

Government Hand-Outs, Political Institutions, and Stock Price Dispersion

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Abstract

Cross-sectional time-series data from 14 stock markets, from 1973-1996, are used to study how comparative political institutions affect party governments' incentives to enrich one group of industries at the expense of another. Using measures of cross-sectoral variance of prices within stock markets as a proxy for change in redistributive policy, I show political change is important in both proportional representation (PR) and majoritarian systems. As parties shift in and out of government, trade and industrial policy is redistributed to favor the parties' industrial supporters. Such changes in policy increase the cross-sectoral dispersion in stock prices, with newly advantaged industries seeing their stock increase while the price of those losing favorable policy declines. The temporal impact of political change differs across institutions, with the impact of political change being more immediate in majoritarian systems and the effect being longer run and more diffuse in PR systems. Majoritarian systems are also more responsive to economic shocks, while changes in economic conditions have few discernable effects on the dispersion of prices in PR countries. PR systems, however, experience overall higher levels of price dispersion. I contrast these results with the dominant extant arguments of radical policy shifts in majoritarian systems and policy stability in PR systems.

Introduction

Scholars are increasingly interested in how politics affects stock-market prices. In part, this is because reactions in the stock market can tell us something about the policy implications of government change¹. In this paper I use stock prices to test whether political change affects the distribution of government assistance to industries. Redistributive policies-- such as subsidies, research grants, low-interest loans, and tax-exemptions-- privilege some industries at the expense of others. A change in these policies alters the relative profitability, and hence value, of firms. The purpose of this paper is to link changes in industry stock prices with change in party government-- the causal mechanism being that political changes mean new interests are represented and so policies change accordingly. The variability of prices among industry indices provides a measure of the redistributive component of government policies.

The theoretical hook of the paper is that the effect of political change on relative stock prices depends upon the moderating effect of political institutions. The electoral rule influences both the electoral process and the legislative bargaining context. These in turn affect whether or not a turnover in government will lead to change in trade and industrial policy. I argue that political change leads to the redistribution of policy rewards in both proportional representation (PR) and majoritarian systems. As parties shift in and out of government, trade and industrial policy is redistributed to favor key industrial supporters. However, in PR systems, the new policies represent a compromise of the policy goals of numerous actors. Negotiating a compromise can be a lengthy process, so the temporal impact of policy change on stock market

¹ For example, see Alesina, Cohen and Roubini 1992; Brander 1991; Gilligan and Krehbiel 1988; Hays, Stix and Freeman 2000; Herron 2000; Herron et al 1999; Roberts 1990.

prices is expected to be more diffuse. These predictions are tested using general stock indices and industry subindices for 14 industrialized countries from 1973-1996. The empirical evidence shows that political change affects the relative value of different industries' stock across all political systems. Yet there are important differences. In PR systems, the response of stock prices to political change is spread out over a longer time period. In majoritarian systems, these effects are more immediate. Further, only in majoritarian systems do economic changes have a significant effect on the stock price dispersion between various industries. While majoritarian systems are more directly responsive to political and economic change, PR systems overall experience greater dispersions in price.

The outline of the paper is as follows. First, I discuss why stock prices capture the redistributive component of government trade and industrial policy. Following this I examine how different features of the political system affect government turnover and policy change. Finally, the empirical predictions are tested using general stock indices and industry subindices for 14 industrialized countries from 1973-1996.

Why Use Stock Prices?

Lack of policy transparency makes it difficult to measure how governments redistribute public assistance to industries. In part, this is because trade and industrial policy is multidimensional. There are many different policies governments can use to give and take between industries: tariffs, quotas, subsidies, tax-breaks, procurement, etc. Compounding this problem, different governments tend to prefer different policy instruments to favor industries: the Swedes often use debt guarantees; the French prefer to allocate low-interest loans; the British favor regional grants and development subsidies; while the Germans make liberal use of tax exemptions. Comparing

the monetary value of subsidies versus tariffs, or procurement policies versus low-interest loans, is extremely tricky. Instead, I propose using stock prices as an indirect measure of the value of government aid to industry.

To illustrate why stock prices are a useful measurement tool, consider the following example. In 1993, the French government offered a rebate to consumers willing to trade in their old cars for new, less polluting models. The goal of the rebate was to help the environment; however, because it was restricted to the purchase of French automobiles, it also helped French automakers. One way of measuring the value of the government hand-out to Peugeot-Citroen is to estimate how much the rebate affected Peugeot sales in 1984. It is estimated that 7% of Peugeot's increased sales in 1984 were due to the government subsidy.² Alternatively, however, we could look at what happened to the price of Peugeot's stock on the French stock market-- did it rise? Private investors are highly efficient at incorporating this type of information into their expectations about industry share prices. If the future profits of an industry are expected to change because of an alteration in trade or industrial policies, the value of equities in that industry will adjust to reflect this. In addition, in stocks we have comparable units that allow us to compare the value of rebates to Peugeot to the low-interest loans the French government made to the chemical company Rhodia.

Market investors have incentives to include all the idiosyncrasies that relate to a particular industry. However good-intentioned researchers are, they can not possibly include this detail across a wide range of industries. This is a major advantage of using stock-market data and

² The Economist 1995. "Clawing its Way to the Top?" May 13.

explains the recent shift towards examining political events through market data³. Of course, stock prices change for many reasons. Movements in stock prices inevitably capture many effects that we are not interested in, such as speculative bubbles. There is no accepted theory to understand the movement or worth of stocks (Brown and Warner 1980; Campbell, Lo and MacKinlay 1987, Shiller 2000). However, there is evidence that financial markets react as expected to shifts in party government and to changes in domestic industrial policy or trade shocks. Using US stock prices, Mahdavi and Bhagwati (1994) find that the announcement of Voluntary Export Restrictions does increase the stock price of affected industries (see also Grossman and Levinsohn 1989; Lenway, Rehbein and Starks 1986; Hartigan, Parry and Kamma 1986). Herron, Lavin, Cram and Silver (1999) found that the profits of different industry sectors reacted as expected to the effect of political change in the 1992 Presidential election.

More generally, this work is related to a body of research that uses financial market and exchange rate reactions to study the politics of elections, party government, and political institutions (Alesina, Cohen and Roubini 1992; Bernhard and Leblang 1999; Brander 1991; Herron 2000; Herron, Lavin, Cram and Silver 1999; Roberts 1990; Rogowski and Kayser 2000; Gilligan and Krehbiel 1988; Hays, Stix and Freeman 2000; Quinn and Jacobson 1989).⁴ Most analyses of market reactions focus on explaining change in the price level of bonds or stock

³ Amongst others see Herron (2000), Heron et al (1999), Hays, Six and Freeman (2000), Brander (1991), Roberts (1990), Alesina et al (1992).

⁴ In the financial economics literature, Brown and Warner (1980, 1985) use event analysis to study how firm-specific events impact stock prices. Their methodology has informed much of the research on politics and financial markets.

prices. As I explain next, this paper takes a different tack, examining how government change affects the variability of stock prices among industry subindices over time.

One way of using stock prices to investigate how political change affects the redistribution of trade and industrial policy is to determine how stock prices change in one industry relative to another. For example, the French 1993 rebate on the purchase of French automobiles was initiated under a socialist government. Mr Chirac's new gaullist government (elected March 1993) was far less receptive to Peugeot Citroen's calls for government assistance. In 1995, Peugeot demanded either tax breaks for leasing a new car or a reduction in VAT. Their pleas fell on deaf ears.⁵ Yet this didn't prevent the new government from subsidizing other industries, such as chemical and aerospace.

Unfortunately, it is impossible as a practical matter to assign industry indices to all the different industries that support different parties for all 14 countries in this study.⁶ In this context, using market indices as a direct measure of government attempts to privilege one industry relative to another is not feasible. In response I measure price dispersion⁷ between industry indices. When political change leads to policy change, some industries win and some lose. Although it is often impossible to say which industries will win and which will lose, policy changes shift the relative valuation of firms. When policy change occurs, stock prices diverge. The dependent variable '*price dispersion*'⁸ measures the extent to which prices diverge between

⁵ The Economist 1995. "Clawing its Way to the Top?" May 13.

⁶ Herron et al (1999) were able to do this for a limited number of industries in the US.

⁷For the precise formula and a detailed discussion, see the empirical section of the paper.

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industries. It does not measure levels, but rather variance. It is stripped of direction; rather, it measures the magnitude of redistribution. It throws away the evidence about which industries were rewarded and which were not. The advantage of the measure, however, is that we don't need to know which industries will be privileged by a new government-- if a change in government causes some industries to win and others to lose, this will increase price dispersion. The construction of the dependent variable is discussed in more detail later in the paper.

The disadvantage of this measure is that stock price dispersion is not a direct measure of the amount of policy change. This creates several measurement issues, perhaps the most serious of which is the relationship between policy change and the timing of stock market response. These, and other specification issues, are discussed following the theoretical section of the paper.

Political Institutions and Policy Change

Institutional features of the political system associated with the electoral rule are widely believed to affect policy outcomes. In this section of the paper, I consider how electoral incentives in PR and majoritarian systems affect which industrial groups parties want to target and how legislative bargaining determines which parties can actually achieve favorable policy for the groups they wish to reward.

Consider first the case of a multiparty PR system. Electors vote for parties in large multi-member districts. Although the details differ slightly by system, seats are allocated in proportion to the national vote for each party. In multi-member districts, policy appeals to voters become increasingly 'narrow' as each party seeks a niche of voters it needs to win a seat (Cox 1990). Since in PR systems it is rare for a single party to obtain a legislative majority, implementing

policy requires cooperation between parties.⁹ As such, the final policy is likely to contain some aspects of things that each of the ruling parties want, as well, perhaps, as aspects of policies that potential veto players want. The desires of out-of-government veto-players might be especially important for minority coalitions which require the support of non-government parties to pass their policies in the legislature. As a result, trade and industrial policy in PR systems represents a compromise of the policy goals of numerous actors. The essential factor for the tests in this paper is that when the government changes, industrial policy shifts, becoming a compromise of things that the new parties in government want.

Tsebelis (1995) argues that veto-players in PR systems make it difficult to reach compromise agreements between coalition partners. Yet, such arguments have typically been constructed in the context of ideological issues. Parties have relatively fixed ideological positions on a wide range of issues. The mass membership of the party can prevent the parliamentary party,

⁹The level of party competition is partly a function of the electoral rule (Rae 1967; Lijphart 1977,1990). Duverger (1954) noted the empirical regularity that majoritarian systems have just two parties. In single-member constituencies, the candidate with the most votes in that district wins. Smaller parties, running second or third in district races, win votes but not representation. Two parties come to dominate with one winning a legislative majority and having the privilege of forming government. It is possible for a party to gain a majority of the seats in the legislature without gaining a majority of the popular vote. In majoritarian systems, parties are less interested in maximizing their share of the vote than they are in maximizing their number of seats and chance of forming a government.

The number of parties in the PR system depends, in part, on the rule used to transfer votes into seats. The St. Lague rule is more proportional than the D'Hondt rule. Consequently, political systems using the St. Lague rule typically have more parties. The number of parties also depends on the vote threshold necessary to hold a seat. For example, Germany has a 5% threshold rule, but in the Netherlands a party only needs .67% of the national vote to qualify for seats. Not surprisingly, fewer parties gain representation in Germany (Gallagher, Laver and Mair 1992). In PR systems a majority of votes is generally necessary to win a majority of seats in parliament. The high level of party competition makes it difficult for one party to get a majority of the votes, and as a consequence, it is rare for one party to be able to form a legislative majority. PR governments are typically multiparty coalition governments and are often minority governments.

and particularly the leader, from altering the party's ideological stance. This can make it very difficult for party leaders to negotiate a compromise in coalition government. Leaders have far more control over policy issues that are not in the core ideology of the party.¹⁰ Trade and industrial policy is such an issue; it tends to have less of an ideological component. While some parties tend to be more protectionist or free-trade oriented than others, redistributive trade and industrial policy is of a far higher dimensionality than the standard right-left ideological issue. It can also be distributed differentially across voters and across geographically specific electoral districts. As such, it is much easier to reach agreement; indeed, such policies can even be used as transferable benefits to buy off veto-players. Policy will be redistributed towards the industrial supporters of new coalition partners and away from the industrial supporters of old coalition partners. However, such negotiations can be lengthy (Strom 1990b). I expect that redistributive industrial policy will change in response to political change in PR systems. Bargaining delays-- such as buying off veto-players-- slow the impact of political change on redistributive policy.

In contrast, majoritarian systems are characterized by two-party competition and single party majority governments. Legislators are elected from single-member districts. As a practical matter, some districts are safe (always won by the same party) and others are marginal (the vote share of the major parties is close). Winning marginal districts often determines the outcome of an election. This is where the income effect from trade and industrial policy will have the largest effect on the parties' reelection chances. Given these incentives, whichever party is in government will want to garner support in marginal districts. As a result, the industrial policy of both parties is targeted towards privileging the same districts. This need not imply that political

¹⁰ Strom (1990a) describes the literature on the motivations of parties.

change has no effect on redistributive policies. Although parties want to enrich the same districts, they might choose different policy instruments and/or firms through which to do so. Furthermore, elections, typically the only time governments are replaced in majoritarian systems, provide evidence through which parties assess which districts are likely to be the battleground marginals for the next election. Given these factors, policy change is likely to accompany political change. Unlike PR systems, where policy change requires negotiation between coalition members as well as any non-government veto-players, the majority status of most governments in majoritarian systems means that party elites can implement policy with minimal delay. The bargaining difficulties and veto-player arguments prevalent in coalition dynamics are overcome. In sum then, the theory predicts that in both majoritarian and PR systems, political change will lead to the redistribution of trade and industrial policy. However, in PR systems, bargaining delays and the need to buy off veto-players diffuses the impact of political change.

The electoral system also moderates government response to economic change. In majoritarian systems, party elites can implement policy choices without the lengthy inter-party negotiations required in PR systems. As such, as economic conditions change, governments in majoritarian systems can more directly and rapidly alter policy. This prompt reaction from the government is rapidly incorporated by the market. Governments in PR systems are less likely to respond decisively to economic shocks and, correspondingly, we should expect the market to respond less decisively.

The theory predicts how political and economic change influences shifts in redistributive trade and industrial policies. Unfortunately, as I discussed earlier, my measure of stock price dispersion does not directly measure policy change and is instead only a proxy for it.

This creates several measurement issues, perhaps the most serious of which is the relationship between policy change and stock market response. It is to this issue that I now turn.

The Timing of Stock Market Reactions

When government policies privilege an industry, firms in that industry become more profitable. This rise in profitability increases demand for the stock of these firms, which in turn drives their stock prices higher. Unfortunately, it is not always certain when such price shifts will occur. There are arguments that market shifts will lag behind the political change that spurred the policy shift. There are also arguments to suggest that markets preempt policy change.

Implementation of policies often lags months, even years, behind political change, suggesting that market adjustment should follow political change. However, efficient market theory suggests that as soon as a future change in profitability is anticipated, this information is immediately incorporated into the price. Therefore, the response of markets to political change depends upon the extent to which political change is anticipated and policy change is predictable.

Public opinion provides markets with information about who is expected to win elections. To this extent, markets should anticipate political change. Yet the situation is not that simple. Beyond the fact that a week is a long time in politics, and sudden scandals or policy failure can rapidly change a party's fortunes, the timing of elections is at the discretion of the incumbent government in many countries in the study (Smith 1996; 2000). Hence the election date often remains unknown until about a month beforehand. This reduces the ability of the market to anticipate political change. The situation is further complicated in PR systems, since the formation of governments is less dependent on new elections and election results can result in numerous

coalitions being possible. Taken together, these factors suggest that markets are unlikely to preempt political change by more than a few months (Strom 1990b).

Even once political change is known, the full extent of policy change is hard to predict completely. As argued above, although in majoritarian systems all parties want to target marginal districts, election results often show how the underlying political geography has changed and hence change parties' perceptions of which districts are marginal. Yet on the whole, I expect the market to respond much more decisively to political change in majoritarian systems since coalition dynamics and the need to buy off veto-players do not complicate redistributive policy. In contrast, in PR systems not only is political change hard to predict but redistributive policy is determined by bargains. Which package of policies the government chooses to appease the various coalition members and to buy off veto-players could vary. Combined, these factors make it hard for even efficient markets to integrate changes in price too far in advance of the actual policies.

Investors can design diversification strategies to hedge against political risk. However, this does not mean that politics has no effect on the variance of industry stock prices. To argue such is to ignore the multi-dimensionality of redistributive politics, the implications of which can best be explained with a hypothetical example. Suppose a new government forms, but in order to implement certain aspects of its legislative agenda it needs the support of additional legislators. In the context of veto point arguments, we might suppose the government needs to buy off some members of particular groups. To be more concrete, suppose the new government needs to buy off any one of three legislators (or other groups), and that each of these legislators has three firms or industries that she would like privileged. To keep the example simple, suppose the government

needs to give one of the legislators \$9 worth of transfer to gain her support, which we might think of in terms of a lucrative government procurement to an industry in her district. While rational expectations indicates a transfer of \$9 will occur to one of the nine potential recipients, the government could pick any of the three legislators and reward any of the three associated firms.¹¹ Hence, in expectation, the valuation of each of the 9 firms should increase by \$1 in anticipation of the bargaining outcome, and upon revelation of the legislative bargain, the valuation of the chosen firm should jump up by \$8, while those of the other 8 firms should fall by \$1 to their previous level. No investor need lose money from the revelation of the bargaining outcome, since it is easy to hedge against. Despite rational expectations, price changes lag behind political change as well as precede it.

The advantage of using stock prices as a measure of expected change in government policy is that many industrialized countries have stock markets. However, stock markets differ considerably in size across the sample of countries. In 1989, Italy had just over 200 domestic companies listed on its stock exchange, while the UK had over 2,000. Italians still prefer investing in bonds to equities.¹² In Germany and France, industries tend to seek capital from banks rather than from shareholders. If countries are ranked in terms of their market capitalization as a percentage of GDP, the biggest are the US, the UK, Belgium, the Netherlands, and Germany. Among the smallest are Italy, Austria and Denmark. If the secondary market lists only a small

¹¹ Bargaining theory suggests it is optimal for the government to randomize over the legislator (see Baron and Ferejohn 1989). If the government always relied on one legislator, then the reservation value of this legislator would rise and the alternative supports could be bought off more cheaply.

¹² There are a number of reasons for these differences, including historical legacy and the legal structure of property rights in the economic market.

proportion of domestic companies, it is unlikely that the stock market will have a large reaction to government change. As such, we should expect that the findings will be strongest in those stock markets with the largest market capitalization. Most of the PR countries, with the exception of Belgium, the Netherlands and Germany, do not have strong stock markets. This will bias the results downwards in these cases.

Another potential problem with using stock market data is globalization. Over time, there have been changes in the operation of these stock markets¹³. Before the 1980s, the international flow of capital was severely constrained and most European markets were very small. Stock markets are becoming increasingly global and interconnected; however, at the same time more domestic industries are going public and listing on their national exchanges.¹⁴ London and New York have much higher foreign trading volumes than any of the European stock indices (Belgium is the next highest). However, European stock markets have grown considerably in the 1980s and 1990s. The empirical analysis uses stock market data running from 1973 through 1996. However, I test the robustness of the results by creating smaller sub-samples based on different time periods. Interestingly, restricting the analysis to the post-1980 period does appear to strengthen the empirical results.

¹³The Economist. 1997. "Survey of Fund Management". October 25th.

¹⁴Since the 1980s, there have been significant changes in the way individuals are trading. Now mutual funds make it easy to shop in different stock markets. Recent years have seen a huge surge in mutual funds in the US (\$4 trillion 1997) and unit funds in the UK (\$250 billion). Most individual investors don't bother tracking political developments abroad. They buy the mutual funds with the best profit record. But the financial-services firms that manage mutual funds or unit funds have an incentive to trace political developments in foreign markets. Fund managers look at each national market in Europe separately when deciding where to invest. As more mutual funds are offered, they compete to win investors' funds. Financial markets are extremely efficient at capturing every scrap of information and incorporating it into the price of stocks.

Data

Fourteen industrialized countries are grouped into majoritarian and PR systems: Australia, Canada, France, the UK and the US being majoritarian; Austria, Belgium, Denmark, Germany¹⁵, Italy, the Netherlands, Norway, Sweden, and Switzerland being PR.¹⁶ Each time series is of similar length, incorporating monthly data from 1973 through 1996. The general market indices, composite industry indices and industry subindices are provided by Datastream.¹⁷ The general price index for each country is Datastream's total market index, available for each country from 1973-1996. The industry subindices list the weighted average movement in price across firms within each industry category. Datastream's indices are calculated similarly across countries and

¹⁵Note: Germany is a 'mixed' electoral system. Half of Parliament is elected from single-member districts, the other half from the list vote. However, the overall allocation of seats in the Bundestag is decided by these list votes. Each party is awarded as many list seats as are needed to make the total number of seats is proportional to the number of votes that party received. In other words, in Germany, maximizing votes and seats are equivalent.

¹⁶There are many differences in the details of each electoral system in the 15 time series. However, these differences are not as important as the similarities between countries within each type of political system. Few of the countries perfectly fit the stylized model of a two party majoritarian system with single party government or a multiparty PR system with multiparty government. Austria has had periods of two-party competition. Germany, with its two large parties and small third party, also displays features of two-partyism. The theory predicts, however, that parties in a two-party PR system will behave differently than parties in a two-party majoritarian system. Germany and Austria remain in the group of PR systems. All the majoritarian countries have experienced multiparty competition at one time or another. Nonetheless, party competition in each of the majoritarian countries is dominated by two large parties, or two large 'teams' of parties. France is the only majoritarian system with multi-party competition and multiparty government. However, two teams of left and right parties form in the general assembly, and one of these teams forms the government. The parties in government are a 'team' rather than a 'coalition' because they are bound by pre-election pacts.

¹⁷ Datastream Corporation, 1999.

are scaled to have the

same starting values. The number of industry subindices varies by country (see Appendix 2), and the number of firms in each subindex varies by country.

The Dependent Variable

Policy changes affect stock prices such that certain industries are and others hurt. Above and beyond existing market variance then, policy changes increase the price dispersion between industries within a country. Next I describe, in a series of steps, the construction of the dependent variable, price dispersion. I use examples of steel and general market prices in Belgium, Germany and Australia to illustrate its construction.

The Building Blocks

An industry subindex measures a weighted average of stock prices for firms within a specific industry.¹⁸ Redistributive policy is not the only variable that affects the price of industry subindices. Changes in world prices, interest rate movements, technology shocks and change in GDP, for example, affect industry share prices. These tend, however, to have similar effects on

¹⁸ For example, Datastream constructs the following industry subindices: Aerospace&Defense, Automobiles, Banks, Beverages, Brews-Pubs-Restaurants, Chemicals, Construction and Building Material, distributors, Electricity, Electronic Equipment, Engineering and Machinery, Food and Retail Drugs, Food Production, Forestry, Gas Distribution, Health, Information and Technical Hardware, Insurance, Investment Companies, Life Assurance, Leisure, Media, Mining, Oil and Gas, Packaging and Forestry, Personal and Household Goods, Pharmaceuticals, Real Estate, General Retail, Speciality Finance, Software and Computer Services, Steel, Support Services, Telecom, Household and Textiles, Tobacco, Transportation, Water. For a full list of industry subindices by country, see Appendix 2.

the general index as on the industry indices (Campbell, Lo and MacKinlay 1997).¹⁹ One way of controlling for these effects is to subtract movements in the general stock index from that in the industry index. This also controls for general shifts in the price of stocks-- which may be tied to investors' expectations about government competency or ideology rather than redistributive policy.

Figures 1 and 2 shows the relationship between the general index and an industry subindex. The vertical axis measures the percentage change in price each month for the Belgian steel subindex and general market index from 1981-1984. The figures also show political change over this period. The construction of the political change variable is discussed later; however, the spike in the figures corresponds to a change in multiparty government that occurred in December 1981. Consideration of this switch from a socialist to a catholic-liberal coalition illustrates the construction of the tests to follow.²⁰ In contrast to its socialist predecessor, the new catholic-liberal government drew much of its political support from the Flemish (Bain 1992). It pushed for reform of the steel industry, specifically, the restructuring and closing of southern (Wallonian) steel plants and the reduction of state support (Capron 1986). Given EU restrictions on steel production, these changes privileged northern Flemish firms at the expense of their older southern counterparts. Since the steel firms listed on the Belgian exchange belong to the newest steel-producing Flemish regions in the north, we should expect to see a rise in the Belgian steel index

¹⁹ Of course, not all industries respond in exactly the same way to these exogenous shocks-- some tend to move less than the general market index, some more.

²⁰The Christian People's party and the Christian Social party remained in government. The Flemish Socialist and Francophone Socialist parties left government and the Liberty and Progress, and Francophone Liberal parties entered government.

as a consequence of these redistributive policies.

Indeed, when the new catholic-liberal coalition took office, the market value of stocks in these northern steel firms rose as expected, increasing by around 20% in each of the three months following the government change. However, movement in the steel subindex closely matches movement in the general price index (see Figure 1). What we could be observing is a rise in the general price of stocks because investors anticipate that the Catholic-Liberal government will be a more competent or market-oriented government than the Socialists with respect to economic management. However, we can control for this by subtracting of the effect of the general market index from the steel index. In Figure 2, the vertical axis measures the difference in change in Belgian steel stocks and the Belgian general market index. The relationship between political change and change in steel prices is now sharply pronounced. Steel stocks strongly outpace the general market index in the two months after the December shift in government.

While the market response to political change appears clear in Figure 2, the story told required a detailed knowledge of party politics and the composition of the steel industry. Indeed, had we not known that the steel index was almost exclusively composed of northern firms, we might have anticipated a decline in the steel index in response to the removal of subsidies. This makes replicating the analysis in Figures 1 and 2 in the cross-sectional context extremely difficult. While without specialist knowledge we cannot predict who the winners and the losers will be across the entire domain of the data, we do know that changes in government policy create winners and losers. Since the winners' stocks rise, while the losers' fall, the dispersion between prices within the market increases with changes in government redistributive industrial policy.

The following example illustrates the construction of the dependent variable, price

dispersion, and shows how it differs from the more familiar concept of price level. Suppose a stock market lists only two industries, A and B. Consider two scenarios. First suppose government redistributive policy remains stable. While the market might experience shifts, perhaps in response to economic conditions or confidence in the government, the effects are largely similar for both industries. For instance both firms might experience a 10% growth in their value. Alternatively, government policy might change, perhaps in response to a political change. In this second scenario one industry experiences a relative gain and the other experiences a relative loss. For example, one might grow by 20%, while the other remains constant. The average market movement is the same 10% as in the first scenario, but unlike the first case in which there was zero price dispersion, here the average dispersion in prices from the market average is 10%. The dependent variable measures the extent to which prices diverge between industries. It does not measure levels, but rather variance.

With a knowledge of the parties in government, industry indices composition and the basis of party support, we could predict winner and losers, as in the example of the Belgian steel industry. Unfortunately, since quantifying that information is not practical, I resort to measuring the second order statistic of dispersion. This statistic measures the extent to which industries win and lose relative to each other. As the examples show, shifts in government policy privilege some industries at the expense of others and so changes in government redistributive policy increase dispersion between industry stock prices. My measure of price dispersion serves as a proxy for redistributive policy change.

I define price dispersion²¹ as follows: Consider country n, where $\Delta base_t$ is the % change in the price of the general market index in month t, and ΔS_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 dispersion for country n at time t is:

$$Dispersion_{n,t} = \sum_{i=1}^m \left| \Delta S_i^t - \Delta base_t \right| / m .$$

This measure is similar to others proposed in the literature (Loungani, Rush and Tave 1990; Lilien 1982; Zagorsky 1994). These studies, based on the US only, used the squared difference between individual stock prices and the market average, rather than the absolute difference used here. A second difference is that this measure does not weight the industry index by market capitalization. This is because my measure was designed to assess relative winners and losers rather than measure the value of transfers. Using squared and/or weighted measures yields similar results. Campbell and Lettau (1999) 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. Their measures of volatility, at all levels, are susceptible to rapid price

²¹ Note that changes in prices are used instead of levels because of potential scaling problems (markets have risen sharply in value since 1973, so large price changes in earlier periods would be obscured if levels rather than changes were used). Technically, this variable should probably be called price-change dispersion; however, the term is rather unwieldy, hence the simpler label price dispersion.

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 over the previous month (i.e. $(\Delta \text{base index}_t)^2$). I also include the lagged dependent variable which reduces autocorrelation.

Campbell and Lettau's results also suggest that market, industry and firm level measures of volatility tend to move in similar patterns and are all susceptible to large shifts in prices. Appendix I shows the correlation between dispersion measures across markets. While related, dispersion is much less correlated across markets than price levels. While this mitigates the problem of the domestic stock market reacting to international changes, it does not eliminate it. The larger, more developed markets show greater correlation. In the final model, I assess the impact of external markets by examining how dispersion within the US market influences the other stock markets.

Independent Variables:

The theoretically important predictor is change in government. However, operationalizing change in government is a non-trivial task. Majoritarian systems are characterized by large, infrequent government changes. In majoritarian countries, political turnover is usually triggered by elections. In contrast, the coalition governments endemic in PR systems often break-up and re-form between elections. As such PR systems typically have more frequent, incremental changes in government composition. Rather than use a dichotomous measure of government change, I develop a

continuous measure²²: the absolute change in the distribution of parliamentary seats among

government parties. The formula for this variable is²³

$$\sum_{k=1}^m \left| \left(s_{kt} * g_{kt} \right) - \left(s_{kt-1} * g_{kt-1} \right) \right|$$

Where $k=1, \dots, m$, represents each of the parties holding seats, S_{kt} is party k 's seat share in month t , and g_{kt} is an indicator variable that takes value one if party k is in government in month t , and takes value zero otherwise.²⁴ This variable measures political change whether it occurs as a

²² An alternative measure could be developed using cabinet portfolios, but as Blais, Blake and Dion (1993) argue, "as cabinet seats tend to be directly proportional to parliamentary seats in coalition governments taking parliamentary seats will give results not much different from those based on cabinet seats." There are still drawbacks to using this measure. Does a party's percentage of seats represent its relative policy influence? In other words, this measure does not consider the pivotalness of parties. While this would be desirable, it is extremely difficult to identify which parties are pivotal. Although power indices designed to do so exist, there is no consensus on their usefulness.

²³For example, in a majoritarian system, suppose party A is in government with 52% of parliamentary seats and an election is held. If subsequently Party B takes over the government with 52% of the parliamentary seats, the change is calculated as 104%. Similarly, in a PR system, suppose parties A and B are in coalition with 30% and 25% of the seats, respectively. Following an election, parties A and C form a coalition with 30% and 30% of the seats. In the variable "political change" this will be measured as 55%. If, instead of the first coalition, parties B and C had formed a government with 25% and 30% of parliamentary seats, this would have registered as 60% on the change scale. Obviously, in both PR and majoritarian systems, parties which win seats but do not join the government do not affect this variable. These examples reveal that there will be differences in the magnitude of variances between the two systems. In majoritarian governments, bigger, less frequent changes in government occur compared to those found in PR systems.

²⁴ Political data from the European Journal of Political Research, special annual data issues beginning with Vol 24. 1993. Also Mackie and Rose 1983.

result of elections or as a result of a change in coalition partners.

Unfortunately, while nominally political change takes place in a single period, as a practical matter political change is not so instantaneous. However determined a government might be, it can not reverse all the policies of its predecessors overnight. As a result, representing political change as a single spike seems inappropriate. Furthermore from a practical viewpoint, attempting to explain monthly changes in stock price dispersion with a variable that is, on average, only non-zero every few years is unlikely to be successful. Such an approach could only hope to explain the deviation from the average price dispersion in the particular month of the political change. Hence for theoretical and practical reasons it is necessary to investigate the temporal impact of political change.

Perhaps the most straightforward fix is to include numerous lag and lead measures of political change. As discussed above, implementation typically lags behind political change, which suggests dispersion should also lag behind political change. In contrast, rational expectations suggests price dispersion should precede political change. I include lags and leads of the political change variable for the six months preceding and following the actual political change. While these lags and leads provide one method to assess the time relation between political change and price dispersion, the large number of variables introduced makes observation of the underlying pattern difficult. For this reason, I simply report the analysis of the lags and leads variables as a final test and instead use a series of smoothers to spread the effect of political change over a number of months. In particular, I use locally weighted scatterplot smoothing (KSM in STATA version 6). 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. The greater the bandwidth, the greater the smoothing. I chose two bandwidths 0.05 and 0.15 (narrow and broad bandwidth).

The best way to observe the impact of this smoothing is graphically. In Figures 3 and 4, the vertical axis measures the difference in change in German steel stocks and the German general market index from 1981 to 1984. It also measures the level of political change that occurred in September 1982 and March 1983 in Germany. The CDU/FDP took over government in September 1982 when a no-confidence vote expelled the SDP/FDP coalition from office. Six months later, in March 1983, Kohl called an early election. The CDU/FDP were reelected; moreover, the CDU had increased its policymaking power within the CDU/FDP coalition (there was a significant rise in votes for the CDU, but a drop in votes for the FDP). Despite its right-wing ideology, regional incentives caused the CDU to target industrial policy towards the steel industry. We should expect such political changes to influence steel stock prices. However, a question remains as to when this should occur? The value of the steel index fell heavily in 1981 and continued to fall, until the government coalition changed in 1982. Steel stocks strongly outpaced the general market index after the 1982 shift in government but before the 1983 election solidifying the CDU vote. The wider bandwidth on political change captures this effect, while the narrow one misses the change.

Figures 5 and 6 show how steel prices reacted to a switch in government in a majoritarian system. In March 1983, the left-wing Labour party entered office in Australia. At the time, the steel industry was concentrated in several important marginal districts in Australia (McGillivray and Smith 1997). We expect that steel prices should have risen in expectation that the Labour government would redistribute in favor of the steel industry. There was indeed a shift in the steel

index, it increased 10% above the general market index in the month prior to the election of the Labour government (the vertical axis is difference in change between the Australian steel and general market index). In the Australian case, the narrow bandwidth on political change (Figure 5) captures the reaction of the market. The broader bandwidth (Figure 6) obscures the effect. The results from the quantitative empirical analysis back the German and Australian examples; narrower bandwidth captures the stock market reaction to political change better in majoritarian than PR systems and broader bandwidth better captures the effect of political change in PR systems.

Model Specification

The pooled data are for 14 countries, approximately 3,000 country-month observations. There are a number of methodological problems linked to cross-sectional time series analysis (Beck and Katz 1995; Green, Kim and Yoon 2000). Fortunately, the results reported are robust to the method used and the inclusion or exclusion of control variables²⁵. Given this I report only a limited number of specifications in Table 1.²⁶

²⁵ Although not for all specifications, Hausman tests typically reject the null hypothesis of independence between regressors and country-specific intercepts. This suggests fixed effects are more appropriate than random effects models. Fortunately, both fixed and random effects models are similar to the GLS analyses reported. The GLS model was estimated using STATA's xtglm specifying heteroskedastic panels and first order auto-correlation. Given the large number of time periods for each nation (around 275), Beck and Katz's (1995) critique of feasible GLS and suggestion to use panel corrected standard errors instead can be ignored. Without the inclusion of the lagged dependent variable, first order auto-correlations between residuals are typically around 0.3. With the inclusion of the lagged dependent variable, first order auto-correlation is between 0 and -0.06 for most model specifications. The magnitudes and significance of the regression coefficients are remarkably insensitive to whether or not the lagged dependent variable is included. Similarly, although the inclusion of market volatility drastically improves the fit of the model, its inclusion or exclusion has only small effects on other regression coefficients.

²⁶ The variable descriptions, means and variances are summarized in Table 2.

The results in Table 1 support the predicted pattern. I start by considering the effect of political change. In model 1, I do not distinguish between electoral systems and treat political change as a single unsmoothed data point (*Political Change*). The positive and significant coefficient indicates that, if political change occurs within a given month, this increases price dispersion between industry subindices across all political systems. In the remaining models, I distinguish between electoral systems and differentiate between narrow and broad political change. To do so I use a narrow measure of political change interacted with indicator variables for both PR and majoritarian systems. I also have similar broad measures of political change for both systems. These measures are shown in models 2 through 5.

As predicted, the effect of political change is more immediate in majoritarian systems than in PR systems. In majoritarian systems, the narrow measure of political change has a statistically significant coefficient of around 0.12, with the broader measure being smaller in magnitude and statistically insignificant. This accounts for about 3% of the variance in the dispersion measure. In contrast, broad, rather than narrow, measures of political change account for dispersion of stock prices in PR systems. The coefficient on the broad political change measure for PR systems in model 2 is 0.47, which accounts for about 12% of the variance in the dispersion measure. Although it appears that the effect of political change is stronger in PR systems, this is hard to gauge. The nature of political change is very different in PR and majoritarian systems so it is difficult to judge what a unit of political change means in a PR and a majoritarian system. The key result is that political change affects the level of price dispersion in both PR and majoritarian systems, and this pattern of broad political change mattering in PR and narrow political change mattering in majoritarian systems is a consistent theme throughout all analyses.

Before moving on to consider economic factors, I pause to examine alternative political variables. For example, one might argue that it is not political change per se that matters, but, for example, elections or the change in the ideological position of the government. Model 1 includes two dummy variables for the presence of an election.²⁷ The first is an indicator for whether an election has occurred within this or any of the previous three months. The second indicates the presence of an election in this or any of the three following months. In neither model 1 nor other models run did the presence of either election variable significantly influence the level of price dispersion once controlling for political change. It appears elections are influential only to the extent that they lead to political change.

The results above support the argument that political change leads to changes in redistributive policy. Yet one might argue that it is not change in party government but change in government ideology that is important. Although I speculated earlier that parties are not wedded to redistributive issues to the same extent they are to ideological issues, this question deserves testing. I construct a measure of government ideology and change in government ideology 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. In addition, I create a measure of ideological change using an analogous construction to that of political change (formula below). This variable was then smoothed in the same manner as the narrow measure of political change.

²⁷ In addition to the prospects for political change, political business cycle theorists (for example Nordhaus 1975) anticipate that governments will alter their behavior prior to elections in order to enhance their prospects for re-election.

$$ideological\ change = \sum_{k=1}^m \left| \left(ID_{kt} * s_{kt} * g_{kt} \right) - \left(ID_{kt-1} * s_{kt-1} * g_{kt-1} \right) \right|.$$

Once political change is controlled for, shifts in the ideological composition of the government had no significant effect. As a further check, I created an analogous change variable looking at party positions on trade issues using data from the Comparative Manifesto Project (Issues P406 and P407). This variable, not reported, has no significant impact on price dispersion. Yet 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*). Scholars such as Cameron (1978) and Alvarez, Garrett and Lange (1991) suggest that, in different settings, left or right ideological parties generate larger shifts in policy upon taking office. The negative coefficient on government ideology suggests that moving from the extreme left to the extreme right reduces dispersion by about 0.068, where the standard deviation of the dispersion measure is 0.44. One possible explanation for this difference is that, on average, left-wing governments are more interventionist, which exaggerates the impact of any policy changes.

There are four other political variables: PR, regional autonomy, presidential, and effective number of parties in government.²⁸ The first three of these are dummy variables indicating whether the system is PR, has regional autonomy such as federalism and is presidential. The analyses suggest PR and regional autonomy increase dispersion, while presidentialism and number of parties in government reduce dispersion. Although PR systems average about 1.5 more governing parties than majoritarian systems, the net effect of the PR and number of party variables

²⁸ EJPR coding.

indicates that, on average, PR countries have one tenth of a standard deviation more dispersion than majoritarian systems. Unfortunately, since there is no time series variation for the three dummies and only limited time series variation for the number of parties variable, these results can be discounted as simply country level effects.

Political change increases price dispersion in both PR and majoritarian systems, with the effect being more immediate in majoritarian systems and more diffuse in PR systems. The theory also suggested that the electoral rule should influence how governments respond to economic conditions, with majoritarian governments predicted to respond more directly to changes in economic conditions than PR governments. I next move to the question of response to economic conditions.²⁹ Model 1 includes variables for the interest rate (measured as the discount rate) and the inflation rate.³⁰ Both of these variables influence price dispersion, with the larger and more significant factor belonging to the interest rate variable. In the remaining models, the interest and inflation rate variables are interacted with indicator variables for political systems. The impact of these variables differs drastically across political systems. Although the effects are small in magnitude, an increase in the interest or inflation rate produces a statistically significant increase in price dispersion in majoritarian systems, but the impact of these variables is insignificant in PR systems. I also tested for the effect of growth rate and unemployment rate. In neither type of system did these variables significantly affect price dispersion. This is probably due in part to the

²⁹ Economic data are gathered on a quarterly basis for GDP and on a monthly basis for inflation, interest rates and unemployment. The data are from a variety of sources. See the IMF's "International Financial Statistics" CD-ROM (1999) and the OECD's "Quarterly and Monthly Labor Force Statistics" (various years).

³⁰ Monthly data on inflation rates are not available for Switzerland. However, in regressions not involving inflation, the inclusion of Switzerland did not alter the results.

fact that these variables are measured on a far coarser scale than the other variables. For this time-frame the GDP data are only available at the quarterly level.

Throughout the analyses, I utilized the control variables market volatility and the lagged dependent variable. These variables were strongly significant, yet their inclusion or exclusion leaves the effect of the remaining variables relatively unchanged. Models 4 and 5 restrict the analysis to markets with capitalization greater than 40% of GDP (in 1989).³¹ As we would expect, removing the under-capitalized markets on the whole enhances the results. Many European stock market were under-developed in the 1970s and, although not reported here, restricting the time domain of the sample to the post-1980 period also strengthens the results.

Equity markets are linked. Appendix I shows the correlation in the dispersion measure across countries. Even though the relationship is much weaker than the correlation between price levels, dispersion is highly correlated particularly between the highly capitalized markets. Hence there is a risk European markets are responding to political change in the US rather than domestic political factors. As a control, model 5 includes dispersion in the US as a independent variable. The coefficient of 0.25 indicates that around 25% of price dispersion in other markets is driven by dispersion within the US. Despite this large effect, the impact of the other regressors remains largely unchanged.³²

For ease of interpretation and presentation, I smoothed the political change variable over

³¹ Market capitalization figures for 1989, taken from the World Bank. The excluded countries are Austria, Denmark, Italy and Norway.

³² As an additional test, I allowed for cross-sectional correlation between units. Since this test requires strictly balanced panels it required a reduced time dimension. As such I do not report the results, however, the analysis is consistent with those reported.

the months surrounding political change. While the analyses reported above suggest that a narrow measure of political change best captures price dispersion in majoritarian systems and that a broad measure of political change is most appropriate in PR systems, we should be concerned that these results are an artefact of the construction of the smoother. To investigate this possibility, I replace the smoothed measure of political change with a series of lags and leads on the political change variable. In particular I generate both lead and lag political change for six months and interact these with the political system. The analysis is reported in Table 3. To shorten notation, let MPC_{t-1} represent political change in the previous month multiplied by a dummy for majoritarian system and let $PRPC_{t+1}$ represent political change in the following month multiplied by a dummy for PR system. I then perform joint hypothesis tests to determine whether the overall effect of political change over a series of lags and leads can be considered non-zero. In support of earlier results, I reject the null hypothesis that in majoritarian systems political change in the current month, the previous and the next month all have zero effect on price dispersion.³³ In contrast, in PR systems the probability of these three variables all simultaneously being zero can not be rejected at the 5% level, although only just.³⁴ Like the earlier results, these tests support the prediction that political change has a more significant effect in majoritarian than PR systems. However, if political change is considered over a longer period, the reverse effect is visible. For instance, the joint hypothesis test that all six lags, six leads and immediate political change coefficients are all simultaneously

³³ The null hypothesis is that the coefficients on MPC_{t-1} , MPC_t , and MPC_{t+1} are all simultaneously zero. The test statistic is $\chi^2(3 \text{ d.o.f.}) = 9.24$. The probability of observing this under the null is only 0.0263, thus rejecting the null hypothesis.

³⁴ $\chi^2(3 \text{ d.o.f.}) = 7.62$ (Pr.=0.0545)

zero is rejected only in PR systems.³⁵

Overall, the findings suggest that political change affects the level of redistribution in both majoritarian and PR countries. In both cases, political change positively and significantly affects the level of price dispersion among industry indices. However, there are temporal differences between PR and majoritarian systems. The impact of political change on price dispersion is relatively immediate in majoritarian systems. In contrast, in PR systems the effect of political change takes longer to filter through and its diffuse effects are felt over a longer time period. As predicted, majoritarian systems are more responsive to economic change. Changes in inflation and interest rates affect price dispersion only in majoritarian systems. Prices on stock markets in PR countries are not similarly affected.

Conclusion

Cross-sectional time-series data for 14 stock markets, from 1973-1996, are used to study how comparative political institutions affect party governments' incentives to enrich one group of industries at the expense of another. Using measures of cross-sectoral dispersion of prices within stock markets as a proxy for change in redistributive policy, I show that political change is important in both PR and majoritarian systems. As parties shift in and out of government, trade and industrial policy is redistributed to favor the parties' industrial supporters. Such changes in policy increase the cross-sectional dispersion in stock prices, with newly advantaged industries seeing their stock increase while the price of those losing favorable policy declines. The temporal

³⁵ The null hypothesis is that the coefficients on $MPC_{t-6}, \dots, MPC_t, \dots, MPC_{t+6}$ are all simultaneously zero. The test statistic is $\chi^2(13 \text{ d.o.f.})=19.57$. The probability of observing this under the null is 0.1066. The corresponding test for PR systems has $\chi^2(13 \text{ d.o.f.})=24.72$ (Pr.=0.0251).

impact of political change differs across institutions, with the impact of political change being more immediate in majoritarian systems and the effect being longer run and more diffuse in PR systems. Majoritarian systems are also more responsive to economic shocks, while changes in economic conditions have few discernable effects on the dispersion of prices in PR countries. PR systems, however, experience overall higher levels of price dispersion. These findings complement those of Herron (2000) and Hays, Stix and Freeman (2000). Both find that political change affects prices in financial markets. The innovation in this paper, however, is the discovery that the timing of these effects differs across political systems.

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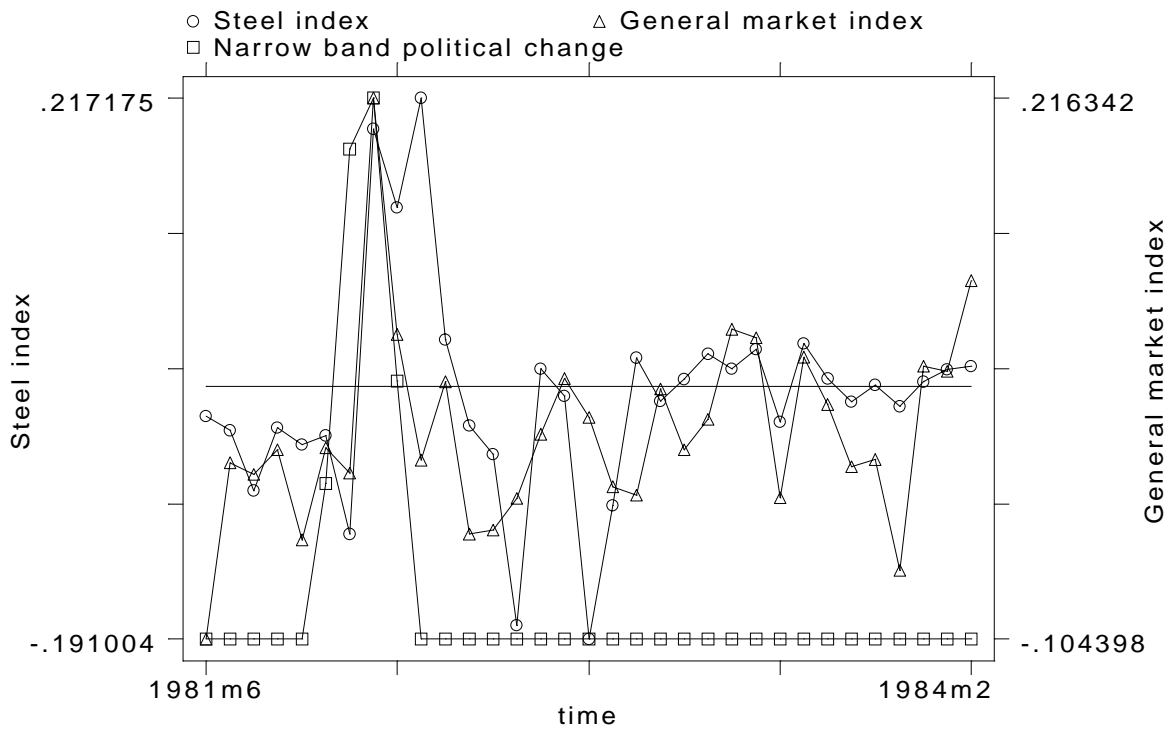
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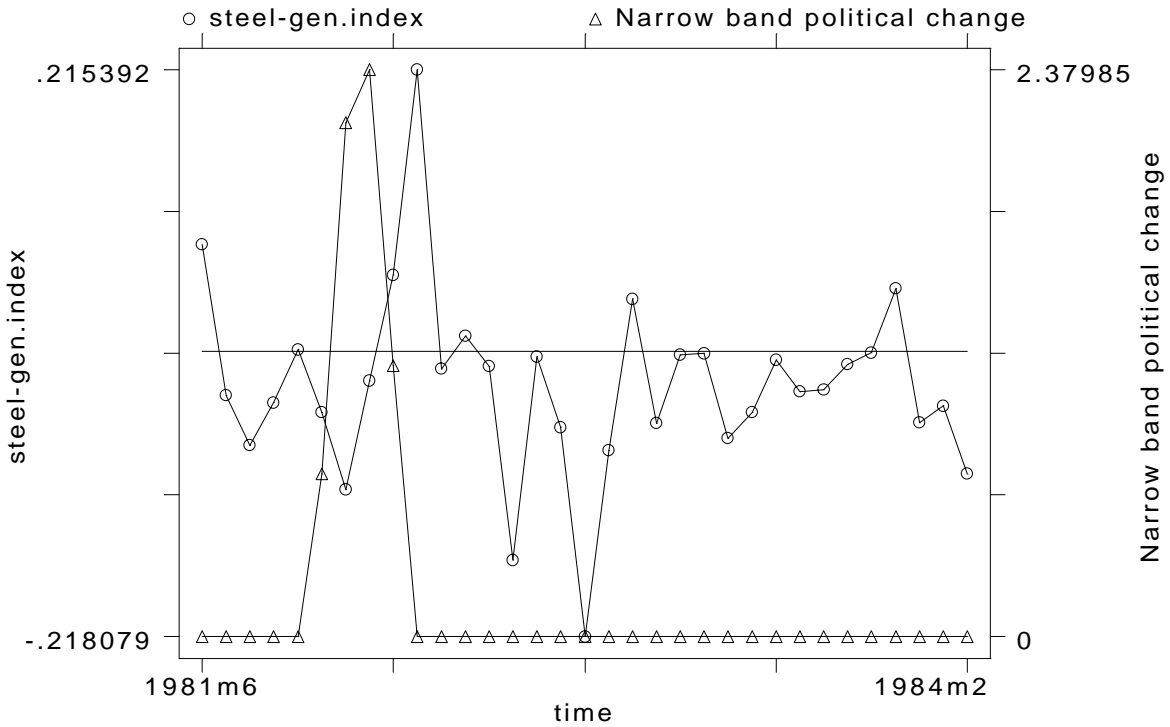
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Figure 1: Graphing Political Change* and Price Change in the Belgian General Market and Steel Indices 1981-1984.**



Belgian general market and steel indices 1981-1984

Figure 2: Graphing Political Change* and Differences in Price Change between the Belgian Steel Index and the Belgian General Index**

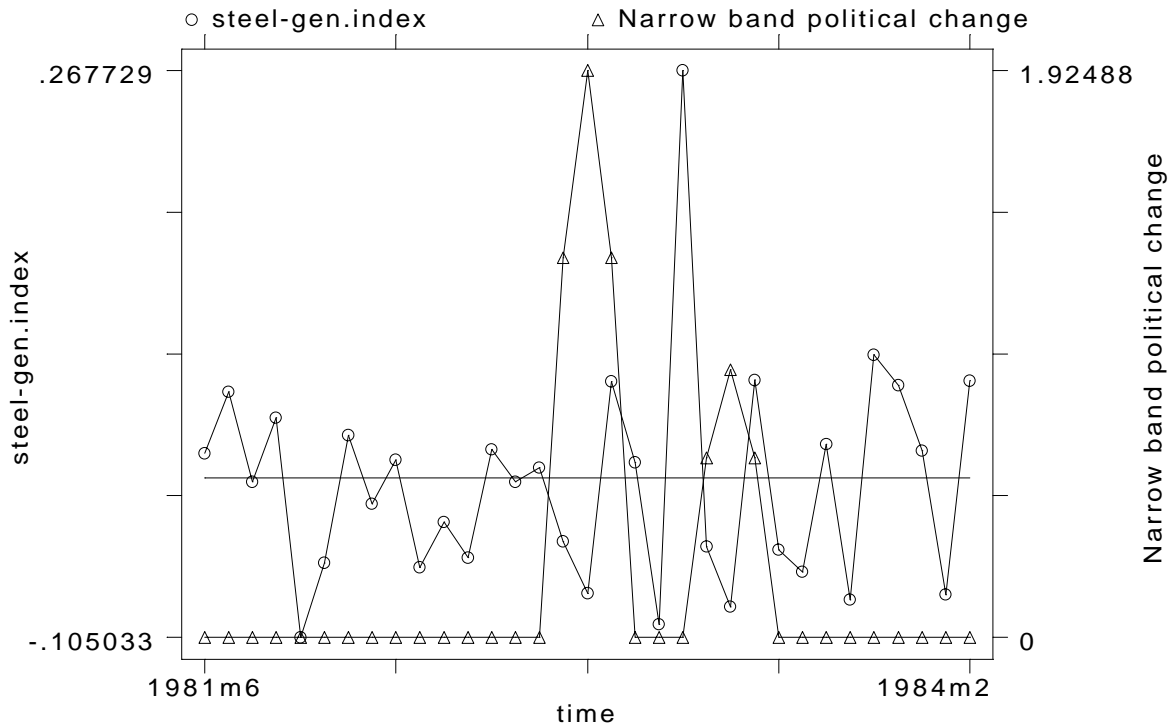


Belgium: Change in steel index-change in general index.

*Political Change with KSM smoother. See discussion in text.

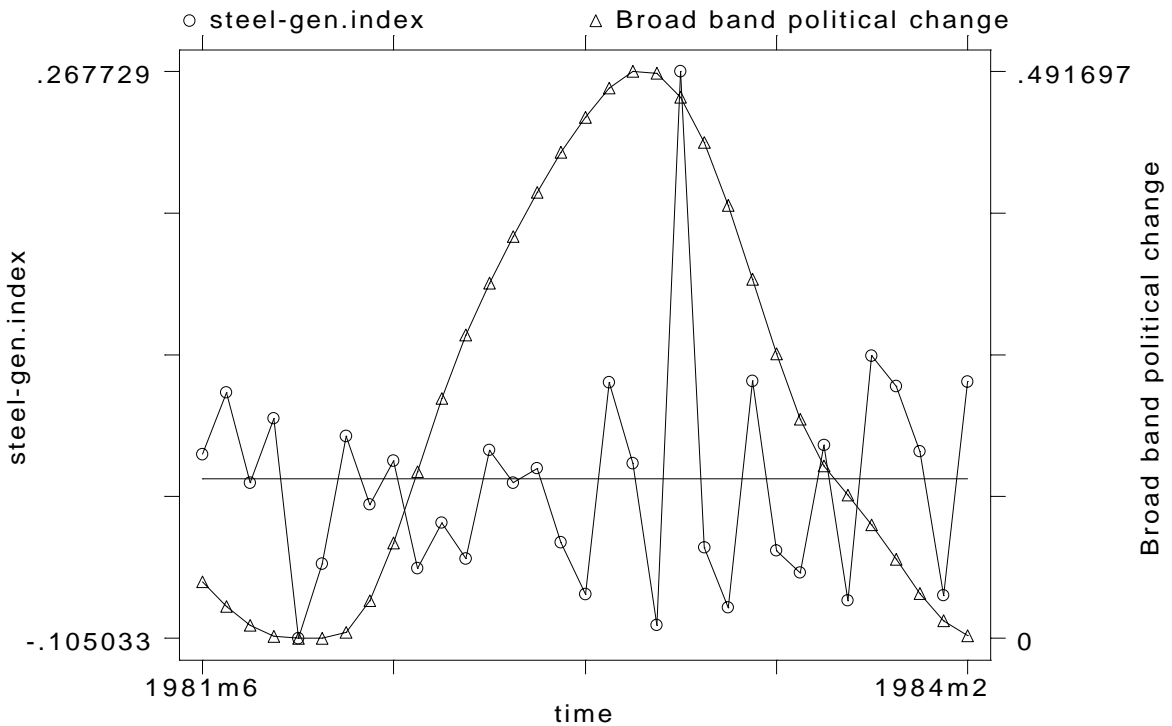
**Changes are calculated as monthly percentage change in the price index.

Figure 3: Graphing Political Change* (Narrow Band) and Differences in Price Changes between the German Steel Index and the German General Index.**



Germany: Change in steel index-change in general index.

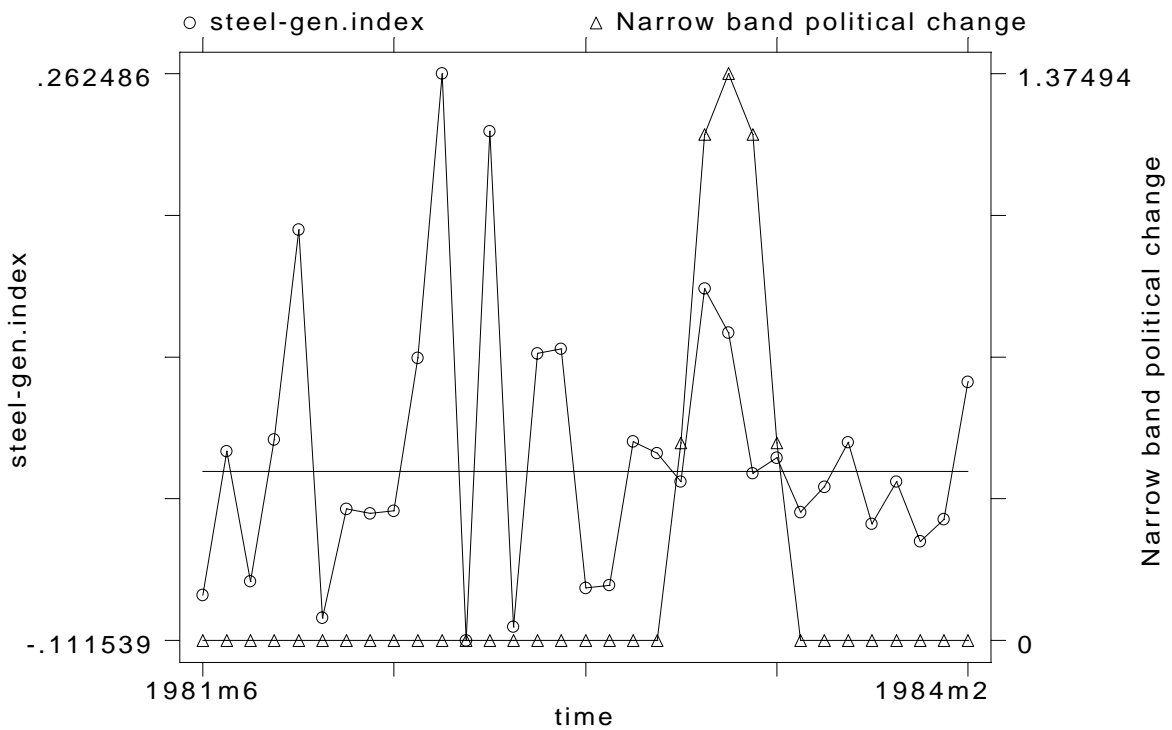
Figure 4: Graphing Political Change* (Broad Band) and Differences in Price Changes between the German Steel Index and the German General Index.**



Germany: Change in steel index-change in general index.

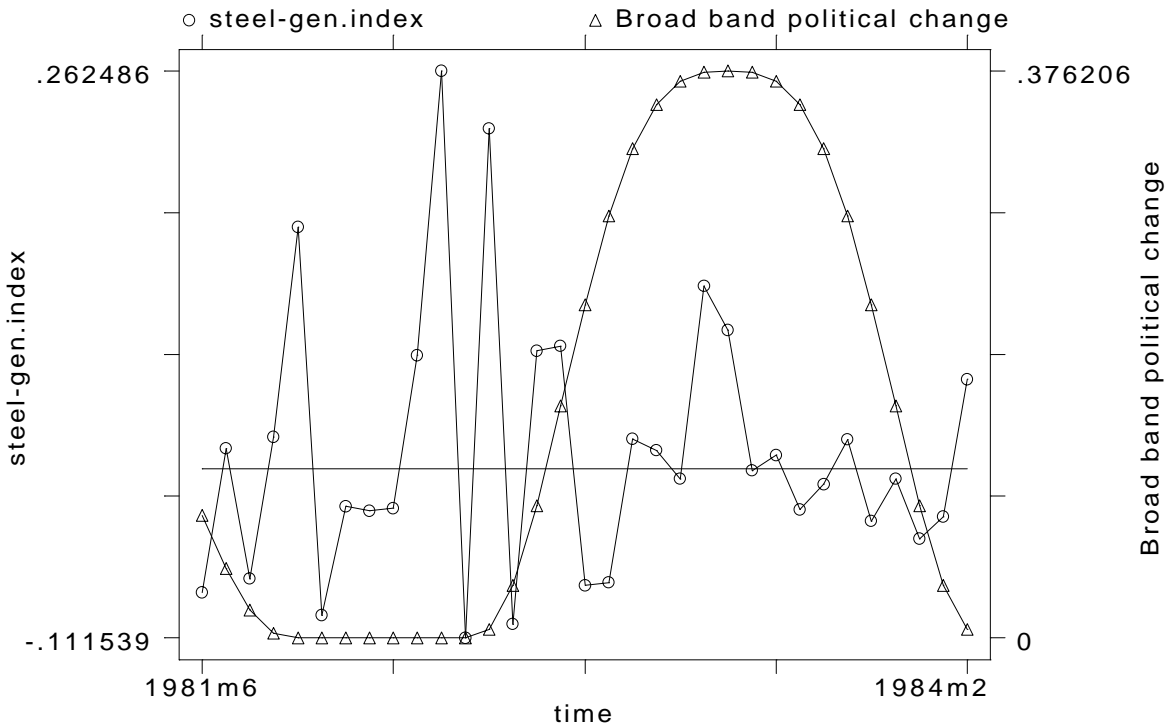
*Political Change with KSM smoother. Narrow band width= 0.05. Broad band width=0.15. See discussion in text. **Changes are calculated as monthly percentage change in the price index.

Figure 5: Graphing Political Change* (Narrow Band) and Differences in Price Changes between the Australian Steel Index and Australian General Index.**



Change in steel index-change in general index.

Figure 6: Graphing Political Change* (Broad Band) and Differences in Price Changes between the Australian Steel Index and the Australian General Index.**



Change in steel index-change in general index.

*Political Change with KSM smoother. Narrow band width= 0.05. Broad band width=0.15. See discussion in text. **Changes are calculated as monthly percentage change in the price index.

Table 1. Alternative GLS and Fixed Effect Analyses of the Effects of Political and Economic Change on the Level of Price Dispersion in Industry Subindices in 14 Countries 1973-1996[⊙].

Variables	Model 1:GLS	Model 2:GLS	Mod.3:Fixed Effects	Model 4:GLS	Model 5: GLS
Political Change (unsmoothed)	.024* .011	.	.	.	.
Pol. Change in Majoritarian systems (narrow bandwidth)	.	.126* .066	.132 .088	.176** .072	.196** .078
Pol. Change in Majoritarian systems (broad bandwidth)	.	-.059 .140	-.133 .197	-.082 .144	-.109 .161
Political Change in PR systems (narrow bandwidth)	.	-.044 .064	-.040 .072	.044 .083	.055 .082
Political Change in PR systems (broad bandwidth)	.	.475** .122	.473** .139	.420** .167	.353** .165
PR Dummy	.	.083** .030	.	.080 .037	.070 .045
Interest Rate	.005** .001	.	.	.	.
Interest rate*majoritarian	.	.009** .002	.007* .003	.010** .002	.008** .002
Interest rate*PR	.	.002 .002	.004 .002	.006 .004	-.002 .004
Inflation rate	.003 .002	.	.	.	.
Inflation*majoritarian	.	.007* .003	.007* .004	.007* .003	.004 .003
Inflation *PR	.	.000 .003	.005 .003	.001 .005	.003 .005
Election in this or the last 3 months	.011 .020	.	.	.	.
Election in this or the next 3 months	-.001 .019	.	.	.	.
ideological change	.055 .071	-.040 .087	-.061 .096	-.125 .113	-.100 .118
ideology of government	-.017** .004	-.019** .003	-.026** .005	-.023** .005	-.021** .005
No. of parties in government	-.003 .004	-.010* .005	-.001 .008	-.014* .007	-.013 .007
Regional Autonomy (Federalism)	.025* .013	.025* .013	.	-.002 .016	-.002 .018
Presidential	-.031** .012	-.032** .012	.	-.017 0.15	-.015 .020
Lagged Dependent Var.	.344** .014	.335** .014	.285** .014	.288** .018	.243** .020
Market Volatility	18.5** .695	18.6** .693	19.6** .741	15.4** .795	12.1** .851
Price Dispersion in US	.	.	.	.	.256** .024
constant	1.24 ** .036	1.20** .038	1.33** .042	1.33** .047	.944** .064
No. obs No. groups	3412 13	3412 13	3412 13	2265 9	1917 8

Notes: Standard errors in parentheses ** p<.01 * p<.05 one-tailed test. Method of analysis: GLS and Fixed Effects. Estimates obtained using xtreg and xtglm procedures in STATA, version 6.0 ⊙ The time series are of variable length. R-squared for the fixed effects analysis in Model 3: within 0.32, between 0.49, overall 0.31.

Table 2: Variable Means and Variances

Variables	Mean	Standard Deviation	Construction
Dependent Variable: Level of Price Dispersion among Industry Subindexes	2.00	.443	$* \sum_{i=1}^m |\Delta S_i^t - \Delta \text{base}_t|/m$
Political Change (unsmoothed)	.088	.530	$** \sum_{k=1}^m |(s_{kt} * g_{kt}) - (s_{kt-1} * g_{kt-1})|$
Pol. Change in Majoritarian systems (narrow band)	.028	.098	Interaction of Political change and Majoritarian dummy variable (KSM smoother, bandwidth 0.05)
Political Change in PR systems (narrow bandwidth)	.059	.129	Interaction of Political change and PR dummy variable (KSM smoother, bandwidth 0.05)
Pol. Change in Majoritarian systems (broad bandwidth)	.028	.059	Interaction of Political change and Majoritarian dummy variable (KSM smoother, bandwidth 0.15)
Political Change in PR systems (broad bandwidth)	.059	.078	Interaction of Political change and PR dummy variable (KSM smoother, bandwidth 0.15)
PR Dummy	.659	.438	PR systems =1, Majoritarian Systems=0.
Interest rate	5.98	4.42	$100 * |(interest\ rate_t - interest\ rate_{t-1})/interest\ rate_{t-1}|$
Interest*majoritarian	3.08	4.71	Interaction of Interest rate and majoritarian dummy
Interest *PR	2.85	3.84	Interaction of Interest rate and PR dummy
Inflation rate	7.51	3.38	$100 * |(inflation\ rate_t - inflation\ rate_{t-1})/inflation\ rate_{t-1}|$
Inflation*majoritarian	3.47	4.75	Interaction of Inflation rate and majoritarian dummy
Inflation *PR	4.73	4.77	Interaction of Inflation rate and PR dummy
Election in this or the previous 3 months	.094	.029	election month (n+3)
Election in this or the next 3 months	.094	.092	election month (n-3)
change in ideology	.027	.087	absolute change in the ideology of the government. See EJPR coding: $\sum_{k=1}^m \left| \left( ID_{kt} * s_{kt} * g_{kt} \right) - \left(ID_{kt-1} * s_{kt-1} * g_{kt-1} \right) \right|$
government ideology	2.21	1.48	average government ideology (using EJPR coding and party seat shares as weights).
No. of parties in government	2.22	1.37	# of parties in government. See EJPR coding
regional autonomy (Federalism)	.477	.499	1 if unitary, 0 if federal. See EJPR coding
Presidential	.582	.493	0 if parliamentary, 1 if presidential. See EJPR coding
Lagged Dependent Variable	1.98	.414	Lagged Dependent Variable
Market Volatility	.003	.008	$(\Delta \text{base}_t)^2$
Price Dispersion in US			$* \sum_{i=1}^m |\Delta S_i^t - \Delta \text{base}_t|/m$ (US)

*for $i=1, \dots, m$, where i is an industry index.

for $n=1 \dots 14$ countries.

ΔS_i^t is the percentage change in the price for the industry index i in month t .

Δbase_t is the % change in the price of the general market index in month t .

**for $k=1, \dots, m$, where m is number of parties holding seats.

let S_{kt} be the seat share for party k in month t .

let $g_{kt} = 1$ if party k is in government in month t

let $g_{kt} = 0$ if party k is not in government in month t