}^N CAR_{i,t} . \quad (5)$$

We employ the generalized sign Z-test to examine whether the number of stocks with positive and with negative cumulative abnormal returns in the event window exceeds the number expected in the absence of abnormal performance. The non-parametric test statistic in the stock return setting reflects the findings of return-based studies (e.g., Corrado, 1989; Campbell and Wasley, 1996; Bartholdy *et al.*, 2007; Campbell *et al.*, 2010) that find this test to be more powerful in detecting abnormal security return performance than does a parametric test statistic. The number of positive excess returns expected is based on the fraction of positive abnormal returns in the 250-day estimation period:

$$\hat{p} = \frac{1}{N} \sum_{i=1}^N \frac{1}{250} \sum_{t=E_{-31}}^{E_{-281}} S_{i,t} , \quad (6)$$

where

¹⁰ While the length of the period over which to estimate these parameters is arbitrary, Armitage (1995) concludes that, so long as the period is over 100 days in length, parameter estimates are not sensitive to changes in the length of the estimation period.

$$S_{i,t} = \begin{cases} 1 & \text{if } AR_{i,t} > 0 \\ 0 & \text{otherwise} \end{cases} \quad (7)$$

The test statistic uses the normal approximation to the binomial distribution with parameter \hat{p} . Define $W_{(T_1, T_2)}$ as the number of stocks in the event window (T_1, T_2) for which the cumulative abnormal return $CAAR_{i,(T_1, T_2)}$ is positive and D the number of trading days in the interval T_1, T_2 . The generalized non-parametric sign Z test statistic for the hypothesis that $W_{(T_1, T_2)} > N \hat{p} D$ is:

$$Z_{(T_1, T_2)} = \frac{w_{(T_1, T_2)} - N \hat{p} D}{[N \hat{p} D (1 - \hat{p})]^{1/2}}. \quad (8)$$

We use one-tailed test critical values to determine at what level of significance the number of positive CAARs in the interval (T_1, T_2) exceeds the expected number. The same procedure, *mutandis mutatis*, is used to evaluate the significance of the negative CAARs.

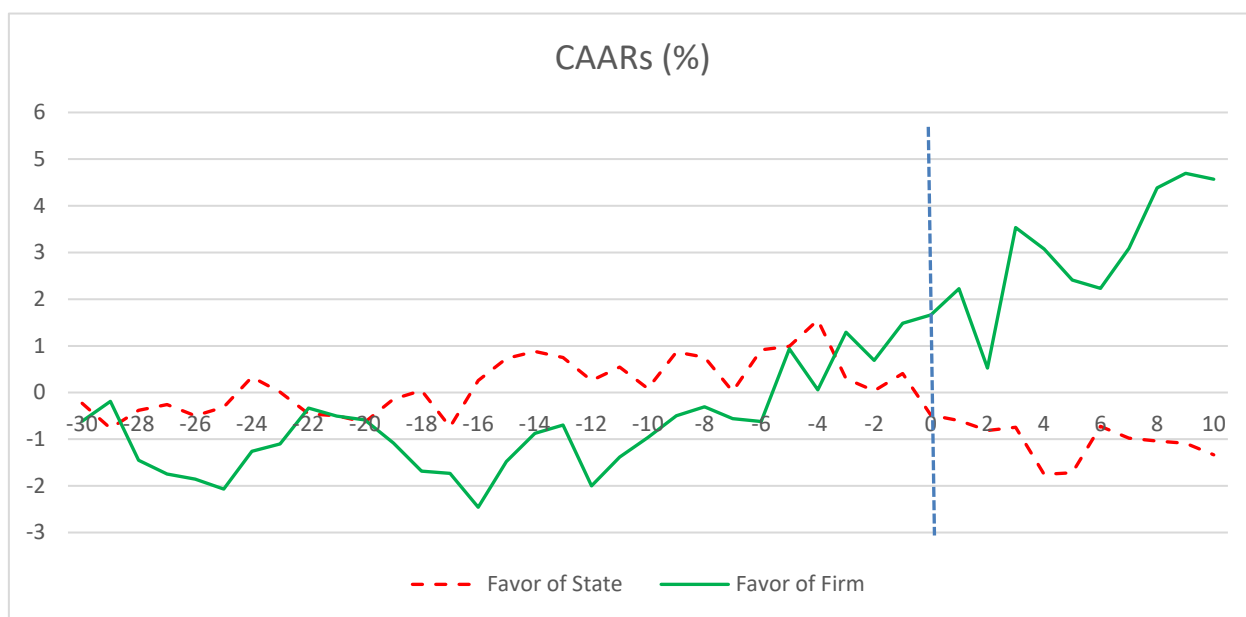
4 Results

A Excess returns from arbitral decisions

Plots of the CAARs of firms that received monetary awards from the arbitral tribunal and of the firms where the tribunal ruled in favor of the state are reported in Figure 1.¹¹ The positive effect on the firms' share prices of an arbitral decision in favor of the investor is evident from the plot of the CAARs. A decision in favor of the firm increases the value of its shares by slightly more than 3% over the 9 days following the announcement of the tribunal's decision. These excess returns are, as the arguments put forward in Section 3 above suggest, greater in magnitude than those reported in studies of the effects of domestic litigation on firm value.

¹¹ The daily AARs and CAARs and their significance are reported in Appendix Table 1

Figure 1 CAARs (in %)



If the tribunal rules in favor of the respondent state, the market response is weaker as the value of the firm’s shares declines by less than 2%. This may reflect the fact that investors are less certain regarding the effect of this decision on the firm’s value than is the case where the firm receives a monetary award. The amount of losses claimed by the firm in its complaint may have been overstated, making it hard for investors to judge what the real loss was, and the firm’s future options for continuing operations in the host country are also not clear if the arbitrators rule in favor of the host country.

In Table 2 we report the significance of excess returns over a range of event windows. We choose to use a wider range of event windows than is often the case in event studies. Usually, event studies use a very short window, such as a day or two after the arrival of news, though some studies use windows as long as 5 to 10 days.¹² A short event window has the advantage of avoiding contamination from other news that arrives closely after the occurrence of the event under investigation. The use of short windows assumes that that news of the event is widely broadcast to market participants on the announcement date and that market participants can easily interpret the likely impact of the announced event on the firm’s value.¹³ For more complex events, Oler et al. (2007) conclude that “...short-run measures of returns in event studies should be supplemented by longer-term measures, especially if an event is complex and/or infrequent. The performance implications of such

¹² The literature offers varying opinions on appropriate window lengths. Holler (2014) gives the typical range as between 1 and 11 days while Oler et al. (2007) report that 75% of studies use a window of 5 days.

¹³ For example, many studies use as the announcement date the date on which the news is published in a widely circulated source such as the *Wall Street Journal* or the *Financial Times*.

events are unlikely to be well understood by market participants, and therefore the related short-term responses may be prone to heuristic biases.”

The announcement and evaluation of the effects of an arbitral decision may take longer for market participants to evaluate fully. First, arbitral decisions are rare events and the rulings, which are quite lengthy, will take market participants longer to evaluate. Moreover, the arbitral tribunal, the plaintiff firm, and the respondent country may be on different continents, with consequent time differences, and so there is uncertainty about how fast the information about the announcement is disseminated, especially in relation to the market on which the firm’s shares are traded. Thus, our event windows begin either the day before or the day of the announcement of the arbitral decision and the event window ends either the day after the announcement or 5 days after or 10 days after the announcement date. We cut off the window at 10 days after the event based on a heuristic rule proposed by Krivin et al. (2003) who recommend that the window length be extended based on how long significant daily abnormal returns persist. In our case, that is 9 days for firms that receive an award from the arbitrators and 8 days for the firms that do not, and we round this up to 10 days in order not to be seen as “cherry-picking” the window length. Overall, the CAARs display a high degree of statistical significance for all window lengths.

In cases where the arbitrators rule in favor of the respondent country, the CAARs for all event windows range from -0.64 to -2.12 at a significance level of 5 % except for the $(-1, 10)$ window, which is significant at the 10% level.

Table 2 Cumulative average abnormal returns after arbitral decision (%)

Event window	Decision in favor of state		Decision in favor of investor	
	CAAR (%)	Z-value	CAAR (%)	Z-value
$(-1,1)$	-0.6410	-1.6468**	1.5398	1.7904**
$(0,1)$	-1.0078	-1.7013**	0.7382	1.6452**
$(-1,5)$	-1.7558	-1.7250**	1.7255	2.7999***
$(0,5)$	-2.1226	-1.9012**	0.9239	2.4626***
$(-1,10)$	-0.8467	-1.6107*	2.9088	1.9282**
$(0,10)$	-1.7356	-1.6635**	3.0820	1.9140**

*, **, *** indicate significance at the 10%, 5% and 1% level

Losses of this magnitude are consistent with the findings of studies of the effects of litigation on share prices cited earlier. Although the losses suffered by firms that enter into arbitration and fail to prove their case are smaller than the gains obtained by firms whose arbitration claims are upheld, losing in an arbitral proceeding is costly for the firm. This suggests that the often-made claim that firms that engage in arbitration under the terms of a BIT face a situation of “either we win, or we

do not lose” may not be as correct as is commonly believed. Filing for arbitration does entail risk for the plaintiff of a loss in firm value.

Winning in arbitration has a larger and even more statistically significant effect on a firm’s share price. The CAARs range from 0.74% for the one-day event window, up to 3 % for the 10-day windows. Moreover, all the event windows have positive CAARs that are statistically significant at the 1 and 5% levels. Thus, a favorable ruling for the firm has a significant effect on its share price and the magnitude of this effect is large when compared to the effect found in studies of litigation in domestic courts. This constitutes strong evidence that arbitration under a BIT compensate the investor for the losses suffered in cases where the host country damages the firm’s finances through a violation of the terms of the BIT. This suggests that BITs do serve as a valid way of providing protection for foreign investors against actions of the host government.

It is also worthwhile to examine the relationship between the size of the award and the change in firm value. In our sample of firms that won arbitral awards, for each dollar awarded, the value of the firm increased by \$21.51. Accounting theory suggests that if a firm receives an award, the firm’s value should increase by the amount of the award, and by this reasoning, the \$21.51 increase in value seems excessive. However, many arbitral awards require payments to the firm for profits foregone by the investor due to the actions of the host government. Thus, to the extent that the arbitral awards enjoins the host country from pursuing these policies that reduce the foreign investor’s profits in the future and requires repayment of profits lost in the past, investors can reasonably expect that future profits earned in the respondent country will increase and, also, that the firm’s past profits were understated due to the actions of the host government. Thus, in such cases, the value of the firm should increase not by the amount of the award, but rather by the amount of the award times the firm’s price-to-earnings ratio. If the firm’s P/E ratio is near 20, the relationship between the award the increase in firm value we find can be seen as reasonable. Moreover, as we noted above, the firm also receives non-monetary benefits from the arbitral decision: better treatment in the host country, less risk of maltreatment by other host countries in which it does business and lower costs from stronger protection of property rights, and all these benefits should also be reflected in the change in the firm’s value following the arbitral decision. In the cases where a firm’s claims are entirely denied by the arbitrators, the firm loses \$0.02 in value for every dollar of claims that were not upheld by the arbitral tribunal. The small change in value reflects in part the overinflated claims of loss that plaintiff firms make and may also suggest that investors believe that the firm’s market value largely reflects the losses already suffered by the firm.

B Arbitral awards and firm value

While the results of the event study reported above show that an arbitral decision favoring the firm has a positive and significant effect on the firm's share price following the announcement of the arbitral decision, we also wish to examine the relationship between the size of the award and the change in the firm's value. Specifically, the firm's value should change according to how the award affects investors' valuation of the firm and their expectations regarding its future earnings stream. We examine the determinants of the CAARs of individual firms that received an arbitral award over three event windows (0, 1), (0, 5) and (0, 10). Given the limited sample of firms that won in arbitration, we use a parsimonious set of explanatory variables. The first of these is the ratio of the actual award to the amount of loss claimed by the firm. To the extent that the amount claimed by the firm is a valid measure of the economic losses it has suffered, receiving an award equal to this claim indicates that the firm has been compensated for all of its losses, which should increase its value more than if it receives only a partial award. The next explanatory variable we consider is the ratio of the arbitral award to the firm's assets. An award that is a very small percentage of the firm's assets is unlikely to have a major influence on its market value. We also consider the firm's financial situation. An arbitral award is an injection of cash into the firm, and the value that investors place on such an injection may depend on the firm's current financial performance. Thus we consider the firm's return on assets as an explanatory variable in the expectation that the effects of an award on profitable and unprofitable firms differ.¹⁴ For loss-making firms the award may mean the difference between survival and bankruptcy, with greater subsequent losses for shareholders. Also, as we discussed in the previous section, the effect of an award on firm value may depend on its P/E ratio, and firms with better returns to capital are likely to have higher P/E ratios. Finally, we consider the riskiness of the respondent country. For this we use the OECD country risk index, which covers transfer and convertibility risk as well *force majeure*, including risk of war, revolution or civil disturbance.¹⁵ Such risks could prevent or delay the payment of a judgement against a country.

¹⁴ This consideration is also found in studies of inter-firm litigation, where the risk of bankruptcy of the defendant firm is a consideration (Bizjak and Coles, 1995), although in our case it is the potential bankruptcy of the plaintiff firm that is at issue.

¹⁵ The index is scaled from 0 to 7 with 7 being the highest risk. See <http://www.oecd.org/trade/topics/export-credits/arrangement-and-sector-understandings/financing-terms-and-conditions/country-risk-classification/>

Table 3 Determinants of CAARs for firms receiving an award from the arbitrators
(t-ratios in parentheses)

Variable	CAAR (0,1) (%)	CAAR (0, 5) (%)	CAAR (0, 10) (%)
Award/claim	-0.024 (-0.93)	0.027 (1.23)	0.043* (1.85)
Award/Assets	2.323* (1.90)	5.405*** (5.11)	1.307 (1.18)
Return on assets	0.045*** (4.68)	-0.057*** (-6.89)	-0.165*** (-18.91)
Country risk (0-7)	-0.000 (-0.10)	-0.002 (-0.47)	0.000 (0.01)
Constant	0.018 (0.60)	-0.002 (-0.08)	-0.003 (-0.12)
N	19	19	19
R-squared	0.617	0.876	0.966

*, **, *** denote significance at 10%, 5%, 1% level respectively.

The regression results are reported in Table 3. The award to claim ratio is only weakly significant in the (0, 10) event window, suggesting that investors are not swayed by how much of its claim the firm recovers, perhaps reflecting investors' awareness of claim inflation. The award to assets ratio is significant in two of the regressions suggesting that investors view the award in the context of the total value of the firm. Given the size of the awards relative to firm assets, the positive effect of this ratio is not surprising. The return on assets of the firm has a significant and negative impact on how the arbitral award affects the value of the firm. Profitable firms benefit less, in terms of gains in their stock prices, than do firms that are losing money. This suggests that investors of loss-making firms may view the award as a life-line for the firm. Finally, country risk does not influence the effect of the award on firm value. This is primarily due to the strong international regime for enforcing arbitral awards. That the R-squares of the regressions improve with window length and that some of the coefficients change over window length are consistent with the hypothesis that the market takes time to process all available information and that information that may affect market adjustment in one direction at the start of the adjustment process may influence price movements in a different way as investors further process available information.

C Does the market anticipate arbitral decisions prior to the announcement date?

The suspicious reader looking at Figure 1 might note that the CAARs for firms that win their arbitration cases begin to increase even prior to the date of the announcement of the arbitrators' decision and, conversely, that, in cases where arbitrators rule in favor of the respondent country, the CAARs

become negative prior to the announcement date. In Table 4 we report CAARs for losing and winning firms for three event windows, 20, 14, and 5 days prior to the announcement of the arbitrators' decision. Table 3 shows that, for decisions in favor of the state, a window of 5 days prior to the announcement date yields negative CAARs that are significant at the 10% and 5% levels. The magnitude of the loss in value of the firms is comparable to the loss suffered after the announcement date. Firms that receive an award from the arbitrators experience increased CAARs of about 3% over the 14-day period preceding the announcement day.

Table 4 Cumulative average abnormal returns before an arbitral decision

Event window	Decision in favor of state		Decision in favor of investor	
	CAAR (%)	Z-value	CAAR (%)	Z-value
(-20,0)	0.0141	0.1030	2.1666	0.6485
(-20,-1)	0.9030	0.3572	1.9935	0.5960
(-14,0)	-1.2120	-0.5238	3.1356	1.7654**
(-14,-1)	-0.3231	-0.3791	2.9625	1.6454**
(-5,0)	-1.3994	-1.6430*	2.2830	1.1431
(-5,-1)	-0.5105	-1.7295**	2.1099	1.1573

*, **, *** indicate significance at the 10%, 5% and 1% level

One possible explanation for this phenomenon is that arbitral decisions are leaked to market participants in advance of the announcement day or that rumors in the business or legal press lead investors to anticipate the dates and nature of the arbitrators' decisions. Under the rules of the arbitration procedure, the decision of the arbitral panel is transmitted to the participants as soon as the arbitrators have signed their report. Listed firms are required to report such material decisions to the public immediately, and in the cases we have examined this seems to be the case. Prior information on arbitral decisions would then have to reach market participants either through the parties involved in the dispute or through the arbitrators or their staff. Thus, while we can offer no definitive explanation for this finding, the magnitude of these anticipatory excess returns and their statistical significance warrant additional research.

5 Conclusions

We have used event study methodology to investigate arbitral decisions for 32 firms from six countries for claims brought under bilateral and multilateral treaties for the protection of foreign investors to determine whether and to what extent arbitration under the *aegis* of an investor protection treaty affects the value of the plaintiff firms. We find that firms that receive awards from arbitrators gain

in value by as much as 3%. In cases where the arbitrators rule in favor of the respondent governments, the plaintiff firms lose nearly 2% of their value. Each dollar awarded to a plaintiff firm increases its market value by \$21.51. This suggests that awards obtained through arbitration are quite valuable to the firms receiving them and may explain the increase in FDI arbitration claims over the years. Thus, we conclude that BITs and the system of arbitration does afford significant protection to firms that can demonstrate that they have been injured by host governments that have violated the terms of the relevant BIT. Moreover, our results show that the belief that MNCs face a "win or don't lose" scenario in filing for arbitration do in fact face the risk of loss in firm value if they are unable to win their case.

The results also raise issues that should be addressed by future research. One is to investigate the factors that influence the gain in firm value from a favorable arbitral award. In our study, we have only 19 such firms, so regressing each firm's excess returns on firm-specific factors such as financial condition, sector of activity, nature of the claim against the host country, etc. quickly exhausts the available degrees of freedom. A second area worth investigating is the seeming anticipation by markets of arbitral decisions as manifested by excess returns prior to the announcement of the arbitrators' decision. Both of these projects will become more feasible over time as more arbitral awards are published.

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Appendix

Table 1 Daily AARs and CAARs

Day	Arbitral decision in favor of the state				Arbitral decision in favor of the investor			
	AAR(%)	z-value	CAAR(%)	z-value	AAR(%)	z-value	CAAR(%)	z-value
-30	-0.2301	-1.1313	-0.2301	-1.1313	-0.6172	-0.7569	-0.6172	-0.7569
-29	-0.5364	-0.3406	-0.7666	-1.0408	0.4259	0.5223	-0.1913	-0.1659
-28	0.3823	0.3815	-0.3843	-0.6296	-1.2583	-1.5433	-1.4496	-1.0265
-27	0.1240	0.4029	-0.2602	-0.3438	-0.2983	-0.3658	-1.7478	-1.0719
-26	-0.2369	-1.5900	-0.4971	-1.0186	-0.1113	-0.1365	-1.8591	-1.0198
-25	0.1820	0.5866	-0.3151	-0.6904	-0.2080	-0.2551	-2.0671	-1.0350
-24	0.6493	1.2929	0.3342	-0.1505	0.8061	0.9887	-1.2610	-0.5846
-23	-0.3239	-1.6805	0.0103	-0.7349	0.1598	0.1960	-1.1012	-0.4775
-22	-0.4702	-0.1130	-0.4599	-0.7305	0.7681	0.9421	-0.3331	-0.1362
-21	-0.0395	-0.0038	-0.4993	-0.6943	-0.1742	-0.2137	-0.5073	-0.1968
-20	-0.1334	-0.1845	-0.6327	-0.7176	-0.0822	-0.1009	-0.5896	-0.2180
-19	0.4901	0.3153	-0.1426	-0.5960	-0.4884	-0.5990	-1.0779	-0.3817
-18	0.1846	-0.2228	0.0420	-0.6344	-0.6099	-0.7481	-1.6879	-0.5742
-17	-0.7804	-0.9082	-0.7384	-0.8541	-0.0417	-0.0511	-1.7295	-0.5669
-16	0.9956	1.5417	0.2571	-0.4271	-0.7289	-0.8940	-2.4584	-0.7785
-15	0.4696	0.8856	0.7268	0.8079	0.9821	1.2045	-1.4763	-0.4527
-14	0.1538	0.0678	0.8805	0.8002	0.5994	0.7352	-0.8769	-0.2609
-13	-0.1306	-0.5724	0.7499	0.6428	0.1810	0.2220	-0.6959	-0.2012
-12	-0.4918	-0.2679	0.2581	0.5642	-1.3014	-1.5961	-1.9973	-0.5620
-11	0.2848	-0.3594	0.5430	0.4695	0.6152	0.7546	-1.3821	-0.3790
-10	-0.4588	0.4609	0.0841	0.5588	0.4156	0.5097	-0.9665	-0.2587
-9	0.7831	1.2694	0.8673	0.8166	0.4684	0.5745	-0.4981	-0.1302
-8	-0.1072	-0.2590	0.7600	0.7446	0.1945	0.2385	-0.3036	-0.0776
-7	-0.7370	-0.9260	0.0231	0.5399	-0.2546	-0.3123	-0.5582	-0.1398
-6	0.8912	1.3373	0.9142	0.7965	-0.0654	-0.0803	-0.6237	-0.1530
-5	0.0745	1.2345	0.9888	1.0231	1.5614	1.9151	0.9377	0.2256
-4	0.5638	1.2429	1.5526	1.2432	-0.8830	-1.0830	0.0548	0.0129
-3	-1.2585	-2.2966	0.2941	0.7868	1.2338	1.7132	1.2885	0.2987
-2	-0.2572	0.0120	0.0369	0.7753	-0.6040	-0.7408	0.6846	0.1559
-1	0.3668	0.3202	0.4037	0.8207	0.8016	1.9832	1.4862	0.3328
0	-0.8889	-1.9901	-0.4852	0.6296	0.1731	2.2124	1.6593	0.3655
1	-0.1190	-1.4288	-0.6041	0.5438	0.5651	1.6931	2.2244	0.4823
2	-0.2129	-1.6599	-0.8170	0.4823	-1.7000	-1.0850	0.5244	0.1120
3	0.0715	0.3668	-0.7456	0.5380	3.0076	3.6888	3.5320	0.7429
4	-1.0083	-2.4986	-1.7539	0.1080	-0.4598	-0.5640	3.0721	0.6369
5	0.0350	-0.3395	-1.7189	0.0499	-0.6621	-0.8120	2.4101	0.4927
6	0.9957	1.6433	-0.7232	0.3193	-0.1789	-0.2194	2.2312	0.4499
7	-0.2562	-1.7698	-0.9793	0.0280	0.8571	1.7512	3.0883	0.6145
8	-0.0626	0.4225	-1.0419	0.0953	1.2939	1.8587	4.3822	0.8607
9	-0.0443	0.3881	-1.0863	0.1555	0.3137	1.3847	4.6959	0.9107
10	-0.2456	-0.3684	-1.3319	0.0960	-0.1277	-0.1567	4.5682	0.8750
11	0.1435	-0.3816	-1.1884	0.0360	-0.7822	-0.9594	3.7860	0.7165
12	0.2128	-0.5772	-0.9756	-0.0524	-0.6914	-0.8480	3.0946	0.5788
13	0.0383	-0.1697	-0.9372	-0.0774	-0.7217	-0.8852	2.3728	0.4387
14	0.2810	0.4866	-0.6563	-0.0040	-0.2369	-0.2906	2.1359	0.3905
15	-0.3408	-0.9368	-0.9971	-0.1421	0.1117	0.1370	2.2476	0.4065
16	-0.2843	-1.4821	-1.2814	-0.3568	0.3386	0.4152	2.5862	0.4627

Day	Arbitral decision in favor of the state				Arbitral decision in favor of the investor			
	AAR(%)	z-value	CAAR(%)	z-value	AAR(%)	z-value	CAAR(%)	z-value
17	0.0617	0.1029	-1.2197	-0.3382	-0.4472	-0.5485	2.1390	0.3787
18	0.4455	0.7191	-0.7742	-0.2320	-0.2234	-0.2740	1.9156	0.3356
19	0.0549	-0.7003	-0.7192	-0.3287	0.8566	1.0506	2.7722	0.4808
20	0.3808	2.5020	-0.3384	0.0249	0.1658	0.2033	2.9380	0.5046
21	-1.0478	-1.6719	-1.3862	-0.2072	-2.0411	-2.5034	0.8969	0.1525
22	0.4292	0.5124	-0.9571	-0.1348	0.0531	0.0652	0.9500	0.1600
23	0.6364	0.5478	-0.3207	-0.0590	0.5630	0.6905	1.5130	0.2525
24	0.2684	0.8129	-0.0523	0.0511	0.5907	0.7245	2.1037	0.3479
25	-0.8182	-0.7749	-0.8704	-0.0529	0.0110	0.0135	2.1147	0.3466
26	-0.0794	-0.6173	-0.9498	-0.1342	-1.2387	-1.5193	0.8760	0.1423
27	0.8902	1.5019	-0.0596	0.0642	0.3073	0.3769	1.1832	0.1906
28	-0.1810	-0.0297	-0.2406	0.0598	0.0083	0.0102	1.1916	0.1903
29	-0.4856	-0.7356	-0.7262	-0.0357	-0.8445	-1.0358	0.3470	0.0549
30	-0.3943	-0.4443	-1.1205	-0.0923	0.1139	0.1396	0.4609	0.0724

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