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Market Anticipation and the Rule of Law: A cross-country comparison

Carlos Alvarado

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Comisión para el Mercado Financiero (CMF) - Chile

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Market Anticipation and the Rule of Law: A cross-country comparison

Carlos Alvarado[1]

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ABSTRACT

In this paper, I present evidence on the degree of market anticipation to mergers and acquisitions (M&A) announcements for a set of 27 countries during the period 2000-2018. I do this by measuring the "Average Run-up Index" (ARI) for each country, a measure of the price change observed before an important announcement. All countries in the sample present some degree of price anticipation but there is large heterogeneity among them, ranging from 33% ARI in the US to 75% ARI in Argentina. Possible hypotheses that explain market anticipation are: i) market sophistication ("forecast abilities") and ii) presence of information leakage and illegal insider trading. Regression analysis show that ARI is negatively correlated with countries' Rule of Law –a proxy for regulatory and enforcement context. Other controls, such as countries' GDP and a measure of markets sophistication, are not statistically significant. I interpret these results as evidence against the market sophistication hypothesis. Moreover, the negative correlation with countries' Rule of Law would imply that the level of market regulation and enforcement play an important role in reducing market anticipation to news through, for example, discouraging information leakage and illegal insider trading. (JEL G14, G18, K42).

RESUMEN

En este trabajo, se presenta evidencia sobre el grado de anticipación de precios a anuncios de fusiones y adquisiciones (M&A), para un conjunto de 27 países durante el período 2000-2018. Para ello, se mide el "Índice Run-up Promedio" para cada país (ARI, por sus siglas en inglés), que es una medida del cambio en precios observado antes de un anuncio importante. Todos los países en la muestra presentan algún grado de anticipación de precios pero hay gran heterogeneidad entre ellos, desde un ARI de 33% en Estados Unidos hasta un ARI de 75% en Argentina. Las posibles hipótesis que explican la anticipación de mercado son: i) sofisticación de mercado ("habilidades para predecir") y ii) la presencia de filtraciones de información y transacciones con información privilegiada. El análisis de regresión muestra que la medida ARI está negativamente correlacionada con el "Imperio de la Ley" (Rule of Law) en cada país –una aproximación al contexto regulatorio y sancionatorio. Otros controles tales como el GDP o una medida de sofisticación de mercado en cada país, no son estadísticamente significativos. Se interpreta estos resultados como evidencia en contra de la hipótesis de mercados sofisticados. Más aún, la correlación negativa con la medida de Imperio de la Ley implicaría que el nivel regulatorio y sancionatorio en el mercado financiero juega un rol importante en reducir la anticipación de precios a noticias, a través de, por ejemplo, desincentivar la filtración de información y las transacciones con información privilegiada.

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1. Introduction

Trading with inside information has been regarded as more harmful than beneficial for financial markets. This has not always been the case, however. It has been argued that insider trading –that is, trading by companies' directors or executives- might be beneficial, as this allows markets to quickly incorporate information into prices, therefore, improving the allocation of resources in financial markets (Manne, 1966; Carlton and Fischel, 1983; Demsetz, 1986). Despite such benefits, in the 1980s and especially the 1990s, most jurisdictions enacted regulation to restrict some forms of insider trading, and to impose strict sanctions on other forms of insider trading, that is, those cases where trading occurs while having access to material or privileged information about a given company (Battacharya and Daouk, 2002). These legal and regulatory developments in financial markets have been accompanied over the years by increased market depth, creation of new financial products, and large efficiency gains due to technological advances. While it has been shown that, in general, financial regulation and enforcement contributes to the proper development of financial markets (for example, see La Porta et al., 1997, 1998; Zingales, 2015; Brown et al. 2017), it remains an important empirical question to evaluate the extent of such claims.

Battacharya and Daouk (2002) presents one of the first comprehensive efforts to evaluate and measure the contribution of insider-trading rules on market outcomes. They surveyed a group of 103 countries (22 developed; 81 emerging) that had stock markets by the end of 1998, to determine whether those countries had insider-trading rules in place (and from when); whether there had been a prosecution under these laws, and when was the first prosecution. As the authors show, countries that adopted insider-trading rules and enforced them saw a significant improvement in market liquidity thereafter, measured as a reduction in the cost of equity -between 0.3% and 7%, depending on the empirical approach. Moreover, they also stress that it is not only the existence of insider-trading rules that drove the improvement on market outcomes but it was the enforcement of such rules that is associated with a lower cost of equity. In contrast, countries that enacted insider-trading rules but did not enforced them, showed no significant change in the cost of equity over time.

Similarly, recent empirical work shows that introducing these rules and enforcing them improves other market-related outcomes. For example, Levine et al (2017), using the same dataset as Battacharya and Daouk (2002), show that enforcement of insider-trading rules promotes firms' innovation, by incentivizing outside investors to devote resources on valuing innovative activities and consequently, increasing the flow of financing to innovative activities. Another work by Christensen et al. (2016) show, for a sample of European countries, that market liquidity improved after the implementation of the Market Abuse (2004) and Transparency (2007) EU Directives. They estimate an increase in market liquidity equivalent to 0.1% to 0.2% of the total market capitalization, every year, after implementation and enforcement of these Directives. Moreover, they find a stronger effect in countries with higher regulatory quality in the past, and stronger effect where there is stricter implementation and enforcement of such rules. Finally, Del Guercio et al. (2017) show that stock price *run-ups* –a measure of market anticipation- in the US are negatively correlated with the resources available to the Securities and Exchange Commission (SEC) –either in the form of more budget or more enforcement staff. They interpret this finding as evidence of a deterrence effect of enforcement on illegal insider trading. In line with Christensen et al. (2016), these authors also document that, as the SEC deploys more resources, market liquidity improves.

The goal of this paper is to contribute to the literature that studies financial market outcomes, specifically, by measuring the degree of market anticipation to mergers and acquisitions (M&A) announcements, in a sample of 27 developed and developing countries. Following existing literature (see Section 2), I measure market anticipation to M&A announcements as in Jarrell and Poulsen

(1989) and others.[2] Namely, I measure the stock price *Average Run-up Index* (hereafter, ARI), which measures the proportion of price increase (decrease) that is realized before the announcement date, relative to the total price increase (decrease) associated with the news. In most cases, this measurement ranges from 0 to 100%, but there are cases were prices over (under) shoot before the announcements, which yields a value less than 0 or greater than 100%. Higher numbers in the ARI represents a market with higher anticipation to news (see Section 3.d for details). Interestingly, by covering a larger set of countries than previous studies, we can study the relationship between market anticipation and other countries' characteristics, such as their Rule of Law (World Bank Governance Indicators) and their Market Sophistication score (Global Innovation Index).

The main result in this study is that countries that present a low degree of market anticipation to news also rank higher in the Rule of Law Index. In other words, those countries where the perception of the regulatory and law enforcement context is "better" also present a lower degree of market anticipation to news.[3] Other covariates, such as countries' GDP and market sophistication score are not correlated with the measure of market anticipation. This result is important for two reasons: First, it provides evidence towards the long-standing debate on whether stock price anticipation is related to investors' sophistication or their "forecast abilities", or whether market anticipation is more related to information leakage and illegal insider trading. If the market sophistication hypothesis were true, we should observe minor differences in market anticipation across countries. If any, we should observe that countries that are more "sophisticated" present higher degree of market anticipation. Contrary to this, I find a large heterogeneity in the measure of market anticipation across countries. Moreover, I find a negative correlation with the measure of Rule of Law, which would imply that the level of market regulation and enforcement in a given country play an important role in reducing market anticipation to news through, for example, discouraging information leakage and illegal insider trading.

This paper is organized as follows: Section 2 presents a discussion on whether measures of market anticipation can be interpreted as information leakage and illegal insider trading, or whether these measures are more related to invertors' sophistication and their "forecast abilities". Section 3 describes the data and methodology. Section 4 presents the analysis of market anticipation to M&A announcements and countries Rule of Law. Section 5 discusses the results and concludes.

2. Market sophistication, information leakage and Insider Trading

Whether measures of market anticipation can be interpreted as illegal insider trading is an active research area. Early literature argues that a plausible explanation for market anticipation before important corporate announcements is that markets are efficient and participants are able to process all public information and predict sharp price movements, such as those seen in many M&A announcements.[4] For example, such claims can be found in Jarrell and Poulsen (1989), as they show that the presence of media speculation around potential M&As (i.e. rumors) is the strongest variable in explaining unanticipated premiums and prebid run-ups for a sample of 172 deals that occurred in the US between 1981 and 1985. They also show that unanticipated premiums are higher and stock price run-ups are lower in cases where government agencies later prosecuted for insider trading, which they interpret as evidence against the idea that insider trading pushes price before announcement. Similarly, Meulbroek (1992) finds evidence that sophisticated investors are able to process order-specific characteristics, such as order size, direction and frequency, and from this information, they are able to predict the presence of informed trading, therefore anticipating to information releases. A more recent

[2] Other papers that look at versions of the Run-up Index are Keown & Pinkerton (1981), King (2009), Agrawal and Nasser (2012), Jain and Sunderman (2014), Del Guercio et al (2017).
[3] See Section 3.e for a formal definition of the Rule of Law Index.
[4] See for instance Manne (1966); Carlton and Fischel (1983); Demsetz (1986); Jarrell and Poulsen (1989); Meulbroek (1992).

paper by Hendershott et al (2015), argues that informed institutional investors are able to forecast unexpected value-destroying events, which provides evidence in favor of the ability to better process public information.

In turn, several other papers in the literature have shown, indirectly, that a more plausive explanation for stock price anticipation is the presence of insider trading. For example, Keown and Pinkerton (1981) document for the US that, for a sample of 194 successfully acquired firms between 1975 and 1978, their cumulative abnormal return one day before the M&A announcement reached an average of 13.2%, whereas the cumulative abnormal return one day after the announcement reached an average of 26.7%. The ratio of these numbers –known as the run-up index- yields 49%, which indicates that almost half of the announcement premium was observed before the public announcement.

Similarly, Bhattacharya et al (2000) show that corporate announcements in Mexico have no impact on prices or volume traded after the date of the announcement. Their explanation for this is that the stock prices moves well before the announcement date, therefore, they conclude that the "event is not an event" (p. 94). Interestingly, the particular setting in this study allows the authors to control by the ability of investors to predict future movements using public information. Namely, they exploit the fact that A-shares can only be held by citizens, whereas B-shares for the same company can be held by foreign investors. If the market sophistication hypothesis is true, we should observe that both A and B shares move in tandem, neither leading the price of the other. However, contrary to this, the authors find that the A-shares leads returns volatility of B-shares, "*suggesting that there is an information spillover from one series type to another*" (p. 72). They argue that what should be driving prices is the presence of insider trading by domestic investors.

Another study for Canada for the period 1985 to 2002, by King (2009), finds evidence "*consistent with insiders trading illegally*". In this study, the author shows that abnormal stock turnover begins far ahead of the announcement date, accompanied by abnormal returns in the last five trading days before the announcement, consistent with more informed trading. By using data on disclosed insider trading, the author documents a sharp increase in volume prior to the takeover announcement, suggesting that insiders make use of private information.[5]

An interesting paper by Jain and Sunderman (2014) studied, using a sample of 873 listed companies in India for the period 1996 to 2015, the stock price run-up observed in M&A deals between companies in the same industry and M&A deals between companies in different industries. They find that mergers occurring within a given industry display an 88.3% stock price run-up (anticipation before the public announcement), whereas mergers occurring between companies in different industries presented an average of 42% stock price run-up. They interpret this result as evidence of insiders trading on non-public information, as the managements of both the target and the acquiring firms clearly understand the value of the merger in the case of intra-industry mergers, whereas it is less clear in the case of inter-industries mergers.

3. Data and Methodology

a. Data

The main data source for this study comes from Bloomberg's Mergers and Acquisitions data (*MA <GO>*). From this service, I extracted information on all M&A deals announced in 27 developed and emerging countries in the period 2000-2018. For each M&A deal, I collect information on the parties

[5] In the context of accounting scandals, Agrawal and Cooper (2015) find that insiders of a company who have access to material information on misstated earnings (earning-decreasing statements) also engage in selling company stock during the misstated period. This finding, as authors argue, suggests that insider trading would be more widespread in the market than has been found in previous literature, as transactions based on other sources of privileged information would be harder to track and prove.

involved (target, seller, buyer), and, when available, I collect descriptive information on the deal, that is, date of announcement, deal size, deal type, and announced premium. It is important to highlight that Bloomberg sets as *date of announcement* the earliest date related to the M&A announcement, extracted from several sources (news wires, regulatory filings and public statements).[6] This is crucial, as having the exact date on which the information became public is key to construct proper market anticipation measurements.

b. Sample Selection Process

Table 1 presents information on the number of M&A deals to be analyzed -by country; see Column D- and it also describes the stages of the sample selection process. I start the analysis with 91,000 M&A deals across 29 countries, for the period 2000-2018. Note that this number is not the universe of M&A deals, as for some countries I selected a random sample of M&A deals, due to the large size of the market and Bloomberg data access restrictions. From this group of M&A deals, and for every public firm involved, I extract market information on daily prices and volume, for at least 2 years before the date of each announcement. Given that many companies are illiquid, I drop those deals for which I could either not retrieve any market data (see column B in Table 1) and those deals for which I could not retrieve enough market data (see column C in Table 1). After cleaning the sample for data availability, I select the final sample by considering only those deals that appear to be material. To do this, I drop from the sample those cases that presented a cumulative abnormal return between T=-20 and T=1 less than 1% (in absolute terms). This yields a final sample of 6,166 deals (see column D in Table 1).

[6] Nonetheless, they also record, from 2012 onwards, a "proposal date", which in some cases is different (i.e. earlier) to the announcement date. For those cases, in the main analysis I update the date to consider the earliest of both. In robustness exercises not presented here, I found no significant effect of using "proposal" or "announcement" date. They are different only in 281 cases (about 3%) from column B in Table 1.

Table 1. Number of M&A deals, by country

Country	(A) # M&A Deals	(B) # Deals with some market data	(C) # Deals with sufficient market data	(D) # Selected Deals
ARGENTINA	921	49	31	29
AUSTRALIA (*)	1,349	296	243	232
BRAZIL (*)	4,452	280	192	176
CANADA (*)	3,098	503	393	384
CHILE	1,256	97	53	52
CHINA	1,051	259	173	165
DENMARK	4,178	135	106	102
EGYPT	417	56	32	31
FRANCE	1,470	769	438	401
GERMANY	1,240	580	474	446
GREECE	1,343	164	145	139
HONGKONG (*)	12,213	327	225	220
INDIA	942	548	421	398
INDONESIA	1,696	147	82	79
ITALY	525	269	252	238
JAPAN (*)	2,412	780	700	669
MEXICO (*)	1,834	60	39	35
PORTUGAL	1,440	67	47	45
RUSSIA	4,433	326	111	101
SINGAPORE	8,310	415	318	301
SOUTHAFRICA	4,503	347	246	231
SOUTHKOREA	8,249	495	408	390
SPAIN	322	123	99	92
SWEDEN	8,406	286	259	251
TURKEY	1,432	125	119	109
UK (*)	2,558	588	474	460
USA (*)	9,701	531	397	390
Total	89,751	8,622	6,477	6,166

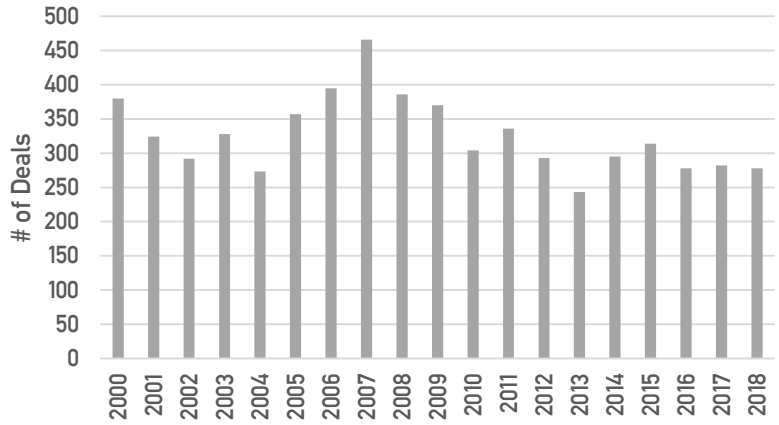
Notes: This table presents the number of M&A announcements analyzed for each country. First column (A) shows total number of deals selected from Bloomberg, that were either "Completed" or are in "Pending" status. As mentioned in main text, I am not analyzing deals that were "Withdrawn" or "Cancelled". Column (B) shows the announcements for which I was able to collect market data, namely, price, volume and market index data. Column (C) shows the announcements for which I have sufficient market data, that is, those that have at least 20 days of data for the "normal period" (-100,-30), at least 10 days of data for the "pre announcement period" (-30,-1), and at least 5 days of data for the "post announcement period" (0, 30). In Column (D) I drop from the sample those cases that displayed contrary behavior before and after the announcement (that is, presented downward/upward price behavior before and upward/downward price behavior after)

(*): Due to large number of deals, we selected a random sample of deals, for which we then collected information on prices and volume.

c. M&A Sample Statistics

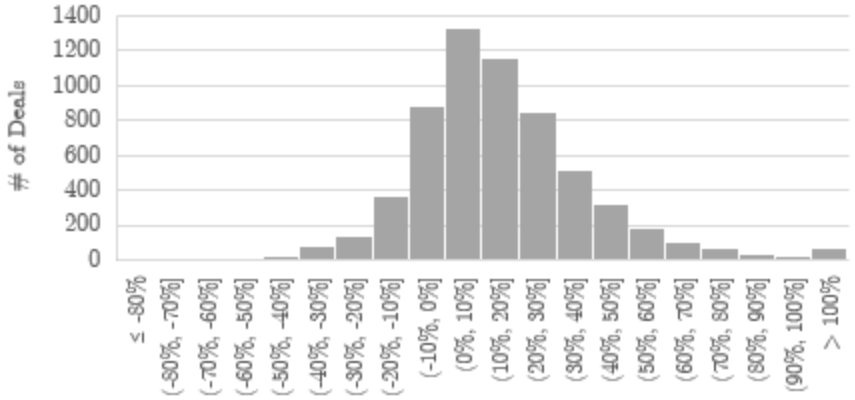
For the selected deals (6,166), Figure 1 presents their distribution by year. The sample is relatively balanced across year, with peak deals in 2007 and trough deals in 2013.

Figure 1. Distribution of selected M&A deals, by year



Notes: Figure presents the distribution of M&A deals for the selected sample across years. Source: Author's calculation using data extracted from Bloomberg.

Figure 2. Announcement Premium Distribution



Notes: This histogram plots the distribution of CAR(T+1) across deals. CAR stands for Cumulative Abnormal Return, as defined in Section 3.d. Source: Author's elaboration using data extracted from Bloomberg.

Figure 2 shows the distribution of announcement premium, measured by CAR(T+1). CAR stands for Cumulative Abnormal Return, and it's defined in detail in Section 3.d. In simple terms, CAR(T+1) measures an estimate of the value of the M&A announcements. As can be seen from Figure 2, most M&A announcements (4,659, that is, 75%) are positive (i.e. CAR greater than 1%, given that I drop those cases with CAR < 1% in absolute terms). The complement (1,535, that is, 25%) are negative M&A announcements.

d. Measuring Market Anticipation

In order to construct a measure of market anticipation to M&A announcements, I follow the procedure to calculate the Run-up Index, as defined in Jarrel and Poulsen (1989) and others. The Run-up Index measures the proportion of abnormal price increase (decrease) that is observed before the

announcement, relative to the total abnormal price increase (decrease) that is observed after the announcement (typically, one day after the announcement). To calculate it, I first measure the expected stock return, by estimating a regression of the stock return on the market return, namely:

$$r_{ijt} = \alpha_{ij} + \beta_{ij} * r_{jt} + e_{ijt} \quad (1)$$

Where r_{ijt} is the return on stock *i* in country *j* at time *t*; r_{jt} is the return on the main equity market index for each country *j* at time *t*, and e_{ijt} is the error. I present the list of market indices used by country in the Appendix.

After this, I define the abnormal return as the estimate of the errors derived from an OLS regression for Equation (1). In order to have better estimates for α and β, I estimate Equation (1) with data for the normal period only (that is, from T-100 to T-30), and then use those estimates for estimating the abnormal return for the *pre* (that is, from T-30 to T-1) and *post* periods (that is, from T to T+30), where T represents the date of the announcement. For each company, then, the cumulative abnormal return (CAR) is defined as,

$$CAR_{ijt} = \hat{e}_{ijt} + CAR_{ij,t-1}$$

That is, after estimating the abnormal returns, I calculate the cumulative abnormal return (CAR) starting in the *pre* period up to the *post* period. This means that CAR in *t*=-31 is equal to zero, and it accumulates from that date onwards.

Finally, the Run-up Index by firm/event is calculated, as follows:

$$RI_{ij} = \frac{CAR_{ij\ (T-1)}}{CAR_{ij\ (T+1)}}$$

That is, the Run-up Index measures the proportion of abnormal price increase that is realized up to *t*=T-1, relative to the price increase after the material information is becomes public, that is, when *t*=T+1. To understand this ratio, let's assume companies X and Y have been working on a M&A deal, which would increase company Y's stock price by 20%. If there is no information leakage, the cumulative abnormal return for company Y's stock would be, on average, around 0%. This would yield a Run-up Index of 0%. Instead, if there is information leakage before the M&A announcement, company Y's stock would jump up to 20%, which in turn would cause company Y's cumulative abnormal return to reach, on average, 20% increase before the announcement. Given that all the M&A premium was realized before the announcement, the Run-up Index in this case would be 100% (that is, 20%/20%).[7]

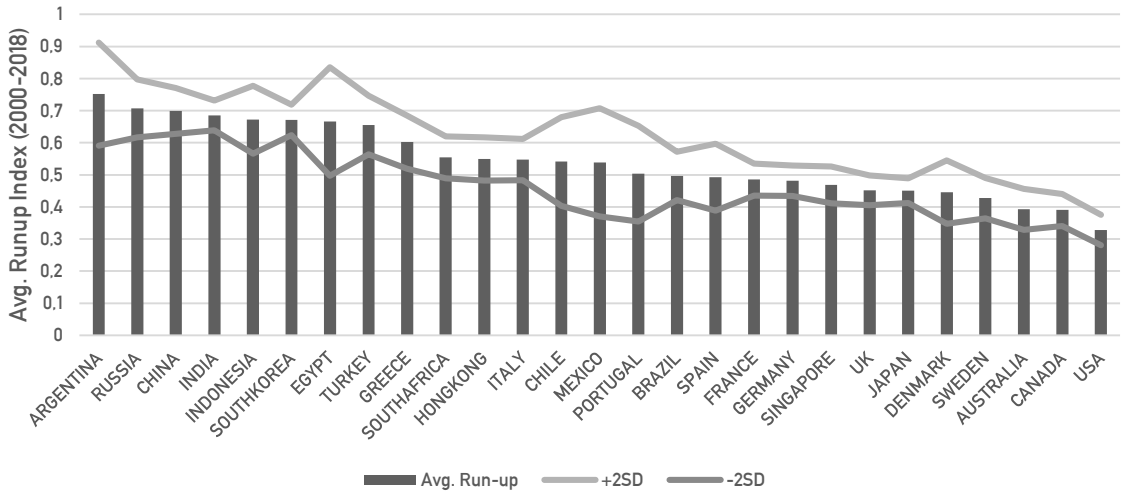
After measuring the Run-up Index, I calculate the Average Run-up Index (ARI) for each country, by taking the simple average of the Run-up Index for all events in all countries. Note that, in robustness exercises not presented here, several other aggregation methods were used, and results did not change significantly.[8]

Figure 3 shows the distribution of ARI across countries, with two standard deviations around the average value. The extreme values for ARI correspond to 75% for Argentina and 33% for the US.

[7] It is important to stress that having a high Run-up Index is not a necessary nor sufficient condition to determine the presence of illegal insider trading.

[8] Robustness exercises available upon request.

Figure 3. Average Run-up Index (ARI) and Standard Deviation, all countries



Notes: This figure presents the Average Run-up Index (ARI) for the sample of 27 countries, sorted in decreasing order. The lines represents two standard deviations from the average for each country. Source: Author's calculation using data extracted from Bloomberg.

The numbers in Figure 3 are relatively similar to those found in other papers in the literature, as seen in Table 2.

Table 2. Average Run-up Index documented in previous literature

Country	Period	ARI	Source
EEUU	1975-1978	49%	Keown & Pinkerton (1981)
	1981-1985	39%	Jarrel & Poulsen, (1989)
	1988-2006	23%	Agrawal & Nasser, (2012)
	2006-2010	12%(*)	Del Guercio et al, (2017)
	2011-2013	6%(*)	Del Guercio et al, (2017)
Canada	1985-2002	34%	King, (2009)
	1985-1995	44%	Jabbour et al. (2000)
India	1996-2010	81%	Jain & Sunderman, (2014)

Notes: This table presents a comparison of the ARI documented in previous literature. Source: Author's elaboration, using data from each paper. (*) The Run-up Index in Del Guercio et al. (2017) are calculated by a different methodology.

e. Rule of Law

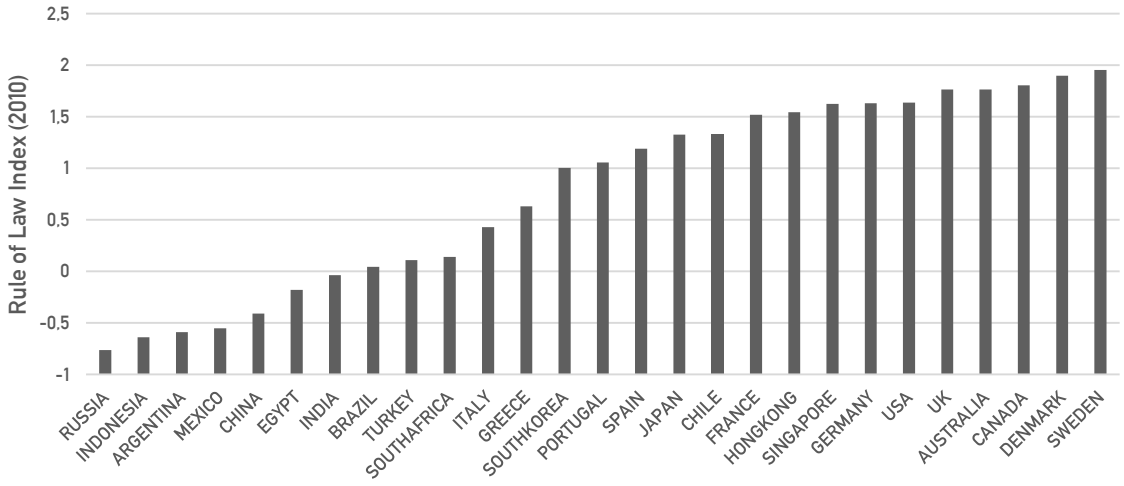
Ideally, in order to assess the strength of financial regulation and enforcement to deter insider trading one would have to assess and compare insider-trading rules in place in each country, and also assess and compare the enforcement available actions (and resources) in each country. Unfortunately, this information is not available, at least for the length of time and countries in my sample.

To overcome this empirical difficulty, I focus on average measures of the strength of law in each country, namely, I will use the measure of Rule of Law compiled by the World Bank in their World Governance Indicators. The Rule of Law Index, as the World Bank describes it, "*captures perceptions*

of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence" (Kaufmann et al, 2010).

While this is not a perfect measurement for the regulatory and enforcement environment in financial markets, it allow us to make comparisons across very different countries and financial regulatory settings. Moreover, the Rule of Law Index should be highly correlated with a similar type of index for financial markets.

Figure 4. Rule of Law Index, year 2010 (WGI – WB)



Notes: This figure presents the Rule of Law Index in 2010 for the 27 countries in the sample, sorted in increasing order. The Rule of Law Index measures the perception of the quality and enforcement of laws in a given country. Source: Author's elaboration, using data from the World Bank (WGI)

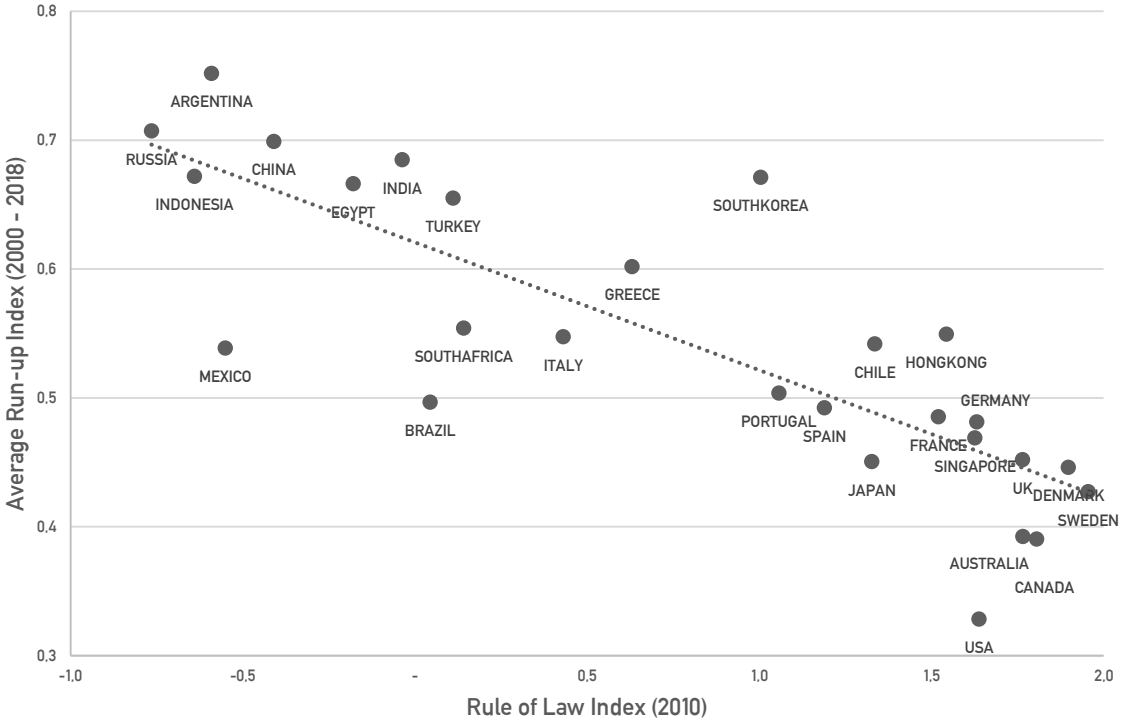
In the empirical specifications below, I will focus on the Rule of Law Index for 2010, given that the Index is not easily comparable over time for several countries. As the World Bank stresses out, "*changes over time in a country's score on the WGI reflect a combination of three factors (i) changes in the underlying source data, (ii) the addition of new data sources for a country that are only available in the more recent period, and (iii) changes in the weights used to aggregate the individual sources.*" (WGI website)[9]. Due to these factors, I will take a more conservative approach by not focusing on the value of the Index but rather interpret the Rule of Law Index as a ranking in a given year. I will arbitrarily choose 2010, given that my sample covers from year 2000 to 2018.

4. Analysis

Figure 5 plots the ARI and Rule of Law Index (2010) for the sample of 27 countries. The first observation is that there is a significant and negative correlation between these measurements. This means that countries that rank better in the Rule of Law Index (right-hand-side of the graph) also display a lower market anticipation index –as measured by the ARI.

[9] https://info.worldbank.org/governance/wgi/Home/FAQ. Visited in September 2019.

Figure 5. Average Run-up Index (ARI) and Rule of Law Index, by country



Notes: This figure presents the relationship between ARI and the Rule of Law Index (2010) for the sample of 27 countries. The dotted line shows the linear fit between these two variables, which shows that there is a negative (and significant) correlation between ARI and the Rule of Law Index. Source: Author's elaboration using data from Bloomberg and the World Bank.

Table 3 presents different specifications, to control for other covariates that might be correlated with the ARI by country. In Column (1) I show the simple correlation with the Rule of Law Index, with a significant coefficient of -0.1. This means that increasing the Rule of Law Index by one (for example, moving from Russia to Turkey, Turkey to Portugal or Portugal to Sweden) would reduce the ARI in 10%. Column 2 presents the same regression, but controlling by countries' GDP per capita (log). Columns 3 through 5 control by a liquidity measure (Average Stock Turnover) and Market Sophistication as of 2013 (from the Global Innovation Index dataset).[10]

[10] https://www.globalinnovationindex.org/home

Table 3. Regression Analysis by country

	Dep. Variable: Average Run-up Index (2000-2018)				
	(1)	(2)	(3)	(4)	(5)
Rule of Law Index (2010)	-0.10***	-0.10***	-0.11***	-0.07***	-0.08***
	(-7.38)	(-7.48)	(-8.84)	(-3.69)	(-4.07)
Log(GDP Per Capita 2010)		-0.02	-0.03**	-0.01	-0.02
		(-1.66)	(-2.19)	(-0.80)	(-1.45)
Average (Stock Turnover / Market Cap.)			0.00		0.00
			(1.31)		(1.28)
Market Sophistication (WEF 2013)				-0.00*	-0.00
				(-1.75)	(-1.60)
Constant	0.62***	0.86***	0.99***	0.84***	0.97***
	(34.28)	(6.20)	(6.00)	(6.75)	(6.00)
Observations	27	27	27	26	26
R-squared	0.67	0.70	0.72	0.73	0.76

This table presents several regressions of the ARI on different covariates. The main variable is the Rule of Law Index (2010), which yields a negative and significant coefficient in all specifications. The next control is the Log(GDP per capita), which is obtained from the World Bank Dataset. The next control is the average stock turnover, which is an average measure of liquidity. Finally, the next control is a measure of Market Sophistication, from the Global Innovation Index database (https://www.globalinnovationindex.org/).
Robust standard errors presented in parenthesis. See main text for more information.
Source: Author's elaboration, using data from Bloomberg, the World Bank and the Global Innovation Index dataset.

As can be seen from Table 3, after controlling by GDP, liquidity and market sophistication measures, the coefficient on Rule of Law remains negative and significant. The previous analysis is suggestive of a positive effect of regulation and enforcement in reducing market anticipation to news.

A way of checking for robustness would be to run the same regression disaggregated by firm/event, which allows for additional controls.

Table 4. Regression Analysis by firm/event

	Dep. Variable: Run-up Index by firm/event				
	(1)	(2)	(3)	(4)	(5)
Rule of Law Index	-0.11***	-0.05**	-0.05**	-0.06**	-0.06**
	(-6.80)	(-2.70)	(-2.07)	(-2.29)	(-2.76)
Log(GDP Per Capita)		-0.04***	-0.04***	-0.04***	-0.03***
		(-3.82)	(-4.05)	(-3.26)	(-3.72)
Average (Stock Turnover / Market Cap.)			0.00	0.00	0.00
			(0.29)	(0.19)	(0.12)
Time Effect (linear)				-0.00	-0.00
				(-1.35)	(-1.38)
Constant	0.63***	0.99***	0.98***	7.19	7.46
	(26.36)	(11.32)	(11.51)	(1.55)	(1.57)
Industry Fixed Effects and Interaction with Rule of Law	NO	NO	NO	NO	YES
Observations	6,166	5,886	5,296	5,296	5,296
R-squared	0.04	0.05	0.04	0.04	0.05

This table presents several regressions of the Run-up Index on different covariates. The main variable is the Rule of Law Index, by year, which yields a negative and significant coefficient in all specifications. The next control is the Log(GDP per capita), which is obtained from the World Bank Dataset. The next control is the average stock turnover, which is an average measure of liquidity. A linear time effect is included, to control for possible trends in the Run-up Index, as documented by Del Guercio et al. (2017). Column 5 includes additional controls, namely a set of industry fixed effects and their interaction with the Rule of Law Index.
Clustered standard errors by country presented in parenthesis. See main text for more information.
Source: Author's elaboration, using data from Bloomberg, the World Bank and the Global Innovation Index dataset.

Table 4 presents a set of regressions disaggregated by firm/event, using as dependent variable the individual Run-up Index observed in each of the 6,166 M&A announcements. As can be seen, the coefficient on the Rule of Law Index remains negative, significant and about the same level as the aggregated regression by country.

It is interesting to note that, however, when controlling by each country's GDP, some of the effect in Rule of Law is captured by GDP. This suggests that there is some effect coming from the economic cycle. In fact, the negative coefficient on GDP has also been documented before in Jain and Sunderman (2014). As these authors show, Run-ups in recessions are higher than in expansions. They interpret this result as follows: in recessions, investors are more cautious and speculate less. Because of this, they only trade when their private signal is strong.

In Column 5, I control by industry fixed effects and their interaction with the Rule of Law Index. These additional controls allow for differences across industries which could explain different trends by industry. Overall, there seems to be no significant difference between Column 4 (without fixed effects and interactions) and Column 5. A Hausman specification test between these two models does not reject the null of no difference between coefficients.

5. Discussion and conclusion

The development of insider-trading regulation, across countries and over the years, have placed greater emphasis on market fairness, with the view that such regulation should encourage the participation of more investors and increase investors' trust in markets. This, in turn, should improve the allocation of resources in financial markets, as prices would reflect all available public information. Overall, the evidence in the literature supports this view (Battacharya and Daouk, 2002; Christensen et al., 2016; Levine et al., 2017, among others).

However, there is not much agreement on whether the observation of market anticipation to important corporate news –such as M&A announcements- can be interpreted as evidence of the presence of information leakage and illegal insider trading, or whether it is a natural response given that markets are able to forecast these news (the market sophistication hypothesis). This study tried to contribute to this literature, by providing a comparative view across several developing and developed countries.

This study shows that all countries present some degree of market anticipation to news (as measured by the ARI). Moreover, those with a better Rule of Law Index also display lower anticipation –even after controlling by other covariates such as countries income (GDP), stock's liquidity measure or market sophistication. This is evidence that support the information leakage and insider-trading view. If the market sophistication hypothesis were true, we should find that investors in countries with sophisticated markets are able to predict future prices movements more accurately than in countries with less sophisticated markets, and, therefore, display a higher ARI. Moreover, if the market sophistication hypothesis were true, we should also find that price discovery (i.e. market anticipation) does not vary significantly across countries. However, this study shows large heterogeneity in ARI across countries, from 33% in the US to 75% in Argentina.

Considering that improving market outcomes is a permanent desire for financial regulators, there still remain some questions that should be further answered. First, it is not clear what is the exact improvement in terms of financial regulation and enforcement that might induce a reduction in information leakage and insider trading. For example, both Battacharya and Daouk (2002) and Christensen et al (2017) highlight the role of enforcement (over regulation), arguing that regulation by itself does not appear to have any impact on market outcomes. If this is the case, regulators around the world should devote more resources to enforcement actions. Nonetheless, the evidence provided by

these authors do not shed light on the optimal regulation neither on the level of enforcement needed. These questions should be studied further.

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Appendix I – Market Indices to estimate abnormal returns

Table A1. Market Indices to estimate abnormal returns

Country	Index	Country	Index
ARGENTINA	MERVAL Index	ITALY	FTSEMIB Index
AUSTRALIA	AS51 Index	JAPAN	NKY Index
BRAZIL	IBOV Index	MEXICO	MEXBOL Index
CANADA	SPTSX Index	PORTUGAL	PSI20 Index
CHILE	IPSA Index	RUSSIA	RTSI$ Index
CHINA	SHCOMP Index	SINGAPORE	FSSTI Index
DENMARK	KFX Index	SOUTHAFRICA	JALSH Index
EGYPT	EGX30 Index	SOUTHKOREA	KOSPI Index
FRANCE	CAC Index	SPAIN	IBEX Index
GERMANY	DAX Index	SWEDEN	OMX Index
GREECE	ASE Index	TURKEY	XU100 Index
HONGKONG	HSI Index	UK	UKX Index
INDIA	NIFTY Index	USA	SPX Index
INDONESIA	JCI Index		

Appendix II – Robustness

One concern with the ARI measurement has to do with the selected window for measuring CAR. In the case of this paper, I arbitrarily chose a 30-day window to measure CAR, which is also selected by other papers in the literature. However, it is interesting to see how would the results change if a different window is selected.

In the following table, I present the correlation between ARI and Rule of Law (column 1 from Table 3), but for different windows to measure CAR. The first column uses a 10-day window (that is, calculates the cumulative abnormal return from T-10 onwards), and the last column uses a 50-day window.

Table A2. Correlation between ARI and Rule of Law, for different CAR-windows

	Dep. Var: Average Run-up Index (2000-2018)				
CAR Window	10-day	20-day	30-day	40-day	50-day
	(1)	(2)	(3)	(4)	(5)
Rule of Law	-0.10***	-0.09***	-0.10***	-0.09***	-0.09***
	(-7.72)	(-7.29)	(-7.38)	(-7.53)	(-7.55)
Constant	0.49***	0.57***	0.62***	0.64***	0.65***
	(27.84)	(33.09)	(34.28)	(40.21)	(44.27)
Observations	27	27	27	27	27
R-squared	0.66	0.64	0.67	0.68	0.64

As can be seen from Table A2, the correlation between ARI and Rule of Law does not changes significantly when changing the CAR-window from 10 to 50 days. Interestingly, what does changes is the level of ARI: it presents an average of 49% for a 10-day CAR-window, and increases to 65% for a 50-day window. This result is reasonable, considering that a shorter window leaves some of the increase in price out of the measurement. In contrast, longer windows considers price changes that are observed in a longer period.

Table A2 also shows that there is not a lot of change between a 30-day window and a 50-day window. This implies that, on average, price anticipation occurs very close to the announcement. In fact, almost 80% of the 30-day anticipation (49% ARI over 62% ARI) occurs within the 10-day window before the announcement.

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