

## The Coalition Poker Game and Stock Price Volatility

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Work in Progress

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There are a number of explanations for stock price volatility.<sup>1</sup> Volatility is a leading indicator of an economic recession. In an economy teetering on the edge of recession, turbulent prices reflect the reallocation of resources in the contracting economy among different sectors. Uncertainty about the future of the economy and underlying fundamentals also affects the volatility of the market (Campbell and Lettau. 1999; Zagorsky 1994). However, heightened uncertainty can, in and of itself, affect market volatility. Investors are perhaps more prone to irrational behavior when the market is operating under a cloud of doubt (Schiller 1992).

In much the same way, stock market volatility is affected both by political change and uncertainty about political change. Political change can affect the allocation of resources among sectors—a new party government has incentives to shift resources from the supporters of the previous government, towards its own supporters. If a government that has ignored the brewing industry is replaced by a government that credibly promises to support brewers, shares in that industry will rise relative to the rest of the market. However, uncertainty about which parties will form the government also affects the volatility of the market. We might expect fluctuating prices as the market tries to anticipate which parties, and hence which sectors of the economy, will benefit. This is particularly likely in political systems with coalition governments. Not only is political change hard to predict but the election does not end the political uncertainty. Parties bargain over the formation of government. This can last days or months and is characterized by breakdown of negotiations, multiple formation attempts and even switches in the negotiating parties (Laver and Schofield 1990). Additionally, political uncertainty can have a psychological effect that increases market volatility but is unrelated to shifting expectations about the future partisan composition of government. Political uncertainty, in and of itself, increases general unease in the market and makes irrational behavior more likely.

This paper examines whether the stock market volatility surrounding a change in government is due to the political change itself, or to the heightened uncertainty from the coalition bargaining process. If the latter, is this uncertainty due to shifting expectations about the composition of the future coalition government, or is it simply because political uncertainty heightens irrational behavior among nervous investors? I use data from eight stock markets, from 1973~1996 to test these arguments.

### **Politics and Stock Market Volatility**

This work is related to a body of research that uses stock market reactions to study the politics of elections, party government, and political institutions.<sup>2</sup> There are a number of ways that politics affects stock price volatility. The decision to go to war affects future economic conditions and returns to stocks. Stock prices, which had been doing poorly, rallied strongly at the start of the war with Iraq. Investors anticipated a quick end to the war. However, this rally proved temporary; after a weekend of slow coalition progress, markets fell.

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1 Campbell and Lettau 1990, Lilien 1982, Loungani, Rush and Tave 1990, Schwert 1989, Voth 2002, Cutler, Poterba and Summers 1989, David and Veronesi 2001.

2 See for example, Brander 1991, Gilligan and Krehbiel 1998, Herron 1992, Herron et al 1999, McGillivray 2003, and Roberts 1990.

“What Wall Street really fears is uncertainty,” said Jack Caffrey, equity strategist at J. P. Morgan Private Bank. “What today’s events seem to be pointing to is a reduction in uncertainty, even if the outcome of that is not necessarily a good thing”. New York Times, March 18<sup>th</sup> 2003.

According to this argument, it is uncertainty in and of itself, rather than fears about future economic conditions that causes market volatility. War, over longer periods, does not appear to lead to significantly higher volatility in stock prices (Schwert 1989).

Another political variable that affects stock market volatility is regime stability. Political instability can create uncertainty about the future of the current regime; if there is a regime change, this will put future returns to stock at risk. During the Great Depression, the US had the highest volatility in the history of its stock market. The Russian revolution had only been 10 years before and there was real fear that this could happen in the US. (Schwert 1989, Voth 2002).

In this paper I focus on how change and uncertainty about political change can lead to volatile stock prices. Most of the work on politics and stock price reactions focuses on the US stock market.<sup>3</sup> In earlier work, I find that political change affects the variability of industry-level stock prices in both PR and majoritarian countries. (McGillivray 2003). This is to say that when political change occurs there is greater dispersion within stock markets with some industries outperforming the market average and others lagging behind. It is the extent to which industries’ stock performance differ from market average performance that I use here as the dependent variable. In earlier work, I found the timing of the stock market response to political change to be more diffuse in PR systems than majoritarian systems. I argue this is because the coalition bargaining process makes political change harder to anticipate and hence the full extent of policy change is hard to foretell. Here political uncertainty is linked to expectations about future political change. However, it could simply be that political uncertainty, in and of itself, drives this effect.

I build on previous work by looking more closely at the uncertainty generated by the coalition process in the eight countries characterized by multiparty government. I test whether stock prices in coalition governments react to political change or political uncertainty. If uncertainty matters, is it uncertainty about political change or an irrational response to heightened uncertainty that drives the spike in price volatility.

Many scholars in comparative politics are interested in understanding the politics of the coalition formation process: in particular, why it can take a few days or a few months to form a government (Diermeier and Van Roozendaal 1998; Martin and Vanberg 2003; Groffman and Van Roozendaal 1997). However, few study the policy implications of this process. This paper adds to this literature in comparative politics as well as the growing literature on the politics of financial markets. Using monthly data for 8 countries from approx 1973-96, I test whether stock volatility is better explained by political change or by the coalition bargaining process.

The dependent variable is a measure of industry-level volatility. Drawing from the comparative politics literature, I used a number of variables to capture the institutional features of the bargaining process that affect the amount of uncertainty facing party

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<sup>3</sup> See Gilligan and Krehbiel 1998, Herron 1992, Herron et al 1999 and Roberts 1990. But see Brander 1991 and McGillivray 2003.

leaders during the negotiation process (Diermeier and Van Roozendaal 1998; Martin and Vanberg 2003). If political leaders are unsure of what bargain will be wrought, so will investors on the stock market. If uncertainty, rather than political change is driving the findings, I expect that during the coalition bargaining process, industry level volatility will be higher than average. If it is irrational behavior that is driving stock price volatility, this volatility will not be explained by institutional variables that affect the ability of investors to predict which parties will form the government. The findings are surprising. I find no evidence of higher stock price volatility during the coalition bargaining process affects stock market prices. Political uncertainty, whether rational or irrational, does not appear to affect industry-level volatility. However, I confirm earlier findings that political change is an important determinant of industry-level volatility. The theoretical argument is explained next.

### **Political Change and Political Uncertainty**

Coalition Politics affects stock prices in at least four ways.

#### *1. Political change can affect price levels.*

A change in party government can lead to a market-wide rise in the price of stocks if investors anticipate that the new government will be a more competent or market-oriented government than the incumbent. There is plenty of anecdotal evidence that markets prefer right wing governments (Herron 1992). For example, on Sept 23<sup>rd</sup>, 2002, the Monday after the German general election, stock prices on the DAX plunged. In part, this was because the market was surprised that the socialist/green coalition had managed to hold onto power. With a slim majority and no firm economic plan, the fall in prices reflected the markets' lack of optimism about the future of the German economy under the red-green coalition.<sup>4</sup>

Although the competency or the market-orientedness of the government affects market volatility, its effect on price levels tends to be the same across all stocks; this is captured in movement in the general market index. This is not the type of volatility that I am interested in. I control for changes in the general market index in the empirical analysis. I argue that political change affects the allocation of resources among sectors. Hence, I am interested, not in the change in levels, but in the second order statistic, the variability of stock prices.

#### *2. Political change can affect market volatility.*

Politics can affect stock price dispersion. Different parties tend to draw from different political supporters (Cox 1990). If a government that has tended to ignore an industry is replaced by one that credibly promises to aid that industry, then we should expect stocks in the firms associated with that industry to rise relative to the rest of the market. Anticipating that the new government will redistribute resources among industries, stock prices will fluctuate, some will rise, others will fall. A shifting of government resources/policy among industries, will increase the amount of price change that is distinctive to each industry. As a result, we should see greater divergence in changing industry prices with a change in government (McGillivray 2003). For example, returning

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<sup>4</sup> <http://germany-info.org/relaunch/info/publications/week/2002/092702/economy2.html>  
“The Week in Germany: economics and Technology”. Sept 27<sup>th</sup>, 2002.

to the Feb 22<sup>nd</sup> 2002 election in Germany; the Social democrats and Greens reformed their coalition government, however, with their greater electoral success, the Greens now had a stronger hand in that coalition government. On the Monday after the election, stocks on the DAX for renewable energy suppliers, jumped between 10% and 30%, while the market as a whole fell. In contrast, the price of stocks in the chemical industries fell relative to the market average.<sup>5</sup> The variable industry-level volatility is described later in the paper, but it captures these types of price movement in the stock market. In the empirical analysis, political change is measured as the absolute difference in parliamentary seats among the governing parties. It is a continuous variable that captures the characteristics of political change in coalition governments—small, but frequent, turnovers in the party composition of the coalition that often occur between elections.

### *3. Political Uncertainty affects market volatility.*

Suppose political change does lead to reallocation of resources among sectors. According to the rational expectations model, as soon as investors anticipate political change, we observed one-off shift in market prices. However, there is often high uncertainty about whether we are going to get a political change. It matters, therefore, the extent that political change is anticipated and policy change is predictable. Political change should be a one time hit, but uncertainty about which party getting into government, causes fluctuating prices over the bargaining period.

The amount of political uncertainty-- the extent that political change is anticipated and policy change is predictable-- varies across political systems. In systems with single party government, there is less uncertainty about who is going to get into government and the policy impact of this political change. Typically only one of the two parties forms the government. We might expect the market to react prior to the election: public opinion surveys provide markets with information about who is expected to win elections. Of course, there are always surprises. Sudden scandals, a downturn in the economy or policy failure can rapidly change a party's fortunes.

But in systems that are characterized by coalition governments, it can be difficult to foretell who will form the government. It is not the case that the party with the highest number of votes necessarily gets into govt. The formation of governments is less dependent on new elections and election results can result in numerous coalitions being possible. Even once the election result is known, the full extent of policy change is often still unclear.

In single party systems there is less uncertainty about the policy impact of political change. There is a single party in government that is accountable for its policy 'mandate'. In coalition systems, coalition partners need to negotiate their policy mandate. Which package of policies the government chooses to appease the various coalition members and to buy off veto-players could vary. Negotiating a compromise amongst coalition partners can be a lengthy process. In some coalition systems, this takes only days, in others it takes months. Coalition building in the fragmented Dutch party system is slow process, the shortest cabinet formation took 10 days, the longest lasted over 208 days. As the number of parties needed to form a majority coalition rises, so it gets more

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<sup>5</sup> <http://germany-info.org/relaunch/info/publications/week/2002/092702/economy2.html> "The Week in Germany: economics and Technology". Sept 27<sup>th</sup>, 2002.

difficult to find a compromise that everyone can agree too. If these parties are also ideologically divided, it can be difficult to reach any kind of bargain (Martin and Vanberg 2003; Tsebellis 1995, 1999). In fact, the duration of coalition bargaining is often used as a measure of ideological division within the coalition (Martin and Vanberg 2003).

During the process of coalition negotiations, the full extent of political change is often revealed incrementally in the days and months following the change in party government.<sup>6</sup> For example in Norway on September 10<sup>th</sup>, 2002, the Christian democrats and the Conservative party began negotiations over entering government. The parties disagreed strongly a range of issues, from EU membership to regional and industrial policy. They argued about who would be Prime Minister and whether or not the liberals should be invited to join the government. In the end the Progress Party, a far right populist party became the powerbroker in the coalition that was finally formed on October 16<sup>th</sup>.<sup>7</sup> Hence in coalition systems, not only is political change hard to predict but government policy is determined by bargains that can take a long time to negotiate.

The institutional format of the coalition bargaining process affects the duration of the negotiations (Diermeier and Van Roozendaal 1998; Martin and Vanberg 2003; Groffman and Van Roozendaal 1997). Diermeier and Van Roozendaal argue that institutional features of the coalition process affect the amount of uncertainty facing political leaders during negotiations. In this case, the uncertainty is about party leaders preferences, about the type of bargain that they are willing to accept; the greater the uncertainty, the longer the coalition formation process. We might expect that factors which lower the uncertainty facing political actors in the bargaining process also make it easier for market actors to determine the probabilities of different party governments forming. For example, in Denmark, Norway and Sweden, the rule is the incumbent initiates the negotiation process. The duration of bargaining is typically shorter because of this feature of coalition bargaining. In part, this is because there is less uncertainty about the preferences of political actors involved in the negotiations. The incumbent is able to begin negotiations before the election; hence he is better informed about what type of bargains he can strike with other party leaders (Diermeier and Van Roozendaal 1998). I expect that the continuity rule also lowers the political uncertainty in the stock market. The incumbent government may have engaged in pre-election talks that signaled information to the market about likely coalition partners. In the empirical model I include a number of variables that capture institutional features of the coalition process which affect political uncertainty. The root for many of these variables are the original Diermeier/Van Roozendaal (1998) and Martin/Vanberg (2003) variables.

Features of party competition also affect the political uncertainty surrounding coalition bargaining. Tsebellis (1995, 1999) argues that veto-players in coalition governments can make it difficult to reach compromise agreements between coalition partners. The larger the number of parties needed to form a majority government, the harder it is to find an agreement that satisfies all parties. This is even more difficult if there is ideological diversity among the negotiating parties (Martin and Vanberg 2003).

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<sup>6</sup> Described as Coalition Poker Game BBC. 27<sup>th</sup> January.

<sup>7</sup> <http://odin.dep.no/odin/engelsk/nytt/nyheter/032091-210112/index-dok000-b-n-a.html>  
Norway Daily No. 176.01. 14th Sept 2001. The Royal Ministry of Foreign Affairs, Oslo. Press Division.

The greater the number of parties and the larger their ideological diversity, the higher the level of political uncertainty about the formation process. I expect industry-level volatility to be higher under these circumstances. I test for this, and other types of institutional and party effects in the empirical analysis.

#### *4. Irrational reactions to political uncertainty.*

Political uncertainty might increase price variability, not because of shifting expectations about which parties will form the coalition government, but because a lack of government generates a general unease in the market. This heightened unease about the political future of the country generates a cloud of confusion over the direction of the market. Investors are more prone to irrational, herd like, behavior under these circumstances (Schiller 1992). Evidence of higher stock volatility supports this hypothesis. In a crude way, it is possible to distinguish whether investors are reacting rationally, or irrationally to greater political uncertainty. If investors are acting rationally, prices are fluctuating because of changing expectations about the party composition of the future coalition. If the institutional and party variables (for example, the continuity rule) predicted to either lower or increase political uncertainty about the future government are found to be insignificant, there might be something to the argument that irrational behavior is the source of the price volatility. In other words, this result suggests the increased volatility has nothing to do with changing expectations about political leadership, rather investors are reacting irrationally to the uncertainty in the market.

#### **Empirical Work:**

The eight stock markets analyzed are Belgium, Denmark, Germany, Italy, the Netherlands, Norway, Sweden, and Switzerland. Each time series is of similar length, incorporating monthly data from approximately 1973 through 1996. The general market indices, composite industry indices and industry subindices are provided by Datastream.<sup>8</sup> The general price index for each country is Datastream's total market index, available for each country for 1973-1996.<sup>9</sup> The results from the fixed effects models are shown here.

There are a variety of ways to measure market volatility. I used industry-level stock data to construct the indices. An industry subindex measures a weighted average of stock prices for firms within a specific industry. The dependent variable measures the extent to which shifting prices diverge between industries. It does not measure levels, but rather the second order statistic of dispersion.

I define *industry-level volatility* as follows: Consider country  $n$ , where  $\Delta \text{base}_t$  is the % change in the price of the general market index in month  $t$ , and  $\Delta S_i^t$  is the percentage change in the price for the industry index  $i$  in month  $t$ . If there are  $m$  industry subindices for country  $n$ , then the level of price dispersion for country  $n$  at time  $t$  is:

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<sup>8</sup> Datastream Corporation, 1999. Data on Stock Market Capitalization was provided by Global Financial Data.

<sup>9</sup> The industry subindices list the weighted average movement in price for firms within each industry category. Datastream's indices are calculated similarly across countries and are scaled to have the same starting values. The number of industry subindices varies by country, and the number of firms in each subindex varies by country.

$$\frac{1}{m} \sum_{i=1}^m \left| \Delta S^t_i - \Delta base_t \right| / m$$

Figure 1 illustrates the construction of the tests to follow. The vertical axis graphs monthly industry-level volatility in Belgium from 1981-1984. The figure also graphs the coalition bargaining period. Parties negotiated over the formation of government in two periods during this time frame; the first is March through April, and thereafter October through November of 1981. These bargaining periods are captured in a dummy variable that is coded 1 from the beginning to the end of bargaining period, and 0 otherwise. In this particular case it appears that political uncertainty had no effect on stock price volatility in either bargaining period. There is a sharp rise in volatility at the end of the second bargaining period. This is when a major political change occurred. Previous coalition governments were a mishmash of northern and southern parties. The coalition government that formed on December 1981 represented mainly northern interests. This was a radical political change, and something of a surprise to the market. Hence the sharp rise in stock price volatility as the market scrambled to reallocate resources among sectors. As mentioned earlier, political change is measured as the absolute difference in parliamentary seats among the governing parties. While nominally political change takes place in a single period, the market reaction sometimes precedes political change, at other times it lags behind. As the graph shows, I use smoothers to spread the effect of political change over a few months.<sup>10</sup> The political change variable is weighted so that the central point gets the largest weight and the points further away— based on the specified band width— receive less.<sup>11</sup>

In the empirical models I include additional independent variables which are explained in the results section. These capture institutional features of the coalition process that affect the amount of political uncertainty in the bargaining process. Thanks again to Lanny Martin for generously providing this data. Earlier in the paper I discussed how the continuation rule probably lowers stock volatility during the bargaining process. This effect is captured in the variable *Bargainsuccessor*. This variable takes the value 1 during the bargaining period if the incumbent remains in power during negotiations, 0 otherwise. The incumbent initiates the negotiation process. Knowing this, he might well begin negotiations before the actual election. We might expect this to lower the amount of uncertainty in the coalition process. Another example of a dummy interactive term is *Bargainduration*. This takes the value 0 if there are no negotiations underway, otherwise it takes the value of the total number of days between the beginning and the end of the bargaining. Expost, if the negotiations are long, hard struggle, it was probably due to divisive policy differences between the negotiating party. Exante, if investors anticipate a long, divisive battle, we should expect higher stock price volatility. These and other political variables are discussed in the results section.

## Economic Control Variables

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<sup>10</sup> locally weighted scatterplot smoothing (KSM in STATA version 6).

<sup>11</sup> I test two bandwidths 0.05 and 0.15 (narrow and broad bandwidth).

The dependent variable—industry-level volatility-- is similar to others proposed in the literature (Lilien 1982, Campbell and Lettau 1999; Zagorsky 1994).<sup>12</sup> Campbell and Lettau find that measures of volatility, at all levels, are susceptible to rapid price shocks, such as the one associated with the 1987 market crash. Since markets around the world are highly correlated, this suggests variation in industry price level dispersion could be driven by a few internationally felt shocks. Fortunately, my measure of dispersion controls for change in average level of prices and so is less dominated by a few market collapses. However, Campbell and Lettau's results suggest some important control variables. I include a measure of overall market volatility, which I measure as the squared change in price levels in the total market index in the previous month. I also include the lagged dependent variable which reduces autocorrelation. Both variables are substantively and statistically significant. However, their inclusion or exclusion does not affect the impact of the political variables under consideration.

I include a number of additional economic variables in the analysis. Any big shock in the US market and European markets seem to react with even greater price volatility. Campbell and Lettau (1999) find that all measures of volatility are susceptible to large shifts in prices. I control for the impact of external markets by examining how industry-level volatility in the US market influences price dispersion in the other stock markets.

The final control variable is market capitalization. Stock markets differ considerably in size across the sample of countries. If the countries are ranked in terms of their market capitalization as a percentage of GDP, among the biggest are the Netherlands, Sweden and Belgium, and the smallest are Italy and Austria. Less developed stock markets tend to be more volatile. Markets with low market capitalization could well exhibit larger sector-specific shifts in prices relative to the average. The empirical analysis includes a control for the size of the stock market in relation to GDP (*market capitalization*). As with the other economic control variables, the inclusion or exclusion of this variable produces no substantive changes in the overall results.

### **The Findings**

The pooled data are for 8 countries, with approximately 2000 country-month observations. There are a number of methodological problems linked to cross-sectional time series analysis. Fortunately, the results reported are robust to the method used and the inclusion or exclusion of control variables.<sup>13</sup> Given this I report only a few fixed effect specifications in Table 1.

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<sup>12</sup> One difference is that this measure does not weight the industry index by market capitalization. This is because my measure was designed to assess dispersion in the market rather than measure the value of transfers. Campbell and Lettau (1990) examine differing sources of variance in stock prices. In addition to the industry level that I consider, they also estimate market and firm level volatility. They find strong correlations between all three sources of volatility. Their study examines US markets only. Unfortunately, the data required for their measures are unavailable for all the countries in my study.

<sup>13</sup> For instance, the results are similar whether under random effects or GLS controlling for AR(1) error correlations.

Overall, the findings support the argument that political change, rather than political uncertainty, drives stock price volatility. This finding is consistent with the argument that, anticipating that the new government will redistribute resources among industry supporters, stock prices volatility increases with political change. Political change is measured as the absolute difference in parliamentary seats among the governing parties. The positive and significant coefficient on the variable *political change* accounts for about 4% of the variance in the volatility measure. This finding, that political change matters, is a consistent theme throughout all the analyses.

The models in Table 1 include a dummy variable for the presence of an election in any given month. The election variable controls directly for cases where elections took place without a change in incumbent. This variable, however, is statistically insignificant. It appears elections are influential only to the extent that they lead to political change.

One might argue that it is not change in party government, but change in government ideology, that is important. I construct a measure of government ideology and government ideological change using the European Journal of Political Research's (EJPR) five point ideological scale. I use party seat shares as weights and calculate the average government ideology. Government ideological change is constructed using an analogous construction to that of political change. I find shifts in the ideological composition of the government have no significant effect. However, while change in the ideological composition of the government has little impact on price dispersion, the overall left-right ideological stance of the government does (*government ideology*). Substantively, this variable is as important as political change. The negative coefficient suggests greater industry-level volatility under a right wing government. This is plausible. Investors might well anticipate that market-oriented governments will liberalize the economy creating more opportunities for investors on the stockmarket.

While the *political change* and *government ideology* variables held up extremely well, the bargaining variables were either insignificant or weakly significant but wrongly signed. The variables used to capture the uncertainty in the coalition bargaining process are as follows:

- |               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bargain:      | This variable is coded 1 for each month from the beginning to the end of bargaining period (starts at the termination of previous cabinet or election and ends when new cabinet has passed the institutional hurdle for that country—investiture vote, head of state), 0 otherwise. A positive coefficient is predicted.                                                                                                                                                            |
| BargainElect: | This variable is coded 1 each month of the bargaining period if the negotiations follow an election. Leaders are used to dealing with other parties in legislature, they have a good idea of what deals can be struck. However, after an election, there are many new actors in the legislature. This makes it more difficult for party leaders to bargain effectively. It is harder for investors to know which types of coalition will form. A positive coefficient is predicted. |
| Bargaindefeat | This variable is coded 1 each month of the bargaining period if the                                                                                                                                                                                                                                                                                                                                                                                                                 |

bargaining followed a parliamentary defeat. The parliamentary defeat was probably caused by party infighting. Investors are not privy to internal party politics, hence, it is difficult for investors to predict which coalitions will form. A positive coefficient is predicted.

Bargainsuccessor	This variable is coded 1 each month of the bargaining period if the incumbent initiates the bargaining process. This allows the incumbent to start negotiations while in office. A negative coefficient is predicted.
Bargainident	Each month of the bargaining period, a score is used to reflect expert opinion to which pre-electoral governmental options are possible (0, 1, 1.5). (Strom 1990). If pre-electoral coalitions common, each month of the bargaining process receives a high score of 1.5. If it is obvious to experts that pre-electoral options are possible, it is obvious to investors. I predict a negative coefficient.
Bargainduration	This variable is coded 0 outside of the bargaining period, otherwise it takes the value of the total number of days. If the bargaining period is long, the negotiations were likely controversial and divisive. Anticipating this, investors might expect a long, drawn-out battle over government formation. I predict a positive coefficient.
Form	This variable is coded 1 on the month the coalition government is formed, 0 otherwise. I predict a positive coefficient.
Post form	This variable is coded 1 the month after the coalition negotiations have ended, 0 otherwise. I expect a negative coefficient.
Ongoing form	During the bargaining process, this variable is a counter for number of days the bargaining ongoing, it is 0 otherwise. As the bargaining process draws on, I expect greater volatility in stock prices. I predict a positive coefficient
Bargain*no of parties	During the bargaining process this variable measures the number of parties participating in the bargaining process. It is expected, the greater the number of actors, the greater the complexity, the harder it is to predict which coalitions will form.
Bargain*ideology	During the bargaining process, this variable measures the absolute left-right distance within the coalition. See Martin and Vanberg (2003). I predict a positive coefficient. The greater the ideological diversity between the coalition members, the more difficult to find an amiable policy compromise.

The most significant of these variables was bargaining duration, and it was incorrectly signed. This result suggested the longer the bargaining process, the lower the stock market volatility. This is highly unlikely. I did carry out various robustness tests, including a series of lags and leads on the bargaining variable. However, these insignificant results are extremely robust.

The findings support the hypothesis that political change leads to a redistribution of resources among different sectors of the economy. There is no support for either the rational or irrational, versions of the political uncertainty story. Next I take a few moments to discuss why the bargaining process appears to have so little effect.

### **What is going on?**

While I am not surprised that political change matters, it is surprising that the political uncertainty generated by the bargaining process has no effect on stock price volatility. One of the difficulties is capturing exactly when investors think coalition formation processes are highly uncertain. Returning to the case of Belgium in the 1980s, Figure 2 uses a bigger scale to show the series of coalition formation attempts that predate the final October through November negotiations. Only this final set of negotiations led to a major political change. Prior to the Dec 1981 change, these negotiations led, in each case, to a slightly different mix of north and southern parties forming a government. Political pundits expected that in Dec 1981 the negotiations would end as they usually did, with a big coalition government representing both north and southern interests. However, there was a major upset, and the catholic liberal parties formed a government which underrepresented parties in the south of the country. In none of the coalition negotiations was there high uncertainty about the future coalition government. It is therefore not surprising that the bargaining process did not affect price volatility. Generally speaking, many of the bargains struck during negotiations are not of great importance to the market— for example, many traders do not care which party wins the transportation ministry. Negotiations during the coalition process are often rather laborious discussion of relatively minute policy details. Negotiations could be long because there are ideologically opposed parties, or they could be long because parties are negotiating a finely detailed policy agreement.

The final figure is of industry-level volatility in the Netherlands in 1977. In this case the bargaining process took 208 days to complete and is characterized by the breakdown of negotiations, multiple formation attempts and switches in the negotiating parties. At point 1, the biggest winner in the election, Labor, announced it had negotiated a policy package with center and right wing parties. At point 2, this fell apart with leadership fighting over cabinet portfolios and at point 3, the right and center parties formed the government. Despite all the turmoil and uncertainty, there is very little reaction from the market. Figure 4 suggests that the bargaining uncertainty does not affect market volatility. Another possibility is that the quantitative empirical analysis might be right.

There are numerous ways to improve on this research. It would be useful to have daily data to track these events more closely. But as a first cut, this analysis provides interesting insights about the effects of political change and political uncertainty on stock market prices.

## **Conclusion**

I argue the following: parties typically draw support from different groups of voters, hence a shift in the partisan composition of coalition government will lead to a reallocation of resources among different sectors of the economy. This is reflected in more volatile stock prices. However, it is very difficult to predict which parties will win in the coalition bargaining process: we might expect fluctuating prices as market tries to anticipate which parties, and hence which sectors of the economy, will benefit. More generally, greater political uncertainty in and of itself might affect stock price volatility if investors are more likely to act irrationally in an atmosphere of heightened uncertainty.

In February of this year, Sharon had a massive win in the Israeli national elections, doubling amount of parliamentary seats for his party. But Likud still did not have an outright majority. Sharon had 28 days, and 14 more if necessary to form a coalition. Shares on Tel Aviv Stock Market (TASM) moved higher after Sharon's election victory but with the onset of the coalition poker game the market braced for turbulent share prices. "It is all about what kind of Coalition is formed," Said Daniel Hass, a dealer at Bank Hapoalim.<sup>14</sup> Using data on industry-level volatility from 8 stock markets 1973~1996, the findings in this paper suggest that it really is all about what coalition is formed and not simply the political uncertainty surrounding the coalition bargaining process.

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<sup>14</sup> BBC News Wed 29<sup>th</sup> Jan 2003.

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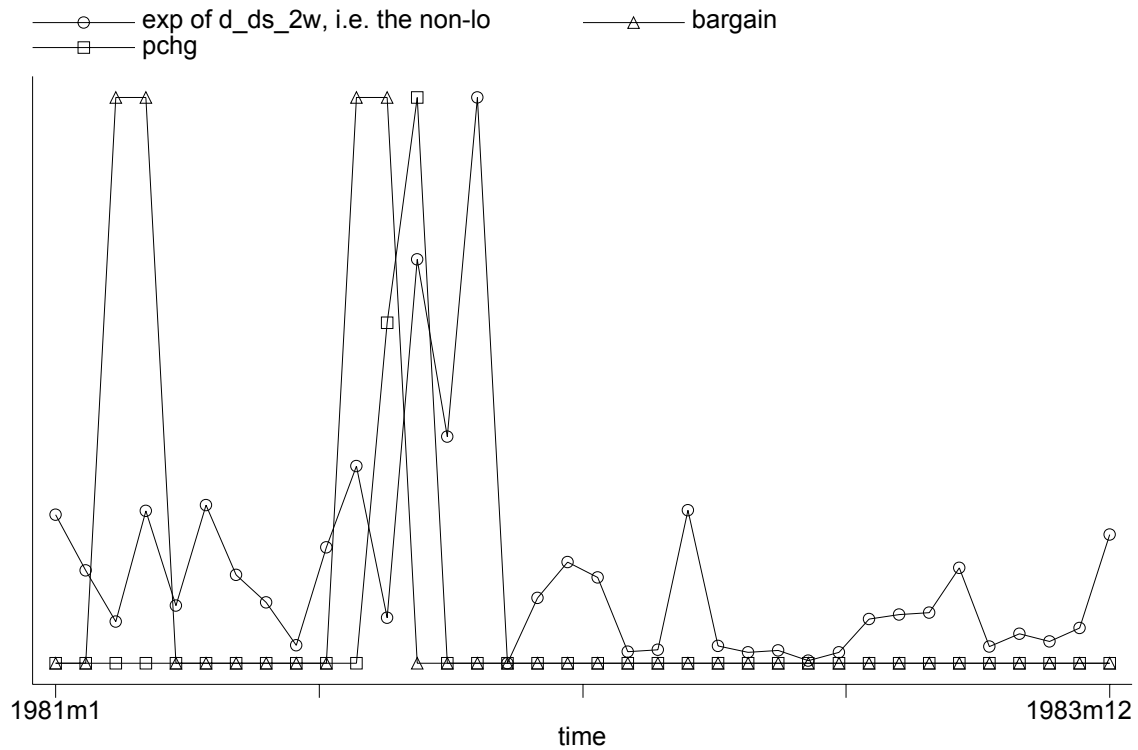
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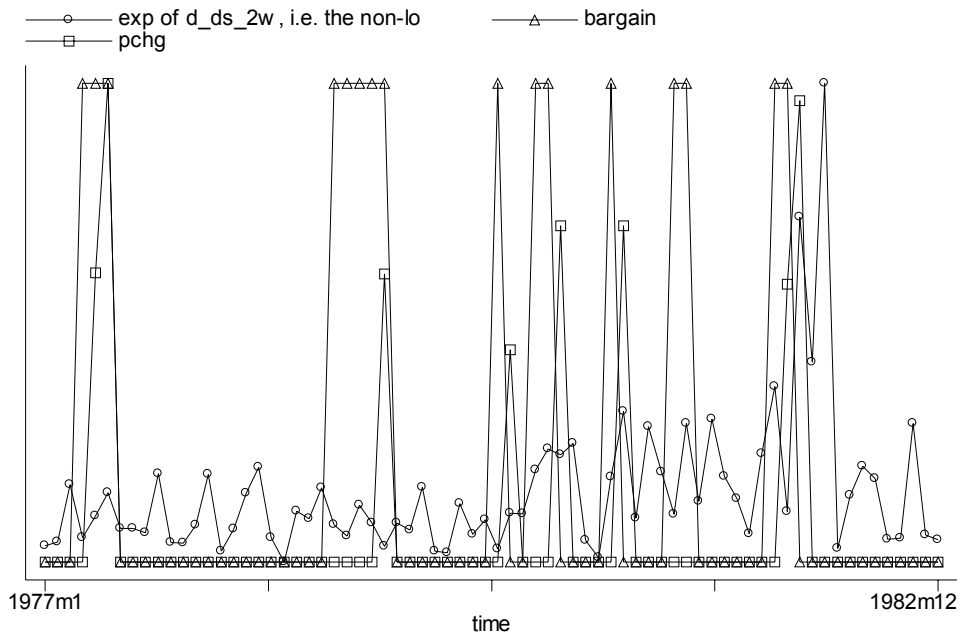
Figure 1. Graphing Industry-Level Volatility and Coalition bargaining in Belgium 1981-1983.\*



\*Changes are calculated as monthly percentage change in the price index. In December 1981, the Christian People's party, the Christian Social party, the Liberty and Progress and the Francophone Liberal party formed a new government.

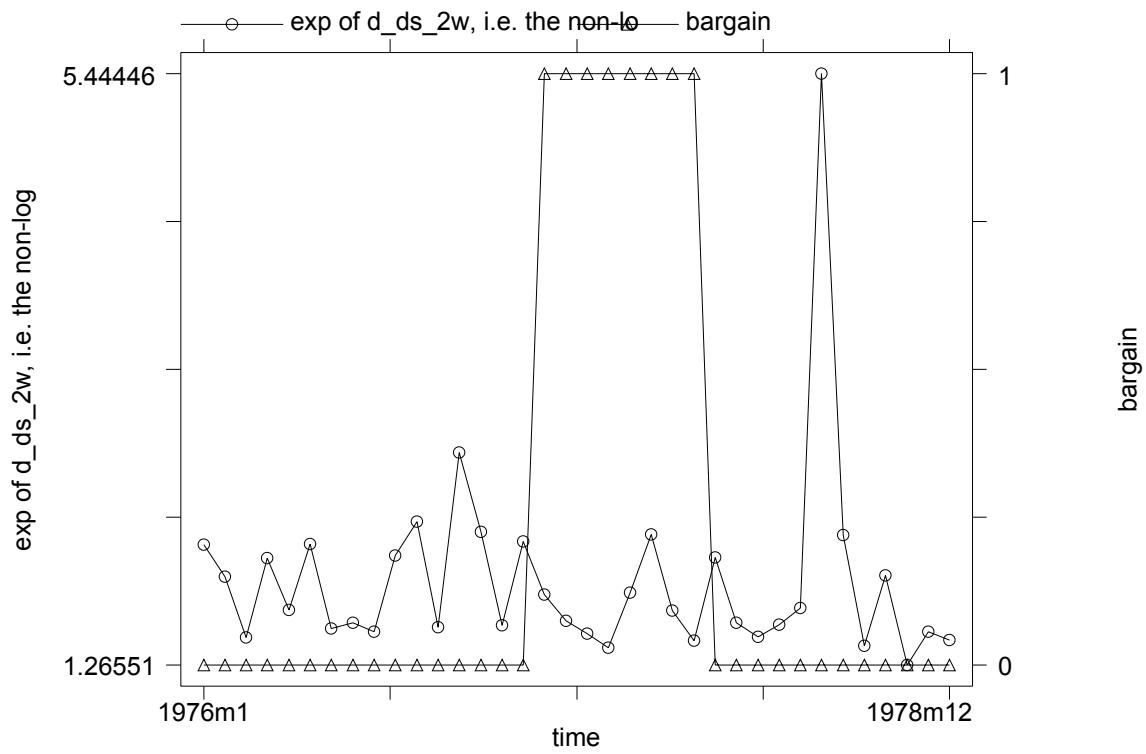
Note: exp\_ds\_2w = industry-level volatility, pchg= political change and Bargain= coalition formation negotiations.

Figure 2. Graphing Industry-level volatility\* and Coalition bargaining in Belgium 1977-1982.



Note: exp\_ds\_2w = industry-level volatility, pchg= political change and Bargain= coalition formation negotiations.

Figure 3. The longest Coalition Bargain: Industry-level volatility and Coalition bargaining in the Netherlands 1977 (208 days)



Note: exp\_ds\_2w = industry-level volatility, Bargain= coalition formation negotiations.

Table 1. Fixed Effect Analyses of the Effects of Coalition Politics on Industry-Level Price Volatility in 8 Countries 1973-1996<sup>\*</sup>.

Variables	Model 1	Model 2	Model.3	Model 4
Political Change (smoothed)	.0581** .276	.337* .213		
Ideological change	-.057 .077	-.053 .012		
Ideology of Government	-.043** .017	-.053** .011		
Bargain	.089 .491		.094 .484	.057 .076
Bargain * Parliamentary Defeat	.051 .293		.030 .291	
Bargain* Identifiability	-.037 .132		-.020 .131	
Bargain*Successor	-.036 .231		-.081 .104	
Bargain* absolute left-right distance within the coalition.	-.100 .104		-.087 .104	
Bargain* number of parties in govt	.043 .074		.046 .073	
Bargain*Duration	-.003* .002		-.003* .002	
Ongoingformation	.083 .075		.074 .075	
Election month	.096 .177		.106 .175	.008 .099
Post Formation	-.167 .117		-.151 .116	
Interest Rate	.009 .007	.001 .005	.008 .006	-.001 .004
Inflation Rate	.015* .009	.014* .006	.017* .009	-.018** .006
Lagged Dependent variable.	.198** .016	.225** .012	.202** .016	.229** .013
Market Capitalization	.056 .202	.002 .085	-.071 .197	-.048 .087
US dispersion	.025 .034	.165** .022	.027 .034	.163** .024
Market Volatility	65.749** 2.399	43.295** 1.654	65.711** 2.38	48.001** 1.71
Constant	1.149** .152	1.083** .097	1.098** .124	.920** .085
No of observations No of groups	2145 8	2157 8	2157 8	2157 8

Notes: Standard errors in parentheses \*\* p<.01 \* p<.05 one-tailed test. Method of analysis: Fixed Effects. Estimates obtained using xtgls procedures in STATA, version 6.0 <sup>\*</sup> The time series are of variable length.

