The effect of fiscal announcements on interest spreads: Evidence from the Netherlands

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Abstract

We estimate the effect of consolidation efforts on investors' perception of government's solvency. To this end, we analyze announcements by Dutch government officials between September 2008 and December 2014 and select those messages that contain relevant new information on the likelihood and substance of consolidation packages. We then scrutinize whether announcements affect the yield spread of Dutch ten year government bonds vis-à-vis German bonds. Our findings indicate that announcements hinting at improvements in the budget balance significantly lowered yield spreads. As most announcements involve events during the negotiation process on consolidation packages rather than the official date of agreement or implementation of these packages, our results illustrate the importance of accurately assessing the news content of messages.

Keywords: Fiscal policy announcements, Consolidation measures, Interest spreads, Political processes, Global financial crisis.
JEL classification: E43, E62, G01, G12, H61, H62.

1 Introduction

In response to fast rising budget deficits following the global financial crisis and the euro crisis, many European countries undertook large consolidation efforts. As a result, the euro area budget deficit came down to 1.5% of GDP in 2016, from 6.3% of GDP in 2009. At the same time, consolidations in the midst of the financial crisis have arguably deepened the recession and muted the recovery to some extent (Krugman, 2012). This brings up the question of whether consolidation efforts during the crisis contributed to enhancing governments' solvency, as measured by a reduction in the yields on long-term government bonds.

The impact of budget deficits or consolidation efforts on sovereign bond yields or spreads has been studied by many authors, especially since the crisis (Born et al., 2015; Bernoth and Erdogan, 2012; Akitoby and Stratmann, 2008). Most findings indicate that higher deficits lead to a significant increase in long-term yields or spreads. However, spreads could increase in the short run in response to consolidation efforts if adverse growth effects are strong (Cottarelli and Jaramillo, 2012) or if consolidation is carried out in times of fiscal stress (Born et al., 2015). The effect might furthermore be time-varying, with financial markets caring more about projected deficit differentials since the beginning of the global financial crisis (Bernoth and Erdogan, 2012).

Often, authors include macroeconomic or fiscal variables as explanatory variables in their analysis, to gain a fundamental understanding of what is driving sovereign yields. However, many of these variables, such as GDP growth or the government deficit or debt level, are only available at a relatively low frequency. This introduces the challenge of identifying exogenous policy shocks, as fiscal outcomes are at least partly an endogenous outcome of the economic process.

We circumvent the issue of endogeneity by using high-frequency, i.e. daily, data. In particular, we analyze the effect of announcements of (imminent) consolidation packages on investors' perception of the Dutch government's solvency, as measured by the change in the yield spread on Dutch ten year government bonds vis-à-vis German bonds. Since the construction of consolidation packages typically takes weeks or months, we consider it highly unlikely that these announcements are motivated by changes in yield spreads on the same or previous day, especially since the Netherlands have hardly been under strong market pressure during the crisis.

In constructing our list of announcements, we manually select all messages we believe contain relevant new information on the likelihood and substance of consolidation packages. These messages could, for example, indicate that a deal on a consolidation package is nearby, that the deal is officially agreed upon, but also that parties fail to reach agreement. The manual selection of events allows us to obtain a more complete idea of the true effect fiscal measures have in the eyes of investors and is therefore valuable. Including *all* news items on the negotiation process, for example by performing an automated search routine for news articles containing certain words, likely introduces a lot of noise into the analysis. In contrast, only including news messages referring to more or less official events (such as political or parliamentary approval) likely ignores impor-

tant events that happened during the negotiation process and influenced the likelihood of the fiscal consolidation taking place. However, our approach of reading and selecting news items relies on the personal judgment of the researcher on the relevance of news messages. To avoid biases in the selection of news messages, it is therefore important to be very clear on what news messages are included in the analysis, to allow for an open and informed discussion with external observants.[1]

In analyzing the effect of fiscal announcements – or fiscal events – we rely on important insights gained from the event study methodology. Event studies, introduced in the seminal work of Fama et al. (1969), are widely used in the field of financial economics to examine the behavior of, e.g., firms' stock prices around corporate events (Khotari et al., 2006). The idea behind this approach is that in an efficient market, new information about any determinant of market prices will be quickly incorporated into market prices of these assets. Event studies thus easily allow for analyzing data at a high frequency. Exactly this feature – the use of daily data – implies that endogeneity should be less of a concern (Kontonikas et al., 2013). Furthermore, by using high-frequency data temporal aggregation problems are largely circumvented (Knot and De Haan, 1999).

To the best of our knowledge, event type studies to date have not been used to assess the effects of announcements on consolidation packages as such on sovereign spreads, taking into account the sometimes long and difficult trajectory for constructing a consolidation package. Among the early adopters of event studies in the field of fiscal policy analysis are Wachtel and Young (1987) and Thorbecke (1993), who demonstrate that for the case of the US news of larger deficits in OMB and CBO releases raise interest rates. Knot and De Haan (1999) find similar results for fiscal policy forecasts in Germany. More recent papers, which are more in line with our research, include Beetsma et al. (2013); Petrakis et al. (2012) and Falagiarda and Gregori (2015). They all analyze the impact of news on sovereign spreads. Beetsma et al. (2013) investigate the effect of economic news – among which are fiscal policy announcements – on yields, confirming that bad economic news drives up interest spreads. For the case of Italy, Falagiarda and Gregori (2015) find that during 2009-2013, fiscal policy announcements by Monti's cabinet – as opposed to announcements by Letta's and Berlusconi's cabinets – had a significant impact on the Italian spread. Petrakis et al. (2012) investigate the effect of public statements by representatives from different countries on Greek spreads. In general, negative statements have a significant effect, whereas only positive statements from French officials have a spread-reducing effect. However, none of the above studies focuses in a very detailed manner on the incremental process leading up to specific consolidation packages.

Our findings indicate that announcements on final agreements on six substantial consolidation packages in the Netherlands significantly lowered yield spreads on ten year bonds vis-à-vis German bonds. However, most of the spread-reducing effect was already realized in earlier stages of the process, i.e. before the official implementation date. This underlines the importance of carefully reading, analyzing and selecting the events

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[1]A list of events included in the current analysis can be found in table 7 in the appendix. The list was presented to fiscal experts from CPB Netherlands Bureau for Economic Policy Analysis and the Ministry of Finance to discuss its completeness and correctness.

of interest. Our results carry over to yields on seven year and longer term bonds, but become insignificant when yields on one or two year bonds are investigated. This could suggest that – apart from potentially reflecting differences in the investor's base for short and long-term bonds – consolidations hardly affect liquidity in the short run, but do enhance government solvency in the longer run.

This paper continues as follows. Section 2 explains the basic idea, presents the model to be estimated and describes the data used in the empirical section. Section 3 shows the empirical findings. Section 4 concludes.

2 Model and data

2.1 Fiscal events and announcements

We used the online news archive LexisNexis[2] to search for fiscal policy communications in news releases from ANP (*Algemeen Nederlands Persbureau*, or Dutch press agency) and some major Dutch newspapers (i.e., *Financieele Dagblad* and *NRC Handelsblad*). We searched for news items containing relevant, generic terms, such as *kabinet* (cabinet), *regering* (government) or *ministerraad* (council of ministers), and *bezuiniging* (consolidation), *meevaller* (windfall gain) or *tegenvaller* (windfall loss). As ANP usually is the first to report, the very large majority of our selected events are published by ANP. All in all, this yielded over 10.000 articles, which we manually brought back to a list of 144 relevant major and minor events (see below).

Next, fiscal policy announcements were classified on the basis of their signaling-content about future budget developments, and then numerically coded. We ignored announcement on fiscal measures with a structural impact of less than 50 mln EUR (about 0.01% of GDP) annually. We coded events as follows. Announcements hinting at a(n increased likelihood of a) budget improvement are coded 1. This budget improvement might follow from net consolidation efforts or from unspent windfall gains. Likewise, announcements or events suggesting a fiscal loosening might be at hand are coded -1. Neutral announcements or two contradicting messages within a day get a 0.

This approach of classifying fiscal policy announcements is necessarily subjective. For cross-checking our list of (major) events, we therefore interacted with representatives from CPB Netherlands Bureau for Economic Policy Analysis and the Ministry of Finance to discuss whether our list provides an adequate and complete overview of budgetary events during the period of interest. For an overview of the article titles (in Dutch) corresponding to the list of major events, see table 7 in the appendix.

As said, we identified 144 events. We split these events in two types, following the Dutch fiscal policy practice and the experience during the crisis. In brief, the Dutch budgetary policy framework works as follows. At the beginning of a government's term, the target for the budget balance in the final year of its term is selected and expenditures and taxes are set accordingly. During the government's term, expenditures in principle are only adjusted to compensate for windfall losses, while taxes are only adjusted in

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[2]See www.lexisnexis.nl

case of structural changes in health insurance premiums or to compensate for (other) tax policy changes. However, during the crisis, additional consolidation measures were implemented during the term of some governments, for example, after the European Council recommended the Netherlands to exert more consolidation efforts with an eye on bringing the budget deficit below 3% of GDP.

The first type of event we distinguish are events (implicitly) leading to a revised target for the budget balance – we call these major events. Major events are our prime variable of interest, as they concern measures or events explicitly aiming to bring about or leading to a change in the government's solvency position. The second type of events – minor events – concerns announcements on fiscal measures (or the absence of them) implemented to stick to the initial targets. Whether they have an effect on the government's perceived solvency, depends on the credibility of the Dutch fiscal framework. If investors believe windfalls will always be compensated for, as the framework demands, one would expect no effect of minor events on interest spreads, as they are fully predictable. Realistically speaking, however, the actual implementation of fiscal measures reduces uncertainty at least to some extent, so we might see some effect of minor events.

In total, we recorded 61 major events. Although we very likely did not capture all potentially relevant news items, announcements concerning at least the major consolidation packages can be traced back in our list of events. On balance, we have more positive (budget balance improving) than negative (budget balance deteriorating) events, reflecting the fact that we focus on an era with large consolidation efforts (table 1). For the 83 minor events, the picture is more balanced. Announcements are spread over time relatively equally (figure 1), with some clustering of major events in March-May 2012, when the cabinet Rutte 1 resigned after failed negotiations on a consolidation package, but a broad coalition of parties reached agreement in the end. Minor events are in some years clustered in March-May, as at that moment next year's budget is usually discussed.

Table 1: Major and Minor events

	-1	0	1	Total
Major	15	16	30	61
Minor	30	16	37	83
Total	45	32	67	144

-1 is budget deteriorating, 0 is neutral, 1 is budget improving.

2.2 Econometric model and other data

In the large majority of cases, fiscal announcements refer to structural changes in government expenditures or tax revenues. Given this nature of codified events, we would expect events to have a permanent effect on the yield spread between Dutch and German bonds. Therefore, and in line with, e.g., Beetsma et al. (2013) and Falagiarda and Gregori (2015), we take the change in the spread as our dependent variable. We estimate the

Figure 1: Major and Minor events
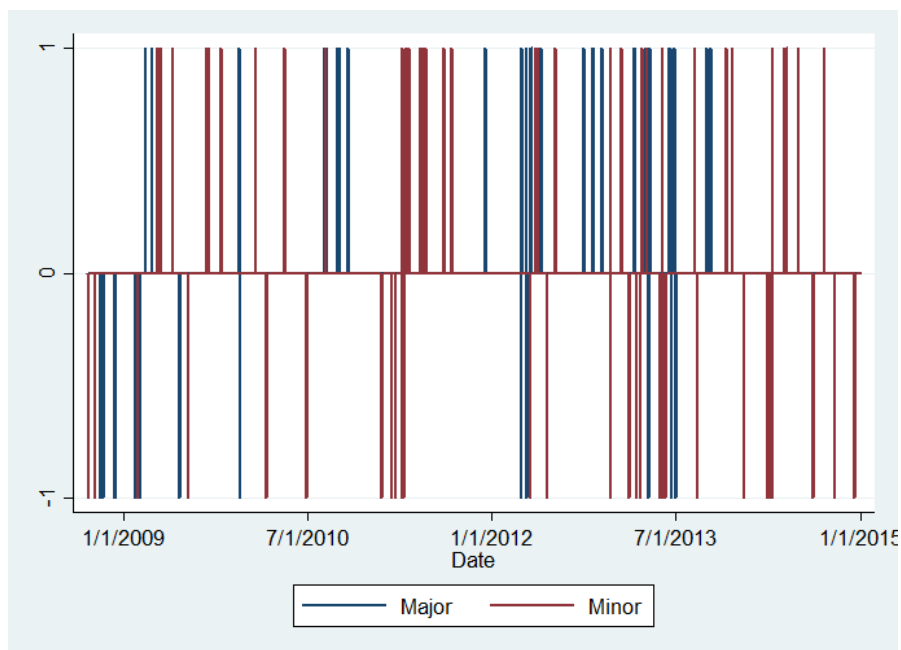
following model, using daily data for the period 15 September 2008-31 December 2014[3]:

$$\Delta Spread_t = \alpha MajorEvent_t + \boldsymbol{\gamma'}\boldsymbol{C_t} + \epsilon_t \qquad (1)$$

with $Spread_t$ measuring the yield spread on ten year government bonds between the Netherlands and Germany; $MajorEvent_t$ denoting a coded variable taking value 1 in case of a budget improving event, -1 in case of a budget worsening event, and 0 otherwise; $\boldsymbol{C_t}$ a vector of potential control variables, including minor events, the daily change in a stock market index for the euro area, the daily change in a stock market volatility index, the daily change in the Amsterdam Midkap Index (AMX), revisions in fiscal projections for the Netherlands, dummies for each government and dummies for each weekday (see below for their motivation). Data on Dutch and German sovereign yields used to calculate the yield spread, the stock market index, the stock volatility index and the AMX index are taken from Thomson-Reuters. Fiscal projections are taken from CPB.

The sovereign spread on Dutch government bonds vis-à-vis German bonds (see Figure 2) is taken as a comprehensive measure of the sustainability of Dutch public finances (cf. Born et al., 2015).[4] Developments in this spread might to some extent be driven by Germany's safe haven status during the crises, meaning that international events

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[3]We take the day Lehman Brothers filed for bankruptcy as the starting point of our analysis. In the selected time period, all major consolidation packages of recent years were addressed by the lower and upper house of parliament.

[4]Dunne et al. (2007) provide evidence for the benchmark role of German Bunds in the ten year segment.

Figure 2: Yield spread between Dutch and German ten year sovereign bonds
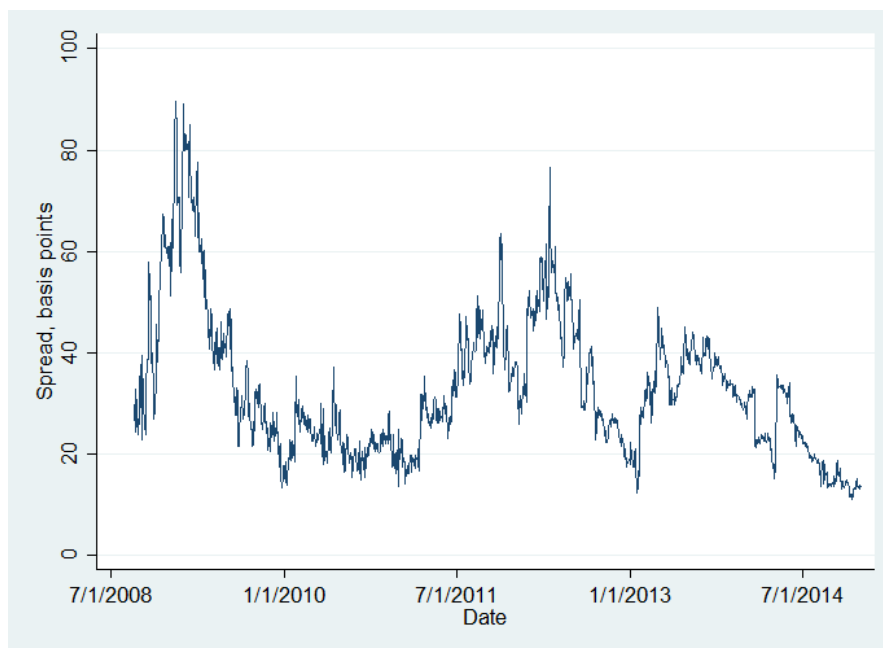
can actually affect German interest rates and therefore drive our dependent variable. However, assuming that Dutch sovereign bonds, like German Bunds, were perceived to be relatively safe assets (see e.g. De Santis, 2012), these very same international events likely also affected Dutch interest rates.[5] Therefore, using the spread rather than the Dutch interest rate itself in our view has the advantage of filtering out to a large extent major international events that (also) drive Dutch sovereign yields. This allows us to more accurately estimate the effect of our domestic events of interest. Moreover, since we consider it unlikely that fiscal news or announcements concerning major consolidation efforts in the Netherlands usually follow within the day in response to international events, the potential impact of international events on our dependent variable should not bias our findings too much.

Our list of major events tracks political discussions on six substantial consolidation packages that in the end were implemented. These packages add up to about 8% of GDP. Furthermore, in the beginning of the crisis there was an ongoing discussion leading to a decision not to consolidate. Events tracking this discussion are also recorded in our list of events.

The other regression variables are included to control for other factors driving changes in the spread and to increase the accuracy of our estimates. We include the Euro Stoxx

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[5]The Netherlands have maintained their triple A-status throughout the crisis from Fitch and Moody's. Standard & Poor's downgraded the Netherlands from AAA to AA+ on 29 November 2013, but increased the rating back to AAA on 20 November 2015. The credit rating for the Netherlands has thus been relatively favorable compared to many other euro area countries.

50 as a control for a euro area wide change in the business climate. A more favorable euro area wide business climate should pull investors towards more risky assets. As German bonds can be seen as the more risk-free and thus safer of the two, we expect this business climate variable to be negatively signed. A stock volatility index for the euro area is furthermore included to control for financial turmoil (Falagiarda and Gregori, 2015; Arghyrou and Kontonikas, 2012; Glick and Leduc, 2012). On the same account, we expect turmoil to have a positive effect on the Dutch-German spreads. The AMX index is included to reflect economic developments in the Netherlands. The AMX reflects the performance of the 25 second most largest and actively traded shares listed on Euronext Amsterdam. Next, we include revisions in the forecasts for the current and next year's budget balance, provided by the independent CPB (Van Geest and Van Vuuren, 2018). This way, we include a comprehensive measure of newly available fiscal information in our estimates. Dummies are included for each government in place during our period of analysis to control for level differences in spreads between different governments. Between 2008 and 2014, three cabinets have been in charge, Balkenende IV, Rutte-1 and Rutte-2.[6] The first two have been caretaker governments for at least some period, yielding five different regimes[7]. Weekday dummies are included to control for weekly patterns in the yield spread.

3 Results and discussion

3.1 Baseline results

Table 2 presents our main findings. In the first column, the effect of major events – those affecting the targeted budget balance – are strongly significant. The average budget improving event lowers the yield spread permanently by about 1.7 basis points. Although small, the effect is non-negligible, as the average spread during the time period of investigation stood at 32.8 basis points only. Successively adding control variables lowers the coefficient somewhat, but it remains firmly significant.

Concerning the control variables, their coefficients mostly have the expected sign. Minor events hinting at budget improving (deteriorating) fiscal measures reduce (increase) yield spreads. The effect is significant at 5% in the most extensive regression, and at 1% otherwise. This indicates that investors do appreciate efforts to live up to the fiscal framework. Somewhat surprisingly, the effect of minor events is rather large, namely about three quarters of the impact of major events. A potential explanation for this is that for major events, there is usually a lot of discussion and thus a lot of news. Each new announcement might reduce the uncertainty on a new consolidation package only a little. For minor events, we often only record one announcement, stating that a cer-

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[6]The cabinet Balkenende IV was a coalition of Christian-democrats (CDA), social-democrats (PvdA) and socially conservative Christian-democrats (ChristenUnie). Rutte-1 was a minority cabinet of conservative liberals (VVD) and Christian-democrats (CDA), with support from a right-wing party (PVV). Rutte-2 consisted of conservative liberals (VVD) and social-democrats (PvdA).

[7]Balkenende IV, without the social-democrats, acted as a caretaker government from 20 February 2010 until 14 October 2010. From 23 April 2012 until 5 November 2012 Rutte-1 was a caretaker government.

Table 2: Baseline estimation results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Dependent variable: $\Delta Spread_t$						
Major Event$_t$	-1.737***	-1.715***	-1.614***	-1.559***	-1.527***	-1.460**	-1.183**
	(0.586)	(0.572)	(0.573)	(0.569)	(0.558)	(0.590)	(0.542)
Minor event$_t$		-1.101***	-1.053***	-1.071***	-1.063***	-1.044***	-0.866**
		(0.395)	(0.394)	(0.395)	(0.396)	(0.397)	(0.365)
ΔStoxx$_t$			-0.116***	-0.020	0.078	0.071	0.071
			(0.030)	(0.055)	(0.063)	(0.061)	(0.061)
ΔVStoxx$_t$				0.211**	0.205*	0.202*	0.202*
				(0.104)	(0.106)	(0.106)	(0.106)
ΔAMX$_t$					-0.065***	-0.062***	-0.060***
					(0.022)	(0.021)	(0.021)
CPB current year$_t$						0.332	0.230
						(0.650)	(0.667)
CPB next year$_t$						-1.470**	-1.533**
						(0.688)	(0.718)
Cabinet dummies	No	No	No	No	No	No	Yes
Weekday dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1643	1643	1643	1643	1643	1643	1643
Adjusted R^2	0.014	0.020	0.043	0.053	0.059	0.060	0.070

Dependent variable in all regressions is the change in the yield spread between Dutch and German 10 year government bonds. Newey-West standard errors (6 lags) between brackets. * significant at 10%, ** significant at 5%, *** significant at 1%.

tain measure is implemented. Hence, the lower budgetary impact of most minor events might largely be compensated for by the larger reduction in uncertainty resulting from the recorded announcement.

The coefficient on changes in the Euro Stoxx 50 index is significantly negative. Improvements in the euro area wide business climate thus reduce spreads, indicating that German bonds are considered more of a safe asset than Dutch bonds. When financial market turmoil is controlled for, this conclusion still holds. However, now it is borne out by the significantly positive coefficient on changes in the volatility index, while changes in the Euro Stoxx 50 index are no longer significant. Favorable economic developments in the Netherlands, as measured by changes in the AMX, reduce spreads significantly. Fiscal forecasts by CPB do affect yield spreads in the baseline model, but this only holds for the year ahead budgetary fiscal forecasts. On average, a one percentage point upward revision in next year's forecasted budget balance reduces the spread by about 1.5 basis points.

3.2 Robustness

First, we assess the importance of the choice of our dependent variable. The yield spread vis-à-vis Germany is not only driven by fiscal and economic events in the Netherlands, but also by events in Germany. It is conceivable that events in the Netherlands and Germany actually take place on the same day. For example, if the European Commission

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presents country-specific recommendations, it presents them for all EU countries at the same time. This might trigger policy responses or announcements in Germany and the Netherlands on exactly the same date. If this happens often, our result could be driven by German rather than Dutch events. To circumvent this problem, we therefore estimate our baseline model, using simply the change in the yield on ten year Dutch sovereign bonds as a dependent variable. In principle, this yield should be less sensitive to German fiscal and economic policy events. Our main results do not change (see column 1 in table 3). The effect of major events remains significant and similar in size. Many of the control variables lose significance, with the main exception being the change in the Euro Stoxx 50. This variable is strongly significant and signed positively, suggesting that an improvement in economic conditions in Europe increase Dutch yields. This is to be expected. During the crisis, money typically flowed from periphery to core countries when market stress increased, thus reducing yields in core countries. The reverse took place when economic conditions relaxed.

Next, we focus on the role of our explanatory variables.[8] Whether events suggest a budget balance improvement, deterioration, or contain no real news, is not always clear-cut. As a result, when coding events some subjectiveness cannot be avoided. Our primary safeguard against this subjectiveness was to present our event list to external observants (see footnote 1). Interaction with representatives of CPB and the Ministry of Finance did not reveal major flaws in our classification of events. The major concern, if any, was whether some specific events should be coded as major or minor, not the sign of the coding. Dropping the distinction between major and minor events altogether, returns a highly significant coefficient estimate on the combined event variable (see column 2 in table 3).[9]

Additionally, we perform an extra test to gauge the sensitivity of our results to the classification of events. We randomly set 25% of events coded as either +1 or -1 equal to zero and re-estimate our baseline specification. Then, we repeat this exercise 2000 times. A histogram of the 2000 coefficient estimates on 'Major event' is presented in figure 3. In more than 99% of the cases, the estimated coefficient has the expected sign. In more than two thirds of the cases, the coefficient exceeds 1 in absolute size. This exercise provides confidence that our main findings are not driven by subjective coding decisions.

In our baseline specification, we chose not to model the time series dynamics potentially present in our dependent variable. In doing so, we accepted potential autocorrelation in the residuals, for which we corrected our standard errors by using Newey-West standard errors. Since we like to be sure that omitting dynamics from our model does not bias our findings, our next two robustness checks test whether results are sensitive

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[8]In addition to the results shown in this section, we also tested whether our way of controlling for economic news was important. We controlled for economic news by replacing our AMX variable by, alternatively, the Amsterdam SmallCap Index, a dummy for every day Statistics Netherlands issued a press release on macroeconomic news, and by revisions in GDP forecasts by CPB. Our main results remain largely unaffected. Results are available upon request.

[9]The combined event takes the value of the underlying minor or major event. In only one instance, a major and minor event take place on the same day. Since both were codified as -1, we set the value for that day equal to -1

Figure 3: Sensitivity of estimation results to the coding of events
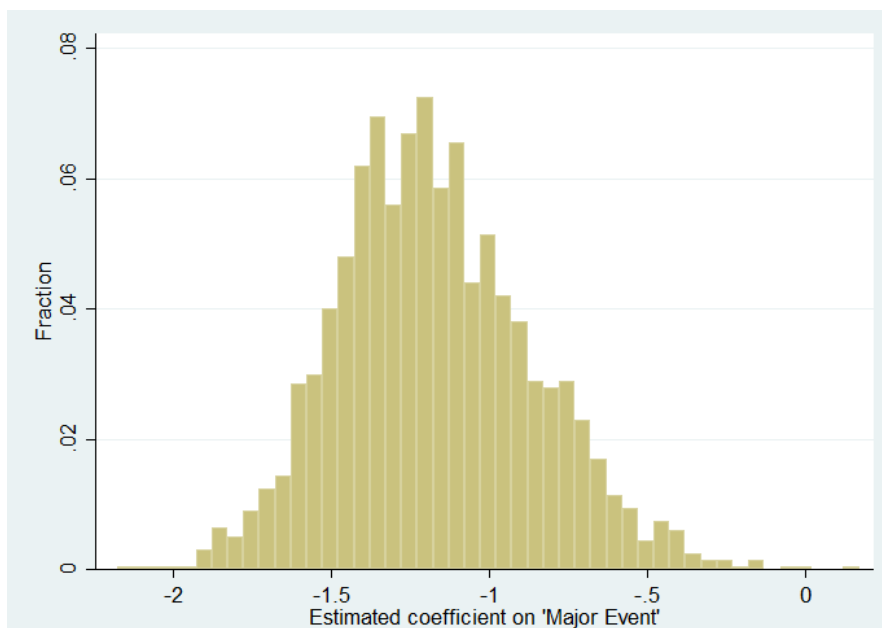
The histogram presents the distribution of estimates for α (see equation 1). To this end, major events coded as +1 or -1 were randomly set to zero with a probability of 25%. Next, the baseline equation was re-estimated. This was done 2000 times to obtain a distribution.

to our choice not to estimate a dynamic model. In column 3 of table 3, we report results for a regression in which we include as explanatory variables the number of lags of the dependent variable needed to purge the residuals from autocorrelation. As it turns out, based on the results from a Breusch-Godfrey LM test with 5 lags included, it suffices to include one lag of the change in the spread. Using robust standard errors now, as the issue of autocorrelation is in principle addressed, our main results remain largely unchanged.[10] The coefficient on our main variable of interest increases slightly. But since the lagged spread has a significant negative coefficient, about 12-13 % of this effect dies out in the long run. In column 4 we include lags of our major and minor events, to rule out the possibility that markets overshoot in response to announcements and correct for this overshooting the day after. The coefficients on lagged events are practically zero and insignificant, suggesting that overshooting is not a general phenomenon.

Finally, in columns 5-7 we split the sample in three periods of equal length, with 21 October 2010 and 27 November 2012 as the starting date of the second and third periods, respectively. The coefficient on major events increases (in absolute size) from the first to the second period and declines afterwards. However, the effect is significant (at 10%) in the second and third interval only. This might reflect that most consolidation packages

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[10]Applying Newey-West standard errors cf. the baseline estimations leaves results practically unchanged.

Table 3: Robustness

	$\Delta Yield_N L_t$		Dependent variable: $\Delta Spread_t$				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Major Event$_t$	-1.522**		-1.248**	-1.182**	-1.151	-1.552*	-0.522**
	(0.621)		(0.518)	(0.544)	(1.462)	(0.802)	(0.259)
Major Event$_{t-1}$				0.088			
				(0.473)			
Major/Minor Event$_{t-1}$		-0.990***					
		(0.311)					
Minor event$_t$	-0.725		-0.919**	-0.868**	-0.845	-0.270	-1.142**
	(0.541)		(0.399)	(0.365)	(0.764)	(0.617)	(0.549)
Minor event$_{t-1}$				0.096			
				(0.358)			
$\Delta Spread_{t-1}$			-0.144***				
			(0.038)				
ΔStoxx$_t$	0.622***	0.071	0.066	0.071	0.264***	-0.248***	-0.098**
	(0.077)	(0.061)	(0.057)	(0.061)	(0.094)	(0.078)	(0.048)
ΔVStoxx$_t$	0.196**	0.203*	0.171**	0.202*	0.345**	-0.099	0.063
	(0.200)	(0.106)	(0.083)	(0.106)	(0.144)	(0.097)	(0.092)
ΔAMX$_t$	-0.017	-0.060***	-0.063***	-0.060***	-0.085*	-0.027	-0.014
	(0.040)	(0.021)	(0.024)	(0.021)	(0.044)	(0.028)	(0.025)
CPB current year$_t$	-0.494	0.163	0.228	0.234	0.067	0.656	2.161
	(0.884)	(0.663)	(0.600)	(0.670)	(1.068)	(1.622)	(1.973)
CPB next year$_t$	-1.213	-1.556**	-1.414**	-1.544**	-1.878***	0.278	1.113
	(0.888)	(0.732)	(0.663)	(0.733)	(0.616)	(2.111)	(1.290)
Cabinet dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Weekday dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1643	1643	1643	1643	548	548	547
Adjusted R^2	0.163	0.070	0.089	0.069	0.059	0.173	0.081

Newey-West standard errors (6 lags) between brackets, except for column 3 where robust standard errors are presented. * significant at 10%, ** significant at 5%, *** significant at 1%. In column 1, the dependent variable is the change in the yield on ten year Dutch sovereign bonds. In columns 2-7, the dependent variable is the change in the yield spread between Dutch and German ten year sovereign bonds. In column 2, major and minor events are combined into one variable, taking the value of either the major or the minor event of that day. In one instance, there is both a major and a minor event. Since both have value -1, the combined variable is coded -1 as well. In columns 5-7, the sample period is subdivided in three periods of equal length: 15 September 2008 to 20 October 2010, 21 October 2010 to 26 November 2012, and 27 November 2012 to 31 December 2014.

were agreed upon in the latter two periods. The coefficients on the control variables seem more volatile. Minor events have the expected sign in all three periods, but are only significant in the final third of the sample. In contrast, changes in the volatility index, AMX and CPB forecasts seem to be relevant in the first sub-sample only. Changes in the general euro area business climate are significant throughout the whole period, but with an unexpected sign in the first sub-period.

3.3 Negotiations versus final agreements

As stressed in the introduction, the approach taken in this paper allows for a detailed and rich analysis of the effect that fiscal measures have in the eyes of investors. We specifically selected messages that contain relevant new information on the likelihood and substance of consolidation packages. Only including news messages referring to more or less official events, such as political or parliamentary approval, likely ignores important events that happened during the negotiation process and influenced the likelihood of the fiscal consolidation taking place.

To illustrate this point we divided our major events in two categories: those referring to final agreements on consolidation packages, and those on developments during the negotiation process of a certain package. As six consolidation packages were implemented during the time period of investigation, we have six major events belonging to the first category. The remaining events belong to the second category.

Estimation results are in table 4. As it turns out, our main findings with respect to the effect of fiscal policy announcements is (more than) completely driven by announcements and developments taking place during the negotiation process. The coefficient on announcements indicating the conclusion of a final agreement is far from significant (and even has the opposite sign). This underlines the importance of carefully selecting the relevant news messages. Failing to take into account relevant news during the negotiation process could lead to wrong conclusions on the impact of fiscal policy announcements.

3.4 Different maturities

Next, we scrutinize whether the effect of major events on interest spreads is constant along the yield curve. The default risk is larger for longer term bonds, meaning we can expect to find the coefficient on major events to increase with maturity. Furthermore, different types of investors, with different trading motives, might be active on the market for short-run and long-run bonds. Short maturity bonds are often held for liquidity management purposes, e.g. by banks' treasuries, by corporates to invest excess cash funds, and pension funds and insurers for short-term obligations. Institutional investors with a long investment horizon, such as pension funds and insurers, might invest more in long-run sovereign bonds to match their long-run obligations. It is therefore conceivable that returns on short term debt paper are mainly driven by liquidity considerations, while those on longer term paper are more responsive to the governments' solvency position - and thus to structural consolidation efforts.

13

Table 4: Negotiations versus final agreements

	$\Delta Spread_t$
Major Event$_t$ if:	
negotiation	-1.452**
	(0.599)
final agreement	0.470
	(0.880)
Minor event$_t$	-0.866**
	(0.365)
ΔStoxx$_t$	0.072
	(0.061)
ΔVStoxx$_t$	0.202*
	(0.106)
ΔAMX$_t$	-0.061***
	(0.021)
CPB current year$_t$	0.292
	(0.646)
CPB next year$_t$	-1.471**
	(0.698)
Cabinet dummies	Yes
Weekday dummies	Yes
Observations	1643
Adjusted R^2	0.071

Dependent variable is the change in the yield spread between Dutch and German 10 year government bonds. Newey-West standard errors (6 lags) between brackets. * significant at 10%, ** significant at 5%, *** significant at 1%.

We re-estimate our baseline model, using interest spreads for bonds with different maturities. We show additional results for maturities of one, two, seven, twenty and thirty years. These maturities provide a relatively complete picture of effects along the yield curve. The seven-year maturity is included, as that was the average (envisaged) maturity chosen by the debt agency as its benchmark to finance Dutch debt (Ministerie van Financiën, 2015).

Results in table 5 show that the effect of major events is absent for maturities of one year. At two years, the coefficient is negatively signed but insignificant. Since announced consolidations in practice take some time to materialize, it is conceivable that this insignificance reflects that consolidations do not affect liquidity in the short run - at least in a country not under severe market pressure, like the Netherlands. For longer investment horizons, we do find significant effects of fiscal policy announcements. The largest and significant effect is found for maturities of seven years, after which the size of the coefficient slowly declines towards the longer end of the yield curve, while retaining its significance. This suggests investors believe that fiscal efforts improve the governments'

14

Table 5: Different maturities

	1 year	2 year	7 year	10 year	20 year	30 year
	(1)	(2)	(3)	(4)	(5)	(6)
Major Event$_t$	0.144	-0.412	-1.672***	-1.183**	-0.937**	-0.879**
	(1.189)	(0.579)	(0.508)	(0.542)	(0.365)	(0.366)
Minor event$_t$	-0.159	0.505	0.036	-0.866**	-0.370*	-0.350*
	(0.352)	(0.378)	(0.264)	(0.365)	(0.224)	(0.198)
Stoxx$_t$	-0.296**	-0.284***	-0.055	0.071	-0.008	0.048
	(0.124)	(0.088)	(0.053)	(0.061)	(0.057)	(0.048)
VStoxx$_t$	-0.587**	0.005	0.083	0.202*	0.082	0.099*
	(0.243)	(0.119)	(0.065)	(0.106)	(0.064)	(0.058)
ΔAMX$_t$	-0.047	0.077**	-0.031	-0.060***	-0.008	-0.026*
	(0.057)	(0.036)	(0.020)	(0.021)	(0.020)	(0.013)
CPB current year$_t$	4.901**	0.316	0.183	0.230	-0.154	-1.041
	(2.377)	(1.184)	(0.693)	(0.667)	(0.834)	(0.927)
CPB next year$_t$	5.862***	2.563	-1.790***	-1.533**	-0.771	-1.094**
	(1.546)	(1.594)	(0.510)	(0.718)	(0.820)	(0.483)
Cabinet dummies	Yes	Yes	Yes	Yes	Yes	Yes
Weekday dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1602	1643	1643	1643	1643	1643
Adjusted R^2	0.031	0.033	0.041	0.070	0.048	0.053

Dependent variable is the change in the yield spread between Dutch and German government bonds, for the indicated maturities. Newey-West standard errors (6 lags) between brackets. * significant at 10%, ** significant at 5%, *** significant at 1%.

solvency in the longer run.

3.5 Budget balance improvements versus budget balance deteriorations

Finally, we look whether investors respond differently to announcements concerning budget balance improvements compared to announcements concerning budget balance deteriorations. To this end, we split our major and minor events in announcements suggesting the likelihood of a budget balance improvement has increased and in announcements suggesting a budget balance worsening has become more likely. This leaves us with 30 major and 37 minor events hinting at a budget balance improvement, and 15 major and 30 minor events hinting at a deterioration.

For major events, announcements hinting at a budget balance improvement significantly reduce interest spreads, as expected (table 6). The effect of budget balance worsening events or announcements is (in an absolute sense) even somewhat larger and positively signed as expected, but estimated with more uncertainty, rendering the coefficient insignificant. For minor events, a broadly similar pattern emerges.

15

Table 6: Positive versus negative events

	$\Delta Spread_t$
Major Event$_t$ if:	
budget balance improving	-1.047**
	(0.522)
budget balance worsening	1.513
	(1.270)
Minor Event$_t$ if:	
budget balance improving	-0.941**
	(0.438)
budget balance worsening	0.772
	0.629
Stoxx$_t$	0.071
	0.061
VStoxx$_t$	0.203*
	(0.106)
ΔAMX$_t$	-0.060***
	(0.021)
CPB current year$_t$	0.356
	(0.735)
CPB next year$_t$	-1.459*
	(0.804)
Cabinet dummies	Yes
Weekday dummies	Yes
Observations	1643
Adjusted R^2	0.069

Dependent variable is the change in the yield spread between Dutch and German 10 year government bonds. Newey-West standard errors (6 lags) between brackets. * significant at 10%, ** significant at 5%, *** significant at 1%.

4 Concluding remarks

In this paper, we investigated the effect of fiscal announcements on the perceived government's solvency, as measured by the interest spreads on Dutch ten year bonds vis-à-vis German bonds. We specifically focused on discussions on six major consolidation packages in the Netherlands in the aftermath of the global financial crisis. Our results show that announcements of events hinting at a budget balance improvement reduce yield spreads. Importantly, as most announcements concern events during the negotiation process on consolidation packages rather than reaching final agreements per se, our results illustrate the importance of carefully tracking the whole process leading up to a consolidation package.

Our results are obtained by analyzing events in a very specific time window, starting with the global financial crisis and followed by the debt crisis in the euro area. The

question therefore is whether results found for this period carry over to 'normal' times.

As already noted by Delors (1989), when discussing the future institutional set-up of the Economic and Monetary Union (EMU), markets might respond 'either [...] too slow and weak or too sudden and disruptive' to rely on market discipline only in enforcing fiscal discipline in the EMU. The start of the global financial crisis seems to demarcate a change between these regimes. Market discipline was largely absent during the first decade of EMU, with markets ceasing to differentiate between sovereign bonds across EMU following the introduction of the common currency (Buti and Carnot, 2012). In 2008 and years thereafter, market discipline returned with a vengeance, with evidence of overshooting and contagion (De Grauwe and Ji, 2012; De Haan et al., 2014; Bernoth and Erdogan, 2012).

From this one might arrive at the conclusion that our event coefficients are inflated, because they were estimated over a period of high market sensitivity. However, this need not be the case. Most importantly, excessive - or disruptive, in the words of Delors - increases in bond yields seem primarily a phenomenon experienced by the periphery countries of the euro area (De Haan et al., 2014). Dutch bonds continued to remain a relatively safe asset for investors, with the Netherlands retaining its triple-A status among the major credit rating agencies during most of the crisis and a gross government debt peaking at 69.0% of GDP only in the first quarter of 2015. There seems, therefore, no reason to suspect that investors would have responded excessively to Dutch fiscal and economic events. Adding to this, both German and Dutch bonds yields reached rather low levels over the course of our sample period. This simple fact seems to have muted the amount of absolute variation in the series, which could actually reduce our estimates in size.

Thus, whether our coefficient estimates on major events are inflated or not, is difficult to say. Especially since the size of the coefficient itself is hard to interpret, given the qualitative nature of our main explanatory variable. We do believe, however, that it might be more difficult to find similar, significant empirical results in normal times for the very simple reason that consolidation efforts are typically more limited in normal times, implying a lower signal-to-noise ratio. But as long as negative effects on economic growth are not strong and persistent, consolidations do lower the need for the government to borrow. The reduced supply of bonds should normally lower yields. Therefore, major events should affect the interest spreads in normal times as well.

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Appendix: Overview of major events

Table 7: Overview of selected major events

Date	Major Event*	Title of news article
24-10-2008	-1	Bos: crisis geen reden om te bezuinigen
31-10-2008	-1	Geen bezuiniging bij slechtere economie
05-12-2008	-1	Balkenende houdt rekening met recessie
08-12-2008	-1	Bos: begroting is juiste antwoord/
		Werkloosheid loopt op, koopkracht stijgt
10-12-2008	0	CDA en PvdA oneens over bezuinigingen bij tekort
11-12-2008	0	Coalitie schuift begrotingsconflict voor zich uit
02-02-2009	-1	ChristenUnie: begrotingsregels desnoods loslaten
03-02-2009	0	Bos nog neutraal over begrotingsregels
13-02-2009	0	Balkenende: Hoofd koel houden
17-02-2009	-1	Bos: garanderen dat rekening wel betaald wordt
05-03-2009	1	Eerste coalitieberaad over crisispakket afgelopen
09-03-2009	0	Coalitiepartijen komen niet nader tot elkaar/
		Coalitie boekt voortgang bij crisisberaad
12-03-2009	0	Impasse over crisisaanpak niet doorbroken
17-03-2009	0	Coalitie in mineur over crisisoverleg
25-03-2009	1	Kabinet sluit sociaal akkoord/
		Regeringsfracties stemmen in met sociaal akkoord
16-06-2009	-1	Geen paniek na nieuwe slechte economische cijfers
10-12-2009	1**	Kabinet bespaart fors minder
11-12-2009	-1**	Donner sprak voor zijn beurt over besparingen
15-12-2009	0	Kabinet wil nog niet bezuinigen
02-07-2010	0	Kamer houdt vast aan bezuiniging 3,2 miljard
20-08-2010	1	Kabinet wil extra bezuinigen
27-08-2010	1	Kabinet bereikt akkoord over begroting
29-09-2010	1	VVD, PVV, CDA eens over kabinet Rutte-Verhagen
05-10-2010	1	CDA-fractie maakt weg vrij voor nieuw kabinet
29-10-2010	1	Kabinet bezuinigt 1,4 miljard extra in 2011
13-12-2011	1	Nieuwe miljardenbezuinigingen op komst
15-02-2012	0	Gedoogcoalitie trekt 3 weken uit voor akkoord
17-02-2012	0	Rutte: spanningen over bezuinigingen lopen op
05-03-2012	0	Eerste Catshuissessie zit er op
28-03-2012	-1	Rutte bindt zich niet aan Europese deadline/
		Onderhandelingen Catshuis in 'moeilijke fase'
30-03-2012	1	VVD, CDA en PVV gaan samen verder
12-04-2012	1	VVD, CDA en PVV dicht bij akkoord in Catshuis
13-04-2012	-1	berichten bijna-akoord prematuur
23-04-2012	-1**	Ingelaste ministerraad maandagochtend/
		Rutte biedt ontslag van zijn kabinet aan
26-04-2012	1	Akkoord over bezuinigingspakket voor 2013
27-04-2012	1	De Jager: veel steun voor begrotingsakkoord/
		Uniek begrotingsakkoord in 2 dagen rond
25-05-2012	1	Vijf partijen bezuinigen netto 12,4 miljard
01-10-2012	1	'Lenteakkoord blijft grotendeels in stand'
25-10-2012	1	VVD en PvdA bereiken akkoord over financiën
29-10-2012	1	Regeerakkoord definitief rond
23-11-2012	1	Kabinet wil wetten snel in de Kamer hebben

20-12-2012	1	VVD en PvdA houden vast aan begrotingsnorm EU
27-02-2013	1	'Extra miljardenbezuinigingen in 2014'
01-03-2013	1	Bezuinigingspakket komt uit op 4,3 miljard euro
02-04-2013	1	Kabinet houdt vast aan terugdringen tekort
12-04-2013	-1	Kabinet stelt bezuinigingen en ingrepen uit/ Weekers: 3 procent halen we sowieso
16-04-2013	1	Dijsselbloem: 3 procent staat buiten kijf
12-06-2013	1	Coalitie gaat uit van 6 miljard bezuinigen
14-06-2013	1	Kabinet gaat 6 miljard bezuinigen in 2014
18-06-2013	-1	nog geen besluit over omvang bezuinigingen
19-06-2013	-1	Kabinet: 6 miljard bezuinigen
26-06-2013	0	Rutte: geen sprake van begrotingsakkoord
28-06-2013	1	Positief gesprek kabinet met D66, GroenLinks
02-07-2013	-1	Kabinetsoverleg met oppositie loopt spaak
26-08-2013	1	Coalitie vrijwel eens over extra 6 miljard
30-09-2013	0	Dijsselbloem maandag om tafel met oppositie/ Bezuinigingsberaad dinsdag verder
02-10-2013	1	Kabinet doet aanbod aan oppositie
04-10-2013	0	Dijsselbloem: vrijdag nog geen akkoord/ 'Kabinet blijft niet steken in eigen gelijk'/ Dijsselbloem praat om 18 uur met fracties
14-10-2013	1	Coalitie en oppositiefracties vinden elkaar
17-12-2013	1	Duivesteijn steunt woonakkoord na toezegging
18-08-2014	0	Weer begrotingsoverleg coalitie met oppositie

Source of news articles is ANP (Dutch press agency)

* +1 = budget balance improving; 0 = neutral; -1 = budget balance deteriorating
**News item from Financieele Dagblad (a Dutch newspaper).

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