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# Precarious Politics and Return Volatility

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We examine how local and global political risks affect industry return volatility. Our central premise is that some industries are more sensitive to political events than others. We find that industries that are more dependent on trade, contract enforcement, and labor exhibit greater return volatility when local political risks are higher. Political uncertainty in countries of trading partners of trade-dependent industries similarly results in greater volatility. Volatility decomposition results indicate that while systematic volatility is associated with domestic political uncertainty, global political risks translate into larger idiosyncratic volatility. (*JEL* G10, G15)

On September 29, 2008, the U.S. House of Representatives voted down the bailout bill proposed by the Treasury and the Federal Reserve in order to provide extra liquidity to the troubled U.S. financial markets. Within two hours the Chicago Board Options Exchange Volatility Index increased by 17%, while in one day the Dow Jones Industrial Average Index dropped 778 points. Global stock markets reacted in a similar fashion.[1] Clearly, the uncertainty about the outcome of a critical vote was reflected by both domestic and global stock

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[1] See Gray and Wood (*Financial Times*, September 30, 2008, p. B7).


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market indexes. A political event can have an explosive or a moderate effect on stock market volatility, depending on the severity of the event's economic implications. At the extreme, fear of a highly disruptive political event can result in excessive risk premia, which is referred to as the "peso problem."[2] At the moderate level, political uncertainty caused by regular political processes could manifest itself in stock market cycles and volatility reactions.

Abundant theoretical arguments and empirical evidence demonstrate how politics may affect economic outcomes, such as inflation and employment (Alesina and Rodrik 1994; Blomberg and Hess 2001; Fowler 2006; Olters 2001). The evidence concerning the effect of politics on stock markets is, however, generally mixed. Some authors document that political factors have a significant impact on equity prices (e.g., Bernhard and Leblang 2006; Foerster and Schmitz 1997; Knight 2006; Pástor and Veronesi 2010; Santa-Clara and Valkanov 2003; Snowberg, Wolfers, and Zitzewitz 2007; Wolfers and Zitzewitz 2009). Other studies challenge this view (e.g., Döpke and Pierdzioch 2006).

While several articles have examined the impact of the political environment on stock market volatility (see, e.g., Füss and Bechtel 2008; Leblang and Mukherjee 2005; Bialkowski, Gottschalk, and Wisniewski 2008), our article differs in several critical ways. Whereas most existing studies rely on a cross-section of countries and examine the economy-wide responses to political events, we focus on industry responses, as it is intuitive to expect some sectors to be more affected by political events than others. We develop several measures of industry-level exposure to local and global political events and differentiate between various political factors, such as elections, party orientation, political risk, labor legislation, and the degree of autocracy. Our results show that industries that are sensitive to political factors are more volatile during periods of higher political uncertainty (e.g., when national elections are held).[3] We select three industry-level dimensions that affect the efficiency of firm operations and are strongly influenced by domestic and foreign politics: 1) international trade exposure—as a pass-through channel for local and foreign political events; 2) sensitivity to institutional quality in a country—as a measure of how domestic politics shape the contractual environment of a business; and 3) labor intensity—as labor is an essential factor of production and labor legislation is closely related to domestic politics.

Disaggregating the analysis at the industry level, as we do in this article, is important for two reasons: First, it allows us to identify the channels through which regular political uncertainty is reflected in volatility, as opposed to the

[2] The origin of the term "peso problem" is disputed. Sill (2000) attributes it to Milton Friedman in reference to the implied expectation of abandoning the fixed rate between the Mexican peso and the U.S. dollar in the 1970s, which could explain the persisting interest differential between Mexican and U.S. funds. However, Paul Krugman claims the term was coined in the Massachusetts Institute of Technology graduate student lunchroom sometime in 1975–1976; see http://krugman.blogs.nytimes.com/2008/07/15/trivial-intellectual-history-blogging/.

[3] A similar political sensitivities approach is employed by Beaulieu, Cosset, and Essaddam (2005) for the sample of Quebec firms in Canada. The authors document larger volatility for less mobile companies.

impact of dramatic shocks, such as wars and revolutions. Second, it partially mitigates the bias due to omitted country- and industry-specific characteristics. The main parameters in our analysis are the measures of industry exposure to political outcomes. In our empirical analysis, we interact the exposure measures with country-level political variables.

Another important contribution our article makes to the literature is that we disentangle the impact of domestic and foreign political events. We begin our examination by considering the effects of local and global political factors in the international trade framework. First, we measure the dependence of an industry on export sales and develop a series of arguments about the impact of politics on a given sector, depending on its international trade reliance. There are several reasons why foreign and domestic political factors influence the volatility of trade-dependent industries. Political uncertainty abroad can increase domestic firms' return volatility if firms expect to reduce exports when their foreign partners face greater political uncertainty. On the other hand, an export-dependent sector that has established ties with entrenched trading partners in an autocratic regime may enjoy greater predictability of export-generated cash flows and, as a result, lower volatility. With regard to domestic politics, preferential domestic trade regulation may be subject to policy uncertainty. In this case, trade-dependent industries would experience greater volatility if a regime change is likely to lead to abrupt redistributive policies. Alternatively, autocratic domestic governments that favor a given industry (e.g., by subsidizing its international trade) can improve its cash flow stability and lower stock return volatility.

We document that the volatility of more export-oriented industries is higher when foreign elections take place or when overall political risk in trading partner countries is larger. Therefore, trade exposure transfers some of the uncertainty that is introduced by foreign elections and overall foreign political risk into the return volatility of domestic firms. We find that global political risk and foreign election uncertainty are more strongly related to idiosyncratic, rather than to systematic, volatility. This result suggests that while the managers of trade-dependent companies can potentially diversify political risks through an optimal selection of trading partners, the benefits of such diversification are limited.[4] On the other hand, domestic political risk and election uncertainty are more related to systematic return volatility. We also document that export-intensive industries are less volatile when trading-partner countries are more autocratic. This stability effect of autocratic regimes may capture established trade relationships with autocratic trading partners, where local regimes have agreed to provide and protect a strong market position for a given domestic sector.

4 Similarly, Desai, Foley, and Hines (2008) argue that opportunities for diversification through foreign subsidiaries are incomplete because the number of such subsidiaries is limited, and country risks are correlated. However, it is possible that investors diversify the remaining risk through the selection of securities in their portfolios.

Next, we investigate the impact of politics on volatility through institutional channels. We rely on the argument that political outcomes affect the quality of institutions and not all industries are equally reliant on the institutional environment (Blanchard and Kremer 1997). The industries that have complex input structures are more likely to have their transactions distorted when the contract enforcement environment is weak, as they find it costlier to establish long-term relationships and vertical integration as a substitute for contracts. Political risk may increase the cost of establishing such relationships or threaten existing ones, as the balance of political power shifts. We establish the fact that industries that are more dependent on efficient contracts exhibit greater volatility during periods of domestic elections and high political risk but not under autocratic governments, which indicates the stability effect of autocratic regimes.

Finally, an important part of the political environment in general, and political party orientation in particular, is the stance toward labor legislation. Political parties differ in their policy priorities. It is argued that right-wing parties cater to upper-class voters, while left-wing parties implement redistributive policies to the working class (Alesina, Roubini, and Cohen 1993; Alt and Chrystal 1983). Botero et al. (2004) document a link between ruling party orientation and the extent of labor regulation, where left-wing parties are associated with tighter labor rules. Therefore, more stringent labor regulations (or anticipation thereof) or uncertainty about future party orientation during election periods can increase uncertainty with regard to future cash flows of labor-intensive industries, contributing to higher volatility for these industries. We observe that labor-intensive industries exhibit higher volatility under left governments and in countries with more rigid employment laws. The increase in total return volatility of labor- and contract-dependent industries is driven by its systematic part. This result implies that the domestic political risk of these industries translates into nondiversifiable risk.

Existing articles explain certain volatility patterns through dramatic political events, such as revolutions and wars, or the anticipation of such events (Voth 2002; Bittlingmayer 1998; Mei and Guo 2004).[5] We, on the other hand, show that even less dramatic political events and characteristics, such as regular election cycles, rotation of different parties in power, or incremental changes in political risk scores, can explain differential levels of volatility across industries. Moreover, unlike existing studies that examine the relation between politics and stock market volatility for a single country (Bailey and Chung 1995; Füss and Bechtel 2008; Leblang and Mukherjee 2005; Herron 2000) or a small group of developed countries (Bialkowski, Gottschalk, and Wisniewski 2008; McGillivray 2003), our article provides evidence based on a sample of fifty countries, including both developed and developing economies.

[5] A notable exception is a study by Julio and Yook (2011), who use data on regular elections to examine their effect on investment cycles.

We subject our findings to a battery of robustness checks. We account for potential endogeneity between economic and political variables and possibility of early elections. We also include a number of control variables and account for potential interdependence of political sensitivity measures.

Our results confirm that political outcomes influence industry return volatility. Political risk is translated into greater return volatility, but the mechanism is not uniform, with some industries affected more than others. This is an important result because return volatility plays a paramount role in investment and risk-management decisions and affects equilibrium outcomes of asset pricing models.

The results have several theoretical and practical implications. We identify additional business sector characteristics that affect return volatility—both its systematic and idiosyncratic parts. The systematic volatility results indicate that exposure to international trade, the complexity of contractual structure, and labor intensity can increase the sensitivity to the market factor when political uncertainty is higher. If one focuses on systematic risk in modeling asset returns, our contract enforcement sensitivity and labor intensity results imply the ability to gauge portfolio exposures to expected domestic political uncertainty. On the other hand, if total risk or idiosyncratic risk is priced, our global trade exposure findings point to channels for this effect and invite further formal asset pricing tests on determining whether international trade is in fact the driver of this risk.[6] However, we note that a full examination of this argument, which is outside the scope of this article, would require different regressions that link the pricing factor to the level, rather than the volatility of returns. Moreover, this article has implications for corporate financial decision-making, as we show that the choice to engage in trade with international partners or invest in lines of business with greater input or labor dependence can increase volatility and can thereby affect the cost of capital.

The rest of the article is organized as follows: Section 1 introduces the industry-level sensitivities to political factors. Section 2 describes the empirical setup, the construction of the volatility measures, and country political variables. Section 3 reports the results. Section 4 concludes.

## 1. Industry Sensitivities to Political Environment: Motivation and Construction

We argue that industries unevenly respond to various sources of local and global political uncertainty, such as elections, strength of democratic institutions, ruling party orientation, and overall political risk. We now introduce

[6] In an attempt to extend the classical asset pricing framework, various studies look for evidence of additional priced factors, such as common market index volatility, referred to as volatility risk (see, e.g., Bollerslev, Tauchen, and Zhou 2009; Carr and Wu 2009). There is also a growing body of literature on idiosyncratic risk as a priced factor. Merton (1987) argues that, since investors do not hold fully diversified portfolios, they should be compensated for idiosyncratic risk. Empirically, Ang et al. (2009) show that firms with high idiosyncratic volatilities have lower returns, while Fu (2009) documents higher returns.

three industry-level sensitivities to political uncertainty: international trade exposure, contract enforcement sensitivity, and labor intensity.

### 1.1 International trade exposure

Engaging in trade is costly and risky. It requires investment in distribution channels, promotion campaigns, and market research. As political factors vary, more trade-dependent sectors face larger risks as the result of unexpected change in contractual agreements and regulations (e.g., subsidies, licensing agreements). If trading partners' (global) political uncertainty increases, the variability of domestic firms' cash flows can increase in case these firms' exports drop in response to the political uncertainty of foreign partners. Consistent with this view, trade flows have been documented to be two- to threefold more volatile than GDP (Engel and Wang 2011). Therefore, on average, firms that rely on exports are vulnerable to greater disruptions in demand, relative to their peers who rely on domestic demand.

Furthermore, Alessandria, Kaboski, and Midrigan (2010) show that participants in international trade face more severe inventory management problems. When firms face difficulties in promptly adjusting inventory levels, a sudden stop in orders may force foreign suppliers to reduce their labor force or keep capacity idle and thereby result in greater volatility (Escaith, Lindenberg, and Miroudot 2010). Consistent with the above arguments, Desai, Foley, and Hines (2008) document that aggregate political risk across foreign subsidiaries is associated with greater variability of fundamentals of multinational corporations. Thus, foreign political factors can influence the volatility of trade-dependent industries.

To illustrate how domestic political uncertainty affects volatility, consider the case of export subsidization. When new politicians come to power, they may shift subsidies to connected firms, which may cause old exporters to go out of business. This effect should show up in industry-level data as a temporary disruption in export flows around an election year, while rearrangements take place. One can think of export uncertainty as facing additional regulatory obstacles (acquiring subsidies, licensing, standardization, etc.) when firms tap into foreign markets. Even when export regulations do not play a role for certain sectors, a source of uncertainty arises for exporting firms if a foreign buyer perceives that their supplier may be facing production difficulties that are due in part to a volatile domestic political climate.[7]

The political economy literature contributes to our arguments by establishing the effects of political regime (democratic vs. autocratic) on trade policy and trade flows. Given the complexity and interdependence of political and economic outcomes, where trade flows are both a result and an influence,

[7] One can argue, however, that more export-oriented industries are less affected by domestic political uncertainty than purely domestic firms, as they can diversify some of this uncertainty through foreign sales. Whether export-oriented industries experience higher or lower volatility is an empirical question.

the existing theoretical setups vary in testable implications. In democratic systems, different parties may attempt to modify trade policies in favor of their constituencies but can be constrained by democratic mechanisms, which results in either higher or lower volatility (Persson 1998). In autocracies, policymaking is often uncontested, favoring the corporate elites that are supportive of the current regime (Tullock 1987). Industries that operate in autocratic environments would be able to rely on export markets only if they are supported by government subsidization or licensing. Therefore, established industries with high export shares in autocratic countries may exhibit lower volatility than do less supported industries. In addition, industries that have established ties with trading partners in autocratic regimes may also enjoy more stable cash flows and lower volatility.

Thus, we expect more trade-dependent industries to exhibit higher volatility when exposed to both higher domestic and foreign political uncertainty. With regard to the strength of democratic institutions, volatility may be lower or higher in more trade-dependent industries in autocratic countries.

Our primary sample consists of fifty-seven Standard Industry Classification (SIC) industries spread over fifty countries that are covered by the Datastream and Worldscope databases, for which we can calculate volatility measures and obtain firm accounting information.

We compute the export exposure of industrial sectors by taking the proportion of the export flows for each year over the period from 1993 (the beginning year of export data) through 2006.[8] We treat the export flows as being descriptive of the industry's dependence on exports as well as a manifestation of domestic trade policy. We test the differential effect of domestic (global) politics on industry return volatility by interacting industry trade dependence and domestic (global) political variables. First, we compute the value of exports (in US$) of industry *ind* in country $c$ directed to trading partner $j$ for year $t$ ($t$ = 1993, . . ., 2006) scaled by the industry's total value of sales (in US$),

$$TRADE^{c}_{ind,j,t} = \frac{EXP^{c}_{ind,j,t}}{SALES^{c}_{ind,t}}. \tag{1}$$

The export data (*EXP*) at the industry level are obtained from the UNCTAD/WTO PC-TAS database compiled by COMTRADE. The value of industrial sales (*SALES*) data are from the United Nations' Industrial Commodity Production Statistical database. To avoid the impact of outliers, we winsorize the export and sales data at the 1% and 99% levels. The trade variables are available for 29 two-digit SIC industries.

8 We further define the variables in Table 1.

**Table 1**
**Variables, definitions, and sources**

| Variables | Definitions | Sources |
|---|---|---|
| *Volatility measures* | | |
| Total volatility | Average annualized industry return volatility calculated as industry average of firm standard deviations of weekly returns multiplied by the square root of 52, annual from 1990–2006. We drop returns lower than -75% and greater than +75%. Returns are measured in US dollars, and a firm is included if it has at least twenty-six weeks of return data. For election years, volatility is centered on election dates. | Computed by authors. Return data are from Datastream. |
| Idiosyncratic volatility | Average annualized idiosyncratic industry return volatility calculated as industry average of firm standard deviations of unexplained (by MSCI World index and MSCI local country index) component of weekly returns multiplied by the square root of 52, annual from 1990–2006. Returns are measured in US dollars, and a firm is included if it has at least twenty-six weeks of return data. For election years, volatility is centered on election dates. | |
| Systematic volatility | Average annualized systematic industry return volatility calculated as industry average of firm standard deviations of explained (by MSCI World index and MSCI local country index) component of weekly returns multiplied by the square root of 52, annual from 1990–2006. Stock returns are measured in US dollars, and a firm is included if it has at least twenty-six weeks of return data. For election years, volatility is centered on election dates. | |
| *Political sensitivity measures* | | |
| International trade exposure | The ratio of the value of exports to sales in an industry, annual from 1993 to 2006. Export data are classified according to the Standard International Trade Classification (SITC). Sales data are organized by commodity type using the International Standard Industrial Classification (ISIC). We convert three-digit ISIC codes to two-digit SITC codes, and then two-digit SITC codes to two-digit SIC codes using computer codes provided by Jon Haveman http://www.haveman.org. We also check the product-industry correspondence manually. | Computed by authors. Export data are from UNCTAD/WTO PC-TAS. Sales data are from UN Industrial Commodity Production Statistical database. |
| Sensitivity to contract enforcement | One minus the Herfindahl index of industry input shares. It equals zero if an industry uses inputs from only one industry, and it approaches one as the number of industries supplying inputs increases. Annual values from 1998–2006. | Computed by authors. Data are obtained from U.S. Input–Output tables compiled by the Bureau of Economic Analysis. |
| Labor intensity | The ratio of the value of labor inputs to the total value of inputs (labor inputs, capital services, material inputs, and energy inputs), annual from 1990–2005. | Jorgenson (1990) and Jorgenson and Stiroh (2000). Data are available at http://post.economics.harvard.edu/faculty/jorgenson/data.html. |

(*continued*)

**Table 1**
**Continued**

| Variables | Definitions | Sources |
|---|---|---|
| *Political variables* | | |
| Autocracy | An annual index ranging from -10 to +10, with larger values representing more democratic governments. POLITY records information on the degree of competitiveness of political processes, openness of political institutions, and constraints imposed on government. We subtract the original index from ten so larger values correspond to more autocratic governments. The modified index ranges from 0–20. | POLITY |
| Political risk | An annual index accounting for government stability, socioeconomic conditions, investment risk, risk of internal conflict, risk of external conflict, corruption, the presence of the military in politics, religious tensions, ethnic tensions, democratic accountability and bureaucracy quality. The original index ranges from 0–100. We subtract the original index from 100 so larger values correspond to higher political risk. | International Country Risk Guide |
| National elections | A dummy variable equal to one during an election year (presidential elections for presidential systems and parliamentary elections for parliamentary systems) and zero otherwise. The political system is classified as presidential when 1) the chief executive is not elected or 2) presidents are elected directly or by an electoral college in the event there is no prime minister. In systems with both a prime minister and a president, exact classification depends on the veto power of the president and the power of the president to appoint a prime minister and dissolve parliament. Systems in which the legislature elects the chief executive are classified as parliamentary. | World Bank Database of Political Institutions, Journal of Democracy, Elections around the World, Election Guide, CIA Factbook, the PARLINE Database on National Parliaments, Keesing's Record of World Events. |
| Party orientation | A dummy variable equal to one in years when the chief executive's party orientation is classified as "left" and zero otherwise. Party orientation is determined according to the party of chief executive using the following rule: Right for parties that are defined as conservative, Christian-Democratic, or right-wing; Left for parties that are defined as communist, socialist, social-democratic, or left-wing; Center for parties that can be best described as centrist. Refer to Beck et al. (2001) for further details. | World Bank Database of Political Institutions, Journal of Democracy, Elections around the World, Election Guide, CIA Factbook, the PARLINE Database on National Parliaments, Keesing's Record of World Events. |
| Rigidity of Employment | An annual index ranging from 0–100, where larger values corresponding to more rigid employment regulations. The index is available from 2004–2006. It is calculated as average values of three sub-indexes: difficulty of hiring index (applicability and maximum duration of fixed-term contracts and minimum wage for trainee and first-time employees); rigidity of hours index (scheduling of nonstandard work hours and annual paid leave); and difficulty of firing index (notification and approval requirements for termination of a redundant worker or a group of redundant workers, obligation to reassign or retrain and priority rules for redundancy and reemployment). | Doing Business Report database (World Bank) |

(*continued*)

**Table 1**
**Continued**

| Variables | Definitions | Sources |
|---|---|---|
| *Control variables* | | |
| Exchange rate risk | An annual index of exchange rate instability. The original index ranges from zero (large percentage changes in exchange rate against the US dollar over the most recent twelve-month period) to ten (small percentage changes). We subtract the original index from ten so that larger values correspond to greater exchange rate risk (larger percentage changes in exchange rate). | International Country Risk Guide |
| Efficiency of law | An annual index of law and order. The index ranges from 0–6. Larger values correspond to better quality of the legal environment. The law sub-component is an assessment of the strength and impartiality of the legal system. The order sub-component is an assessment of popular observance of the law. | |
| Industry size | The log of industry total assets (sum of firms' total assets in an industry) expressed in 2000 US dollars. | Worldscope |
| Industry leverage | The ratio of industry long-term debt (sum of long term debts of all firms in an industry) to industry total assets. | |
| Industry diversification | An average number of two-digit SIC segments a company operate in, weighted by total assets. | |
| Equity dependence | The fraction of capital expenditures financed with net equity. | |
| Skill dependence | One minus the proportion of unskilled employees in German industries. | Outlon (1996) |
| Financial development | The sum of stock market capitalization and private credit relative to GDP. | World Development Indicator database (World Bank) |
| Ownership concentration | An average proportion of shares held by the five largest shareholders in a country's twenty largest publicly traded companies. | OSIRIS |
| GDP per capita | Per capita GDP expressed in 2000 US dollars. | World Development Indicator database (World Bank) |

Next, we sum up the trade proportions of industry *ind* across all of its trading partners $j$ to form total industry trade exposure,

$$TRADE^{c}_{ind,t} = \sum_{j} TRADE^{c}_{ind,j,t} \quad . \tag{2}$$

That is, $TRADE^{c}_{ind,t}$ represents the total share of exports of an industry to all trading partners. The interaction term between trade exposure and *domestic* politics is formed as the product of two variables, $TRADE^{c}_{ind,t} \times POLITICAL^{c}_{t}$, where $POLITICAL^{c}_{t}$ is the value of the political variable (elections, autocracy, or political risk) that pertains to the *domestic* country $c$ for year $t$. Throughout the tables, we call this variable *interaction of trade exposure with* a *national political variable* (*national elections, autocracy,* or *political risk*).

Based on the individual trade shares to each trading partner and political variables pertaining to each (foreign) trading partner, we compute an industry-specific index of exposure to global politics as

$$TRADE^{c}_{ind,t} = \sum_{j} \left( TRADE^{c}_{ind,j,t} \times POLITICAL^{c}_{j,t} \right) \quad , \qquad (3)$$

where $POLITICAL^{c}_{j,t}$ is the value of the political variable (elections, autocracy, and political risk) that pertains to each trading partner $j$ for year $t$. We call this variable *interaction of trade exposure with* a *global political variable* (*global elections, autocracy,* and *political risk*).

To further illustrate this point, consider the electronics industry in Malaysia. For the year 2000, the aggregate political risk for Malaysia was equal to thirty-three; the average across fifty sample countries was twenty-six. A large proportion of production (52%) was exported. Consider Malaysia's top three trading partners: the United States (18% relative to the amount produced in the electronics industry), Singapore (15%), and Japan (11%).[9] Furthermore, the political risk indexes for these countries in 2000 are thirteen for the United States, fourteen for Singapore, and nineteen for Japan. The interaction of trade exposure for the Malaysian electronics industry with *domestic* political risk is equal to $0.52 \times 33 = 17.16$. The interaction for the electronics industry with *global* political risk is then $[0.18 \times 13 + 0.15 \times 14 + 0.11 \times 19] = 6.53$. Extending this example to the case of elections, national elections were held in the United States and Japan in 2000, while there was no election in Malaysia. Therefore, the interaction of trade exposure with national elections is zero. The interaction of trade exposure with global elections is $[0.18 \times 1 + 0.15 \times 0 + 0.11 \times 1] = 0.29$.

Industry average values of the trade exposure measure are reported in column 6 of Table 2 (Panel A). The values of trade exposure exhibit large variation across industries, reflecting a multitude of factors, such as specialization, comparative advantage, country endowments, etc. Across all countries, industries, and years, the average value of trade exposure is 5.44%. Some industries consistently represent a large proportion of trade across countries, e.g., electronic and electrical equipment (16.64%) and industrial and computer equipment (9.57%). Industries that have consistently low trade shares are building materials (2.41%) and electric, gas, and sanitary services (2.28%).

### 1.2 Sensitivity to contract enforcement

The efficiency of contract enforcement is another channel for the effect of politics on industry-level volatility. Businesses efficiently function in environments where property rights are well protected and contracts are enforced. Property rights protection and contract enforcement depend on the quality of institutions, which are in turn affected by political forces.

The need for good, quality institutions varies by industry, depending upon its input complexity (Blanchard and Kremer 1997; Levchenko 2007; Rajan and Subramanian 2007). The more complex the production structure of a business,

[9] We consider the top three trading partners to keep this example simple.

**Table 2**
**Descriptive statistics**

Panel A: Descriptive statistics by industry

| Industry name | SIC code | Total volatility | Idiosyncratic volatility | Systematic volatility | International trade exposure (%) | Sensitivity to contract enforcement | Labor intensity | Number of country-years | Number of firm-years |
|---|---|---|---|---|---|---|---|---|---|
| Agricultural crops | 100 | 0.444 | 0.408 | 0.148 | 5.03 | – | 0.245 | 319 | 1, 130 |
| Agriculture livestock | 200 | 0.446 | 0.415 | 0.143 | 2.76 | 0.899 | – | 510 | 1, 308 |
| Forestry | 800 | 0.389 | 0.355 | 0.136 | – | 0.495 | – | 292 | 904 |
| Fishing and hunting | 900 | 0.605 | 0.569 | 0.180 | 3.17 | – | – | 136 | 533 |
| Metal mining | 1000 | 0.556 | 0.505 | 0.196 | 3.40 | 0.905 | 0.183 | 415 | 8, 481 |
| Coal mining | 1200 | 0.525 | 0.474 | 0.188 | 2.58 | – | 0.291 | 228 | 1, 011 |
| Oil and gas extraction | 1300 | 0.511 | 0.456 | 0.194 | 7.47 | 0.799 | 0.132 | 415 | 6, 317 |
| Quarrying of minerals | 1400 | 0.498 | 0.452 | 0.179 | 4.66 | 0.913 | 0.283 | 311 | 1, 720 |
| Building construction | 1500 | 0.448 | 0.400 | 0.177 | – | 0.933 | 0.369 | 1, 299 | 9, 743 |
| Food products | 2000 | 0.384 | 0.340 | 0.154 | 6.75 | 0.860 | 0.174 | 753 | 11, 281 |
| Tobacco products | 2100 | 0.359 | 0.318 | 0.147 | 3.26 | – | 0.154 | 282 | 1, 015 |
| Textile mill products | 2200 | 0.472 | 0.427 | 0.171 | 5.47 | 0.823 | 0.250 | 562 | 5, 041 |
| Apparel | 2300 | 0.446 | 0.403 | 0.165 | 7.29 | – | 0.303 | 587 | 2, 809 |
| Lumber and wood products | 2400 | 0.446 | 0.402 | 0.169 | 4.01 | 0.813 | 0.257 | 408 | 1, 503 |
| Furniture and fixtures | 2500 | 0.461 | 0.422 | 0.160 | 3.04 | 0.923 | 0.372 | 433 | 1, 928 |
| Paper and allied products | 2600 | 0.419 | 0.368 | 0.174 | 4.41 | 0.861 | 0.255 | 621 | 4, 126 |
| Printing and publishing | 2700 | 0.438 | 0.396 | 0.159 | – | 0.931 | 0.423 | 552 | 3, 892 |
| Chemicals and allied products | 2800 | 0.456 | 0.406 | 0.179 | 7.81 | 0.832 | 0.195 | 701 | 19, 467 |
| Petroleum refining | 2900 | 0.402 | 0.321 | 0.211 | 4.36 | 0.512 | 0.057 | 440 | 1, 996 |
| Rubber and plastics products | 3000 | 0.462 | 0.409 | 0.187 | 6.28 | 0.826 | 0.333 | 561 | 4, 083 |

(*continued*)

**Table 2**
**Continued**

Panel A: Descriptive statistics by industry

| Industry name | SIC code | Total volatility | Idiosyncratic volatility | Systematic volatility | International trade exposure (%) | Sensitivity to contract enforcement | Labor intensity | Number of country-years | Number of firm-years |
|---|---|---|---|---|---|---|---|---|---|
| Leather and leather products | 3100 | 0.452 | 0.400 | 0.185 | 3.8 | 0.830 | 0.245 | 262 | 1, 201 |
| Stone, clay, and glass | 3200 | 0.436 | 0.376 | 0.189 | 8.14 | – | 0.344 | 669 | 5, 410 |
| Primary metal industries | 3300 | 0.458 | 0.401 | 0.192 | 7.77 | 0.791 | 0.195 | 663 | 7, 853 |
| Fabricated metal products | 3400 | 0.458 | 0.413 | 0.168 | 3.98 | 0.847 | 0.303 | 517 | 4, 928 |
| Industrial and computer equipment | 3500 | 0.490 | 0.443 | 0.181 | 9.57 | 0.910 | 0.330 | 630 | 13, 960 |
| Electronic and electrical equipment | 3600 | 0.506 | 0.452 | 0.194 | 16.64 | 0.909 | 0.274 | 607 | 18, 629 |
| Transportation equipment | 3700 | 0.441 | 0.391 | 0.176 | 8.89 | 0.819 | 0.139 | 602 | 7, 279 |
| Measuring instruments | 3800 | 0.468 | 0.425 | 0.173 | 4.91 | 0.843 | 0.501 | 428 | 8, 799 |
| Miscellaneous industries | 3900 | 0.490 | 0.449 | 0.171 | 4.17 | 0.939 | 0.272 | 437 | 2, 811 |
| Railroad transportation | 4000 | 0.315 | 0.281 | 0.124 | 3.32 | 0.913 | 0.354 | 259 | 917 |
| Highway passenger Transportation | 4100 | 0.392 | 0.360 | 0.135 | – | 0.935 | – | 292 | 1, 282 |
| Motor freight transportation | 4200 | 0.413 | 0.373 | 0.155 | – | 0.896 | – | 393 | 2, 361 |
| Water transportation | 4400 | 0.417 | 0.373 | 0.163 | – | 0.851 | – | 574 | 2, 990 |
| Transportation by air | 4500 | 0.452 | 0.395 | 0.191 | – | 0.852 | – | 510 | 1, 909 |
| Pipelines, except natural gas | 4600 | 0.365 | 0.338 | 0.121 | – | 0.884 | – | 134 | 724 |
| Transportation services | 4700 | 0.463 | 0.413 | 0.178 | – | 0.930 | – | 499 | 2, 477 |
| Communications | 4800 | 0.471 | 0.386 | 0.233 | – | 0.796 | 0.223 | 637 | 5, 818 |
| Electric, gas, and sanitary services | 4900 | 0.393 | 0.330 | 0.184 | 2.28% | 0.807 | 0.191 | 642 | 7, 643 |
| Wholesale trade-durable goods | 5000 | 0.469 | 0.421 | 0.179 | | 0.913 | 0.453 | 626 | 10, 680 |
| Building materials | 5200 | 0.424 | 0.388 | 0.146 | 2.41% | | – | 235 | 1, 013 |
| Eating and drinking places | 5800 | 0.443 | 0.401 | 0.164 | – | 0.847 | – | 367 | 2, 908 |

(*continued*)

**Table 2**
**Continued**

Panel A: Descriptive statistics by industry

| Industry name | SIC code | Total volatility | Idiosyncratic volatility | Systematic volatility | International trade exposure (%) | Sensitivity to contract enforcement | Labor intensity | Number of country-years | Number of firm-years |
|---|---|---|---|---|---|---|---|---|---|
| Miscellaneous retail | 5900 | 0.477 | 0.432 | 0.165 | – | 0.922 | – | 477 | 3, 530 |
| Depository institutions | 6000 | 0.355 | 0.285 | 0.189 | – | 0.897 | 0.223 | 768 | 15, 984 |
| Security and commodity brokers | 6200 | 0.444 | 0.384 | 0.190 | – | 0.819 | – | 596 | 4, 676 |
| Insurance carriers | 6300 | 0.364 | 0.304 | 0.176 | – | 0.372 | – | 559 | 5, 005 |
| Real estate | 6500 | 0.427 | 0.377 | 0.173 | – | 0.920 | – | 651 | 10, 511 |
| Investment offices | 6700 | 0.436 | 0.385 | 0.172 | – | 0.382 | – | 644 | 12, 089 |
| Hotels | 7000 | 0.437 | 0.389 | 0.174 | – | 0.946 | 0.481 | 510 | 2, 636 |
| Business services | 7300 | 0.537 | 0.489 | 0.194 | – | 0.928 | – | 612 | 21, 625 |
| Motion pictures | 7800 | 0.545 | 0.502 | 0.188 | – | 0.743 | – | 263 | 1, 530 |
| Amusement services | 7900 | 0.477 | 0.436 | 0.162 | – | 0.921 | – | 457 | 2, 998 |
| Health services | 8000 | 0.504 | 0.463 | 0.171 | – | 0.936 | – | 390 | 2, 682 |
| Legal services | 8100 | 0.649 | 0.610 | 0.185 | – | 0.892 | – | 86 | 417 |
| Educational services | 8200 | 0.556 | 0.517 | 0.178 | – | 0.884 | – | 266 | 1, 328 |
| Social services | 8300 | 0.496 | 0.472 | 0.131 | – | 0.939 | – | 142 | 662 |
| Museums and art galleries | 8400 | 0.385 | 0.369 | 0.093 | – | 0.819 | – | 120 | 469 |
| Membership organizations | 8600 | 0.516 | 0.471 | 0.195 | – | 0.883 | – | 80 | 411 |
| **Average** | | 0.456 | 0.409 | 0.171 | 5.44% | 0.841 | 0.275 | 464 | 5, 025 |
| **Minimum** | | 0.315 | 0.281 | 0.093 | 2.28% | 0.372 | 0.057 | | |
| **Maximum** | | 0.649 | 0.610 | 0.233 | 16.64% | 0.946 | 0.501 | | |
| **Total** | | | | | | | | 26, 429 | 286, 433 |
| **Number of industries** | | 57 | 57 | 57 | 29 | 50 | 32 | | |

This table contains summary statistics by industry (average values across countries and years from 1990 to 2006). SIC code is two-digit Standard Industry Classification code. All of the variables are defined in Table 1. *Number of country-years* is the aggregate number of country observations across industries and sample years. *Number of firm-years* is the aggregate number of firm observations across industries and sample years used to calculate the volatility measures. The last row contains the number of industries for each variable.

**Table 2**
**Continued**

Panel B: Descriptive statistics by country

| Country | GDP per capita (in 2000 US$) | Total volatility | Idiosyncratic volatility | Systematic volatility | Availability of return series | Autocracy | Political risk | Number of industry-years | Number of firm-years |
|---|---|---|---|---|---|---|---|---|---|
| Argentina | 7, 334 | 0.497 | 0.398 | 0.268 | 1990–2006 | 2.333 | 30.147 | 318 | 774 |
| Australia | 19, 854 | 0.468 | 0.432 | 0.159 | 1990–2006 | 0.000 | 15.647 | 982 | 12, 827 |
| Austria | 22, 684 | 0.309 | 0.269 | 0.136 | 1990–2006 | 0.000 | 13.559 | 386 | 961 |
| Belgium | 21, 384 | 0.323 | 0.292 | 0.118 | 1990–2006 | 0.000 | 18.412 | 493 | 1, 497 |
| Brazil | 3, 641 | 0.621 | 0.524 | 0.291 | 1990–2006 | 2.000 | 34.206 | 580 | 2, 351 |
| Canada | 21, 989 | 0.516 | 0.490 | 0.139 | 1990–2006 | 0.000 | 15.353 | 1, 021 | 13, 788 |
| Chile | 4, 572 | 0.374 | 0.321 | 0.178 | 1990–2006 | 1.333 | 25.353 | 537 | 1, 961 |
| China | 880 | 0.442 | 0.424 | 0.109 | 1990–2006 | 17.000 | 33.706 | 655 | 12, 600 |
| Colombia | 2, 427 | 0.453 | 0.322 | 0.290 | 1992–2006 | 3.000 | 45.700 | 137 | 300 |
| Czech Rep. | 5, 507 | 0.387 | 0.300 | 0.210 | 1994–2006 | 0.167 | 20.846 | 100 | 184 |
| Denmark | 28, 130 | 0.344 | 0.307 | 0.137 | 1990–2006 | 0.000 | 13.088 | 482 | 2, 180 |
| Egypt | 1, 332 | 0.469 | 0.393 | 0.235 | 1995–2006 | 15.500 | 38.206 | 93 | 212 |
| Finland | 21, 905 | 0.374 | 0.337 | 0.139 | 1990–2006 | 0.000 | 10.853 | 500 | 1, 423 |
| France | 21, 358 | 0.408 | 0.382 | 0.122 | 1990–2006 | 1.000 | 21.088 | 981 | 8, 167 |
| Germany | 22, 012 | 0.363 | 0.337 | 0.115 | 1990–2006 | 0.000 | 16.265 | 909 | 9, 317 |
| Greece | 11, 329 | 0.518 | 0.482 | 0.158 | 1990–2006 | 0.000 | 24.594 | 705 | 3, 321 |
| Hungary | 4, 541 | 0.495 | 0.429 | 0.197 | 1991–2006 | 0.000 | 21.706 | 171 | 310 |
| India | 433 | 0.559 | 0.497 | 0.231 | 1990–2006 | 1.000 | 42.588 | 594 | 5, 959 |
| Indonesia | 811 | 0.602 | 0.526 | 0.251 | 1990–2006 | 7.667 | 45.324 | 650 | 3, 177 |
| Ireland | 21, 891 | 0.401 | 0.373 | 0.124 | 1990–2006 | 0.000 | 14.882 | 336 | 801 |
| Israel | 17, 998 | 0.484 | 0.436 | 0.188 | 1990–2006 | 0.333 | 38.235 | 413 | 1, 788 |
| Italy | 18, 309 | 0.358 | 0.310 | 0.160 | 1990–2006 | 0.000 | 23.588 | 623 | 2, 803 |
| Japan | 36, 289 | 0.425 | 0.369 | 0.189 | 1990–2006 | 0.000 | 17.441 | 1, 045 | 45, 751 |
| Luxembourg | 42, 342 | 0.344 | 0.319 | 0.113 | 1991–2006 | 0.000 | 7.588 | 236 | 371 |
| Malaysia | 3, 765 | 0.480 | 0.397 | 0.249 | 1990–2006 | 7.000 | 27.412 | 907 | 10, 009 |
| Mexico | 5, 547 | 0.398 | 0.348 | 0.161 | 1990–2006 | 3.167 | 29.429 | 384 | 1, 057 |
| Morocco | 1, 338 | 0.287 | 0.238 | 0.140 | 1993–2006 | 16.250 | 32.353 | 93 | 255 |
| Netherlands | 22, 286 | 0.344 | 0.310 | 0.129 | 1990–2006 | 0.000 | 12.059 | 594 | 2, 209 |

(*continued*)

**Table 2**
**Continued**

Panel B: Descriptive statistics by country

| Country | GDP per capita (in 2000 US$) | Total volatility | Idiosyncratic volatility | Systematic volatility | Availability of return series | Autocracy | Political risk | Number of industry-years | Number of firm-years |
|---|---|---|---|---|---|---|---|---|---|
| New Zealand | 12, 805 | 0.417 | 0.385 | 0.138 | 1990–2006 | 0.000 | 14.559 | 584 | 1, 150 |
| Norway | 34, 932 | 0.423 | 0.382 | 0.158 | 1990–2006 | 0.000 | 13.618 | 427 | 1, 471 |
| Pakistan | 530 | 0.470 | 0.422 | 0.176 | 1991–2006 | 11.083 | 52.382 | 289 | 1, 208 |
| Peru | 1, 996 | 0.358 | 0.337 | 0.096 | 1991–2006 | 5.000 | 41.188 | 183 | 484 |
| Philippines | 959 | 0.541 | 0.505 | 0.162 | 1990–2006 | 2.000 | 36.719 | 472 | 2, 227 |
| Poland | 4, 034 | 0.452 | 0.383 | 0.215 | 1991–2006 | 0.583 | 24.265 | 281 | 803 |
| Portugal | 10, 086 | 0.356 | 0.319 | 0.135 | 1990–2006 | 0.000 | 14.385 | 381 | 716 |
| Russia | 1, 987 | 0.551 | 0.403 | 0.328 | 1994–2006 | 5.250 | 40.833 | 131 | 360 |
| Singapore | 20, 860 | 0.479 | 0.430 | 0.183 | 1990–2006 | 12.000 | 16.324 | 785 | 4, 973 |
| South Africa | 3, 095 | 0.486 | 0.438 | 0.187 | 1990–2006 | 1.000 | 32.235 | 647 | 3, 490 |
| South Korea | 10, 565 | 0.566 | 0.494 | 0.248 | 1990–2006 | 2.500 | 24.912 | 831 | 10, 319 |
| Spain | 13, 452 | 0.337 | 0.297 | 0.141 | 1990–2006 | 0.000 | 23.000 | 588 | 1, 686 |
| Sri Lanka | 794 | 0.469 | 0.372 | 0.258 | 1990–2006 | 4.750 | 48.176 | 140 | 336 |
| Sweden | 26, 118 | 0.424 | 0.372 | 0.184 | 1990–2006 | 0.000 | 13.941 | 622 | 2, 951 |
| Switzerland | 33, 761 | 0.330 | 0.301 | 0.119 | 1990–2006 | 0.000 | 11.765 | 595 | 3, 082 |
| Taiwan | 12, 931 | 0.458 | 0.369 | 0.244 | 1990–2006 | 1.000 | 22.324 | 647 | 9, 752 |
| Thailand | 1, 961 | 0.515 | 0.452 | 0.215 | 1990–2006 | 2.167 | 33.088 | 778 | 5, 031 |
| Turkey | 3, 881 | 0.698 | 0.523 | 0.434 | 1990–2006 | 2.833 | 41.412 | 602 | 2, 748 |
| United Kingdom | 23, 294 | 0.368 | 0.344 | 0.111 | 1990–2006 | 0.000 | 16.353 | 1062 | 19, 998 |
| United States | 32, 454 | 0.506 | 0.499 | 0.144 | 1990–2006 | 0.000 | 17.706 | 1147 | 66, 845 |
| Venezuela | 4, 939 | 0.563 | 0.418 | 0.341 | 1990–2006 | 3.250 | 40.088 | 145 | 239 |
| Zimbabwe | 594 | 0.475 | 0.470 | 0.062 | 1990–2006 | 14.500 | 47.353 | 167 | 211 |
| **Average** | 12, 958 | 0.446 | 0.390 | 0.184 | | 2.913 | 26.325 | 529 | 5, 729 |
| **Minimum** | 433 | 0.287 | 0.238 | 0.062 | | 0 | 7.588 | | |
| **Maximum** | 42, 342 | 0.698 | 0.562 | 0.434 | | 17 | 52.382 | | |
| **Total** | | | | | | | | 26, 429 | 286, 433 |

This table contains summary statistics by country (average values across industries and years from 1990 to 2006). All of the variables are defined in Table 1. *Number of industry-years* is the aggregate number of industry observations across countries and sample years. *Number of firm-years* is the aggregate number of firm observations across countries and sample years used to calculate the volatility measures.

the more practical it is to regulate transactions through contracts versus through long-term relationships and vertical integration. If the institutional quality is poor, industries that have complex input structures are more likely to suffer from poor contract enforcement and have their transactions distorted. Therefore, we expect these industries to exhibit higher volatility when exposed to higher political uncertainty.

To construct the contract enforcement measure, we follow Blanchard and Kremer (1997). They define input complexity by concentration of industry purchases, which is calculated as one minus the Herfindahl index of industry input shares,

$$C_{ind} = 1 - \sum_{k} \phi^2_{ind,k} \,, \tag{4}$$

where $\phi^2_{ind,k}$ is the share of input of industry $k$ in the production of industry *ind*. Contract enforcement sensitivity is zero if the industry uses inputs from only one industry (Herfindahl index of input shares equals 1), and it approaches one as the number of inputs coming from other industries increases and their shares become smaller.

The data used to compute contract enforcement sensitivities are from the U.S. Input-Output tables, as compiled by the Bureau of Economic Analysis. The data are assembled annually from 1998 to 2006 at the two-digit SIC level. This measure is available for fifty industries. The earlier data are not usable because the input–output matrix prior to 1998 was organized by Industrial Organization codes that do not correspond to SIC codes.

Contract enforcement sensitivity is computed by using U.S. data, and the measure is then applied to industries in other countries. Therefore, we assume that a given industry in all of the sample countries has the same underlying production technology and firms do not easily change the input structure of their production process in response to poor institutions.[10]

Contract enforcement sensitivities are reported in column 7 of Table 2 (Panel A). The average value is 0.841. Forestry industry requires few inputs from other industries for production, which results in a low sensitivity score. On the other hand, building construction industry exhibits a high score, which reflects its reliance on numerous inputs from diverse industries.



[10] While this may seem to be a strong assumption, we provide its justification as follows. Consider two possible courses of action for a firm that relies on a wide variety of inputs, and is thereby exposed to additional uncertainty, as its transactions are in danger of being disrupted under low-quality contract enforcement. The firm can adjust its behavior by reducing the number of suppliers. However, even in an environment of weak contract enforcement, a firm that produces a good or service that requires a complex set of inputs is still likely to require inputs from several different industries. Another response for a firm to reduce its dependence on contract enforcement is to internalize operations through vertical integration. However, according to Hart and Moore (1990), although vertical integration mitigates the problem of contract enforcement, it also creates additional transaction costs.

### 1.3 Labor intensity

Labor-related issues often appear on parties' electoral agendas. Voters supply labor, and political parties cater to voters' interests in order to secure votes. We therefore define our third industry-level sensitivity to politics as a measure of an industry's reliance on labor.

One of the key differences between left- and right-wing parties is their attitude toward labor regulation. In fact, in countries where the distinction between "left" and "right" parties is not clear-cut (as could be the case with coalition governments), one of the major factors used in determining a government's party orientation is their stance toward labor regulation. Botero et al. (2004) show that the ruling party orientation and the extent of labor regulation are related. In particular, using cross-country regressions, they find more stringent labor regulation in countries that have a longer history of leftist or centrist governments. Using European data, Rueda (2005) uncovers a similar relation between employment protection and left government partisanship (even after controlling for party fixed effects).

We argue that higher volatility is to be expected in labor-intensive industries under left governments. Consider a case in which the profitability of a certain industry decreases. Under left governments, when labor regulation is stringent and firing workers is costly, companies are incapable of scaling down their labor force and, therefore, their financial losses are going to be exaggerated. Thus, pro-labor legislation is expected to increase volatility of labor-intensive industries.[11]

Periods of national elections are characterized by policy uncertainty (including labor legislation), which in turn manifests into additional uncertainty regarding future cash flows of labor-intensive industries. Therefore, we expect greater volatility in labor-intensive sectors during election periods.

We compute labor intensity for industry *ind* by dividing the value of labor inputs over the total value of production inputs, $vl_{ind}/(vl_{ind} + vk_{ind} + ve_{ind} + vm_{ind})$, where $vl_{ind}$, $vk_{ind}$, $ve_{ind}$, and $vm_{ind}$ denote the values of labor inputs, capital services, and intermediate inputs, such as energy and materials, respectively. Data are obtained from the input–output database developed by Dale W. Jorgenson and described in Jorgenson (1990) and Jorgenson and Stiroh (2000). The authors assembled a detailed dataset of values on labor, capital, energy, and material inputs, using information from the Bureau of Economic Analysis and Bureau of Labor Statistics.[12] The dataset covers



[11] Atanassov and Kim (2009) provide evidence of that. They document that strong union laws lead to asset sales for poorly performing firms in order to prevent large scale layoffs. However, left government orientation may not always be a good predictor of pro-labor legislation (Pagano and Volpin 2005; Bobbio 1996). Therefore, we do not exclusively rely on political party orientation to capture political risk transmission through the labor intensity channel. Instead of the left party indicator variable, we apply several direct indexes that capture the strictness of labor regulation.

[12] The value of labor inputs is computed as the product of hours worked by different types of workers and the hourly wage earned by each type of worker (see Appendix C on pp. 204–207 in Jorgenson and Stiroh 2000). The calculation of the value of capital services is more complex (see Appendix B on pp. 190–204 in Jorgenson

thirty-two sectors at the two-digit SIC level from 1959 to 2005. We use the data from 1990 to 2005.

There are several potential difficulties in the practical implementation of this calculation. The labor intensity of industries could be endogenous to political structures. In other words, in countries where there are stringent labor laws (which in turn could be caused by predominantly left parties being in power), industries may choose to employ fewer workers than they would otherwise employ. Alternatively, extremely labor-intensive production processes could be outsourced to countries with less strict regulation and thereby less expensive labor markets. Our approach of using industry-level labor intensities, as calculated from U.S. data, and applying the intensities to all countries partially alleviates this endogeneity problem. Another concern is that labor intensities may vary across countries because of differences in the cost of labor. We address this issue in the robustness section by using country-specific data on publicly listed firms.

Column 8 of Table 2 (Panel A) reports labor intensity. The average value is 0.275, and the least labor-intensive industry is petroleum refining (0.057), whereas measuring instruments (0.501) and hotels (0.481) are among the most labor-intensive industries.

## 2. Empirical Setup, Volatility, and Country Political Measures

### 2.1 Empirical setup

The regressions we run include the interaction effects of industry-level sensitivities to political factors with local and global country-level political variables. We include industry-, country-, and year-specific fixed effects in order to account for unobserved heterogeneity. We examine whether more politically sensitive industries have larger volatility in countries and years where there is high political uncertainty. The main advantage of this methodology is that by controlling for the fixed effects, the problem of omitted variable bias or model misspecification, which afflicts cross-country regressions, is mitigated. This methodology also enables us to identify specific channels through which politics affect volatility (see Rajan and Zingales 1998).

Although this method does not fully resolve the endogeneity concern caused by the reverse causality between economic performance and political outcomes (the deterioration in economic performance may increase political uncertainty, trigger elections, or define party orientation), it is less plausible that within-country differences in industry volatility have a countrywide effect on politics.

and Stiroh 2000). Capital services are defined as a flow of productive services from the cumulative stock of past investments. The OECD Productivity Manual (2010) provides the following example on p. 52: "... take an example of an office building. Service flows ... are the protection against rain, the comfort and storage services ..." Since the quantities of capital services are not directly observable, they are typically assumed to be in fixed proportion to capital stock. Prices of capital services are measured as rental prices.

Nevertheless, we later provide additional tests that address remaining endogeneity.

We estimate the following panel regressions,

$$
\begin{aligned}
LVOL^{c}_{ind,t} = & \alpha_{ind} + \delta_c + \eta_t + \\
& + \beta \cdot SENSITIVITY^{\mathbf{C}}_{ind,t} \times POLITICAL^{c}_{t} \\
& + \gamma \cdot POLITICAL^{c}_{t} + \lambda \cdot SENSITIVITY^{\mathbf{C}}_{ind,t} , \\
& + CONTROLS^{c}_{ind,t} + \varepsilon^{c}_{ind,t} \, ,
\end{aligned} \tag{5}
$$

where *ind* indexes industries, *c* countries, and *t* years. Regression 5 includes industry fixed effects ($\alpha_{ind}$), country fixed effects ($\delta_c$), and year fixed effects ($\eta_t$). Industries are defined at the two-digit SIC level. The dependent variable $LVOL^{c}_{ind,t}$ is the natural log of annual volatility, which is defined below. The independent variables include interaction terms of industry sensitivity measures (*SENSITIVITY*) with country political variables (*POLITICAL*).[13] The choice of control parameters (*CONTROLS*), which include country economic indicators and various industry characteristics, is described below.

After controlling for fixed effects, the main coefficient of interest ($\beta$) measures the incremental increase in volatility given a unit increase in political sensitivity conditional on the country's political structure. The standard errors in Equation (5) are clustered by country and year to adjust for heteroscedasticity, cross-sectional, and time-series correlations.

The list of the sample countries appears in the first column of Table 2 (Panel B). When analyzing labor and contract enforcement sensitivities, U.S. industries are dropped from the sample, since they are used as a benchmark. Our results remain robust if we keep U.S. industries in the sample.

## 2.2 Return volatility

The sample consists of firms covered by the Worldscope and Datastream databases, which contain accounting and market data for publicly listed companies from fifty countries. Our sample starts in 1990 and ends in 2006. We measure industry volatility as the average standard deviation of weekly returns of firms in an industry.[14] Firms are assigned to an industry according to their primary two-digit SIC codes, which we obtained from the Worldscope database. We confirm that all of the results are robust for both daily and weekly returns; however, weekly, rather than daily, returns are used because daily returns might be affected by stale prices in countries with low liquidity.

---

[13] The trade exposure sensitivity varies across industries, countries, and years, while the contract enforcement sensitivity and labor intensity vary across industries and years.

[14] Alternatively, one can first compute portfolio returns for an industry and use the standard deviation of that portfolio. However, volatility of such portfolios can be affected by the diversification effect. In addition, using the average volatility, as we do, lessens the problem of autocorrelation in industry portfolios (see, e.g., Moskowitz and Grinblatt 1999 for the description of this issue). Our results are not sensitive if we use the portfolio approach.

To reduce the impact of extreme corporate events and outliers, we drop returns lower than -75% and greater than +75%. Returns are expressed in U.S. dollars.[15]

The sample size is 26,429 two-digit SIC industry-years, which is based on 286,433 firm-year observations. A firm is included if it has at least twenty-six weeks of returns. For the election tests, we center volatility on the reported dates of the elections by using returns twenty-six weeks before and twenty-six weeks after an election. For nonelection years, we compute the volatility measures by using calendar years. All of the independent variables are also based on calendar years.

For each year, we first compute firm return volatility as

$$\sigma_f = \sqrt{\frac{1}{W-1}\sum\nolimits_{w=1}^{W}\left(r_{f,w} - \frac{1}{W}\sum\nolimits_{w=1}^{W} r_{f,w}\right)^2}; \tag{6}$$

here, $r_{f,w}$ is the weekly return of firm $f$ in week $w$ and $W$ indicates the total number of weeks in a year. We average firm volatility measures to get industry volatility, which we use in our analysis,

$$\sigma_{ind} = \frac{1}{F_{ind}}\sum\nolimits_{f=1}^{F_{ind}} \sigma_f, \tag{7}$$

with $F_{ind}$ indicating the number of firms in industry *ind*.

To further strengthen our tests, we decompose total volatility into idiosyncratic and systematic components. This split allows us to make further claims about whether global and national political risks, coupled with different sensitivities, affect the idiosyncratic or systematic component of the total industry volatility. We break down volatility by using a two-factor model, with the MSCI World index as a measure of global risk factor and an MSCI local country index factor as a measure of local risk. Specifically, for each year, we run the following time-series regression to compute the idiosyncratic and systematic volatility for firm $f$,

$$r_{f,w} = \alpha_j + \beta_{1,f} \cdot r_{world,w} + \beta_{2,f} \cdot r_{country,w} + \varepsilon_{f,w}, \tag{8}$$

where $r_{world,w}$ and $r_{country,w}$ are world and country indexes, respectively, expressed in U.S. dollars. The idiosyncratic (systematic) volatility of a firm is defined as the standard deviation of the unexplained (explained) component of returns in Equation (8).[16] The above measures are also centered on election

15 The results of this study do not change if we express returns in local currencies.

16 In decomposing volatility, we follow the methodology of Morck, Yeung, and Yu (2000) and Jin and Myers (2006). It is relatively common in the literature to use more complex techniques when modelling volatility in the context of prediction and pricing (see, e.g., Fu 2009). While Fu's EGARCH approach allows one to better estimate the expected value of idiosyncratic volatility, our objective is to estimate a contemporaneous relationship between political variables and realized volatility components at an annual frequency. Therefore, a parsimonious model is chosen.

dates. As in the case of total volatility, the idiosyncratic and systematic parts are averaged across all of the firms in an industry to obtain industry-specific idiosyncratic and systematic volatility measures. The volatility measures are annualized by multiplying them by the square root of fifty-two. They are expressed in logs because the raw volatility measures are not distributed in accordance with the normal distribution (we call them *LVOL* in order to differentiate them from raw volatility).[17] We also winsorize the measures at the 1% and 99% levels.

### 2.3 Country political factors

To collect data on the political system (presidential or parliamentary), the chief executive's party orientation (left, right, or center), and election dates of the chief executive, we rely on the 2006 edition of the World Bank Database of Political Institutions (see Beck et al. 2001 for description). The data are manually cross-checked, using a number of sources, such as *Journal of Democracy*, *Elections around the World*, *Election Guide*, *CIA Factbook*, the *PARLINE Database on National Parliaments*, and *Keesing's Record of World Events*. An election year is the year of presidential elections for presidential systems and parliamentary elections for parliamentary systems. The *national election* dummy is a variable that takes the value of one for national election years and zero otherwise.

Party orientation is determined in accordance with the party of the chief executive, using the following rule: R, right, is for parties that are defined as conservative, Christian democratic, or right-wing; L, left, is for parties that are defined as communist, socialist, social democratic, or left-wing; and C, center, is for parties that are defined as centrist or when a party position can be best described as centrist. Refer to Beck et al. (2001) for further details. The *left party orientation* indicator variable takes the value of one for years when the chief executive's party orientation is classified as left and zero otherwise.[18]

As a measure of the nature of political regimes, we use the POLITY score to determine the degree of autocracy (Marshall and Jaggers 2006). The POLITY takes into consideration factors such as the competitiveness and openness of executive recruitment, constraints on the chief executive, and competitiveness of political participation. The original POLITY score is measured on a scale of -10 to +10, with points added for features of a democratic state (e.g., two points for free elections) and points subtracted for features present in an autocratic regime (e.g., three points subtracted for lack of limitations on executive's actions). We transform the scale by subtracting the original index from ten.



[17] For example, the level of total volatility is highly positively skewed (skewness = 3.134). The log of volatility, however, has lower skewness (0.610). The skewness-kurtosis combined test does not reject the hypothesis that the log of volatility is normally distributed (chi-squared statistics = 3.12 with *p*-value = .30).

[18] Country-level information on the political system (presidential or parliamentary), the chief executive's party type (left, right, or center), and the chief executive election dates is available from the appendix on the Journal website.

The *national autocracy* index used in this study ranges from 0 to 20, where larger values represent more autocratic governments.

We also employ a more general *political risk index* provided by the International Country Risk Guide (ICRG). The index takes into account measures such as government stability, socioeconomic conditions, investment risk, risk of internal conflict, external conflict, corruption, the involvement of the military in politics, religious tensions, ethnic tensions, democratic accountability, and quality of bureaucracy. The original index ranges from zero (political instability) to 100 (political stability). We subtract the original index from 100 so that larger values indicate greater political risk.

### 2.4 Control variables

In addition to industry, country, and year fixed effects, we include several other country and industry factors (their levels and interactions with the proposed political characteristics) to ensure that the relationship between volatility and political sensitivities is not spurious. These variables are as follows:

*GDP per capita:* We include GDP per capita (expressed in constant 2000 US$) and its interaction with country political variables. More economically advanced countries are also more politically stable. It is likely that politically sensitive industries are less volatile in countries with stable political structures. GDP per capita is from the World Development Indicators (World Bank) database.

*Efficiency of law:* There is evidence (e.g., Johnson et al. 2000) that more politically sensitive industries exhibit higher volatility during periods of economic downturn in countries where the legal system is inferior and does not adequately protect investors. Periods of economic slowdown are often characterized by political instability. Therefore, we control for the level of law efficiency index and its interaction with country political factors. We use ICRG's rule of law index for this purpose.

*Exchange Rate Risk:* We control for the index of exchange rate risk and its interaction with country political factors. Evidently, the fundamentals of export-oriented industries are harder to predict during periods of higher exchange rate volatility. At the same time, an established political structure is less stable when exchange rates are volatile. Alternatively, large exchange rate fluctuation can reflect unstable macroeconomic policies, which can increase the volatility of returns. Exchange rate risk is taken from the ICRG. The index ranges from 0 to 10 and takes larger values for currencies with significant appreciation or depreciation episodes in a given year.

Next, we include several industry characteristics, such as industry size, diversification, and leverage, as these parameters may affect industry volatility. *Industry size* is defined as the log of industry total assets (sum of firms' total assets in an industry expressed in US$). *Industry leverage* is the ratio of industry long-term debt (sum of firms' long-term debt) to industry total assets.

*Industry diversification* is the number of two-digit SIC segments in which the companies operate, weighted by total assets.

We also take into account the differences in industrial structure. Carlin and Mayer (2003) show that the degree of financial development affects industrial growth and investment patterns, which in turn can change return volatility. Specifically, industries that are dependent on external financing and skilled labor grow faster and invest more in intangible capital in countries with better developed markets and more concentrated ownership. Therefore, we control for interaction terms of equity dependence with country financial development and skill dependence with country ownership concentration. Industry equity dependence is the fraction of capital expenditure financed with net equity calculated by using the sample of U.S. companies. Country financial development is the sum of stock market capitalization and private credit relative to GDP from the World Development Indicators. Industry skill dependence is one minus the proportion of unskilled employees in German industries, as reported in Oulton (1996). Country ownership concentration is the average proportion of shares held by the five largest shareholders in a country's twenty largest publicly traded companies obtained from OSIRIS.

Finally, when we analyze the interaction terms of trade exposure with global political risk, we control for their levels, i.e., *global elections*, *global autocracy*, or *global political risk*. They are calculated as export-weighted proportions of trading partners with elections in a given year and export-weighted average autocracy or political risk scores across trading partners, respectively.

## 3. Results

Table 1 contains the definitions of the variables. Table 2 (Panel A) reports industry-level variables. In columns 3–5, we present industry average values of volatility measures (expressed in levels before the log transformation)—total, idiosyncratic, and systematic volatility. Statistics by country (GDP per capita, volatility measures, availability of return series, autocracy, and political risk) are reported in Table 2 (Panel B).

To further motivate our industry approach, we compare average volatility levels across different political regimes. Table 3 reports mean comparison tests (assuming unequal variances) and contrasts volatility measures depending on whether it is an election year or not (Panel A), the political orientation of the main party in government (Panel B), conditional on high (75th percentile) versus low (25th percentile) autocracy index (Panel C), and high (75th percentile) versus low (25th percentile) political risk index (Panel D). Panels A and B reveal that market volatility is not significantly different during election years or across different party orientations. However, volatility is significantly higher in less autocratic regimes and when political risk is higher, as evident from Panels C and D. We also run a simple panel cross-country regression of log

**Table 3**
**Mean comparison tests of volatility for subsamples based on elections, party orientation, autocracy, and political risk**

| Panel A | | | Panel B | | |
|---|---|---|---|---|---|
| Elections | *N* | Total volatility | Party orientation | *N* | Total volatility |
| ELECTIONS | 5,642 | 0.451 | LEFT PARTY | 8,370 | 0.441 |
| NO ELECTIONS | 19,902 | 0.448 | OTHER PARTIES | 9,362 | 0.447 |
| DIFFERENCE | | 0.003 | DIFFERENCE | | −0.006 |
| *t*-statistic | | 0.440 | *t*-statistic | | −0.523 |
| *p*-value | | (.408) | *p*-value | | (.302) |

| Panel C | | | Panel D | | |
|---|---|---|---|---|---|
| Autocracy | *N* | Total volatility | Political risk | *N* | Total volatility |
| HIGH AUTOCRACY | 6,607 | 0.422 | HIGH RISK | 6,607 | 0.523 |
| LOW AUTOCRACY | 6,607 | 0.520 | LOW RISK | 6,607 | 0.404 |
| DIFFERENCE | | **−0.098*** ** | DIFFERENCE | | **0.119*** ** |
| *t*-statistic | | **−3.408** | *t*-statistic | | **3.903** |
| *p*-value | | (.00) | *p*-value | | (.00) |

This table reports the mean comparison tests (with unequal variances) of total return volatility between the sets of observations split according to elections, party orientation, autocracy, and political risk. For these tests, we use the entire sample of industry-country-year observations. The groups are: elections vs. no elections (Panel A); left party versus other parties (Panel B); high autocracy versus. low autocracy (Panel C); and high political risk vs. low political risk (Panel D). The numbers in parentheses are *p*-values. The coefficients significant at the 10% level (based on a two-tailed test) or higher are in boldface. All of the variables are defined in Table 1. *N* is the number of observations in each group. The high autocracy (low autocracy) group contains industry-country-year observations that belong to the top 75th percentile, autocracy $>2.9$ (bottom 25th percentile, autocracy = 0), of the autocracy index. The high political risk (low political risk) group contains industry-country-year observations that belong to the top 75th percentile, political risk $>36.7$ (bottom 25th percentile, political risk $<15.9$), of the political risk index.

of volatility on the political variables with country and time fixed effects. The unreported results indicate that, except for the overall political risk index, the rest of the variables (election dummy, autocracy index, and left party dummy) are not significantly related to volatility. This is not surprising: We confirm that country-level regressions are not reliable, as political and economic outcomes may simultaneously determine each other. Moreover, volatility response to political factors may not be uniform, which is explored below, using the political sensitivity approach.

## 3.1 International trade

In Table 4 (specifications 1–3), we report regression results of the impact of global and national elections on volatility. These regressions are run by using the panel of 10,663 industry-country-year observations from 1993 to 2006. In the regressions, we control for a number of variables that are described in Section 2.4.

We find a significantly positive coefficient on the interaction of trade exposure with global elections when the dependent variable is total return volatility. This result suggests that when export exposure is coupled with

**Table 4**
**Volatility of industries exposed to international trade conditional on political variables**

| | Elections | | | Autocracy | | | Political risk | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total volatility | Iidiosyncratic volatility | Systematic volatility | Total volatility | Idiosyncratic volatility | Systematic volatility | Total volatility | Idiosyncratic volatility | Systematic volatility |
| Specification | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| *Interaction of International Trade Exposure with Global Political variable* | **0.4108***<br>(0.000)** | **0.3986***<br>(0.000)** | (0.1101<br>(0.412) | **−0.0386***<br>(0.010)** | **−0.0262**<br>(0.011)** | **−0.0430**<br>(0.038)** | **0.0816***<br>(0.000)** | **0.0521***<br>(0.000)** | (0.0113<br>(0.480) |
| *Interaction of International Trade Exposure with National Political variable* | **0.1342***<br>(0.000)** | 0.0480<br>(0.219) | **0.1162***<br>(0.000)** | **−0.0617**<br>(0.030)** | (0.0486<br>(0.221) | **−0.0970*** ** | **0.0650**<br>(0.011)** | (0.0120<br>(0.168) | **0.0513***<br>(0.010)** |
| *Global Political Variable* | 0.0121<br>(0.312) | 0.0213<br>(0.503) | 0.0314<br>(0.208) | **−0.1148*<br>(0.070)** | **−0.2119**<br>(0.021)** | −0.0729<br>(0.333) | **0.0030***<br>(0.000)** | **0.0018***<br>(0.000)** | **0.0014***<br>(0.000)** |
| *National Political Variable* | **0.1509***<br>(0.000)** | 0.1300<br>(0.142) | **0.1490*<br>(0.072)** | **−0.0299***<br>(0.010)** | −0.0068<br>(0.414) | **−0.0189**<br>(0.041)** | **0.0026*<br>(0.078)** | **0.0020**<br>(0.031)** | **0.0038***<br>(0.010)** |
| *Level of International Trade Exposure* | **−0.4090***<br>(0.000)** | **−0.3890***<br>(0.000)** | **−0.4162***<br>(0.000)** | **−0.3460***<br>(0.000)** | **−0.2349***<br>(0.000)** | **−0.1128***<br>(0.000)** | **−0.1890***<br>(0.002)** | **−0.1000*<br>(0.100)** | −0.0804<br>(0.180) |
| *Interaction of International Trade Exposure with GDP per Capita* | −0.0360<br>(0.281) | −0.0308<br>(0.312) | −0.0222<br>(0.390) | −0.0508<br>(0.222) | −0.0180<br>(0.309) | −0.0512<br>(0.581) | −0.0150<br>(0.314) | 0.0032<br>(0.600) | −0.0108<br>(0.295) |

(*continued*)

**Table 4**
**Continued**

| | Elections | | | Autocracy | | | Political risk | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total volatility | Iidiosyncratic volatility | Systematic volatility | Total volatility | Idiosyncratic volatility | Systematic volatility | Total volatility | Idiosyncratic volatility | Systematic volatility |
| Specification | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| *Interaction of International Trade Exposure with Efficiency of Law* | **−0.2080*** | −0.1902 | **−0.1421**** | **−0.1903***** | **−0.0818*** | **−0.1211**** | −0.0108 | −0.0714 | −0.0621 |
| | **(0.056)** | (0.214) | **(0.050)** | **(0.000)** | **(0.100)** | **(0.050)** | (0.318) | (0.421) | (0.500) |
| *Interaction of International Trade Exposure with Exchange Rate Risk* | −0.0514 | −0.0621 | (0.0208 | −0.0706 | **−0.0822*** | −0.0198 | −0.0360 | −0.0200 | (0.0395 |
| | (0.333) | (0.150) | (0.226) | (0.109) | **(0.100)** | (0.316) | (0.121) | (0.200) | (0.237) |
| *Country GDP per Capita* | **−0.4900***** | **−0.2779***** | **−0.3503***** | **−0.4029***** | **−0.3111***** | **−0.2908***** | **−0.3909***** | **−0.2409***** | **−0.2421***** |
| | **(0.000)** | **(0.000)** | **(0.000)** | **(0.000)** | **(0.000)** | **(0.000)** | **(0.000)** | **(0.000)** | **(0.000)** |
| *Country Efficiency of Law* | **−0.0221***** | **−0.0218*** | −0.0130 | **−0.0261***** | **−0.0212***** | −0.0139 | **−0.0290***** | **−0.0264***** | **−0.0161**** |
| | **(0.010)** | **(0.052)** | (0.208) | **(0.000)** | **(0.000)** | (0.313) | **(0.000)** | **(0.000)** | **(0.020)** |
| *Country Exchange Rate Risk* | **0.0440***** | **0.0333***** | **0.0189***** | **0.0100***** | (0.0086 | **0.0293***** | (0.0120 | (0.0121 | (0.0182 |
| | **(0.000)** | **(0.000)** | **(0.010)** | **(0.010)** | (0.112) | **(0.000)** | (0.190) | (0.412) | (0.189) |
| *Industry Size* | **−0.0129***** | **−0.0093***** | −0.0020 | **−0.0176***** | **−0.0172***** | −0.0018 | **−0.0230***** | **−0.0289***** | −0.0020 |
| | **(0.000)** | **(0.000)** | (0.312) | **(0.000)** | **(0.000)** | (0.331) | **(0.000)** | **(0.000)** | (0.412) |
| *Industry Leverage* | **0.0738**** | (0.0041 | **0.0324***** | **0.0830***** | (0.0036 | **0.0377**** | **0.0690**** | (0.00390 | **0.0338***** |
| | **(0.040)** | (0.312) | **(0.000)** | **(0.000)** | (0.281) | **(0.020)** | **(0.041)** | (0.200) | **(0.000)** |
| *Industry Diversification* | **−0.0438***** | **−0.0486***** | −0.0029 | **−0.0338***** | **−0.0412***** | 0.0042 | **−0.0414***** | **−0.0516***** | −0.0011 |
| | **(0.000)** | **(0.000)** | (0.305) | **(0.000)** | **(0.000)** | (0.200) | **(0.000)** | **(0.000)** | (0.308) |

(*continued*)

**Table 4**
**Continued**

| | Total volatility | Elections Idiosyncratic volatility | Systematic volatility | Total volatility | Autocracy Idiosyncratic volatility | Systematic volatility | Total volatility | Political risk Idiosyncratic volatility | Systematic volatility |
|---|---|---|---|---|---|---|---|---|---|
| Specification | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| *Interaction of Equity Dependence with Financial Development* | −0.1960 | **−0.2200*** | −0.1303 | −0.2999 | −0.1170 | 0.0721 | −0.1821 | **−0.2090*** | −0.0614 |
| | (0.140) | **(0.100)** | (0.286) | (0.117) | (0.181) | (0.340) | (0.120) | **(0.100)** | (0.150) |
| *Interaction of Skill Dependence with Ownership Concentration* | −0.2030 | −0.1030 | 0.0239 | −0.1712 | −0.1768 | −0.0130 | −0.1319 | −0.0920 | −0.0110 |
| | (0.102) | (0.110) | (0.342) | (0.162) | (0.300) | (0.281) | (0.152) | (0.162) | (0.387) |
| *Equity Dependence* | **0.0413*** | 0.0204 | 0.0259 | **0.0432*** | 0.0211 | 0.0186 | **0.0309*** | **0.0256*** | 0.0154 |
| | **(0.100)** | (0.196) | (0.182) | **(0.100)** | (0.101) | (0.289) | **(0.100)** | **(0.060)** | (0.324) |
| *Financial Development* | 0.0549 | 0.0262 | 0.0311 | 0.0595 | 0.0288 | 0.0279 | 0.0470 | 0.0172 | 0.0331 |
| | (0.200) | (0.289) | (0.381) | (0.211) | (0.281) | (0.112) | (0.388) | (0.182) | (0.229) |
| *Skill Dependence* | −0.0023 | −0.0062 | −0.0013 | 0.0019 | −0.0010 | 0.0011 | 0.0034 | 0.0012 | −0.0038 |
| | (0.288) | (0.309) | (0.381) | (0.321) | (0.314) | (0.108) | (0.321) | (0.514) | (0.440) |
| *Ownership Concentration* | 0.0200 | 0.0123 | 0.0034 | 0.0086 | 0.0017 | 0.0078 | 0.0018 | 0.0036 | 0.000 |
| | (0.509) | (0.429) | (0.414) | (0.316) | (0.412) | (0.458) | (0.418) | (0.404) | (0.203) |
| Regression $R^2$ –adj. | 0.4378 | 0.4294 | 0.4039 | 0.4220 | 0.4118 | 0.3914 | 0.4283 | 0.4262 | 0.4390 |
| Number of observations | 10,633 | 10,633 | 10,633 | 10,633 | 10,633 | 10,633 | 10,633 | 10,633 | 10,633 |

This table reports the results of OLS regressions of the logs of total return volatility, idiosyncratic volatility, and systematic volatility on the interaction terms of industry international trade exposure with political variables: global and national elections index (specifications 1–3), global and national autocracy index (specifications 4–6), and global and national political risk (specifications 7– 9). All of the variables are defined in Table 1. Every regression includes industry, country, and year fixed effects. The numbers in parentheses are $p$-values. The coefficients significant at the 10% level (based on a two-tailed test) or higher are in boldface. *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively. Standard errors are clustered by countries and years to adjust for heteroscedasticity, cross-sectional, and time-series correlations.

the uncertainty that is triggered by elections in some of that sector's trading partners, its total volatility is higher. Interestingly, the increase in volatility is driven by its idiosyncratic part, whereas the systematic part of return variation is not significantly affected by trade exposure. This result implies that while international trade provides certain diversification benefits, the managers of trade-sensitive industries cannot completely diversify political risk. Perhaps this is because the number of potential trading partners is limited. A similar argument appears in Desai, Foley, and Hines (2008), who document higher volatility of fundamentals of MNCs that establish subsidiaries in countries with higher political risks.[19]

In contrast, while national elections also increase volatility of export-oriented industries, the increase comes from the systematic part. Therefore, national elections expose trade-sensitive industries to the nondiversifiable part of risk. The level of trade exposure alone decreases total volatility and both its components. This is consistent with the findings of Manova (2006), who documents that trade may dampen volatility if it alleviates financial dependence. The coefficient on GDP per capita is negative and significant, which is consistent with the notion that stock markets in more economically developed countries are less volatile. Furthermore, the interaction of efficiency of law with trade exposure is negative and significant (when total and systematic volatility measures are used as dependent variables), which suggests that industries are better able to take advantage of trade in countries that have high-quality institutions (Nunn 2007; Levchenko 2007). Some of the industry control variables are significant as well. For example, total and idiosyncratic volatilities are lower for larger and more diversified industries. The interaction terms of equity dependence with financial development and industry skill dependence with ownership concentration are mostly insignificant.

Overall, our first set of tests documents that trade exposure tends to transfer some of the uncertainty that is introduced by foreign elections in the idiosyncratic part of the return volatility of domestic firms, while uncertainty induced by national elections increases the systematic part of volatility.

In specifications 4–6 of Table 4, the levels of national and global autocracy indexes are significantly negative with respect to total volatility, which implies a stability effect, just as trade alone may serve as insurance against domestic



19 While the foreign trade exposure results are related to the findings in Desai, Foley, and Hines (2008), our research question is different along several key dimensions. First, while Desai, Foley, and Hines analyze the transmission of foreign risks to U.S. parent companies from their subsidiaries, we examine multi-directional political risk transmission across the world. Second, we use foreign trade exposure not only as a channel through which political risk of foreign trading partners could be transmitted, but also as a measure of risk exposure to the domestic political environment. Third, we differentiate between various political factors such as elections, party orientation, labor legislation, and autocracy. Fourth, we use stock return volatility measures and not operating profitability as in Desai, Foley, and Hines. Fifth, we decompose total return volatility into systematic and idiosyncratic parts and find new results that global political risk is more strongly linked to the idiosyncratic part of return volatility.

economic turbulence. We also find negative and significant coefficients of the interaction terms of trade exposure with global autocracy (for total volatility and both of its components) and national autocracy (for total volatility and its systematic part). Since the majority of developed economies are democracies, what we may be capturing are established trade relationships in autocratic trading partners, where local regimes have agreed to provide and protect a strong market position for a given domestic sector. This may guarantee a preferential position, which when combined with large trade exposure acts as a volatility-reducing mechanism. Overall, the results suggest that autocracy has a dampening effect on volatility.

Specifications 7–9 of Table 4 report results for the interaction of global and local political risk scores with trade exposure. The results are similar to the setup where we use elections as a measure of political uncertainty. In particular, the global political risk of trading partners of trade-dependent industries matters for total return volatility and its idiosyncratic part. On the other hand, trade-dependent industries have significantly higher total return volatility and higher systematic volatility when local political risk is larger.

The trade regressions provide a consistent message that trade exposure, when coupled with global political uncertainty (measured by elections and political risk scores), increases volatility. However, autocracy is a source of stability that becomes stronger with greater trade exposure. We highlight the fact that political risk and autocracy scores capture quite distinct aspects of the political environment, and researchers must exercise care when using both measures as proxies for the same underlying factor.

A few examples help illustrate the economic significance of the above statistical results. Consider Canada and Brazil, which are two countries that generate a substantial part of their national income from exports. Brazil has a high political risk score (34.21), and Canada's political risk score is 15.35. A large export sector for Canada is transportation equipment. A substantial part of it is accounted for by Bombardier—a manufacturer of railway equipment and aircraft—which exports more than 90% of its output. In the case of Brazil, transportation equipment is the second largest export sector, which is similarly represented by the Brazilian aircraft manufacturer Embraer. Our results suggest that return volatility of the transportation equipment sector, relative to a less export-oriented sector, would be larger in Brazil than it is in Canada. To illustrate, we compare the difference between the log of return volatility of the transportation equipment sector (28.0% export share in Canada; 23.3% in Brazil) and volatility of the leather sector (8.2% export share in Canada; 7.6% in Brazil) in Canada to the difference between the log volatility levels of the two sectors in Brazil. The coefficient on the interaction term of trade exposure with political risk (specification 7 of Table 4) is equal to 0.065. The total return volatility of the transportation equipment industry in Canada is $0.065 \times (0.280 - 0.082) \times 15.35 = 19.8\%$ higher than the volatility of the leather industry. In Brazil, however, the relative volatility of the transportation equipment industry with respect to the leather industry is much higher; the increase is equal to 0.065 × (0.233 – 0.076) × 34.21 = 34.9%. Thus, industries with higher trade exposure suffer from greater return volatility when the domestic political environment is less stable.

A less evident result is the vulnerability to foreign political risk that export-oriented sectors incur when their trading partners suffer from political uncertainty. Leather exports from Canada are mostly directed to the United States, a politically stable country (political risk = 17.71). On the other hand, much of the transportation equipment production from Canada is shipped to emerging economies (export-weighted average political score across trading partners = 29.20). Holding everything else equal, the magnitude of the coefficient on the interaction term of trade exposure with global political risk (0.082 from specification 7 of Table 4) suggests that the volatility of the transportation equipment industry is 18.7% (= 0.082 × (0.280 – 0.082) × (29.20 – 17.71)) larger than the volatility of the leather industry.

With regard to national elections, similar calculations imply the increase in return volatility of the transportation industry in Brazil (relative to the leather industry) of 2.1%. Therefore, the coefficient on the interaction of national election with trade exposure is statistically significant, although national elections are not an economically significant vehicle of transmission of political uncertainty into trade-dependent industries. However, if elections take place abroad (in trading-partner countries), there is a larger increase in return volatility. Specifically, when the proportion of trading partners that have national elections increases from 10% to 30% (a one-standard-deviation change in our sample), the volatility of the transportation industry in Brazil is higher by 9.8%, relative to the leather industry. This result may echo a "home bias" in terms of better predictability of domestic compared with foreign elections.

The above estimates also enable us to compare the magnitude of volatility increase caused by normal political events with volatility responses caused by more dramatic events, such as wars, financial crises, and revolutions, documented in the literature. Berkman, Jacobsen, and Lee (2011) document that the start of an international crisis increases worldwide monthly stock return volatility by about 10%–15%, with the average monthly world stock volatility of 3.7 percentage points. Mei and Guo (2004), by using a sample of emerging markets during 1994–1997, document that annual volatility is five percentage points higher in crisis years (while a political event may not be a primary trigger for the crisis, the authors document that eight out of nine crises in the sample occurred in election and transition periods). In pre-crisis and crisis sample periods, annual volatilities were 3.2% higher during periods of political transitions and elections. Therefore, the volatility increase that results from the routine politics that we document is of comparable magnitude with those that result from more extreme political events. This comparison is, of course, very crude because of differences in methodology, data periods, and samples.[20]

### 3.2 Contract enforcement

The regressions with the contract enforcement sensitivity are run by using the panel of 7,389 industry-country-year observations from 1998 to 2006. The results are reported in Table 5. Industries in greater need of contracts (industries that use more suppliers) have higher return volatility during periods of elections or when the overall political risk is higher. The increase in total volatility comes from both its systematic and idiosyncratic parts.

These results are economically significant as well. We compare the increase in volatility of an industry with below-average contract enforcement sensitivity, primary metals (0.79), relative to an industry with above-average contract enforcement sensitivity, printing (0.93), if it is located in Canada compared with Brazil. In Canada, the volatility of the printing industry is 12.0% larger (= 0.056 × (0.93 – 0.79) × 15.35, where 0.056 is the coefficient on the interaction of enforcement sensitivity with political risk from specification 4 in Table 5) than is volatility of the primary metals industry. This difference is much larger in Brazil, and it is equal to 26.8% (= 0.056 × (0.93 – 0.79) × 34.21).

The interaction of contract enforcement sensitivity with autocracy is negative, albeit marginally significant, which we believe indicates a certain stability effect of an autocratic regime. The level of contract enforcement sensitivity is significantly negative when total return volatility or systematic volatility is used as the dependent variable. The level variables are not our focus; however, if the negative coefficient reflects a substantive relation, it is consistent with the following interpretation. In situations with the absence of political uncertainty (since the coefficient on one level variable in a regression with interactions is conditioned on a zero level of the other), more complex production processes exhibit lower return volatility, because they may rely on conglomeration to achieve greater predictability of financial outcomes.

### 3.3 Labor intensity

We now turn to the discussion of the impact of labor intensity on volatility. The results are reported in Table 6. The sample consists of 11,518 industry-country-year observations from 1990 to 2005. The primary variable of interest is the interaction term of labor intensity with the national election dummy variable and the left party indicator variable. The interaction term of labor intensity

[20] All of our results survive if we explicitly account for political and financial crises in the above regressions by including country-year-specific financial crisis and political crisis dummy variables. The financial crisis variable is equal to one for countries when their stock market declines by more than 20%. To calculate the political crisis measure, we identify forty-six instances of political disruptions across eighteen countries using data from the International Crisis Behaviour (ICB) database (www.cidcm.umd.edu). The unreported results indicate that, although the magnitudes of some of the previously reported coefficients decrease, all of the documented results remain statistically and economically significant.

**Table 5**
**Volatility of industries sensitive to contract enforcement conditional on political variables**

| Specification | Total volatility<br>1 | Idiosyncratic volatility<br>2 | Systematic volatility<br>3 |
|---|---|---|---|
| *Interaction of Sensitivity to Contract Enforcement with National Elections* | **0.0562*****<br>**(0.001)** | **0.0300***<br>**(0.082)** | **0.0914*****<br>**(0.000)** |
| *Interaction of Sensitivity to Contract Enforcement with National Autocracy Index* | **−0.0292***<br>**(0.100)** | −0.0214<br>(0.112) | **−0.0321***<br>**(0.080)** |
| *Interaction of Sensitivity to Contract Enforcement with National Political Risk Index* | **0.0158*****<br>**(0.000)** | **0.0146*****<br>**(0.000)** | **0.0200*****<br>**(0.000)** |
| *Sensitivity to Contract Enforcement* | **−0.4093*****<br>**(0.009)** | 0.1332<br>(0.221) | **−0.3003****<br>**(0.020)** |
| *National Elections* | **0.1403***<br>**(0.076)** | **0.1009***<br>**(0.100)** | **0.1108*****<br>**(0.009)** |
| *National Autocracy Index* | **−0.0216*****<br>**(0.000)** | **−0.0211*****<br>**(0.000)** | **−0.0268*****<br>**(0.000)** |
| *National Political Risk Index* | **0.0012*****<br>**(0.000)** | **0.0013*****<br>**(0.000)** | **0.0015*****<br>**(0.000)** |
| *Interaction of Contract Enforcement Sensitivity with GDP per Capita* | **−0.0917*****<br>**(0.000)** | **−0.0821*****<br>**(0.000)** | **−0.0432*****<br>**(0.005)** |
| *Interaction of Contract Enforcement Sensitivity with Efficiency of Law* | **0.1030*****<br>**(0.000)** | **0.0940*****<br>**(0.000)** | **0.0551****<br>**(0.000)** |
| *Interaction of Contract Enforcement Sensitivity with Exchange Rate Risk* | −0.0262<br>(0.200) | −0.0051<br>(0.430) | −0.0230<br>(0.186) |
| *GDP per Capita* | **−0.177*****<br>**(0.000)** | **−0.1580*****<br>**(0.000)** | **−0.1621*****<br>**(0.000)** |
| *Efficiency of Law* | **−0.0711*****<br>**(0.000)** | **−0.0701*****<br>**(0.000)** | **−0.0249*****<br>**(0.000)** |
| *Exchange Rate Risk* | **0.0200*****<br>**(0.000)** | **0.0202****<br>**(0.012)** | **0.0213****<br>**(0.011)** |
| *Industry Size* | **−0.0214*****<br>**(0.000)** | **−0.0221*****<br>**(0.005)** | 0.0070<br>(0.303) |
| *Industry Leverage* | **0.0913****<br>**(0.012)** | 0.00719<br>(0.211) | **0.0666***<br>**(0.086)** |
| *Industry Diversification* | **−0.0443*****<br>**(0.000)** | **−0.0489*****<br>**(0.000)** | 0.0077<br>(0.170) |
| *Interaction of Equity Dependence with Financial Development* | −0.0926<br>(0.282) | −0.0182<br>(0.333) | −0.0071<br>(0.232) |
| *Interaction of Skill Dependence with Ownership Concentration* | −0.0414<br>(0.381) | −0.0721<br>(0.132) | −0.0100<br>(0.210) |
| *Equity Dependence* | **0.0319***<br>**(0.052)** | 0.0155<br>(0.118) | 0.0180<br>(0.112) |
| *Financial Development* | 0.0453<br>(0.303) | 0.0219<br>(0.220) | 0.0344<br>(0.328) |
| *Skill Dependence* | 0.0018<br>(0.403) | −0.0063<br>(0.389) | −0.0022<br>(0.419) |
| *Ownership Concentration* | 0.0080<br>(0.621) | 0.0053<br>(0.419) | 0.0011<br>(0.521) |
| Regression $R^2$−adj. | 0.3601 | 0.3319 | 0.3680 |
| Number of observations | 7,389 | 7,389 | 7,389 |

This table reports the results of OLS regressions of the logs of total return volatility, idiosyncratic volatility, and systematic volatility on the interaction terms of industry contract enforcement sensitivity with national elections, autocracy, political risk, and control variables. All of the variables are defined in Table 1. Every regression includes industry, country, and year fixed effects. The numbers in parentheses are *p*-values. The coefficients significant at the 10% level (based on a two-tailed test) or higher are in boldface. *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively. Standard errors are clustered by countries and years to adjust for heteroscedasticity, cross-sectional, and time-series correlations.

**Table 6**
**Volatility of labor-intensive industries conditional on elections and party orientation**

| Specification | Total volatility 1 | Idiosyncratic volatility 2 | Systematic volatility 3 |
|---|---|---|---|
| *Interaction of Labor Intensity with Left Party Orientation* | **0.1609*****<br>**(0.004)** | 0.0861<br>(0.416) | **0.1920*****<br>**(0.000)** |
| *Interaction of Labor Intensity with National Elections* | **0.0566***<br>**(0.080)** | 0.0094<br>(0.358) | **0.0409***<br>**(0.050)** |
| *Labor Intensity* | **0.1716*****<br>**(0.000)** | 0.1480<br>(0.211) | **0.1201***<br>**(0.100)** |
| *Left Party Orientation* | −0.0220<br>(0.116) | **−0.0496****<br>**(0.028)** | 0.0360<br>(0.230) |
| *National Elections* | **0.1250***<br>**(0.081)** | 0.1480<br>(0.140) | **0.1130***<br>**(0.080)** |
| *Interaction of Labor Intensity with GDP per Capita* | −0.0262<br>(0.202) | −0.0240<br>(0.321) | **−0.1290*****<br>**(0.000)** |
| *Interaction of Labor Intensity with Efficiency of Law* | 0.0228<br>(0.434) | 0.0490<br>(0.182) | 0.0172<br>(0.504) |
| *Interaction of Labor Intensity with Exchange Rate Risk* | −0.0130<br>(0.200) | −0.0340<br>(0.102) | **−0.0866****<br>**(0.030)** |
| *GDP per Capita* | **−0.2888*****<br>**(0.000)** | **−0.2540*****<br>**(0.000)** | **−0.2011*****<br>**(0.000)** |
| *Efficiency of Law* | −0.0086<br>(0.662) | −0.0203<br>(0.320) | −0.0042<br>(0.714) |
| *Exchange Rate Risk* | **0.0320*****<br>**(0.000)** | **0.0319*****<br>**(0.000)** | 0.0120<br>(0.130) |
| *Industry Size* | **−0.0216*****<br>**(0.000)** | **−0.0131****<br>**(0.049)** | −0.0036<br>(0.303) |
| *Industry leverage* | **0.0707****<br>**(0.029)** | 0.0080<br>(0.148) | **0.0600*****<br>**(0.000)** |
| *Industry diversification* | **−0.0279*****<br>**(0.000)** | **−0.0414*****<br>**(0.000)** | 0.0041<br>(0.280) |
| *Interaction of Equity Dependence with Financial Development* | −0.0830<br>(0.231) | −0.0777<br>(0.308) | −0.0803<br>(0.250) |
| *Interaction of Skill Dependence with Ownership Concentration* | −0.0890<br>(0.328) | −0.0764<br>(0.162) | −0.0402<br>(0.209) |
| *Equity Dependence* | **0.0403***<br>**(0.100)** | **0.0241***<br>**(0.082)** | **0.0202***<br>**(0.100)** |
| *Financial Development* | 0.0493<br>(0.222) | 0.0222<br>(0.228) | 0.0228<br>(0.186) |
| *Skill Dependence* | 0.0010<br>(0.114) | −0.0010<br>(0.165) | −0.0062<br>(0.180) |
| *Ownership Concentration* | 0.0062<br>(0.513) | 0.0051<br>(0.444) | 0.0012<br>(0.612) |
| Regression $R^2$–adj. | 0.3930 | 0.3814 | 0.3827 |
| Number of observations | 11,518 | 11,518 | 11,518 |

This table reports the results of OLS regressions of the logs of total return volatility, idiosyncratic volatility, and systematic volatility on the interaction terms of industry labor intensity with the left party orientation dummy variable, national elections dummy variable, and control variables. All of the variables are defined in Table 1. Every regression includes industry, country, and year fixed effects. The numbers in parentheses are *p*-values. The coefficients significant at the 10% level (based on a two-tailed test) or higher are in boldface. *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively. Standard errors are clustered by countries and years to adjust for heteroscedasticity, cross-sectional, and time-series correlation.

with national elections is positive, albeit marginally significant, which implies higher total return volatility for labor-intensive industries during election periods. Similar to the results with the contract enforcement sensitivity, the increase in volatility is driven by its systematic portion. In addition, the level of labor intensity is statistically significant with respect to total return volatility and systematic volatility, meaning that even in non-election years, labor-intensive industries exhibit greater volatility.

With respect to party orientation, the interaction term between labor intensity and the left-party indicator variable is positive and significant, implying higher total volatility for labor-intensive industries under left governments. Higher volatility of labor-intensive industries under greater political risk is in line with Botero et al.'s (2004) finding that labor regulation introduces rigidities. Our results suggest that one important, inefficient consequence of labor regulation may be higher return volatility.

In contrast to trade dependency, the increase in volatility during elections, or when party orientation is left, comes from its systematic part and not its idiosyncratic part. This could be due to the fact that labor-intensive industries are more sensitive to the priced factors (world and country factors, in our case) when domestic political uncertainty is higher, which could increase the systematic component of the volatility for these industries and in turn increase total return volatility.

There is a potential endogeneity problem in the above analysis: The political orientation of the ruling party could itself be determined by past economic and financial outcomes. We tackle the problem by employing a two-stage estimation. First, we regress (using the Probit estimation method) the left party dummy on potential economic factors that may determine the likelihood of the particular party to be elected: lagged volatility, GDP per capita, foreign currency reserves scaled by GDP, current account scaled by GDP, inflation rate, and country and year fixed effects. In the second stage, we regress volatility on the explained and unexplained parts of party orientation and their interactions with labor intensity. The second-stage results for the impact of unexplained party orientation on volatility are reported in Table 7. It turns out that the unexplained part of party orientation (interacted with labor intensity) matters for all of the three volatility measures, i.e., the relationship between volatility, labor sensitivity, and left party government is not driven by past volatility or economic performance.

We also noted above that, based on the existing literature and our own analysis, the evidence that left governments favor stricter labor regulations is weak. When we run cross-country panel regressions of the strictness of labor regulation on the left party orientation dummy variable (controlling for country and year fixed effects, GDP per capita, financial development, and efficiency of laws), the results depend on proxies we use for labor regulation. Therefore, we run direct tests that link return volatility to labor intensity conditional on countries' employment laws. For these tests, we interact industry labor dependence with country-level rigidity of employment index from the Doing Business Report (World Bank) database. Results in Table 8 show that total return volatility and systematic volatility are larger for labor-intensive industries in countries with more stringent labor laws.

**Table 7**
**Decomposition of left party orientation variable**

| Specification | Total volatility 1 | Idiosyncratic volatility 2 | Systematic volatility 3 |
|---|---|---|---|
| *Interaction of Labor Intensity with Unexplained Portion of Left Party Orientation* | **0.0682*****<br>**(0.000)** | **0.0590*****<br>**(0.000)** | **0.0190****<br>**(0.000)** |
| *Interaction of Labor Intensity with Explained Portion of Left Party Orientation* | **0.0530***<br>**(0.052)** | **0.0232****<br>**(0.030)** | **0.0617***<br>**(0.100)** |
| *Labor Intensity* | **0.3082*****<br>**(0.000)** | 0.2886<br>(0.144) | 0.2089<br>(0.117) |
| *Unexplained Portion of Left Party Orientation* | −0.0218<br>(0.176) | −0.0421<br>(0.187) | −0.0406<br>(0.414) |
| *Explained Portion of Left Party Orientation* | −0.0030<br>(0.608) | −0.005<br>(0.402) | −0.0030<br>(0.180) |
| *Interaction of Labor Intensity with GDP per Capita* | −0.0186<br>(0.208) | −0.0128<br>(0.302) | −0.0211<br>(0.128) |
| *Interaction of Labor Intensity with Efficiency of Law* | 0.0267<br>(0.311) | 0.0308<br>(0.249) | 0.0161<br>(0.202) |
| *Interaction of Labor Intensity with Exchange Rate Risk* | **−0.0246*****<br>**(0.000)** | **−0.0208*****<br>**(0.000)** | **−0.0462*****<br>**(0.000)** |
| *GDP per Capita* | **−0.3060*****<br>**(0.000)** | **−0.3240*****<br>**(0.000)** | **−0.4221*****<br>**(0.000)** |
| *Efficiency of Law* | −0.0882<br>(0.209) | −0.0940<br>(0.338) | −0.0050<br>(0.725) |
| *Exchange Rate Risk* | **0.0305*****<br>**(0.000)** | **0.0338*****<br>**(0.000)** | 0.0106<br>(0.300) |
| *Industry Size* | **−0.0265*****<br>**(0.000)** | **−0.0110*****<br>**(0.000)** | −0.0082<br>(0.160) |
| *Industry Leverage* | **0.0932*****<br>**(0.000)** | 0.0012<br>(0.364) | **0.0800*****<br>**(0.000)** |
| *Industry Diversification* | **−0.0336*****<br>**(0.000)** | **−0.0431*****<br>**(0.000)** | 0.00304<br>(0.256) |
| *Interaction of Equity Dependence with Financial Development* | −0.0345<br>(0.350) | −0.0360<br>(0.241) | −0.0351<br>(0.238) |
| *Interaction of Skill Dependence with Ownership Concentration* | −0.0630<br>(0.236) | −0.0650<br>(0.311) | −0.0711<br>(0.308) |
| *Equity Dependence* | 0.0381<br>(0.108) | 0.0271<br>(0.111) | 0.0170<br>(0.210) |
| *Financial Development* | 0.0424<br>(0.211) | 0.0293<br>(0.189) | 0.0350<br>(0.220) |
| *Skill Dependence* | 0.0013<br>(0.482) | −0.0062<br>(0.311) | 0.0041<br>(0.339) |
| *Ownership Concentration* | 0.0182<br>(0.409) | 0.0191<br>(0.330) | −0.0030<br>(0.208) |
| Regression $R^2$-adj. | 0.3380 | 0.3318 | 0.3640 |
| Number of observations | 11,518 | 11,518 | 11,518 |

This table reports the results of OLS regressions of the logs of return volatility, idiosyncratic volatility, and systematic volatility on the interaction terms of labor intensity with unexplained and explained (by lagged macroeconomic variables) portions of party orientation and control variables. All of the variables are defined in Table 1. Every regression includes industry, country, and year fixed effects. The numbers in parentheses are $p$-values. The coefficients significant at the 10% level (based on a two-tailed test) or higher are in boldface. *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively. Standard errors are clustered by countries and years to adjust for heteroscedasticity, cross-sectional, and time-series correlations.

To sum up our results, we show that industries that rely more on exports and contract enforcement have more volatile returns (measured by total volatility and its systematic part) when domestic political uncertainty is

**Table 8**
**Volatility of labor-intensive industries conditional on rigidity of employment index**

| | Total volatility | Idiosyncratic volatility | Systematic volatility |
|---|---|---|---|
| Specification | 1 | 2 | 3 |
| *Interaction of Labor Intensity with Rigidity of Employment Index* | **0.0581*** | 0.0230 | **0.0778**** |
| | **(0.052)** | (0.316) | **(0.031)** |
| *Rigidity of Employment Index* | **0.5630***** | **0.7181***** | **0.7310***** |
| | **(0.000)** | **(0.000)** | **(0.000)** |
| *Labor Intensity* | **0.1902*** | 0.0702 | 0.1212 |
| | **(0.100)** | (0.288) | (0.306) |
| *Interaction of Labor Intensity with GDP per Capita* | 0.1211 | 0.1621 | −0.1714 |
| | (0.262) | (0.120) | (0.493) |
| *Interaction of Labor Intensity with Efficiency of Law* | 0.0386 | 0.0312 | 0.0514 |
| | (0.314) | (0.110) | (0.229) |
| *Interaction of Labor Intensity with Exchange Rate Risk* | **−0.0208**** | **−0.0301*** | **−0.0560**** |
| | **(0.020)** | **(0.100)** | **(0.041)** |
| *GDP per Capita* | **−0.2359***** | **−0.2903***** | **−0.2000***** |
| | **(0.000)** | **(0.000)** | **(0.000)** |
| *Efficiency of Law* | −0.0160 | −0.0414 | −0.0190 |
| | (0.336) | (0.421) | (0.403) |
| *Exchange Rate Risk* | **0.0342***** | **0.0338***** | **0.0316***** |
| | **(0.000)** | **(0.000)** | **(0.000)** |
| *Industry Size* | **−0.0104***** | **−0.0081**** | −0.0039 |
| | **(0.000)** | **(0.030)** | (0.308) |
| *Industry Leverage* | **0.0516***** | 0.0014 | **0.0816***** |
| | **(0.000)** | (0.420) | **(0.000)** |
| *Industry Diversification* | **−0.0220***** | **−0.0216***** | 0.0099 |
| | **(0.000)** | **(0.000)** | (0.214) |
| *Interaction of Equity Dependence with Financial Development* | **−0.1488*** | −0.0562 | **−0.1405*** |
| | **(0.100)** | (0.216) | **(0.100)** |
| *Interaction of Skill Dependence with Ownership Concentration* | 0.0016 | 0.0010 | 0.0119 |
| | (0.312) | (0.409) | (0.365) |
| *Equity Dependence* | 0.0191 | 0.0152 | 0.0173 |
| | (0.190) | (0.121) | (0.314) |
| *Financial Development* | 0.0590 | 0.0120 | 0.0454 |
| | (0.286) | (0.134) | (0.180) |
| *Skill Dependence* | −0.0031 | −0.0030 | 0.0042 |
| | (0.518) | (0.431) | (0.615) |
| *Ownership Concentration* | 0.0231 | 0.0011 | 0.0060 |
| | (0.122) | (0.214) | (0.328) |
| Regression $R^2$–adj. | 0.2693 | 0.2560 | 0.2822 |
| Number of observations | 2,005 | 2,005 | 2,005 |

This table reports the results of OLS regressions of the logs of total return volatility, idiosyncratic volatility, and systematic volatility on the interaction term of industry labor intensity with country rigidity of employment index and control variables. The regressions are run using the panel of industry-country-year observations from 2004 to 2006. Every regression includes country, industry, and year fixed effects. All of the variables are defined in Table 1. The numbers in parentheses are *p*-values. The coefficients significant at the 10% level (based on a two-tailed test) or higher are in boldface. *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively. Standard errors are clustered by countries and years to adjust for heteroscedasticity, cross-sectional, and time-series correlations.

larger. Moreover, the political uncertainty of trading partners affects total and idiosyncratic volatility of trade-dependent industries. Equally consistent is the negative association between volatility and the interaction of industry-level sensitivities (trade and contract enforcement) with the degree of national autocracy. Moreover, volatility is higher for labor-intensive industries when a party in power is left-wing or in countries with stricter employment laws.

### 3.4 Additional robustness tests

We address a number of concerns that may cast doubt on our findings. The results described above are robust to the remaining endogeneity, the use of alternative volatility measures, labor sensitivity, and additional control variables. In order to save space, we do not tabulate the robustness results and describe them in the text below. Unless stated otherwise, they generate a similar pattern of coefficients and statistical significance levels as the main results.

*Remaining endogeneity.* The industry political sensitivity approach mitigates endogeneity resulting from omitted time-invariant country and industry characteristics. It also reduces the likelihood of reverse causality since it is unlikely that within-country volatility differences systematically impact political variables across countries. Nonetheless, reverse causality can still be a problem for smaller countries with homogeneous production, as dominant industries spend significant resources on lobbying, thus influencing political outcomes. Therefore, political structure can be endogenously related to the economic performance of a particular industry. We attempt to address this issue using the instrumental variables (IV) regressions. Specifically, we use settlers' mortality rate and ethnolinguistic fractionalization as instruments for the autocracy index and overall political risk.[21] We use the IV estimation for Tables 4–6, in which autocracy and political risk are used. We do not find a significant change in the pattern of the previously reported coefficients.

Elections, likewise, can be endogenous to economic outcomes, as in many countries a chief executive has the option to call early elections (Lewis-Beck and Stegmaier 2000; Chang 2010). To address this issue, we divide the elections in our sample based on whether they have fixed or flexible timing (i.e., the elections that can potentially be called), using the classification of Julio and Yook (2011). Out of fifty sample countries (183 elections), twenty-seven countries (115 elections) have flexible timing. Moreover, within countries with flexible election timing, we identify "called" elections as those that are held more than three months ahead of the due date (Bialkowski, Gottschalk, and Wisniewski 2008 employ a similar classification).[22] Sixty-three elections fall into this category. Using the Wald test of the regression coefficients equivalence (between different sets of data), we find that there is no significant difference between the sets of elections with fixed timing and flexible timing. While the coefficients are statistically different for

[21] Acemoglu and Johnson (2005) show that in countries with greater risks of tropical diseases, the settlers were more likely to set up weak institutions to extract rents from the native population. La Porta et al. (1999) claim that governments intervene more in countries with greater ethnolinguistic fractionalization. The F-test of the joint significance of the instruments and the Hansen J-test of over-identifying restrictions indicate that these instruments can be treated as relevant and exogenous.

[22] China and Morocco did not hold national elections in our sample period. The details of the different types of elections by country are available from the appendix on the Journal website.

the sample of regularly scheduled elections compared to early elections, the variables of interest retain their significance in either sample. Therefore, we conclude that our results are not driven by early elections or countries with flexible electoral systems.

Finally, we rely on the previously described sample of forty-six political crises to strengthen our causality argument. These crises can be considered exogenous with respect to volatility levels of specific industries. We form interaction terms of trade dependence, contract enforcement, and labor intensity with the crisis dummy variable. Although the sample size decreases substantially, the interactions remain significant at the 10% level.

*Volatility of returns.* Volatility measures can be affected by industry heterogeneity, resulting from systematic differences in business complexity, size, and capital structure. We control for these industry factors. As an additional robustness check, we modify the volatility measures to assign weights for firms with different characteristics. Specifically, we calculate industry volatility, using weighting by size (measured by total assets), long-term debt, or diversification (the number of two-digit SIC segments a firm reports in its financial statement). Furthermore, to remove the diversification effect, we replicate our analyses using the sample of only pure-play firms, i.e., firms that operate in single segments. Our results remain robust.

*Volatility of fundamentals.* To exclude the possibility that our results are driven by the volatility of fundamentals, we explicitly control for industry (average across firms) ROA volatility. The result that the volatility of politically sensitive industries is higher after controlling for fundamental volatility is consistent with the “peso problem” explanation of excess volatility—the market anticipates a significant event (a drastic change in a political regime or economic policy) that may or may not materialize.

*Alternative definition of labor intensity.* One may argue against the applicability of U.S.-based labor intensities to other countries. First, because of the differences in the cost of labor around the world, labor intensities may vary substantially across countries. Second, one may argue that, with regard to labor intensities, U.S. markets are not frictionless. While the level of labor regulation in the United States is not as stringent as in some other developed countries (e.g., Sweden and New Zealand), it is stricter than in many of the emerging economies (e.g., Russia). Therefore, one may expect firms’ true labor sensitivities to be observed in countries with the least strict labor regulations. To address this concern, we replicate our analysis using local market data from Worldscope. Labor intensity that varies across countries and industries is computed as the number of employees divided by the value of sales. All of the reported results remain qualitatively unchanged.

*Interdependence of political sensitivities.* While we use trade dependence and labor intensity separately, we acknowledge a possible interdependence between the two variables. One can consider the case of a democratic system where it is problematic for a government in power to get legislative support for a bilateral trade treaty without including requirements for labor regulation reform in the other country. Alternatively, ethnic or nationalistic political pressure may result in direct trade subsidies for labor-intensive sectors that are crucial for electoral success. Lastly, the industries that thrive in an autocratic regime may be those that are labor-intensive, as it proves to be economically viable to operate in a country where labor laws are not protective of workers. If all of these scenarios are in fact behind the data, it is hard to distinguish between the trade and labor channels. To address this concern, we run regressions where we include all sensitivities in the same regression. We find that the significance of all interactions is maintained. Moreover, if we include the three political sensitivities together (trade exposure, contract enforcement, and labor intensity), the magnitude and the significance of the coefficients on the first two sensitivities remain virtually unchanged while labor intensity becomes less significant.

*Additional sensitivity analysis.* We also control for the following variables: industry life cycle (measured by the log of industry average of firms' number of years since listing), lagged volatility, U.S. elections, industry importance (ratio of industry total sales to country sales). Our results are robust to the inclusion of these variables. Furthermore, the results do not change if we reestimate every regression by excluding countries sequentially or apply the weighted least squares method using the number of industries in a country as weights.

## 4. Conclusion

This article explores whether and how national and global political risks affect return volatility. The within-country, across-industry methodology partially mitigates the omitted variables bias and enables us to identify the transmission channels of political risk into return volatility.

We focus on industrial characteristics along three key dimensions that are affected unevenly by political factors: international trade exposure, contract enforcement dependence, and labor intensity. We develop a panel data structure for our tests, where industry-level sensitivities vary over time. We document that more export-oriented industries, industries dependent on contract enforcement, and labor-intensive industries exhibit higher volatility when political risks are higher. Moreover, labor-intensive industries display higher volatility when left governments are in power or when labor laws are stricter. Autocratic regimes, on the other hand, subdue volatility in industries that are more dependent on trade or contract enforcement.

Notably, global political uncertainty manifested through elections and higher political risk in trading partner countries is reflected in the return volatility of trade-dependent domestic industries. While the literature has documented an insulation effect of trade from domestic disturbances, our study demonstrates that trade brings in foreign political risk.

We decompose return volatility into systematic and idiosyncratic parts. The volatility decomposition results provide robust evidence that global political risk increases idiosyncratic volatility of trade-dependent industries but has a weaker effect on systematic volatility. We argue that while companies can diversify global political risks through an optimal selection of trading partners, the benefits of diversification are not complete. On the other hand, the increase in return volatility caused by home-country political risk has a greater effect on the systematic part of volatility rather than on its idiosyncratic part.

To the best of our knowledge, this is the first article to apply the political sensitivity approach for a large set of countries and industries to analyze the impact of political events on return volatility. The main premise of this methodology is an asymmetric response of industries to political events. We believe our results settle the argument on whether political outcomes influence stock market volatility. Political risk is translated into greater return volatility, but the transmission mechanism is not uniform, with some industries affected more than others.

The results are of importance to investors, as we provide evidence of incomplete diversification of global political risk through international trade channels. From the perspective of corporate decision-making, we highlight the importance of volatility and, thereby, cost-of-capital implications of decisions to engage in foreign trade or invest in businesses with greater input complexities or labor dependence. In this context, our findings of volatility depending on industry political sensitivities (i.e., differential exposure to local and global political events) have implications for future academic inquiry, as well as applied portfolio management. Some directions for future research may include the investigation of the impact of political risk as a potential factor in asset pricing models using levels, rather than the volatility of stock returns.

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