A Work Project, presented as part of the requirements for the Award of a Master's degree in Finance from the Nova School of Business and Economics.

Fire-sale FDI During the European Financial Crisis

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06-09-2021

Abstract

Using data on mergers and acquisitions in the period 1999-2018 for 27 Eurozone countries, I investigate the effects of the recent European financial crisis on the market for corporate assets. The Eurozone presents itself as an arena for testing the fire-sale FDI hypothesis of Krugman (2000). I test the two main implications of the hypothesis which are that the number of M&A deals should increase for the crisis-stricken countries during a crisis. Furthermore, that these deals should see lower prices compared to the rest of the Eurozone. The results indicate that the number of transactions involving the crisis countries do not increase during the crisis, which do not support the fire-sale FDI hypothesis. Moreover, the premiums paid for targets in the crisis countries are lower than the rest of the Eurozone, but this effect persists over the entire period and not only the crisis period.

Keywords: Cross-border M&A, fire-sale FDI hypothesis, financial crises, foreign direct investment

This work used infrastructure and resources funded by Fundação para a Ciência e a Tecnologia (UID/ECO/00124/2013, UID/ECO/00124/2019 and Social Sciences DataLab, Project 22209), POR Lisboa (LISBOA-01-0145-FEDER-007722 and Social Sciences DataLab, Project 22209) and POR Norte (Social Sciences DataLab, Project 22209).

Introduction

The recent financial crisis of 2007-2008 led to the most severe economic downturn since the Great Depression (Brunnermeier, 2009). The crisis started to unfold when the U.S. housing market burst, forcing banks and other financial institutions to write down billions of dollars` worth of mortgages and related assets. The forced write-downs caused widespread failures of financial institutions and a freeze up of capital markets as fear spread (Brunnermeier, 2009). The widespread failures of financial institutions were caused by financial institutions ignoring their own business model and kept their credit risk instead of transferring it to other investors (Acharya and Richardson, 2009). From its epicenter in the U.S., the crisis had global economic repercussions. In Europe, the periphery countries were enjoying stable growth and low deficits in 2007, but by 2010 they were facing severe debt problems (Broner et al., 2014). The first danger signs occurred when Greece reported surprisingly high debt-to-GDP ratios in late 2009 (Lane, 2012). In May, the following year yields on Greek sovereign debt rose sharply amid concerns on economic growth and an unsustainable sovereign debt level (Lane, 2012). Rising yields in Greek sovereign bonds were soon followed by a spike in the sovereign debt yields in Portugal and Italy (Lane, 2012). Consequently, Greece was effectively shut out of the bond market in April 2011, followed by Ireland in November and Portugal in April 2011 (Lane, 2012). All the GIIPS countries experienced higher bond spreads during the crisis, and by the end of 2012 all GIIPS countries had spreads between 400 and 800 basis points, except for Greece whose spread was much higher (Broner et al., 2014). Growing external deficits in the period 2003-2007 led to increased debt levels which ultimately caused fear of insolvency in financial markets. Furthermore, the European economy did not only face a problem of unsustainable sovereign debt it also faced slow economic growth and vulnerable banks (Shambaugh, 2012).

The previous paragraphs outline the general characteristics of the European financial crisis, and it is in this context I wish to test the fire-sale FDI hypothesis of Paul Krugman (2000), which is the main objective of the thesis. In simple terms, the hypothesis argues that as an economic crisis flare up domestic investors sell their assets to opportunistic foreign investors at prices below fundamental value, and one observes a surge in inward FDI to crisis-stricken countries. In the context of the European financial crisis, the hypothesis would predict that domestic investors in Greece, Ireland, Italy, Portugal and Spain (the GIIPS countries) would sell-off their assets to foreign investors at fire-sale prices during the crisis.

The Eurozone presents an interesting arena for testing the fire-sale FDI hypothesis for several reasons. Firstly, there was a significant upswing in M&A activity in the years preceding the crisis as a result of financial liberalization policies, government policies and regional agreements (Coeurdacier et al., 2009). This could imply an increasingly integrated M&A market in the Eurozone. Moreover, Duso et al. (2011) comment that the effectiveness of M&A regulation increased during the 1990s and 2000s and added that the European Commission seemed to "learn over time". The last-mentioned is of particular importance as it has shown to be an important determinant of the level of cross-border M&A activity (Rossi and Volpin, 2004). Europe also create an interesting venue for testing the fire-sale FDI hypothesis, because of the economic divergence that took place during the crisis. While the GIIPS experienced sudden spikes in bond yields during the crisis, other European countries such as Germany experienced historically low bond yields (Attanasi et al., 2009). Similarly, to the Asian financial crisis of 1997-1998, the European financial crisis brought with it news articles describing asset fire-sales from the GIIPS countries to less affected European countries. A 2011 headline in an article in The Guardian said: "Bargain Hunting in Greece" referring to German companies

buying Greek assets cheaply (Lawton and Stevens, 2011). Another news article, in The Wall Street Journal proclaimed that "Greece embarks on a fire-sale" (Smith, 2012).

The empirical result of this thesis indicates that Krugman`s (2000) fire-sale FDI hypothesis does not hold for the European financial crisis. I test the two most important implications of the fire-sale FDI hypothesis, the increase in number of M&A deals in crisis-stricken countries and the lower premium on the M&A targets during the crisis. Both the implications were not found to be present when running the economic analysis and thus I conclude that the fire-sale FDI was not present during the European financial crisis.

The organization of the work project is as follows, first I will introduce the relevant literature on the fire-sale FDI phenomenon and capital flows during previous crises. Secondly, I go through the methodology I follow for the thesis. Thirdly, I go through my main results. Fourth, I conclude.

Past Research on Financial Crises and the Impact on Foreign Direct Investment

The global financial crisis of 2007-2008 brought an abrupt stop to the rapid growth of the increasingly globalized financial system. Milesi-Ferretti et al. (2011), for example, show that the crisis caused a significant retrenchment of international capital during the crisis years, after a decade of growing international financial integration and higher cross-border capital flows. As a share of GDP, international capital flows grew from 7 percent in 1998 to over 20 percent in 2007 (Milesi-Ferretti et al., 2011). Similarly, Forbes and Warnock (2012) note that capital flows surged during the mid-2000s before contracting sharply during the global financial crisis of 2007-2008. McQuade and Schmitz (2017) find that in the aftermath of the recent financial crisis, international capital flows recovered, but still remained significantly below their pre-

crisis peaks. The table below shows global FDI inflows for the period 2006-2014. The pattern for FDI is similar to that described by McQuade and Schmitz (2017), with FDI inflows reaching its peak in 2007-2008 and then contracting sharply. Before settling at a significantly lower level compared to the pre-crisis years.

Table 1. Global FDI flows 2006-2014, UNCTAD Investment Report. In million USD.

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014
Inflows	1 403 562	1 891 708	1 490 066	1 236 120	1 396 203	1 615 081	1 493 828	1 456 323	1 403 865

In a study covering the period 1970 to 2009, Broner et al. (2013) show that during crises total gross capital flows collapse as investors retrench from foreign markets. Moreover, they find that these retrenchments occur during both domestic and global crises. Stoddard and Noy (2015) find that financial crises have had an adverse effect on FDI flows and M&A activity for their dataset of developing and emerging economies for the period 1987-2009. These papers provide evidence suggesting that financial crises are coupled with large retrenchments from crisis-stricken countries and capital flows decrease significantly.

In the aftermath of the Asian financial crisis of 1997-1998, however, a new phenomenon emerged regarding crises and capital flows (Krugman, 2000). The phenomenon was first introduced by Paul Krugman which coined it fire-sale FDI. He remarked that during the Asian financial crisis of 1997-1998 one saw a massive flight of short-term capital and sell-offs of foreign equity holdings, but at the same time large flows of inward direct investment into Asian countries. In his paper, Krugman draws on anecdotal evidence, citing news articles of foreign countries buying Asian companies cheaply to establish the basis for his hypothesis. Moreover, a similar pattern was observed in the 1995 Latin American crisis. The phenomenon is referred to as fire-sale FDI because of the way domestic investors sold off their assets at depressed prices in the face of tightening credit conditions and a worsening macroeconomic situation. As an

example of the drastic reevaluation of the Asian economies and assets that occurred during the crisis, Krugman remarks that the Korean currency lost half of its value relative to the U.S. dollar and that its stock market lost another 40% in domestic currency.

In a perfect capital market, however, depressed asset prices reflect the higher risk level in a market compared to another. Therefore, depressed prices in itself should not initiate a surge in capital to a country in a crisis in a perfect capital market. Thus, large capital inflows to crisis countries can be explained by excessively tight credit conditions in the target country (Weitzel et. al., 2014). Krugman (2000) also mentioned this possibility in his initial paper. He commented that during the Asian financial crisis, tight credit conditions were prominent and could in part explain the observed surge in capital inflows. Schleifer and Vishny (2011) also emphasize the role of creditors in relation to fire sales. They refer to fire sales as "essentially a forced sale of an asset at a dislocated price". The sale of the asset is forced in that the owner of the asset will not be able to pay its obligations without selling the asset.

Baker et al. (2009) differentiate between two motivations for increased inward FDI to countries in crisis. The first relates to foreign investors acquiring assets that are sold below their fundamental values and thus providing foreign investors with outsized returns relative to their risk. The second relates to cheaper capital in one country relative to another, investors with access to better credit terms acquire assets from investors with more limited access to credit. The latter motivation for acquiring assets in a crisis-stricken country reflect market frictions rather than a fire-sale. In a situation without such "credit arbitrage", lower prices might reflect a higher risk level and thus not reflecting mispricing as the fire-sale FDI suggests.

Aguiar and Gopinath (2005) present evidence in support of the fire-sale hypothesis, in their study of the Asian financial crisis. They document a significant decrease in domestic M&A activity, but at the same time large increases of FDI inflows to East Asia, which was the most affected region, during the crisis. Moreover, they show that firms located in countries that experienced severe credit constraints were more likely to be acquired during the crisis than those with less severe credit constraints. Their findings are further evidence of the effect of tighter credit conditions on capital inflows proposed by Krugman (2000). Acharya et al. (2009) find that inward FDI flows surged in the Asian financial crisis even as portfolio flows reversed, in contrast to the positive relationship in normal times.

Broner et al. (2013) study aggregate capital flows during crises over the 1970-2009 period and their results indicate that fire-sales were not an important determinant of aggregate capital during crises within their time period. Alquist et al. (2013) use the Thomson Reuters SDC database in the period 1990-2007 to investigate the fire-sale FDI hypothesis for 16 emerging economies. They focus their efforts on the effect of banking crises and the fire-sale FDI phenomenon. Their results suggest that the fire-sales are "business as usual" rather than a characteristic of crises within the context of emerging economies in that M&A activity during crises do not differ from that of crisis periods.

In the recent financial crisis, there was also signs of fire-sales. Analysts of the crisis refer to the role of "fire-sales" in depleting the balance sheets of financial institutions and aggravating the fragility of the financial system (Schleifer and Vishny, 2011). Reddy et al. (2014) show that in the aftermath of the recent financial crisis, emerging economies took advantage of attractive asset prices in developed economies by increasing their foreign acquisitions. Similarly, the fire-sale FDI hypothesis is also tested by Weitzel et al. (2014). They test the hypothesis for a panel

of corporate transactions in 27 EU countries covering the period 1999-2012. Weitzel et al. (2014) focus on the cross-border M&A activity in the context of the European financial crisis and find that countries with lower credit liquidity have depressed asset prices, but that the effect of the crisis is not significant. Meaning that countries with lower credit liquidity exhibit lower asset prices overall and not only in crisis times. Thus, their findings do not support the fire-sale FDI hypothesis.

To sum up, the Asian financial crisis stands out in that the crisis was coupled with large FDI inflows to the crisis-stricken countries. Further support for the fire-sale FDI hypothesis during the Asian financial crisis is given by Aguiar and Gopinath (2005) and Acharya and Shin (2009). When the fire-sale FDI hypothesis has been tested for other crises, however, there have been little evidence suggesting that it holds. See for example, Weitzel et al. (2014) on the European financial crisis and Alquist et al. (2013) for banking crises in emerging markets. In summary, there is little evidence apart from the studies regarding the Asian financial crisis that are in support of the fire-sale FDI hypothesis. Bogach and Noy (2012), however, comment that Krugman was not wrong, but the Asian financial was unique and the reasons for the crisis unfolding as it did was different.

This paper tests the fire-sale FDI in the context of the European financial crisis. The paper adds to current literature by using a longer sample period of 1999-2018 compared to 1999-2014 in Weitzel et al. (2014). Moreover, the definition of the duration of the European financial crisis is altered to see if that impact the results. The reason for altering the definition of crisis years is that in 2008-2009 all the European countries were facing severe economic difficulties, but it was not until late in 2009 that the first sign of a sovereign debt crisis came to the fore (Lane, 2012). When the global economy was on its way to recovery, however, the European sovereign

debt crisis started to unfold. The table below depicts the GDP growth rates of a sample of large countries in 2010, the year in which the European financial crisis started to unfold. The GDP growth rates in 2010 indicate that the global economy was on the road to recovery, while the GIIPS countries were experiencing severe economic difficulties.

Table 2. Data from World Bank database. GDP growth rates in 2010.

	United States	Japan	Brazil	Canada	China
GDP growth in %	2.564	4.192	7.528	3.089	10.636

	Greece	Ireland	Italy	Portugal	Spain
GDP growh in %	-5.479	1.773	1.713	1.738	0.163

	France	Germany	Netherlands	Sweden	United Kingdom
GDP growth in %	1.949	4.18	1.343	5.952	2.074

The first warning signs were in late 2009, when Greece reported a surprisingly high debt-to-GDP ratio which in 2010 saw yields on Greece`s government debt spike. Later, concern for state finances spread to other countries across Europe, but most severely to Greece, Italy, Ireland, Portugal and Spain. The beginning of the crisis is thus set in 2010, but this paper also argues that the end of the European financial crisis is later than 2012 which is definition given by a previous paper, see Weitzel et al. (2014). The ending of the crisis period is here given at end-2014 as 2014 saw Portugal exit its austerity measures and by then most of the other countries were on the road to recovery, the only exception being Greece. See the table of GDP growth rates below.

Table 3. Data from World Bank database. GDP growth rates in 2014.

	Greece	Ireland	Italy	Portugal	Spain
GDP growth in %	0.698	8.64	-0.005	0.792	3.835

Consequently, the research question for this paper is the following

> *"Did domestic investors in the GIIPS countries sell-off assets in a fire-sale to opportunistic European investors during the European financial crisis?"*

Methodology

To investigate the effect of the European financial crisis on cross-border M&As, I make use of the Thomson Reuters SDC database to extract data on M&A deals in the period January 1st 1999 to December 31st 2018. I make use of the Thomson Reuters SDC database as it is recognized as a highly reliable source for M&A transactions (Barnes et al., 2014). Within this time-period, I extracted data on M&A deals recorded with the condition that both the acquirer and target is based in one of the 27 Eurozone countries selected. Furthermore, I extracted data on the offer price to stock price premium one week prior to announcement as given by the SDC database, this is in line with previous research papers such as Alquist et al. (2013) and Weitzel et al. (2014). In addition, the form of the transaction for each deal is included in the data. In this paper, the focus is on M&A deals rather than all forms of FDI, such as greenfield investment in line with previous papers on the fire-sale FDI hypothesis by Alquist et al. (2013). The focus on M&A deals rather than all forms of FDI is due to the element of data quality, as FDI consist of components other than investments such as retired earnings and inter-company loans which would bring limited empirical value (Erel et al., 2013). Furthermore, the sample excludes deals that involve an acquirer or target that are in the energy and power, financials or government

and agencies according to the Thomson Reuters Macro Description. LBOs, spinoffs, recapitalization, self-tender offers and repurchases are also excluded from the sample. The final sample then consist of 115 229 M&A deals, of which 27 859 are cross-border which is equal to 24 percent of the total M&A deals in the 27 Eurozone countries. This paper focus on M&A within the Eurozone to exclude effects of heterogenous institutions and in particular M&A legislation, in line with Weitzel et al. (2014).

Dependent variables:

Merger activity: The merger activity variable is used to estimate the willingness of a firm from one country to acquire a firm from another country. In the context of the European financial crisis, it is particularly interesting to investigate if the willingness increases if the target firm is based in a country which is defined as a crisis country. Therefore, following Erel et al. (2013) and Weitzel et al (2014), $Y_{TA,t}$ measures the proportion of cross-border mergers between a country-pair in a specific quarter t as a percentage of the number of the domestic deals in the particular target country and the number of cross-border deals between the country-pair. The dependent variable is then defined as $Y_{TA,t} = X_{TA,t}/(X_{TA,t}+X_{T,t})$, where $X_{TA,t}$ being the number of cross-border deals in a country-pair and $X_{T,t}$ is the number of domestic deals in the target country. By definition the variable will be in the 0-1 range. A higher value in $Y_{TA,t}$ means that the number of cross-border deals grew comparatively to the number of domestic deals in the target country. By including both domestic and cross-border deals in the variable one accounts for factors that drive both types of M&A activity.

Target premium: The target premium is a percentage measure which is provided by the Thomson Reuters SDC database. The percentage is calculated by taking the final price paid for the shares of the target firm minus the price of the shares one week prior to the announcement

of the deal minus one. This measure of the target premium is in line with Weitzel et al. (2014) and Erel et al. (2013). Using that data given by the SDC database, I take the average value for each country-pair per quarter.

Independent variables:

Crisis period: The dummy variable is equal to 1 in the period from 2010 to 2014 and equal to 0 otherwise. The first signs of a European sovereign debt crisis were when a number of countries reported a much higher-than expected growth in the debt/GDP ratio in late 2009 (Lane, 2012). Later, Greece was shut out of the bond market in May 2010, Ireland followed in November 2010 and Portugal in April 2011 (Lane, 2012). Thus, the starting point of the crisis period is set to be in the first quarter of 2010 as that was when financial trouble was starting to unfold in Europe. The end of the crisis has been set to end-2014 as in 2014 all the crisis countries apart from Italy were experiencing economic growth measured by GDP (World Bank GDP Database).

Crisis countries: The crisis country dummy is equal to 1 for deals in which either Greece, Ireland, Italy, Portugal or Spain is the target country and equal to 0 otherwise. These countries are defined as crisis countries as they experienced severe economic problems during the crisis and were partly cutoff from capital markets or were in danger of being excluded (Beetsma et al., 2013). A similar variable in which Ireland is excluded as a crisis country is also constructed in line with previous work by Weitzel et al. (2014). Cyprus is left out as a crisis country because of the low number of deals involving the country.

By using merger activity and target premium as dependent variables this paper investigates the most important implications of Krugman`s (2000) fire-sale FDI hypothesis. Firstly, the merger

activity variable tests the implication that one should observe higher number of sales of corporate assets from crisis-stricken countries during a crisis. Secondly, the target premium variable tests the implication given from Krugman (2000) that one should observe lower target premiums in crisis-stricken countries during a crisis. The dependent variables thus serve well to test the fire-sale FDI hypothesis in the context of the European financial crisis.

M&A activity during the European financial crisis

Table 4 shows the number of cross-border acquisitions for each country in the dataset for the period 1999-2018. The table shows that the United Kingdom, Germany and France were the biggest acquirers during this time period, which should be expected given they are the three largest economies in Europe. The United Kingdom being the largest acquirer may reflect its position as the financial center for Europe. Similarly, the Netherlands are relatively large acquirer country relative to the size of their economy which may reflect its position as a financial center and having the headquarters of many multinational enterprises, taking advantage of its corporate law (Jong et al., 2005). The number of deals in which the GIIPS countries were the acquirer during the time period is equal to 3 707. That number seems rather low taking into the account that Italy and Spain were the 4th and 5th largest economies in the Eurozone, this may indicate that the significant economic problems faced by these countries did affect their outward M&A activity negatively.

Table 4 (Number of acquisitions per country 1999-2018)

	Freq.	Percent
Austria	1142	4.10
Belgium	1424	5.11
Bulgaria	19	0.07
Cyprus	110	0.39
Czech Republic	184	0.66
Denmark	1102	3.96
Estonia	110	0.39
Finland	1190	4.27
France	3786	13.59
Germany	4057	14.56
Greece	261	0.94
Hungary	68	0.24
Ireland-Rep	921	3.31

Italy	1269	4.56
Latvia	54	0.19
Lithuania	78	0.28
Luxembourg	627	2.25
Malta	37	0.13
Netherlands	2659	9.54
Poland	287	1.03
Portugal	209	0.75
Romania	31	0.11
Slovak Rep	50	0.18
Slovenia	33	0.12
Spain	1047	3.76
Sweden	2714	9.74
United Kingdom	4390	15.76
Total	27859	100.00

Table 5 shows the number of target firms from each country in the time period. When comparing it to table 4, one can see that the 3 of the GIIPS countries are more likely to be the target than the acquirer. Spain was the acquirer in 1047 deals (3.76 percent of the total), but the target in 2078 deals (7.46 percent). Similarly, Portugal was the acquirer in 0.75 percent of deals while being the target in 1.87 percent. The same goes for Italy being more likely to be acquired than to be the acquirer. Ireland and Greece, however, are more likely to be acquirers than targets throughout the period. These observations are giving mixed signals, Spain, Portugal and Italy are more likely to be acquired which may support the Krugman (2000) hypothesis that the crisis countries saw large FDI inflows. At the same time, Greece and Ireland are in the opposite direction in that they are more likely to acquire than to be acquired which is not in line the hypothesis.

Table 5 (Number of targets per country 1999-2018)

	Freq.	Percent
Austria	816	2.93
Belgium	1370	4.92
Bulgaria	258	0.93
Cyprus	97	0.35
Czech Republic	710	2.55
Denmark	1168	4.19
Estonia	251	0.90
Finland	1052	3.78
France	2873	10.31
Germany	4154	14.91
Greece	190	0.68
Hungary	407	1.46
Ireland-Rep	607	2.18
Italy	1687	6.06
Latvia	177	0.64

Lithuania	226	0.81
Luxembourg	219	0.79
Malta	36	0.13
Netherlands	2015	7.23
Poland	991	3.56
Portugal	521	1.87
Romania	471	1.69
Slovak Rep	231	0.83
Slovenia	118	0.42
Spain	2078	7.46
Sweden	1670	5.99
United Kingdom	3466	12.44
Total	27859	100.00

Results

Table 6 (Descriptive statistics)

Variable	Obs	Mean	Std. Dev.	Min	Max
$Y_{TA,t}$	10343	.13	.198	.002	1
PMWK	350	23.902	48.153	-91.3	506.48

Table 6 depicts the descriptive statistics for the dependent variables used in this paper. As described earlier, $Y_{TA,t}$ is measuring merger activity per quarter and PMWK is measuring the average target premium one week prior to the announcement of the deal per quarter. The number of observations for $Y_{TA,t}$ is equal to 10343, for PMWK the number of observations is 350. The reason for the number of observations for the target premium variable being lower is that private M&A deals do not have target premiums by definition.

The mean value for $Y_{TA,t}$ is equal to .13 which means that the number of cross-border deals relative to the total of cross-border and domestic deals is on average 13 percent per quarter. The mean of PMWK is equal to 23.902 which indicates that the average target premium is equal to 23.9 over the time-period per quarter. The measure is percentagewise so that would indicate that on average the target premium is equal to 23.9 percent above the share price one week prior to announcement.

Merger activity:

Table 7 (Merger activity)

$Y_{TA,t}$	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
crisis_ctry	-.051	.005	-10.36	0	-.061	-.041	***
crisis_year	-.003	.005	-0.63	.53	-.012	.006	
Constant	.14	.002	58.76	0	.135	.145	***
Mean dependent var		0.130	SD dependent var			0.198	

R-squared	0.010	Number of obs	10343.000
F-test	53.783	Prob > F	0.000
Akaike crit. (AIC)	-4282.783	Bayesian crit. (BIC)	-4261.051

*** p<.01, ** p<.05, * p<.1

Table 7 shows the results from the regression in which merger activity is the dependent variable while the crisis country and crisis year are the independent variables. The constant for the regression is equal to .14, which means that the average percentage of cross-border deals in the period is equal to 14%. The crisis country variable has a coefficient of -.051 and is significant at the .01 level. This shows that the number of cross-border deals decreases if the target country is one of the countries defined as a crisis country. The crisis year variable has a coefficient of -.003, but is not significant at either the .01, .05 or .1 significance levels.

The results from this regression contradicts the predictions of the Krugman (2000) hypothesis in the context of the European financial crisis. The crisis country variable has a negative value which is the opposite of the prediction from the fire-sale FDI hypothesis, while the crisis year variable is not significant at any level. These results indicate that the fire-sale FDI hypothesis of Krugman (2000) do not hold for the recent European financial crisis. The results are in line with the previous study from Weitzel et al. (2014), that did not find any support for the fire-sale FDI hypothesis in the context of the European financial crisis.

Table 8 (Merger activity)

yta	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
crisis_ctry4	-.07	.005	-13.49	0	-.08	-.06	***
crisis_year	-.003	.005	-0.66	.512	-.012	.006	
Constant	.142	.002	60.50	0	.137	.147	***

Mean dependent var	0.130	SD dependent var	0.198
R-squared	0.017	Number of obs	10343.000
F-test	91.084	Prob > F	0.000
Akaike crit. (AIC)	-4356.376	Bayesian crit. (BIC)	-4334.644

*** p<.01, ** p<.05, * p<.1

Table 8 shows the results from a regression in which $Y_{TA,t}$ is the dependent variable while the independent variables are crisis year and crisis country. However, the crisis country variable is altered in that Ireland is not defined as a crisis country in contrast to the earlier regression. The reason for leaving out Ireland is that Ireland exited the crisis earlier than the other GIIPS countries. Whereas GDP growth in the four other countries remained negative until 2014, Ireland was exhibiting GDP growth from 2010 and onwards (World Bank). In this regression, the coefficient for crisis country is equal to -.07, a stronger effect of the crisis country variable compared to the previous regression and is still significant at the .01 level. The coefficient for the crisis year variable is equal to -.003, but not significant at any significance level. This regression, with an altered definition of the crisis country variable, are in line with the results from the previous regression and do not document support for the fire-sale FDI hypothesis proposed by Krugman (2000).

The fire-sale FDI hypothesis proposed by Krugman (2000) in the aftermath of the Asian financial crisis of 1997-1998, suggested that during a crisis, one should observe higher FDI inflows to crisis-stricken countries as domestic investors sell off their holdings at "fire-sale" prices. The results presented above, however, did not show an increased propensity for crisis country firms to be a target of a cross-border merger or acquisition during the recent European financial crisis.

Target premium:

Table 9 (Target premium)

PMWK	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
crisis_ctry	-18.013	7.677	-2.35	.02	-33.112	-2.914	**
crisis_year	-2.332	6.864	-0.34	.734	-15.832	11.167	
Constant	26.611	3.01	8.84	0	20.692	32.531	***
Mean dependent var		23.902	SD dependent var			48.153	
R-squared		0.016	Number of obs			350.000	
F-test		2.764	Prob > F			0.064	
Akaike crit. (AIC)		3704.797	Bayesian crit. (BIC)			3716.370	

*** $p<.01$, ** $p<.05$, * $p<.1$

Table 9 shows the results from the regression using the target premium as a dependent variable and crisis year and crisis country as the independent variables. The constant for the regression is equal to 26.611. The coefficient of crisis country is equal to -18.013 and is significant at the .05 level. This variable indicates that if the target firm is located in one of the crisis countries, the target premiums are lower than if the firm is located in other countries. The crisis year variable has a coefficient of -2.332 but not significant statistically at any level.

Table 10 (Target premium)

PMWK	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
crisis_year	-2.339	6.857	-0.34	.733	-15.825	11.148	
crisis_ctry4	-18.996	7.743	-2.45	.015	-34.225	-3.766	**
Constant	26.684	3.002	8.89	0	20.781	32.588	***
Mean dependent var		23.902	SD dependent var			48.153	
R-squared		0.017	Number of obs			350.000	
F-test		3.020	Prob > F			0.050	
Akaike crit. (AIC)		3704.288	Bayesian crit. (BIC)			3715.862	

*** *p<.01, ** p<.05, * p<.1*

Table 10 shows the results when running a similar regression as in Table 6 but altering the crisis country variable by excluding Ireland as a crisis country. The crisis country coefficient is equal to -18.996 and is significant at the .05 level. The coefficient is stronger when Ireland is excluded similarly to the regressions in which merger activity was the dependent variable. As pointed out earlier, Ireland was already on its way to recovery in 2010 and posting positive GDP growth, and this could thus be the reason for Ireland not being as strongly affected as the rest of the GIIPS countries. The crisis year variable, however, is not statistically significant and do not affect the target premiums observed over the time-period.

The second implication of the fire-sale FDI hypothesis is that one should observe lower target premiums in the crisis-stricken countries during a crisis. For the European financial crisis, this would suggest that the crisis countries should see lower target premiums during the crisis than what is observed from other countries. The statistical tests in this paper do not point in that

direction. The lower target premiums for crisis countries seem to be significant over the entire time-period and not only during the crisis. Therefore, the results are not in line with the predictions given by Krugman (2000).

One possible reason for the hypothesis not being present during the recent European financial crisis could be the currency. The example from Krugman (2000) of the Korean stock market losing 40% and then the currency was devalued about 50% to the U.S. dollar. In this case, all the crisis countries were using the Euro only the asset price could determine its "cheapness".

Limitations and future research

The results from this paper do not find evidence suggesting that the fire-sale FDI hypothesis holds, at least for the European financial crisis. There are, however, some limitations for the paper. One limitation that may be pointed out is that the number of observations for the target premium variable is very low and thus it could give a wrong picture of the actual situation. By excluding countries outside the EU, the paper excludes large parts of the global economy which could give us a distorted picture of the situation. A reason this for being relevant is that the crisis did affect Europe as a whole, and then one should observe the FDI inflows from outside Europe into Europe and not only within Europe. But in bringing in the rest of the global economy, other limitations then present themselves such as the structural limitations and legislature preventing firms outside Europe acquiring European firms, but the results would still be interesting. Moreover, the study of why the crisis countries seems to exhibit lower target premiums and lower merger activity over the entire time-period is beyond the scope of this study and could be explored in future research. This would also contribute to the knowledge on the European M&A market in general as well as for the European financial crisis.

Conclusion

This paper explored the subject of the fire-sale FDI hypothesis in the context of the European financial crisis. First and foremost, the paper has investigated the effects of the crisis on cross-border M&A activity in a panel of 27 EU countries in the period 1999-2018. By creating a model with merger activity and target premium as dependent variables and crisis countries and crisis years as dummy variables I have tried to investigate the fire-sale FDI hypothesis of Krugman (2000). The fire-sale FDI hypothesis has two components. Firstly, the hypothesis suggests that one should observe higher FDI inflows to crisis-stricken countries as foreign investors are acquiring assets at depressed prices in the crisis-stricken country. Secondly, one should observe lower target premiums during the crisis in crisis countries as the domestic investors have to fire-sale their assets to meet liquidity requirements and similar limitations.

The regression analysis in which merger activity is the dependent variable, the results show that the crisis country is significant and does affect the merger activity negatively. These results suggest that a firm is less likely to acquire a firm from one of the crisis countries, this phenomenon could imply that these countries negative prospects were a more important determinant for foreign investors than the possibility of being assets at a cheap. The regressions show that this hold for both variations of the dependent variable, the one with five countries and the one that leaves out Ireland as a crisis country. The crisis year variable, however, shows weaker and not significant results in the regressions. This suggests that there was no effect of the crisis years on the propensity for firms buying a firm from a crisis country. Overall, the regressions seem to contradict the element of the fire-sale FDI hypothesis that suggest that one should observe an FDI inflow to crisis-stricken countries. For the European financial crisis, this seems to not be the case.

When considering the regressions in which the target premium is the dependent variable, the regression results indicate that crisis country is significant and affect the target premium negatively. The results show that if the target is a crisis country the target premium in the deal is negatively impacted than if the country is a non-crisis country. The crisis year variable is not significant in these regressions and do not impact the target premium in deals. These results seem to contradict the predictions given by Krugman (2000) that the crisis countries should sell below fundamental value in crisis times, but in this case, it seems like the target premium is lower for the crisis countries throughout the period and not only in the crisis years.

The conclusion of this paper is that there is no evidence suggesting that the fire-sale FDI hypothesis by Krugman (2000) holds for the European financial crisis. Rather it seems like that the effect of crisis countries is a general one lasting over the entire time-period and not only during the crisis, meaning that firms from these countries are generally less expensive and less attractive for the entire time-period and not only during the crisis.

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