Do Autocratic States Trade Less?

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Does the political regime of a country influence its involvement in international trade? A theoretical model that predicts that autocracies trade less than democracies is developed, and the predictions of the model are tested empirically using a panel of more than 130 countries for 1962–2000. In contrast to the existing literature, data on the regime type of individual countries are used rather than information about the congruence of the regime type of pairs of trading countries. In line with the model, autocracies are found to import substantially less than democracies, even after controlling for official trade policies. This finding is very stable and does not depend on a particular setup or estimation technique. JEL codes: F13, F14, O24, P45, P51

Is there a systematic relationship between economic and political liberalization? Does a country’s political regime systematically affect its involvement in international trade? The first question has received much attention recently, with studies of the determinants of democracy (for example, Barro 1999; Acemoglu and others 2008) and economic freedom (for example, Boockmann and Dreher 2003; Dreher and Rupprecht 2007) as well as studies of the relationship between democracy and economic freedom (for example, Sturm and de Haan 2003; Giavazzi and Tabellini 2005). The second, more specific question is much less well researched, and this article aims to provide new answers.

Knowledge of how political regimes influence international trade comes primarily from the political science literature. Two seminal works find that democracy encourages trade. Mansfield, Milner, and Rosendorff (2000) stress the congruence between the political regime of pairs of trading countries. They show that pairs of democratic countries trade more than pairs consisting of a
democracy and an autocracy.\textsuperscript{2} Milner and Kubota (2005) study the relationship between political regime type and trade policy in a sample of developing countries and show that democratic political institutions are associated with liberal trade policy.

This article adds to the literature in two related ways. First, it argues that the theoretical foundations of the previous studies (discussed in more detail in section I) overlook the importance of regime differences in political accountability and external monitoring and how these differences induce societies to build more or less effective incentives for customs officials. The lack of political accountability makes it possible for political leaders to extract rents by imposing restrictions on international trade. Moreover, within a hierarchical government structure, the lack of effective external monitoring (for example, due to the absence of free media) makes it less likely that political leaders choose to strengthen institutions to reduce trade-distorting red tape and other unofficial trade barriers. This effect is strengthened when autocratic leaders share the rents generated by red tape through a structured, hierarchical chain of rent sharing. The theoretical contribution of this article is thus the prediction that autocracies—societies with weak political accountability and underdeveloped external monitoring and rent-sharing chains—trade less with the rest of the world than do democracies—societies with strong political accountability and well-developed external monitoring—for two reasons. Democracy limits the scope for rent extraction through trade restrictions. And democracy encourages institutional reforms that reduce bureaucratic inefficiencies (and trade-distorting red tape).

The second way this article adds to the literature is by looking beyond the existing empirical work’s focus on the congruence of the political regime of pairs of trading countries, which does not cast light on how the political regime of individual countries affects trade volumes. Do autocracies trade less than democracies? This article answers in the affirmative. Furthermore, it uses a much larger data set, with a longer time horizon and deeper country coverage than previous studies, and estimates dyadic as well as single-country panel models. And its empirical design demonstrates that regime differences in trade policy, while playing a role, cannot fully account for the observed differences in trade flows. Both the observation that autocracies trade less and the observation that they trade less conditional on trade policy are consistent with the theoretical model. But evidence is also presented that countries with a free press and effective political accountability trade more, suggesting that the particular transmission channels of the model are important.

Some researchers have argued that international trade encourages democratization (for example, Li and Reuveny 2003; Rigobon and Rodrik

\textsuperscript{2} Using a less rich setup, Morrow, Siverson, and Tabares (1998) also find that democracies trade more with each other. And Daumal (2008) finds that federalist systems increase international trade.
This possibility is obviously a concern when estimating the impact of regime type on trade flows: countries that are not involved in international trade could be autocracies for that reason. This issue is addressed partly by allowing for unobserved country- and time-fixed effects in the empirical specification, partly by lagging the empirical indicators used to capture regime differences between countries, and partly by using instrumental variables. In particular, two new instruments are introduced for the political regime type.

By addressing whether systematic differences in trade integration exist between democracies and autocracies, this article contributes to the broader debate about trade and development and the role of “good governance” in fostering economic progress. First, trade integration is often seen as an engine of economic development. That autocracies trade less may therefore be one reason why so many remain underdeveloped. Second, trade integration and the underlying trade distortions are argued to be endogenous outcomes generated by the quality of political institutions and the type of bureaucracy that governments build. The natural policy implication is that better institutions will lead to better policies and less inefficiency, ultimately enhancing trade integration. This highlights the importance of the World Bank’s and other international institutions’ recent emphasis on a good governance agenda around the world.

The article is organized as follows. Section I presents the model, compares it with existing models, and develops the two hypotheses that govern the empirical investigation. Section II provides evidence on the main assumptions of the model and on its two transmission channels, using partial-regression leverage plots. Section III develops the empirical strategy in detail. Section IV presents the main result. Section V summarizes an extensive set of robustness checks. Section VI introduces the instruments and reports the results from the instrumental variable estimation. Section VII summarizes the findings and offers some concluding remarks.

I. A Model of Political Regimes and Trade Flows

This section presents a model that illuminates two new channels through which regime types can affect trade flows. One channel is the political accountability channel. It is harder for citizens in autocratic countries to hold their rulers accountable, so rulers are more free to use trade taxes to extract rents. The other channel is the external monitoring channel. Lack of a free press, for example, weakens external monitoring in autocratic societies. Rulers can compensate for this by building internal control mechanisms that weed out red tape and other unofficial trade obstructions introduced by the customs services. However, complementarity between external monitoring and internal control mechanisms, modeled as an efficiency wage, implies that autocratic rulers have less incentive to build or strengthen such internal control mechanisms, so the
customs service in an autocracy is freer to introduce and maintain red tape. Both channels suggest that, all else being equal, autocracies trade less than democracies, even conditional on similar official trade policies.

The theoretical work on the link between political regime type and trade flows or policy has focused on the role of international agreements or the effect of an extension of the voting franchise rather than on accountability and external monitoring. The first approach is taken by Mansfield, Milner, and Rosendorff (2000), who study how the incentives to enter a trade agreement differ between pairs of countries with different political regimes. The presumed difference between democracy and autocracy is that the executive in a democracy is constrained by the requirement that the legislature must ratify any trade agreement, while the executive in an autocracy is free of such constraints. With the additional assumptions that the legislature is more protectionist than the executive and that trade negotiations take place sequentially, as suggested by Putnam (1988), Mansfield, Milner, and Rosendorff (2000) show that pairs of democracies agree on a less protectionist trade policy than mixed pairs of autocracies and democracies. The reason for this somewhat surprising result is that a trade war is more costly for a pair of democracies than for other pairs. As a consequence, pairs of democracies face worse outside options than other pairs and hence agree to more concessions than mixed pairs do. While this prediction is robust to a range of bargaining structures, the model is silent on how much pairs of autocracies trade relative to pairs of democracies.

The model in this article shares the presumption that the critical difference between autocracies and democracies is the lack of effective constraints on the executive in autocracies but departs in three important ways. First, it focuses on individual countries and thus on unilateral trade policy, allowing predictions about how the regime type affects trade flows and trade policy. Second, it focuses explicitly on the incentives that the threat of replacement provides for rulers and politicians in different types of political regimes, allowing democracy and autocracy to be conceptualized along a continuum within the same analytic structure. Third, it combines an explicit economic structure with a stylized political structure.

The other approach in theoretical work is taken by Milner and Kubota (2005), who maintain that the link between democratization and free trade is

3. There is also a large literature on the political economy of trade protection (for example, Hillman 1982; Mayer 1984; Grossman and Helpman 1994; Aidt 1997). The aim of this literature is to explain trade protection within the context of competitive political systems often embodied in some form of democratic institution rather than to explain differences between broad regimes types such as autocracy and democracy.

4. Dai (2002) criticizes the theoretical findings of Mansfield, Milner, and Rosendorff (2000) and argues that their main proposition depends on the preferences of the executive and that it is, therefore, not generally true that democratic pairs trade more than mixed pairs. However, as pointed out by Mansfield, Milner, and Rosendorff (2002), this critique is valid only if the two-level game structure of international negotiations is replaced by a structure in which the legislature of a democracy negotiates directly with its counterpart or with the dictator if paired with an autocracy.
an enlarged constituency of government that changes the identity of the median voter. Under autocracy, the constituency of government is typically a small group of individuals who are well endowed with capital. Under democracy with universal suffrage, the median voter is a worker with a small capital endowment. In countries with a comparative advantage in producing labor-intensive goods (such as developing countries), the Stolper-Samuelson Theorem implies that the median voter benefits from trade liberalization as both a consumer and a laborer. The model here complements this. It leaves aside the effects of political transition on the constituency of government and the role of special interests in an autocracy and in a democracy. Instead, it highlights the degree to which rulers can be held accountable for their actions and to which their incentives to invest in “good” institutions vary systematically across regime types within a specific-factors model of international trade.

The focus of the model is more closely related to that of Adserà, Boix, and Payne (2003), who also stress the role of political accountability with free and competitive elections and the role of the media in creating incentives for politicians to reduce rent extraction. They do not, however, trace out the implications for trade policy, nor do they study a hierarchical structure of government or the implications of political failures.

**The Economy**

The model considers a small open economy that produces two goods and has an infinite time horizon. The stage model is similar to the specific-factors model of trade employed by Grossman and Helpman (1994) and many others. Good 0 is a numeraire good produced with constant returns to scale with labor as the only input and with an input–output coefficient of 1. Good 1 is produced by labor and sector-specific capital. The profit function is $\pi(p)$, where $p$ is the domestic price of the good and $p^*$ is the international price. Domestic supply is $\frac{\partial \pi}{\partial p} = y(p)$. Labor can move freely between sectors, so the wage rate in the private sector is $w^p = 1$.

The economy is populated by a continuum of agents with measure 1, which are called workers. Each worker supplies one unit of labor elastically to the labor market in return for wage income $w^p$. Each worker also owns an equal share of the specific factor used in the production of good 1, receiving income $\pi(p)$ from this source each period. Workers consume both goods and spend their entire income each period. Their utility function is $x_0 + u(x_1)$. Optimization subject to the budget constraint yields individual demands, $x_1 = d(p)$ and $x_0 = w^p + \pi(p) - pd(p)$, and the indirect utility $v(p) = w^p + \pi(p) + s(p)$, where $s(p) = u(d(p)) - pd(p)$. All utilities are discounted with the factor $\beta \in (0,1)$.

Good 1 is traded internationally, and net imports are $m(.) = d(p) - y(p)$. Workers care about the domestic price of good 1 for two reasons. First, it

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5. The claims to the specific factor cannot be traded.
6. Individual and aggregate demand for good 1 are identical.
affects them as consumers; second, it affects their profit income. Taking the derivative of the indirect utility function with respect to $p$ yields

$$\frac{\partial v}{\partial p} = -m(p).$$

Accordingly, if good 1 is imported ($m(.) > 0$), workers want the domestic price to be as low as possible, while if good 1 is exported ($m(.) < 0$), they want the domestic price to be as high as possible, to boost their profit income.

Trade flows are distorted by two types of policy interventions. First, the ruler of the country (the government) can levy a trade tax $\tau$ on good 1. If $\tau > 0$ and good 1 is imported (exported), $\tau$ is a tariff (export subsidy); if $\tau < 0$ and good 1 is imported (exported), $\tau$ is an import subsidy (export tax). Second, the customs officials in charge of regulating international trade can introduce various unofficial trade barriers, referred to as red tape. The per unit cost of red tape is denoted by $\theta$. To be concrete, it is assumed that good 1 is imported and thus that $\tau$ is a tariff. Effective trade distortion, $\tau + \theta$, can thus be defined as the difference between the domestic and the foreign price—or $\tau + \theta = p - p^*$. The revenues from the trade tax are

$$r(\tau, \theta) = \tau m(\tau, \theta),$$

where $(\partial m(\tau, \theta)/\partial \tau) < 0$—that is, an increase in $\tau$ pushes up the domestic price, which reduces domestic demand and increases domestic production. Red tape reduces the tax revenues raised for each value of $\tau$ because $\partial m(\tau, \theta)/\partial \theta < 0$. Assuming that $2(\partial m(\tau, \theta)/\partial \tau) + \tau (\partial^2 m(\tau, \theta)/\partial \tau^2) < 0$, this means that $r(\tau, \theta)$ is a Laffer curve. Finally, it is assumed that $(\partial m(\tau, \theta)/\partial \theta) + \tau (\partial^2 m(\tau, \theta)/\partial \tau \partial \theta) < 0$, such that the revenue-maximizing tariff falls with $\theta$. Taken together, these assumptions imply that the revenue-maximizing effective trade tax $(\tau + \theta)$ is increasing in $\theta$.

7. It will be clear from the objective function of the ruler that imports or exports are never subsidized. If good 1 is exported, the ruler will impose an export tax, and if it is imported, the ruler will protect domestic production with a tariff. Both are equally bad from the point of view of workers. In both cases, workers want the domestic price to be as close as possible to the world market price (and thus import and export taxes to be zero). Thus the focus on tariffs here does not lead to any loss of generality. A similar analysis can be conducted for export taxes.

8. If good 1 is exported, the wedge would be $p^* - p = \tau + \theta$.

9. Since $p = p^* + \tau + \theta$, $(\partial m(\tau, \theta)/\partial p) = \partial m(\tau, \theta)/\partial \theta = \partial m(\tau, \theta)/\partial \tau < 0$.

10. Let the effective trade tax be denoted $\tau^e = \tau + \theta$; then $\partial \tau^e/\partial \theta = \partial \tau/\partial \theta + 1$. Using the first-order condition for revenue maximization and noting that $(\partial^2 m(\tau, \theta)/\partial \tau^2) = (\partial^2 m(\tau, \theta)/\partial \tau \partial \theta)$,

$$\frac{\partial \tau^e}{\partial \theta} = \frac{(\partial m(\tau, \theta)/\partial \tau) + \tau (\partial^2 m(\tau, \theta)/\partial \tau^2)}{2(\partial m(\tau, \theta)/\partial \tau) + \tau (\partial^2 m(\tau, \theta)/\partial \tau^2) + 1} + 1 > 0.$$
Politics

The country is governed by a ruler whose objective is assumed to be extracting rents from the economy. These rents are spent on the numeraire good and come from two sources: rents from official trade taxes and rents generated by red tape. The idea is that customs officials in corrupt countries often are part of a sophisticated, institutionalized form of rent seeking, with the rents from red tape passing from the customs officials up a chain that stops with ruler. The ruler’s utility at time $t$ is $u_R = r(\tau, \theta) + \theta b$, where $b$ is the value to the ruler of the red tape introduced by the customs officials. The ruler’s capacity to extract rents depends on the quality of the underlying institutions, measured by $Q \in [0,1]$. At one end of the spectrum is a fully functional democracy with a free press, competitive elections, and respect for civil rights ($Q = 1$), and at the other end is a dictatorship with no effective way for citizens to hold the ruler accountable and no free press to monitor events ($Q = 0$). Depending on $Q$, the ruler can, therefore, be thought of as an unconstrained dictator, a democratically elected politician, or someone in between. The intrinsic objectives of rulers in autocracies and democracies are not assumed to be different. Instead, the quality of institutions forces democratically elected rulers to behave differently from dictators.

The ruler must employ a bureaucracy to run the customs services, collect tariffs, and hand them over to the ruler. The bureaucrats may also create red tape. To capture the idea of a rent-seeking chain, it is assumed that the ruler as well as the bureaucrats benefits from red tape—for example, because bribes can be collected and shared. Red tape can either be low (absent) or high, that is, $\theta \in \{0, \bar{\theta}\}$, where $\bar{\theta} > 0$. The rent that the representative bureaucrat gets from introducing red tape is $\theta B$, where $B$ is a positive constant. For simplicity, it is assumed that the bureaucrat holds...

11. This assumption can be relaxed. A ruler who consumes good 1 has a direct interest in the domestic price of that good and would then effectively be trading off the revenue implications of policy choices, with the desire to minimize the distortion of the domestic price. The conflict of interest between the ruler and citizens would still be present, and the main results of the analysis would be unaffected qualitatively.

12. The implicit motivation for delegating decision-making power to a ruler is that a government is needed to secure private contracts and ensure that markets can operate. The model could be extended to include a public good. In this case, the ruler can keep only the difference between what is spent on public goods and total tax revenues. All the results are essentially unaffected, so for simplicity the Leviathan assumption is used, as in Brennan and Buchanan (1980).

13. Political accountability is simply assumed to be positively related to a free press. However, as shown by Adsera, Boix, and Payne (2003), the relationship can be endogenized by noting that a free press can provide information to the electorate. This information allows voters to reduce the rents extracted by their rulers.

14. This implicitly assumes that, in addition to workers, there is a pool of potential rulers and bureaucrats in the society that can be called on to serve.
office for only one period and consumes good 0 only. The ruler benefits directly from red tape but also realizes that it distorts trade flows and reduces tariff revenues. The ruler might therefore want to design a control system of incentives for bureaucrats to refrain from introducing red tape, which is modeled as an efficiency wage. This is just one example of a costly institution that a ruler might build to discipline the bureaucracy; most important are that the ruler’s choice to pay (or not to pay) the efficiency wage is endogenous and that it is costly to pay the efficiency wage. Rulers can also use penalties to control customs officials, with the maximum penalty assumed to be $\eta \geq 0$.

The incentive to pay the efficiency wage depends critically on the effectiveness of external monitoring. The media play an important part in these activities. A free press, for example, can report on malfeasance, and the ruler can take appropriate action. It is assumed that the external monitoring technology discovers malfeasance of a particular customs official with probability $1 - z(Q)$ and that the ruler cannot use the rents from red tape to deduce who introduced it. The effectiveness of external monitoring is exogenous but systematically related to the quality of institutions, $Q$. It is assumed that $z'(Q) < 0$ and that $z(1) = 0$ and $z(0) = 1$—that is, external monitoring is more effective in societies with high-quality institutions. This reflects systematic differences in media freedom between broad regimes types such as autocracies and democracies. Within-regime variation in media freedom is not modeled, even though in practice it may play a role. Gehlbach and Sonin (2008), for example, show that government control over media in nondemocratic countries is stronger when the government’s need to use the media to mobilize the population is larger or when the advertisement market is large.

A bureaucrat who introduces red tape and is discovered, which happens with probability $1 - z(Q)$, is immediately fired and bears the cost of the penalty and thus loses wage income from the public sector and rents from red tape and returns to the private sector. In the private sector, the former bureaucrat receives $w^p$ starting from the next period onward. A bureaucrat who is not discovered, which happens with probability $z(Q)$, keeps the public sector wage for the current period ($w_t$) and any rent from creating red tape, and returns to the private sector in the subsequent period. The expected utility of a bureaucrat who introduces red tape in period $t$ can be written as

\[
z(Q)[w_t + \bar{n}B] - (1 - z(Q))\eta + \frac{\beta w^p}{1 - \beta}
\]

15. This is not important for the results. It is straightforward to extend the model to allow bureaucrats to hold office forever. Moreover, a bureaucrat who consumes good 1 might be concerned about the impact that red tape will have on the domestic price of the good. In reality, however, that bureaucrat would be only one among many, and it is unlikely that this effect will be taken into account, but even if it were, the main results are still valid as long as the value of red tape is sufficiently high.
and that of a bureaucrat who refrains from doing so as $w_t + (\beta w^p/1 - \beta)$, where $w_t$ is the public sector wage.\footnote{To ensure a positive supply of bureaucrats, it is assumed that $\beta B > 1$.} To strengthen the incentives of the bureaucracy, the ruler may, as suggested by Becker and Stigler (1974), offer an efficiency wage. Its cost is financed from tariff revenues. The efficiency wage that ensures that no red tape is introduced is given by

\begin{equation}
\omega^e = \max \left\{ \frac{z(Q)}{1 - z(Q)} \bar{B} - \eta, 0 \right\}.
\end{equation}

Effective monitoring and harsh penalties reduce the efficiency wage. Faced with the public sector wage $w_t$, the optimal choice of the bureaucrat in any period $t$ can then be summarized as

\begin{equation}
\theta_t(w_t) = \begin{cases} 
0 & \text{if } w_t \geq \omega^e \\
\bar{B} & \text{if } w_t < \omega^e 
\end{cases}
\end{equation}

Citizens attempt to hold the ruler accountable for actions while in office. For simplicity, it is assumed that only workers have political voice. This can be thought of as a situation in which the ruler needs to please the masses, an assumption that makes sense in a democracy but also in many autocracies.\footnote{The model could be extended to allow for lobbying.} Workers try to replace rulers judged to extract too much rent, and the extent to which they can do so depends on the quality of institutions, $Q$. In a fully democratic society, elections and a free press provide accountability (Ferejohn 1986; Persson and Tabellini 2000; Besley and Prat 2006), but even in autocracies and dictatorships, rulers may be constrained by the threat of a coup or a popular revolt (Acemoglu and Robinson 2001). At the beginning of each period, workers announce a performance standard that the ruler has to satisfy to be “reappointed” at the end of the period. Workers base their performance standard on the utility they get from the policies implemented by the ruler and the bureaucrat within the period. The performance standard announced at the beginning of period $t$ is denoted by $\tilde{v}_t$. The standard requires the ruler to introduce a policy package $(\tau_t, w_t)$ that yields at least the utility level $\tilde{v}_t$ in order to be considered for reappointment.

In a well-functioning democracy with a free press (high $Q$), a ruler (politician) who complies with the standard is guaranteed reappointment while a ruler who does not comply is certain of dismissal. Accountability is, however, seriously weakened in societies with dysfunctional institutions (low $Q$). Absence of regular and fair elections, intimidation of the opposition, electoral fraud, suppression of the press, and the like can significantly reduce the degree of accountability. This article focuses on a particular type of governance failure that directly impacts the degree of accountability rulers are subjected to.
Definition 1 (q-failure) Workers can promise to dismiss only a ruler who does not satisfy $\hat{\nu}_t$ in period $t$ with probability $1 - q(Q) \in [0,1]$ with $q'(Q) < 0$, $q(1) = 0$ and $q(0) = 1$.

A q-failure arises when citizens cannot in all cases dismiss underperforming rulers, and a society with $q(Q)$ close to 1 can be interpreted as a dictatorship in which the ruler can rule unchallenged. A society with poor institutions ($Q$ close to 0) suffers from significant q-failures and lacks an effective external control mechanism ($z$ is close to 1). By contrast, in a society with strong institutions ($Q$ close to 1), q-failures are mostly absent, and external monitoring—for example, through free media—is effective ($z$ is close to 0).

The interaction among rulers, bureaucrats, and workers can be summarized as follows. At the beginning of each period, a new bureaucrat enters office, and workers announce a performance standard. Next, the ruler decides on the tariff and the public wage for the period. Then the bureaucrat decides how much red tape to introduce, and the monitoring technology determines whether to fire the bureaucrat prematurely. At the end of the period, workers observe their utility levels, judge the performance of the ruler against the utility standard, and decide whether to reappoint the incumbent ruler. This, together with random events, as captured by $q$, determines whether the incumbent is replaced by another ruler. After this, the sequence of events is repeated.

Analysis and Results

Given a sequence of standards $\{\hat{\nu}_t\}_{t=0}^\infty$, the ruler faces the choice between complying and hoping to stay in power (which allows the ruler to collect rents in the future) or not complying and collecting the maximum rent now.

A ruler who decides not to comply at time $t$ (that is, to deviate, $D$) sets

$$\{\tau^D_t, w^D_t\} = \arg\max_{\tau, w_t} r(\tau_t, \theta(w_t)) - E(w_t) + \theta(w_t)b.$$  

In doing so, the ruler anticipates how the public wage affects the choices of the bureaucrat. It is costly to provide wage incentives, and the expected wage bill is

$$E(w_t) = \begin{cases} zw_t & \text{if } w_t < w^e \\ w_t & \text{if } w_t \geq w^e \end{cases}$$

The ruler knows that the wage has to be paid only if the bureaucrat is not discovered adding red tape. Clearly, either $w^D_t = 0$ or $w^D_t = w^e$ is optimal. In the former case, the optimal tariff is

$$\tau^{D1} = \arg\max_{\tau_t} r(\tau_t, \bar{\theta}) + \bar{\theta}b$$

and the rent is $r(\tau^{D1}, \bar{\theta}) + \bar{\theta}b$ for all $t$. In the latter case, it is

$$\tau^{D2} = \arg\max_{\tau_t} r(\tau_t, 0) - w^e$$
and the rent is \( r(\tau^{D2}, 0) - \omega^e \) for all \( t \). In both cases, the workers attempt to replace the ruler at time \( t + 1 \) but fail to do so with probability \( q(Q) \). The ruler’s expected payoff is

\[
V_t(D) = \max \{ r(\tau^{D1}, \theta) + \bar{\theta} b, r(\tau^{D2}, 0) - \omega^e \} + \beta q(Q)V_{t+1}^*,
\]

where \( V_{t+1}^* \) is the continuation value of holding office at the beginning of period \( t + 1 \). The optimal deviation policy depends on the quality of the monitoring institutions as described by lemma 1.

**Lemma 1** (the optimal deviation policy) Let \( Z(Q) = (z(Q)/1 - z(Q)) \) with \( Z' < 0 \). Moreover,

\[
\Delta R^D = \frac{r(\tau^{D2}, 0) - r(\tau^{D1}, \bar{\theta} B) - \bar{\theta} b + \eta}{\bar{\theta} B}.
\]

Then

1. If \( Z(Q) \geq \Delta R^D \), then \((\tau^{D1}, 0)\) is optimal.
2. If \( Z(Q) < \Delta R^D \), then \((\tau^{D2}, \omega^e)\) is optimal.

**Proof.** The lemma follows from a straightforward comparison of the net rents collected by the ruler, in each case using equation (4).

The quality of institutions \( Q \) effectively determines whether it is in the ruler’s interest to maintain strong wage incentives for the bureaucrat. If institutional quality is high (\( Q \) close to 1), external monitoring is effective (\( z \) is low), it is cheap to pay the efficiency wage, and it is optimal to weed out red tape, even for a ruler who has decided to disregard citizen demands. If, by contrast, institutions are weak (\( Q \) close to 0) and the monitoring technology is ineffective (\( z \) is high), the ruler has no incentive to build (costly) incentives for the bureaucrat. The ruler simply focuses on maximizing tariff revenues subject to red tape. The intuition behind these results is that external monitoring and the efficiency wage are complements rather than substitutes. It is simply cheaper to pay the efficiency wage if the institutional framework allows for effective external monitoring.

An increase in the value derived from red tape (\( b \)) makes it more likely that the ruler decides not to pay the efficiency wage. Thus, insofar as institutionalized rent-seeking chains are more common in an autocracy than in a democracy, an autocratic ruler has an additional reason to pay low wages: to encourage customs officials to generate red tape whose rents directly benefit the ruler. But if an autocratic ruler can punish harder (for example, by not having to worry about the rule of law), it is cheaper to pay the efficiency wage, all else being equal, making this choice more likely. Whether to pay the efficiency wage then
depends partly on whether the ruler can punish hard \((\eta \text{ is larger})\) relative to the value of the rent earned from red tape \((b\theta)\). In situations where the value of the rent is very large and the capacity to punish is limited, paying the efficiency wage is too costly, while in situations where the value of the rent is low and the capacity to punish is larger, paying the efficiency wage becomes the preference.

A ruler who decides to comply \((C)\) in period \(t\) selects the policy package

\[
\{ \tau_t^C, w_t^C \} = \arg\max_{\tau, w} r(\tau_t, \theta(w_t)) - E(w_t) + \theta(w_t)b
\]

subject to \(v(\tau_t, \theta_t) \geq \tilde{v}_t\). Again, the ruler either sets \(w_t^C = 0\) or \(w_t^C = w^e\), and

\[
\tau_t^{C1}(\tilde{v}_t) = \arg\max_{\tau, \theta} r(\tau_t, \theta) + \theta b
\]

subject to \(v(\tau_t, \theta) \geq \tilde{v}_t\) is optimal for \(w_t^C = 0\) and

\[
\tau_t^{C2}(\tilde{v}_t) = \arg\max_{\tau, 0} r(\tau_t, 0) - w^e
\]

subject to \(v(\tau_t, 0) \geq \tilde{v}_t\) is optimal for \(w_t^C = w^e\). Since \(v(\tau, \theta)\) is decreasing in \(\tau\), the ruler must reduce the tariff below the respective rent-maximizing levels to satisfy the constraints. The expected payoff is

\[
V_t(C) = \max \{ r(\tau_t^{C1}(\tilde{v}_t), \theta) + \theta b, r(\tau_t^{C2}(\tilde{v}_t), 0) - w^e \} + \beta V_{t+1}^*.
\]

As shown by lemma 2, the quality of institutions, through its impact on external monitoring, also plays a key role for the choice between the two compliance strategies.

**Lemma 2 (within-period optimal compliance).** Let \(Z(Q) = (z(Q)/1 - z(Q))\) with \(Z' < 0\). Moreover, suppose that \(\hat{v}_t \geq \max\{v(\tau_t^{D1}, \theta), v(\tau_t^{D2}, 0)\}\) and let

\[
\Delta R_t^C = \frac{r(\tau_t^{C2}(\hat{v}_t), 0) - r(\tau_t^{C1}(\hat{v}_t), \theta) - \theta b + \eta}{\theta b}.
\]

Then

1. If \(Z(Q) \geq \Delta R_t^C\), then the optimal compliance policy is \((\tau_t^{C1}(\hat{v}_t), 0)\).
2. If \(Z(Q) < \Delta R_t^C\), then the optimal compliance policy is \((\tau_t^{C2}(\hat{v}_t), w^e)\).

**Proof.** The lemma follows from a straightforward comparison of the net rents collected by the ruler in each case using equation (4).

The intuition behind lemma 2 is similar to that behind lemma 1. In societies with strong institutions, the ruler has an incentive to strengthen institutions and pay an efficiency wage; in a society with weak institutions, this incentive is absent.
The sequence of performance standards is incentive compatible if at all \( t \)
\[
V_t(C) \geq V_t(D). \tag{15}
\]
Workers select the sequence of standards that yields the highest lifetime utility subject to incentive compatibility. The structure of the model implies that the optimal choice is stationary; that is, \( \hat{\nu}_t = \hat{\nu}^* \) for all \( t \), where \( \hat{\nu}^* \) is defined by
\[
\max \left\{ r(\tau^{C1}(\hat{\nu}^*), \theta) + \theta b, r(\tau^{C2}(\hat{\nu}^*), 0) - u^e \right\} = \frac{1 - \beta}{1 - \beta q(Q)} \max \left\{ r(\tau^{D1}, \theta) + \theta b, r(\tau^{D2}, 0) - u^e \right\}. \tag{16}
\]
Incentive compatibility requires that \( q(Q) < 1 \); otherwise, institutions are so bad that no ruler would ever comply with any standard other than the rent-maximizing one. It is also clear from equation (16) that workers’ welfare is increasing in the quality of institutions—that is, \( (\partial \hat{\nu}^*/\partial Q) > 0 \).

Why is the volume of international trade different in autocracies and democracies? To study this, two extremes are compared. At one extreme is a society with well-functioning democratic institutions and a free press (a democracy): \( Q \to 1^- \). At the other end is a society with seriously dysfunctional institutions (an autocracy): \( Q \to 0^+ \). In the real world, most societies fall between these extremes. The following proposition states the main implications of the model.

**Proposition 1** (regime type and the volume of trade). Assume that \( \min \{ \Delta R^C_t, \Delta R^D_t \} > 0 \).

1. The effective trade distortion is higher in autocracies than in democracies and, as a consequence, autocracies trade less with the rest of the world than do democracies.
2. For given official trade policy \( \tau \), autocracies trade less with the rest of the world than do democracies because of differences in red tape and other unofficial trade distortions.

**Proof.** Part 1. Consider an autocracy with \( Q = 0 \). This implies that \( q(0) = 1 \) and \( z(0) = 1 \). Lemma 1 implies that the optimal deviation entails \( w^D = 0 \) and \( \tau^D = \tau^{D1} \), while lemma 2 implies that the optimal compliance policy is \( w^C = 0 \) and \( \tau^C = \tau^{C1} \) for all \( t \). However, since \( q(0) = 1 \), equation (16) implies that the ruler implements \( \tau = \tau^{D1} = \tau^{C1} (v(\tau^{D1} + \theta)) \) and \( w = 0 \) each period until replaced by a new ruler who behaves likewise. Workers get \( v(\tau^{D1} + \theta) \), and the

18. A sufficient condition for this to hold is that \( \eta \geq b\theta \). However, what really matters is that democratic leaders choose to pay the efficiency wage while autocratic rulers do not. Insofar as the punishment cost and the value of red tape vary across regimes, the value of red tape to democratic leaders needs only to be not too high relative to the cost to bureaucrats of being caught creating red tape. For autocratic rulers, no restrictions need to be imposed on the relative size of \( \eta \) and \( b\theta \) to expect that they are both finite.
effective trade distortion is $r^{D1} + \overline{\theta}$. Consider next a democracy with $Q = 1$. This implies that $q(1) = 0$ and $z(1) = 0$. Under the assumption that $\min \{\Delta R_C^C, \Delta R_t^D\} > 0$, lemmas 1 and 2 imply that $w^D = w^C = w^\epsilon$ and that $r^D = r^{D2}$ and $r^C = r^{C2}$ at all $t$. The effective trade distortion is $r^{C2}$. Let $v^{**}$ denote equilibrium utility of a worker, where $v^{**}$ is defined by equation (16):

$$r(r^{C2}(v^{**}), 0) - w^\epsilon = (1 - \beta)(r(r^{D2}, 0) - w^\epsilon).$$

Suppose that $\beta = 0$. Then $r(r^{C2}(v^{**}), 0) = r(r^{D2}, 0)$. The assumptions listed at the end of section I imply that $r^{D2} < r^{D1} + \overline{\theta}$. Since indirect utility is decreasing in the domestic price of good 1, it follows that $v(r^{D2}) > v(r^{D1} + \overline{\theta})$. Consequently, for $\beta = 0$, it follows that $v^{**} = v(r^{D2})$ is larger than $v(r^{D1} + \overline{\theta})$. Since from equation (17), $v^{**}$ is increasing in $\beta$, and $v(r^{D1} + \overline{\theta})$ is independent of $\beta$, it follows that the best incentive-compatible standard under democracy $v^{**}$ entails higher utility than what is obtained under autocracy, $v(r^{D1} + \overline{\theta})$. Since indirect utility is decreasing in the effective tariff rate, it follows that $r^{D1} + \overline{\theta} > r^{C2}(v^{**})$ and thus, as stated in part 1 of the proposition, that autocracies trade less.

Part 2. Begin by observing that $r^{D1}(\theta) \leq r^{D2}$. This follows from the fact that $r^{D1}(0) = r^{D2}$ and the assumption that the revenue-maximizing tariff falls with $\theta$, that is, $(\partial r^{D1}(\theta)/\partial \theta) < 0$. Moreover, $r^{C2}(v^{**}) > r^{D2}$, since $r^{D2}$ maximizes tariff revenues, and $r^{C2}(v^{**})$ is independent of $\theta$. It follows that a $\overline{\theta}$ can be chosen such that $r^{D1}(\overline{\theta}) = r^{C2}(v^{**})$—that is, such that the official tariff is the same in democracies and autocracies. It then follows from the observation that autocracies allow red tape while democracies do not and that autocracies trade less than democracies conditional on having the same official trade policy.

The first part of the proposition shows that autocracies trade less than democracies. The source of this difference is the quality of institutions. These differences affect trade flows through two channels. First, autocracies have weak accountability institutions, as captured by $q(Q)$. This allows autocratic rulers to extract more rents than politicians in a democracy can. The implication is higher trade taxes under autocratic rule and consequently less imports (or exports). An improvement in accountability (better institutions) reduces trade taxes and encourages more trade. Second, autocracies also have weak external monitoring institutions (as captured by $z(Q)$). As a consequence, autocratic rulers have little incentive to weed out red tape and other unofficial trade obstructions introduced by the bureaucrats. In contrast, in a democracy with a free press and effective external monitoring, it is cheap to pay the efficiency wage. In other words, it is optimal for a ruler to enhance institutional quality endogenously. This reduces red tape and encourages trade flows.

One implication is that public sector wages are lower in autocracies than in democracies. In the model, this is due to two factors. First, because of poor monitoring, autocratic rulers find it too costly to pay efficiency wages. Second, autocratic rulers have a direct interest in keeping red tape because they share in
the rents. One interpretation, then, is that autocratic rulers hold public sector wages down to encourage bureaucrats to collect unofficial rents that are (partly) passed up through a chain to them. In fact, for a given quality of institutions, $Q$, an increase in the value of red tape for the ruler, $b$, increases the likelihood that the regime introduces red tape, and consequently it trades less with the rest of the world.\textsuperscript{19} In other words, insofar as rent-seeking chains are more common in autocracies than in democracies—and empirical observations suggest that they are—the model suggests an alternative reason why autocracies trade less: autocratic rulers, unlike democratic politicians, have a direct interest in maintaining and encouraging informal mechanisms (red tape) for extracting rents from international trade. The second part of the proposition shows that precisely because of differences in the incentives for rulers to control red tape in the two types of societies, autocracies trade less than democracies for a given official trade policy. The reason is unobserved red tape.

There may, of course, be other reasons why an autocracy trades less than a democracy with the same official trade policy that are not captured by the model. For example, tariffs and export taxes may violate international trade agreements and induce autocratic rulers, who would have imposed additional trade taxes in the absence of these constraints, to seek informal ways of extracting rents from international trade. To ensure that this does not drive the empirical results, participation in international agreements is controlled for in the estimations (see section III).

Another reason why trade may be more distorted in an autocracy than in a democracy is that autocratic rulers must cater to powerful domestic elites with a particular interest in trade protection. This is likely to play an important role in autocracies where local elites have a substantial stake in import-competing sectors. However, lobbying by special interest groups for trade protection is also common in democracies (see, for example, Grossman and Helpman 1994). It is thus unclear whether this line of reasoning leads to systematic differences in trade flows according to regime.

Yet another reason relates to systematic differences in the protection of property rights in autocracies and democracies. Poor protection of property rights discourages foreign direct investment in autocracies and may have an adverse affect on trade volumes for a given trade policy.

Alternative explanations exist for why public sector wages are low in autocracies. One possibility, suggested by Besley and McLaren (1993), is that paying tax collectors or customs officials a wage below the market wage—a so-called capitulation wage—can yield more net revenue than trying to discipline officials through wage incentives. Another possibility, suggested by Olson (2000), is that autocrats, aiming to extract maximum revenues from the population, tax inframarginal units of work highly while at the same time keeping

\textsuperscript{19} Note that $b$ reduces $R^D$ and $R^C$ (see lemmas 1 and 2) and thus makes it more likely that the ruler, for given $Q$, decides not to weed out red tape.
the tax on extra income close to zero. The result of such a system would also be very low wages for the normal amount of work done by public officials. These are valid explanations, and the focus here on the efficiency wage complements them while stressing a new reason why autocratic rulers might want to keep public sector wages low: to encourage their officials to create rents that they can share in.

II. Empirical Assessment of the Model

Before turning to the main econometric analysis, this section assesses the key assumptions of the model empirically and provides some suggestive but direct evidence on the relevance of the two transmission channels highlighted by the model. This is because these aspect of the model cannot be directly tested (due to lack of sufficient data) in the main empirical analysis, which consequently focuses on testing whether an autocracy trades less than a democracy.

The cornerstone of the model is the parameter $Q$ expressing institutional quality. Press freedom and political accountability go together and are features of democracies that tend to be absent in autocracies. The Freedom of the Press indicator published by Freedom House (2009) and the Democratic Accountability indicator from the International Country Risk Guide (see Knack and Keefer 1995) are used to measure these attributes empirically. Higher values of the two indicators correspond to more freedom and more accountability, respectively (figure 1). Panel a of figure 1 shows that press freedom goes hand in hand with political accountability, as expected based on Adsera, Boix, and Payne (2003). All panels of figure 1 control for GDP, annual time dummy variables, and heteroskedasticity, so figure 1 depicts partial-regression leverage plots. In the econometric analysis below, data limitations force the focus onto broader measures of political regime type, including the Polity IV index. This index measures regime type on a scale from $-10$ (autocracy) to $10$ (democracy), but to make it comparable to similar indicators, it is rescaled so that higher values correspond to more autocratic countries. To see whether the transmission channels identified by the model make sense, the partial correlation between press freedom and political accountability, on the one hand, and the Polity IV index, on the other hand, were studied. The results are shown in panels b and c of figure 1 and support the assertion that democracy (as measured by the Polity IV index) is associated with more press freedom and more political accountability. Finally, data on total real imports to a country in a given year are used to assess whether press freedom and

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20. Systematic data on freedom of the press, for example, is available only from 1994 onward. As basically all political transitions took place before 1994, the fixed effects approach prevents these data from being directly incorporated.

21. Adsera, Boix, and Payne (2003) report a strong, positive relationship between a measure of free circulation of newspapers and a number of alternative measures of political accountability.
FIGURE 1. Press Freedom and Accountability Compared with Regime Type and Imports

Note: The panels depict partial-regression leverage plots (controlling for income, annual time dummy variables, and heteroskedasticity). Data are for 1984–2000 for accountability and 1994–2000 for press freedom. The coefficient of the underlying regression, its standard deviation, and t-statistic are reported below each graph.

political accountability are linked directly to trade volumes. The partial-regression plots in panels d and e show that both press freedom and political accountability are associated with larger volumes of trade. This supports the relevance of the two channels highlighted by the model, albeit only through correlations.

Another key feature of the model is the efficiency wage (or lack thereof). Rulers in autocratic societies (rationally) decide not to pay the efficiency wage, which increases the probability that bureaucrats will create red tape.22 Again, these assumptions are validated using partial-regression leverage plots. Because only cross-sectional information on public sector wages is available, only GDP and heteroskedasticity can be controlled for in figure 2. Figure 2 addresses two questions using survey data from Rauch and Evans (2000) on wages in the public sector (relative to the private sector) for 35 developing countries averaged over 1970–90. Is the fraction of total pay accounted for by bribes or

Note: The panels depict partial-regression leverage plots (controlling for income and heteroskedasticity). Data are averages for 1970–90. The coefficient of the underlying regression, its standard deviation, and $t$-statistic are reported below each graph.

Source: Authors’ analysis based on data from Feestra (2000), Gurr, Jagger and Moore (2003), and Rauch and Evans (2000).

22. The observation is supported by the findings of Gorodnichenko and Sabirianova Peter (2007), who find that public sector employees (including customs officials) in Ukraine receive approximately 30 percent lower wages than those in comparable jobs in the private sector. Yet the consumption expenditures and asset holdings of the two groups are essentially identical, which indicates that bureaucrats receive sizable unofficial payments. The negative relationship between relative civil service pay and corruption is also demonstrated in van Rijckeghem and Weder (2001). Finally, Adsera, Boix, and Payne (2003) report a strong positive relationship between the level of democracy and measures of the quality of the bureaucracy in a sample of about 100 countries for 1980–95. This directly supports the notion that autocratic rulers have less incentive to build incentives for their bureaucrats.
other extralegal sources of income larger in autocracies than in democracies? And does the official public sector wage affect trade flows?

Panel a of figure 2 shows the relationship between the ratio of total to official income (higher values indicate that extralegal income is a more important source of income) and the Polity IV index. Unofficial income accounts for a larger share of total income in autocratic countries. This is consistent with the notion that public officials are more likely to supplement their (low) official wages with bribe income created through red tape in an autocracy than in a democracy. Moreover, as the model suggests, higher official wages in the public sector are positively correlated with the volume of imports, as demonstrated by the partial-regression plot in panel b of figure 2.

Taken together these empirical observations suggest that the model and its basic assumptions provide an empirically sound and consistent theory of why regime type might affect trade volumes. But the question of whether autocracies trade less, and if so, whether the relationship is causal, remains to be answered.

III. Empirical Specification

This section turns to estimating the relationship between a country’s political regime and its involvement in international trade, thereby testing the two main implications of the model listed in proposition 1 and answering the question posed by the title of the article. To this end, a dyadic model of trade is used for a sample of up to 130 countries covering 1962–2000. The dependent variable is imports of country $i$ from country $e$ in year $t$ rather than total trade flows between pairs of countries. This choice avoids what Baldwin (2006, p. 18–19) calls the “silver-medal of gravity mistakes”—that is, the sizable upward bias that regressions with average bilateral trade flows as the dependent variable are subject to when trade is unbalanced. More specifically, the baseline specification is the following dyadic panel model:

$$\ln(\text{import}_{iet}) = \beta_1\text{regime}_{it-1} + \beta_2\text{regime}_{et-1} + \beta_3\ln(\text{GDP}_{it}) + \beta_4\ln(\text{GDP}_{et}) + \beta_5\ln(\text{GDP p.c.}_{it}) + \beta_6\ln(\text{GDP p.c.}_{et}) + \beta_7\ln(\text{WTO}_{it}) + \beta_8\ln(\text{WTO}_{et}) + \beta_9\ln(\text{regional}_{iet}) + \gamma_{ie} + \delta_t + \epsilon_{iet},$$

(18)

where $\text{import}_{iet}$ is imports of country $i$ from country $e$ in year $t$; $\text{regime}_{it-1}$ and $\text{regime}_{et-1}$ are lagged values of measures of regime type (democracy or autocracy) of the importing and exporting country (to be discussed below); $\text{GDP}_{it}$

23. Data on nominal import flows are taken from Feenstra (2000).

24. This follows from the fact that the log of the average is not equal to the average of the logs if the import and export flows are not identical in magnitude (Jensens’s inequality). For a formal proof, refer to Baldwin (2006).
and GDP\textsubscript{et} are real GDP of the importing and exporting country; GDP p.c.\textsubscript{it} and GDP p.c.\textsubscript{et} are GDP per capita of the importing and exporting country; WTO\textsubscript{it} and WTO\textsubscript{et} are dummy variables indicating whether the importer or exporter country is a member of the General Agreement on Tariffs and Trade/World Trade Organization (WTO); and regional\textsubscript{iet} is a dummy variable taking the value of 1 if both the importer and the exporter are members of the same regional trade agreement.

Table 1 lists the sources, definitions, and summary statistics of all the variables used in the analysis. All regressions include fixed effects for the trading pair, \(\gamma_{iet}\), as well as year fixed effects, \(\delta_t\). This is a variant of the approach adopted by Feenstra (2004), who introduced the notion of country-specific effects as “multilateral resistance terms.”\textsuperscript{25} The dyadic effects control for unobserved trading pair characteristics that are fixed over time, with the subtlety that these unobservable effects can be asymmetric, that is, \(\gamma_{it} \neq \gamma_{ei}\). Baltagi, Egger, and Pfaffermayr (2003) and Baldwin (2006) point out the importance of correcting for these trading pair and time fixed effects. Baldwin (2006, p. 15–16) calls the omission of these effects the “gold-medal of gravity mistakes,” noting that fixed effects control only for the time-invariant part of multilateral resistance. However, including time-varying fixed effects would preclude identification of the regime type effect and cannot be done.

Because of the difficulty of obtaining reliable quantitative measures of regime type, three indicators are used as proxies. Each captures different aspects of the institutional environment and has flaws and advantages. The first indicator is the regime type indicator constructed by Alvarez and others (1996) and Przeworski and others (2000). It defines democracy as a political system in which incumbents can lose elections and are forced to comply with these outcomes. More specifically, a country is classified as a democracy if the executive and the legislature are elected through contested elections in which more than one party has a chance of winning. The resulting dummy variable takes the value of 1 for autocracies and 0 for democracies. The second indicator is the Polity IV index constructed by Gurr, Jaggers, and Moore (2003).\textsuperscript{26} The index is measured on a scale of –10 (autocracy) to 10 (democracy). As mentioned above, so that the results obtained with this indicator are

\textsuperscript{25} An alternative to the specification with the dyadic specific effects is to follow Rose (2004) and include the geographic distance between the trading partners, and dummy variables controlling for common language, common border, colonial ties, common colonizer, and landlockedness as well as fixed effects for the importers and exporters. The empirical findings remain unchanged when this is done. For further details on this type of gravity model, see Anderson and van Wincoop (2003), Rose (2004), and Brun and others (2005).

\textsuperscript{26} The Polity IV index—or more accurately the “polity2” index—summarizes different indicators of political authority patterns to measure three key aspects of a country’s political system: competitiveness and openness in executive recruitment, constraints on the chief executive, and competitiveness and regulation of political participation. A weighted sum of the components is used to construct two summary variables, measuring democracy on a scale from 0 to 10 and autocracy from –10 to 0. The Polity IV index is the sum of these two subindexes.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Source</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ln import</td>
<td>Log of nominal imports in U.S. dollars</td>
<td>Feenstra 2000</td>
<td>7.96</td>
<td>3.49</td>
</tr>
<tr>
<td>Polity IV&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Inverse of polity2 indicator: 1 = most democratic, 21 = most autocratic</td>
<td>Gurr, Jaggers, and Moore 2003</td>
<td>7.59 (&lt;i&gt;i&lt;/i&gt;)</td>
<td>7.32 (&lt;i&gt;i&lt;/i&gt;)</td>
</tr>
<tr>
<td>Freedom House&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Average of “political rights” and “civil liberties” indicators: 1 = most</td>
<td>Freedom House 2006</td>
<td>7.58 (&lt;i&gt;e&lt;/i&gt;)</td>
<td>7.30 (&lt;i&gt;e&lt;/i&gt;)</td>
</tr>
<tr>
<td></td>
<td>democratic, 7 = most autocratic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Przeworski and others&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Dummy variable taking the value of 1 for autocratic states</td>
<td>Alvarez and others 1996; Przeworski and others 2000</td>
<td>3.13 (&lt;i&gt;e&lt;/i&gt;)</td>
<td>1.94 (&lt;i&gt;e&lt;/i&gt;)</td>
</tr>
<tr>
<td>ln GDP&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Log of GDP in constant 2000 U.S. dollars</td>
<td>World Bank 2006</td>
<td>24.18 (&lt;i&gt;i&lt;/i&gt;)</td>
<td>2.17 (&lt;i&gt;i&lt;/i&gt;)</td>
</tr>
<tr>
<td>ln GDP p.c.&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Log of GDP in constant 2000 U.S. dollars divided by midyear population</td>
<td>World Bank 2006</td>
<td>24.26 (&lt;i&gt;e&lt;/i&gt;)</td>
<td>2.23 (&lt;i&gt;e&lt;/i&gt;)</td>
</tr>
<tr>
<td>Restriction index&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Subindex economic restrictions of the KOF Swiss Economic Institute Index of</td>
<td>Dreher 2006</td>
<td>7.95 (&lt;i&gt;i&lt;/i&gt;)</td>
<td>1.59 (&lt;i&gt;i&lt;/i&gt;)</td>
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<td></td>
<td>Globalization; combines data on hidden import barriers, mean tariff rate,</td>
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<td></td>
<td>taxes on international trade (percent of current revenue) and capital</td>
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<td></td>
<td>account restrictions</td>
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<tr>
<td>Regional trade</td>
<td>Dummy variable for pairs that are a member of the same regional trade</td>
<td>Rose 2004</td>
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<td>agreement</td>
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<td></td>
<td>0.76 (&lt;i&gt;e&lt;/i&gt;)</td>
<td>0.43 (&lt;i&gt;e&lt;/i&gt;)</td>
</tr>
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</table>

<sup>a</sup>For these variables <i>i</i> refers to importing countries and <i>e</i> refers to exporting countries.

<i>Source</i>: Authors’ analysis based on sources described in the table.
comparable to those obtained with the two other indicators, the variable was recoded so that higher values indicate that a society is more autocratic. The third indicator is the average of the political rights and civil liberties indicators constructed by Freedom House (2006). The resulting indicator ranges from 1 to 7, with higher values indicating that a society is more autocratic.

All of the indicators have drawn criticism. Przeworski’s regime type indicator uses the most clear-cut definition of the three but has the disadvantage of being a dummy variable without “shades of gray.” The Polity IV index has been criticized for the way values are assigned to its various subcomponents. Freedom House draws critique because its indicators are completely survey based. Furthermore, the three indicators focus on slightly different aspects of political institutions and should therefore perhaps best be viewed as complements rather than substitutes. Przeworski and others (2000) aim to capture a combination of political participation and contestability of political power. The Polity IV index basically measures political competition and ignores how widely extended the voting franchise is and other aspects of popular participation in politics. The Freedom House index focuses more on political rights and civil liberties than on de facto political competition and participation. The complementarity of the measures is another good reason to use all three in the analysis.

As Milner and Kubota (2005) argue, it takes time for changes in political institutions to affect trade patterns, and the effects of democratic transitions are likely to be long lasting. For this reason, the three institutional indicators are entered either with a one-year lag or as the average of the five preceding years. This also mitigates potential endogeneity problems arising if international trade encourages the development of democratic institutions, a topic addressed in section IV.

The baseline specification allows testing of the first implication of the model—that autocratic countries trade less. The second implication is that autocratic countries trade less conditional on official trade policy. To test this, the baseline model must be extended with a proxy for trade policy. Trade restrictions can take many forms, so a multidimensional index is used. In particular, the restriction subindex from the KOF Swiss Economic Institute Index of Globalization is employed (see Dreher 2006). This restriction index combines publicly available information on nontariff import barriers, mean tariff rates, other taxes on international trade, and capital account restrictions. It ranges from 1 to 10, with higher values indicating fewer restrictions.

It is important to notice that specification (18) is designed to estimate the effect of the regime type of individual countries (as opposed to pairs of

27. Moreover, as discussed by Vreeland (2008), instances of civil violence are coded as less autocratic than peaceful autocracies because civil violence is taken as a form of political participation. Given that, for example, civil wars often lead to a regime change, this middle range of the scale is associated with regime instability (see Plümper and Neumayer 2009).

28. The correlation between the three measures is, however, high despite these differences, ranging from 0.8 to 0.9.
countries) on trade flows and to do so separately for an importing and an exporting country. This dyadic panel setup allows the results to be directly compared with those in the previous literature. However, the underlying data set is extremely large (more than 80,000 observations). For this reason, it is possible that the $t$-statistics associated with the estimated coefficients on the regime type indicators are spuriously large. An alternative to the dyadic panel setup that circumvents this problem and provides another avenue for testing whether autocracies trade less is a single-country panel model. In the model, the dependent variable is a country’s total annual imports or exports, respectively, and the unit of analysis is a country-year observation:

$$\ln(y_{jt}) = \alpha_1 \text{regime}_{jt-1} + \alpha_2 \ln(GDP_{jt}) + \alpha_3 \ln(GDP\ p.c._{jt})$$

$$+ \alpha_4 (\text{restriction index})_{jt} + \gamma_j + \delta_t + \varepsilon_{jt}$$

(19)

where $y_{jt}$ is either total annual real imports or exports to or from country $j$ at time $t$.30 Country- and time-specific fixed effects are included as well as real GDP, real GDP per capita, and the restriction index. This specification is not based on the gravity model.

IV. The Main Empirical Results

Table 2 shows the results of the estimation of equation (18). To account for the particularities of trade flows, the error terms are clustered at the trading pair level.31 All control variables have the expected signs and are highly significant except GDP per capita and WTO membership of the exporting country in some specifications. More important, all three regime type indicators yield the same result: autocracies trade significantly less. The coefficients for importing and exporting countries are of roughly similar magnitude. Moreover, most of the estimated coefficients on the regime type indicators are modestly larger in the specifications with five-year averages than in the specifications with one-year lags. This suggests that the effect of regime type on trade is persistent; a finding in line with that of Milner and Kubota (2005). It also suggests that changes in trade flows take place gradually after a regime change.

Given its dichotomous nature, Przeworski and others’ (2000) regime type indicator is the easiest to interpret: a democracy that turns into an autocracy experiences an average decrease of 19.6–22.9 percent of imports and 17.3–22.4 percent of exports, all else being equal. Because the fixed effects estimator does not use information from countries that do not change their regime

29. This reduces the sample size to about 1,700 observations.
30. Because this single-country panel model is not derived from the gravity model, real-trade volumes are used. However, using nominal volumes instead leaves the results unchanged.
31. As an alternative, the standard errors were clustered on the importer and exporter levels separately. This did not affect the results.
### Table 2. Results from the Dyadic Panel Model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Przeworski and others 2000</th>
<th>Polity IV</th>
<th>Freedom House</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autocracy (_i ), (t-1)</td>
<td>-0.196** (0.025)</td>
<td>-0.017*** (0.002)</td>
<td>-0.052*** (0.008)</td>
</tr>
<tr>
<td>Autocracy (_e ), (t-1)</td>
<td>-0.173*** (0.025)</td>
<td>-0.012*** (0.002)</td>
<td>-0.040*** (0.008)</td>
</tr>
<tr>
<td>Autocracy (_i ), (t-1) to (t-5)</td>
<td>-0.229*** (0.033)</td>
<td>-0.021*** (0.002)</td>
<td>-0.065*** (0.012)</td>
</tr>
<tr>
<td>Autocracy (_e ), (t-1) to (t-5)</td>
<td>-0.224*** (0.033)</td>
<td>-0.014*** (0.002)</td>
<td>-0.030*** (0.011)</td>
</tr>
<tr>
<td>log GDP (_i)</td>
<td>1.290*** (0.086)</td>
<td>1.142*** (0.099)</td>
<td>1.303*** (0.087)</td>
</tr>
<tr>
<td>log GDP (_e)</td>
<td>1.073*** (0.088)</td>
<td>1.033*** (0.101)</td>
<td>1.088*** (0.088)</td>
</tr>
<tr>
<td>log GDP p.c. (_i)</td>
<td>0.117 (0.082)</td>
<td>0.272*** (0.092)</td>
<td>0.129 (0.083)</td>
</tr>
<tr>
<td>log GDP p.c. (_e)</td>
<td>0.332*** (0.092)</td>
<td>0.431*** (0.107)</td>
<td>0.351*** (0.092)</td>
</tr>
<tr>
<td>Regional trade agreement</td>
<td>0.434*** (0.048)</td>
<td>0.399*** (0.047)</td>
<td>0.410*** (0.048)</td>
</tr>
<tr>
<td>WTO (_i)</td>
<td>0.077** (0.033)</td>
<td>0.098*** (0.038)</td>
<td>0.066** (0.033)</td>
</tr>
<tr>
<td>WTO (_e)</td>
<td>0.147*** (0.035)</td>
<td>0.104*** (0.043)</td>
<td>0.157*** (0.036)</td>
</tr>
<tr>
<td>Observations</td>
<td>181,095</td>
<td>136,813</td>
<td>174,538</td>
</tr>
<tr>
<td>Trading pairs</td>
<td>10,407</td>
<td>8,120</td>
<td>9,753</td>
</tr>
<tr>
<td>R-squared (within)</td>
<td>0.5</td>
<td>0.51</td>
<td>0.51</td>
</tr>
</tbody>
</table>

**Significant at the 5 percent level; ***significant at the 1 percent level.**

**Note:** The dependent variable is the log of imports. Numbers in parentheses are standard errors clustered at the trading pair level. Autocracy \(_i \), \(t-1\) is the autocracy score lagged one year for importing countries and Autocracy \(_e \), \(t-1\) is the autocracy score lagged one year for exporting countries. Autocracy \(_i \), \(t-1\) to \(t-5\) is the average of the five years prior to the observation for importing countries, and Autocracy \(_e \), \(t-1\) to \(t-5\) is the average of the five years prior to the observation for exporting countries. See table 1 for definitions of other variables. All regressions contain trading pair and time-specific fixed effects that are significant at the 1 percent level.

**Source:** Authors’ analysis based on data described in the text.
within the sample period—only the time variation of the political regime indicators is used to identify the effects—these figures likely underestimate the effect of autocracy on trade flows, a notion supported by the data. For example, Nigeria experienced a transition from democracy to autocracy in 1982/83 (according to Przeworski’s regime type indicator). The result was a 37 percent decline in its imports and a 26 percent decline in exports.

Both the Polity IV and the Freedom House indexes are measured on an ordinal scale. On the 21 point scale of the Polity IV index, a one point move toward autocracy reduces imports 1.7–2.1 percent and exports 1.2–1.4 percent, all else being equal. This means that a hypothetical country that undergoes a transition from full democracy to complete autocracy would lose about 34 percent of imports and about 24 percent of exports. On the 7 point scale of the Freedom House index, a hypothetical country that goes through the same transition would lose about 31 percent of imports and about 24 percent of exports. To give a concrete—albeit unrealistic—example, imagine that in 2000 Switzerland suddenly had the political regime of Myanmar. The consequence would be a 28.9 percent reduction of imports and a 20.4 percent reduction of exports, according to the Polity IV index, and a 31 percent reduction of imports and a 24 percent reduction of exports, according to the Freedom House index. Although differences exist, it is striking how similar the results obtained with the three different indicators are.

For a sample of developing countries, Milner and Kubota (2005) show that democracies have lower tariff rates than autocracies do. Thus, the finding from table 2—autocracies trade less—could simply be a result of this effect. To investigate this, the restriction index, introduced above, is added to the specification in equation (18) and the estimation is re-run. Not surprising, the restriction index has a positive impact on trade flows and is highly significant for importing countries (table 3). This indicates that a country with fewer trade restrictions imports more. For exporting countries, the coefficient on the restriction index is also positive, though statistically insignificant in two specifications.

More important, the main finding from the baseline model persists even after controlling for differences in trade policy: autocracies trade less. The coefficients for Przeworski and others’ (2000) regime type indicator and for the Polity IV index are somewhat lower than those reported in table 2 but still highly significant. The coefficients for the Freedom House index remain virtually unchanged. Two factors can account for the difference. First, including the restriction index reduces the sample size, which accounts for most of the difference. Second, the coefficients on the regime type indicators in the specification without the restriction index would be biased downward (more negative) if autocracies had higher trade barriers, as suggested by Milner and Kubota (2005), and trade barriers reduce trade flows.

32. Figure A-1 in the appendix shows that the regime type indicators exhibit enough time variation to allow a fixed effects approach.
Table 3. Results with Trade Restrictions

<table>
<thead>
<tr>
<th>Variable</th>
<th>Przeworski and others 2000</th>
<th>Polity IV</th>
<th>Freedom House</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autocracy, t-1</td>
<td>-0.139*** (0.032)</td>
<td>-0.013*** (0.003)</td>
<td>-0.055*** (0.011)</td>
</tr>
<tr>
<td>Autocracy, e, t-1</td>
<td>-0.174*** (0.031)</td>
<td>-0.012*** (0.002)</td>
<td>-0.054*** (0.01)</td>
</tr>
<tr>
<td>Autocracy, t-1 to t-5</td>
<td>—</td>
<td>-0.188*** (0.039)</td>
<td>—</td>
</tr>
<tr>
<td>Autocracy, e, t-1 to t-5</td>
<td>—</td>
<td>-0.207*** (0.040)</td>
<td>—</td>
</tr>
<tr>
<td>Restriction index, i</td>
<td>0.139*** (0.002)</td>
<td>0.129*** (0.020)</td>
<td>0.132*** (0.020)</td>
</tr>
<tr>
<td>Restriction index, e</td>
<td>0.042** (0.020)</td>
<td>0.053*** (0.020)</td>
<td>0.037* (0.020)</td>
</tr>
<tr>
<td>log GDP, i</td>
<td>1.378*** (0.138)</td>
<td>1.222*** (0.148)</td>
<td>1.351*** (0.138)</td>
</tr>
<tr>
<td>log GDP, e</td>
<td>1.301*** (0.136)</td>
<td>1.081*** (0.145)</td>
<td>1.313*** (0.136)</td>
</tr>
<tr>
<td>log GDP, p.c., i</td>
<td>-0.065 (0.135)</td>
<td>0.104 (0.144)</td>
<td>-0.005 (0.136)</td>
</tr>
<tr>
<td>log GDP, p.c., e</td>
<td>0.1 (0.143)</td>
<td>0.347*** (0.151)</td>
<td>0.128 (0.143)</td>
</tr>
<tr>
<td>Regional trade agreement</td>
<td>0.216*** (0.065)</td>
<td>0.223*** (0.064)</td>
<td>0.191*** (0.065)</td>
</tr>
<tr>
<td>WTO, i</td>
<td>-0.065 (0.002)</td>
<td>-0.064 (0.022)</td>
<td>-0.065 (0.009)</td>
</tr>
<tr>
<td>WTO, e</td>
<td>-0.043 (0.046)</td>
<td>-0.048 (0.100)</td>
<td>-0.043 (0.038)</td>
</tr>
<tr>
<td>Observations</td>
<td>89,148</td>
<td>74,857</td>
<td>87,571</td>
</tr>
<tr>
<td>Trading pairs</td>
<td>4,974</td>
<td>4,255</td>
<td>4,779</td>
</tr>
<tr>
<td>R-squared (within)</td>
<td>0.48</td>
<td>0.52</td>
<td>0.48</td>
</tr>
</tbody>
</table>

*Significant at the 10 percent level; **significant at the 5 percent level; ***significant at the 1 percent level.

Note: The dependent variable is the log of imports. Numbers in parentheses are standard errors clustered at the trading pair level. Autocracy, t-1 is the autocracy score lagged one year for importing countries, and Autocracy, e, t-1 is the autocracy score lagged one year for exporting countries. Autocracy, t-1 to t-5 is the average of the five years prior to the observation for importing countries, and Autocracy, e, t-1 to t-5 is the average of the five years prior to the observation for exporting countries. See table 1 for definitions of other variables. All regressions contain trading pair and time-specific fixed effects that are significant at the 1 percent level.

Source: Authors’ analysis based on data described in the text.
Overall, these results show that the tariff channel, as identified by Milner and Kubota (2005), is not the only transmission mechanism at play. The model points to two alternative transmission channels (the accountability channel and the bureaucracy channel), and the findings here are consistent with the presence of both. The results are not driven by the fact that autocratic rulers would violate trade agreements if they formalized the rents from customs corruption in the form of high tariffs because trade agreements are controlled for in all the estimations. If this were the only reason why autocratic rulers distort trade more than democratic politicians do, no systematic regime differences would be found, conditional on trade agreements.33

The theory here suggests that the regime type of individual countries matters, whereas Morrow, Silverson, and Tabares (1998) and Mansfield, Milner, and Rosendorff (2000) argue that the congruence between the regime type of pairs of trading countries (two democracies, two autocracies, or a mixed pair) is what matters. It is thus important to test these alternatives against each other. Because including the dyadic regime type indicators and the individual country regime type indicators in the same specification leads to perfect collinearity,34 each dyadic regime type indicator is included one at a time in specification (18). Using Przeworski’s regime type indicator,35 the following three dyadic regime type dummy variables are used: two autocracies, which equals 1 if the pair consists of two autocracies; two democracies, which equals 1 if the pair consists of two democracies; and mixed regime, which equals 1 if the pair consists of an autocracy and a democracy. To ensure that the findings of Mansfield, Milner, and Rosendorff (2000) can be replicated using the sample here, which covers more countries and a longer time period, a specification is also estimated without the regime type variables (not reported). In line with Morrow, Silverson, and Tabares (1998) and Mansfield, Milner, and Rosendorff (2000), pairs of democracies are found to trade more than mixed pairs (table 4). However, in contrast to Mansfield, Milner, and Rosendorff (2000), pairs of autocracies are found to trade less than pairs of democracies.

More important, when each dyadic regime type indicator is added to the baseline specification one at a time, the sign and significance of the individual country regime type indicators remain unaffected. This suggests that the regime type of an individual country matters for trade flows over and above any effect that might arise from the congruence or lack thereof with the political regime of the trading partner. So, congruence matters, but not in the way suggested by Mansfield, Milner, and Rosendorff (2000): conditional on a country’s own

33. Formal trade agreements are noisy proxies of obligations toward trading partners and are thus an imperfect measure.
34. Mansfield, Milner, and Rosendorff (2000) take pairs of democracies as the reference group against which the impact of the other possible combinations of regimes is measured.
35. Przeworski’s regime type indicator was also used by Mansfield, Milner, and Rosendorff (2000). Using it rather than the Polity IV or the Freedom House index avoids arbitrary decisions on how to define a particular regime type.
political regime, pairs of autocracies and pairs of democracies trade less, while mixed pairs trade more. Of course, these results are not directly comparable to those reported by Mansfield, Milner, and Rosendorff (2000) because in this specification the coefficient on each dyadic regime type indicator can be interpreted as an interaction term rather than relative to pairs of democracies. Nevertheless, taken together, the political regime of a country is a key determinant of trade flows, while the congruence of its regime with those of its trading partners seems to be of only secondary importance.

V. Robustness Analysis

Perhaps the most important robustness check consists of estimating the single-country panel model (equation 19). To save space, the coefficients on the regime type indicators are reported only in the top two rows of table 5. As in the dyadic panel model, all three regime type indicators yield the same result: autocracies trade significantly less, conditional on trade policy. The size of the effect is, however, somewhat smaller than in the dyadic model for two of the regime type indicators (the Polity IV index and Przeworski’s regime type indicator) but of comparable size for the Freedom House index. Overall, the findings based on the dyadic model are not a statistical artifact of the large number of observations. Moreover, the robust negative effect of autocracy on total imports and exports strengthens the assertion that the regime type of individual countries matters more for trade volumes than does the regime congruence between pairs of trading countries.

Numerous robustness checks were conducted to see whether the results reported in tables 2 and 3 are sensitive to changes in the specification and estimation method. The dyadic panel model with the restriction index (reported in

<table>
<thead>
<tr>
<th>Variable</th>
<th>Przeworski and others 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autocracy_{t-1}</td>
<td>-0.213*** (0.050)</td>
</tr>
<tr>
<td>Autocracy_{t-1}</td>
<td>-0.096*** (0.034)</td>
</tr>
<tr>
<td>Autocracy_{t-1}</td>
<td>-0.154*** (0.034)</td>
</tr>
<tr>
<td>Two democracies_{t-1}</td>
<td>-0.245*** (0.046)</td>
</tr>
<tr>
<td>Two democracies_{t-1}</td>
<td>-0.128*** (0.035)</td>
</tr>
<tr>
<td>Two democracies_{t-1}</td>
<td>-0.186*** (0.032)</td>
</tr>
<tr>
<td>Mixed regime_{t-1}</td>
<td>-0.117** (0.051)</td>
</tr>
<tr>
<td>Mixed regime_{t-1}</td>
<td>-0.117** (0.051)</td>
</tr>
<tr>
<td>Mixed regime_{t-1}</td>
<td>0.059** (0.026)</td>
</tr>
</tbody>
</table>

**Significant at the 5 percent level; ***significant at the 1 percent level.

Note: The dependent variable is the log of imports. Numbers in parentheses are standard errors clustered at the trading pair level. The baseline specification is from table 3. Two democracies_{t-1} is a dummy variable equal to 1 if both trading partners are democracies. Two autocracies_{t-1} is a dummy variable equal to 1 if both trading partners are autocracies. Mixed regime_{t-1} is a dummy variable equal to 1 if the trading pair consists of an autocracy and a democracy. All regressions contain trading pair and time-specific fixed effects that are significant at the 1 percent level.

Source: Authors’ analysis based on data described in the text.
<table>
<thead>
<tr>
<th>Technique</th>
<th>Variable</th>
<th>Przeworski and others 2000</th>
<th>Polity IV</th>
<th>Freedom House</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-country imports</td>
<td>Autocracy$_{it-1}$</td>
<td>0.064**</td>
<td>0.006***</td>
<td>0.055***</td>
</tr>
<tr>
<td></td>
<td>Autocracy$_{it-1}$</td>
<td>0.106***</td>
<td>0.011***</td>
<td>0.066***</td>
</tr>
<tr>
<td></td>
<td>Autocracy$_{it-1}$</td>
<td>0.055**</td>
<td>0.006***</td>
<td>0.048***</td>
</tr>
<tr>
<td></td>
<td>Autocracy$_{it-1}$</td>
<td>0.086***</td>
<td>0.030***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Autocracy$_{it-1}$</td>
<td>0.066***</td>
<td>0.048***</td>
<td></td>
</tr>
<tr>
<td>Single-country exports</td>
<td>Autocracy$_{et-1}$</td>
<td>0.055**</td>
<td>0.004***</td>
<td>0.066***</td>
</tr>
<tr>
<td></td>
<td>Autocracy$_{et-1}$</td>
<td>0.007***</td>
<td>0.009***</td>
<td>0.041***</td>
</tr>
<tr>
<td></td>
<td>Autocracy$_{et-1}$</td>
<td>0.055***</td>
<td>0.048***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Autocracy$_{et-1}$</td>
<td>0.086***</td>
<td>0.030***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Autocracy$_{et-1}$</td>
<td>0.066***</td>
<td>0.048***</td>
<td></td>
</tr>
<tr>
<td>Reweighted least squares</td>
<td>Autocracy$_{it-1}$</td>
<td>0.106***</td>
<td>0.011***</td>
<td>0.041***</td>
</tr>
<tr>
<td></td>
<td>Autocracy$_{it-1}$</td>
<td>0.011***</td>
<td>0.030***</td>
<td></td>
</tr>
<tr>
<td>Least absolute value</td>
<td>Autocracy$_{it-1}$</td>
<td>0.128***</td>
<td>0.010***</td>
<td>0.043***</td>
</tr>
<tr>
<td></td>
<td>Autocracy$_{it-1}$</td>
<td>0.073***</td>
<td>0.011***</td>
<td>0.043***</td>
</tr>
<tr>
<td>Autocratic dummy variables</td>
<td>Autocracy$_{it-1}$</td>
<td>0.180***</td>
<td>0.089***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Autocracy$_{it-1}$</td>
<td>0.113***</td>
<td>0.102***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Autocracy$_{it-1}$</td>
<td>0.277***</td>
<td>0.117***</td>
<td></td>
</tr>
<tr>
<td>Correcting for instability</td>
<td>Autocracy$_{it-1}$</td>
<td>0.220***</td>
<td>0.050</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Autocracy$_{it-1}$</td>
<td>0.150***</td>
<td>0.058***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Autocracy$_{it-1}$</td>
<td>0.180***</td>
<td>0.055***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Autocracy$_{et-1}$</td>
<td>0.187***</td>
<td>0.072***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Autocracy$_{et-1}$</td>
<td>0.205***</td>
<td>0.048***</td>
<td></td>
</tr>
<tr>
<td>Poisson estimation</td>
<td>Autocracy$_{it-1}$</td>
<td>0.204***</td>
<td>0.079***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Autocracy$_{it-1}$</td>
<td>0.351***</td>
<td>0.107***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Autocracy$_{et-1}$</td>
<td>0.220***</td>
<td>0.075***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Autocracy$_{et-1}$</td>
<td>0.375***</td>
<td>0.098***</td>
<td></td>
</tr>
</tbody>
</table>

*Significant at the 10 percent level; **significant at the 5 percent level; ***significant at the 1 percent level.

Note: The dependent variable is total imports or exports for single-country panel regressions. Autocracy$_{it-1}$ is the autocracy score lagged one year for importing countries, and Autocracy$_{et-1}$ is the autocracy score lagged one year for exporting countries. Autocracy$_{it-1}$ to Autocracy$_{et-1}$ to $t-5$ is the average of the five years prior to the observation for importing countries, and Autocracy$_{et-1}$ to Autocracy$_{et-1}$ to $t-5$ is the average of the five years prior to the observation for exporting countries. In the single-country panel regressions, the dependent variable is a country's total real import or export. The control variables are: GDP, GDP p.c., the restriction index as well as country- and time-fixed effects. In the dyadic panel regressions, the baseline specification is taken from Table 3. These regressions contain trading pair and time-specific fixed effects, all of which are significant at the 1% level with standard errors clustered at the trading pair level.

Source: Authors’ analysis based on data described in the text.
Table 3) is used as the baseline, and several estimation techniques that reduce the risk of outliers drive the results. First, the model was reestimated using reweighted least squares, a robust regression technique that weights observations in an iterative process. Starting with ordinary least squares, estimates are obtained through weighted least squares, where observations with relatively large residuals get smaller weights. The coefficients remain highly significant, though their magnitude is somewhat reduced (see row three of table 5). When comparing the coefficients reported in tables 3 and 5, the coefficients on the political regime type indicator of importing countries are approximately halved, while the coefficients for exporting countries change only minimally. The least absolute value estimator, which minimizes the sum of the absolute deviations from the median, was also used. The results are comparable to those obtained with the reweighted least squares estimator, and the regime type effect remains highly significant (see row four of table 5).

Second, the Polity IV and Freedom House indexes are often dichotomized to avoid the problem of dealing with an ordinal scale. This, of course, requires defining a threshold determining which countries to treat as democracies. For the Freedom House index a typical choice is 2.5, and for the Polity IV index, 0 (see, for example, Persson and Tabellini 2003). The estimated coefficients of the two resulting regime type dummy variables remain highly significant and negative, with one exception.

Third, the results presented so far could be driven by regime instability rather than by regime type: if autocracies tend to be more unstable than democracies, the regime type indicators could simply be picking up instability. To rule out this possibility, a variable that counts the number of regime transitions to date for each country is included in the regressions. The estimated coefficients on the regime type indicators remain unaffected when political instability is controlled for in this way, so regime instability can be ruled out (see row six of table 5). Moreover, regime instability, while sometimes significant, is not a robust determinant of trade flows (not reported).

Fourth, the recent literature on estimation of dyadic gravity models stresses the importance of taking into account that many pairs of countries do not trade at all. Ignoring these (non-)flows might lead to biased estimates. Santos Silva and Tenreyro (2006) propose one way to circumvent this potential problem: using the maximum likelihood Poisson estimator instead of ordinary least squares. While the regime type effect for exporting countries loses some of its statistical significance, the results are very similar to those obtained with ordinary least squares.

36. In this context, the term “robust” is used as robustness with respect to the dependent variable.
37. This is also known as mean absolute deviation or L1 norm regression.
38. This choice of threshold is not uncontroversial, however. Pevehouse (2002), for example, suggests a value of 6. Re-estimating using this stricter definition of what constitutes a democracy leaves the findings quantitatively unchanged.
39. To make the results obtained with this estimator comparable with the ordinary least squares results, the dependent variable is the volume of imports rather than the log of the volume of imports.
VI. Instrumental Variable Estimates

As argued by López-Córdova and Meisner (2008), among others, involvement in international trade may foster democratization. This could happen because trade changes relative factor rewards in such a way that the balance of power tilts in favor of social groups that benefit from democracy. If such considerations are important and not effectively dealt with by lagging the regime type indicators, the estimate of the effect of regime type on trade volumes suffers from a simultaneity bias: the coefficients on the regime type indicators are biased toward zero. It is also possible that, despite including fixed effects and many time-varying control variables, the estimates suffer from omitted variable bias or that measurement errors introduce significant biases.

To deal with these issues, the dyadic panel model was reestimated using instrumental variable techniques. To minimize the problem of weak instruments, four instruments for political regime type were used. The leading instrument is the number of successful assassinations of the political leader of a country. While an assassination attempt might be endogenous to regime type—for example, autocratic rulers might be more prone to such attacks—Jones and Olken (2009) contend that the outcome of the attempt is random. In particular, they show that successful assassination of an autocratic leader increases the probability of a transition to democracy. Following Jones and Olken (2009), the number of successful assassinations (per year) was used as an instrument for the regime type indicators.

A second instrument was the percentage of votes cast in line with the Group of Seven (G7) countries in the United Nations General Assembly. Dreher and Sturm (2006) show that more democratic countries are more likely to vote in line with the G7. While the G7 countries share a common set of interests, they do not always agree and vote together. So the risk that the voting pattern of a non-G7 country is driven by commercial interests with respect to one potential trading partner (such as the United States) can be avoided by using the percentage of its votes cast in line with the average vote of the G7 as the instrument. In other words, while it is possible that a non-G7 country supports the stance of a particular G7 country to further its trade interests, it is unlikely that the voting pattern of these countries with respect to the G7 as a whole is driven by trade considerations.

While these instruments have not been used in the literature before, two instruments that have been used were also included. Milner and Kubota (2005)

40. Gassebner, Lamla, and Vreeland (2009) find that trade openness is not robustly related to democratization processes. This casts some doubt on how much of a concern reverse causality is in practice.

41. All models were re-estimated using second to fifth lags of the regime type indicators separately (not reported). Doing so confirms the results reported in the text. In particular, the coefficients on all lags of the regime type indicators are highly significant and cannot be statistically distinguished from the coefficient on the one-year lag of the regime type indicator.
argue that the average age of a country’s political parties and average school attainment can be used as instruments for regime type. The rationale for using the average age of political parties as an instrument is that political parties tend to be younger in democracies than in autocracies because in democratic systems new parties can form as new political and economic interests emerge. An example is the wave of green parties established in Western Europe during the 1970s and 1980s. In autocratic systems, new parties typically do not form as easily. This instrument is clearly relevant. However, if trade causes democratization, the average age of parties could also be affected by trade volumes, but only going forward from the transition to democracy. By construct, the average age of political parties at a given point in time is looking backward, thereby breaking any direct correlation between contemporaneous trade volumes and the average age of the parties.

The rationale for using education as an instrument can be traced back to Lipset (1959), who argued that education is at least a necessary condition for democracy. While education through its effect on human capital certainly is related to the composition of trade through the principle of comparative advantage, it is unlikely to have a direct effect on the volume of trade.

Finding instruments for the political regime is notoriously difficult. All the instruments exhibit only limited time variability, so some endogeneity in the time domain might still prevail, and the results must be treated with caution. Table 6 reports the second-stage regression results (with the four instruments included simultaneously), while table A1 in the appendix reports the results of the first-stage regression. The correlation between each instrument and the three regime type indicators confirms the above reasoning, as suggested in table A1. Moreover, in all specifications the first-stage F-statistics, indicating the relevance of the instruments, easily pass the threshold of 10 proposed by Staiger and Stock (1997). The p-values associated with the Hansen J-test for overidentification show that the test always fails to reject at the 10 percent level. Perhaps the most convincing of the four instruments is the number of successful assassinations. Taking the validity of this instrument as given, the result of the J-test can be interpreted as a validation of the three other instruments.

For importing countries, the coefficient on the regime type indicators remains significant at the 1 percent level. In the presence of reverse causality, the instrumental variable estimates should be numerically larger than the ordinary least squares estimates. The point estimates are clearly larger in absolute size, but for the specification with a one-year lag the instrumental variable estimates are, in fact, not statistically different from the ordinary least squares results reported in table 3. This casts some doubt on whether reverse causality

42. The source of the former data is Beck and others (2001), while the source of the latter is Barro and Lee (2000).
43. The F-statistics range from 10.5 to 23.2. Furthermore, the Anderson canonical correlation, the Cragg-Donald statistics, and the Anderson-Rubin test suggest that the instruments are neither underidentified nor weak.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Przeworski and others 2000</th>
<th>Polity IV</th>
<th>Freedom House</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autocracy, t-1</td>
<td>-1.499** (0.625)</td>
<td>-0.066** (0.027)</td>
<td>-0.298** (0.122)</td>
</tr>
<tr>
<td>Autocracy, e, t-1</td>
<td>0.374 (0.445)</td>
<td>0.027 (0.021)</td>
<td>0.129 (0.120)</td>
</tr>
<tr>
<td>Autocracy, t-1 to t-5</td>
<td></td>
<td>-1.575*** (0.369)</td>
<td>-0.079*** (0.02)</td>
</tr>
<tr>
<td>Restriction index, i</td>
<td>0.203*** (0.038)</td>
<td>0.066** (0.027)</td>
<td>-0.066** (0.033)</td>
</tr>
<tr>
<td>Restriction index, e</td>
<td></td>
<td>-0.030 (0.03)</td>
<td>-0.145* (0.079)</td>
</tr>
<tr>
<td>log GDP, i</td>
<td>0.718** (0.292)</td>
<td>0.629* (0.339)</td>
<td>0.664** (0.294)</td>
</tr>
<tr>
<td>log GDP, e</td>
<td>1.018*** (0.250)</td>
<td>0.733** (0.323)</td>
<td>0.987*** (0.249)</td>
</tr>
<tr>
<td>log GDP p.c., i</td>
<td>0.807** (0.390)</td>
<td>0.950** (0.370)</td>
<td>0.826** (0.370)</td>
</tr>
<tr>
<td>log GDP p.c., e</td>
<td></td>
<td>-0.177 (0.346)</td>
<td>-0.107 (0.280)</td>
</tr>
<tr>
<td>Regional trade agreement</td>
<td>0.209** (0.088)</td>
<td>0.125* (0.07)</td>
<td>0.143* (0.079)</td>
</tr>
<tr>
<td>WTO, i</td>
<td>0.032 (0.075)</td>
<td>0.022 (0.096)</td>
<td>-0.098 (0.078)</td>
</tr>
<tr>
<td>WTO, e</td>
<td></td>
<td>-0.010 (0.092)</td>
<td>-0.011 (0.087)</td>
</tr>
<tr>
<td>Observations</td>
<td>32,580</td>
<td>22,369</td>
<td>32,026</td>
</tr>
<tr>
<td>Trading pairs</td>
<td>2,382</td>
<td>1,909</td>
<td>2,269</td>
</tr>
<tr>
<td>R-squared (within)</td>
<td>0.27</td>
<td>0.25</td>
<td>0.32</td>
</tr>
<tr>
<td>Hansen J-statistic (p-value)</td>
<td>0.84</td>
<td>0.98</td>
<td>0.39</td>
</tr>
<tr>
<td>First state F-statistic (i)</td>
<td>11.73</td>
<td>13.85</td>
<td>12.94</td>
</tr>
<tr>
<td>First state F-statistic (e)</td>
<td>12.07</td>
<td>14.79</td>
<td>10.48</td>
</tr>
</tbody>
</table>

*Significant at the 10 percent level; **significant at the 5 percent level; ***significant at the 1 percent level.

Note: The dependent variable is the log of imports. Numbers in parentheses are standard errors clustered at the trading pair level. Autocracy, t-1 is the autocracy score lagged one year for importing countries, and Autocracy, e, t-1 is the autocracy score lagged one year for exporting countries. Autocracy, t-1 to t-5 is the average of the five years prior to the observation for importing countries, and Autocracy, e, t-1 to t-5 is the average of the five years prior to the observation for exporting countries. See Table 1 for definitions of other variables. All regressions contain trading pair and time-specific fixed effects that are significant at the 1 percent level. The Hansen J-statistic reports the p-value for the test of overidentification. The first stage F-statistic reports the first stage F-statistic of the excluded instruments for the importer (i) and exporter (e).

Source: Authors’ analysis based on data described in the text.
is a major issue (see also Gassebner, Lamla, and Vreeland 2009). By contrast, the coefficients on the regime type indicators for exporting countries become positive but are no longer significant at conventional levels. Again, this is inconsistent with reverse causality but may be driven by the fact that the ordinary least squares estimates suffer from omitted variables bias. For example, if autocracies systematically pursue an industrial policy that makes it hard for export sectors to flourish (while imports are unaffected by this), the ordinary least squares estimates will have a sizable downward bias that is then corrected by the instrumental variable estimator. Based on the instrumental variable estimates, autocracies import less than democracies, but regime type seems to matter less for exports.44

VII. Conclusions

The question that motivates this article is simple: does the political regime of a country systematically affect that country’s involvement in international trade? The theoretical model provides two reasons why the answer is likely yes. In contrast to previous theoretical work, this article argues that the root cause of regime differences in trade flows is differences in political accountability. These differences affect trade flows directly through the impact on trade taxes (which are more prevalent in autocracies than in democracies), but they also work through a more subtle, indirect channel. Rulers of societies with weak accountability institutions have no incentive to strengthen these institutions by offering wage incentives to customs officials. The reason is complementarity between different aspects of the institutional environment. As a consequence, the theory suggests that not only do autocracies trade less but that they trade less conditional on official trade policy.

The implications of the model are tested not only within the framework of a standard dyadic (gravity) model of international trade but also within a single-country panel model where the outcome variable is total imports (or exports). These designs distinguish between the effects of the political regime of an importing and of an exporting country and differentiate the estimations from previous work on the congruence of the regime type of pairs of trading countries. Autocracies are found to trade significantly less than democracies, even after controlling for differences in trade policy. The magnitude of the effect is substantial: according to the most conservative estimates, autocracies have 5.5–22.9 percent less imports and 5.5–22.4 percent less exports, all else being equal. The results of the effect for importing countries are robust to a battery of different estimation techniques, including the use of instrumental variables. The instrumental variable estimates,

44. In principle the restriction index could also be endogenous, as trade patterns could affect trade policy. However, using second lags to instrument for the index does not suggest that this concern is important.
however, cast some doubt on the robustness of the relationship between regime type and exports.

Overall, the analysis shows that autocracies import less (and may export less) and that this effect is driven not only by differences in trade policy but also by systematic differences in political accountability. In other words, a democracy trades more with the rest of the world because democratically elected politicians are less tempted to use trade taxes to extract rents and because these politicians face the right incentives to build institutions that weed out trade-distorting red tape in the customs service. Of course, other explanations are also consistent with the results. For example, rulers must cater to powerful domestic elites who have a special interest in trade protection in many autocracies, as they often have a substantial stake in import-competing sectors. However, lobbying by special interests groups for trade protection is also common in democracies. It is, therefore, unclear if this line of reasoning leads to systematic regime differences in trade flows.

What policy conclusions can be drawn from this study? Trade integration is often seen as an engine of development. As Sachs and Warner (1995, p.2) put it, “Trade liberalization not only establishes powerful direct linkages between the economy and the world system, but also effectively forces the government to take actions on the other parts of the reform program . . . .” This study shows that autocracies are less integrated in world trade than democracies. Moreover, rather than fostering reforms, autocratic regimes are prone to red tape because of a lack of accountability. This missing trade link might be a reason—so far ignored—why many autocratic countries lag behind in development. This is why the “good governance agenda” fostered by the World Bank and many other international institutions is such an important initiative to counterbalance the negative impact that autocratic regimes have on economic integration.

### APPENDIX

**Table A-1. Instrumenting for the Regime Type Indicators: First-Stage Regression Results**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Przeworski and others 2000</th>
<th>Polity IV</th>
<th>Freedom House</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Importer</td>
<td>Exporter</td>
<td>Importer</td>
</tr>
<tr>
<td>$t - 1$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assassination$_{t-1}$</td>
<td>-0.099***</td>
<td>0.005</td>
<td>-0.652***</td>
</tr>
<tr>
<td>Assassination$_{t-2}$</td>
<td>0.011</td>
<td>-0.098***</td>
<td>0.055</td>
</tr>
<tr>
<td>Voting in line G7$_{t-1}$</td>
<td>-0.419***</td>
<td>0.014</td>
<td>-10.612***</td>
</tr>
<tr>
<td>Voting in line G7$_{t-2}$</td>
<td>0.022</td>
<td>-0.429***</td>
<td>-0.319</td>
</tr>
<tr>
<td>Average party age$_{t-1}$</td>
<td>0.001***</td>
<td>6.0E-05</td>
<td>0.014***</td>
</tr>
<tr>
<td>Average party age$_{t-2}$</td>
<td>-5.8E-05</td>
<td>0.001***</td>
<td>-0.001</td>
</tr>
</tbody>
</table>

(Continued)
Table A-1. Continued

<table>
<thead>
<tr>
<th>Variable</th>
<th>Przeworski and others 2000</th>
<th>Polity IV</th>
<th>Freedom House</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Importer</td>
<td>Exporter</td>
<td>Importer</td>
</tr>
<tr>
<td>School attainment, $t - 1$</td>
<td>0.012</td>
<td>-0.004</td>
<td>0.092</td>
</tr>
<tr>
<td>School attainment, $t - 1$</td>
<td>-0.001</td>
<td>0.023**</td>
<td>-0.014</td>
</tr>
<tr>
<td>Assault, $t - 1$ to $t - 5$</td>
<td>-0.665***</td>
<td>-0.019</td>
<td>-2.994***</td>
</tr>
<tr>
<td>Assault, $t - 1$ to $t - 5$</td>
<td>-0.018</td>
<td>-0.725***</td>
<td>-0.653</td>
</tr>
<tr>
<td>Voting in line $G7$, $t - 1$ to $t - 5$</td>
<td>-1.010***</td>
<td>0.028</td>
<td>-20.257***</td>
</tr>
<tr>
<td>Voting in line $G7$, $t - 1$ to $t - 5$</td>
<td>0.048</td>
<td>-1.010***</td>
<td>0.156</td>
</tr>
<tr>
<td>Average party age, $t - 1$ to $t - 5$</td>
<td>0.001***</td>
<td>6.2E-05</td>
<td>0.022***</td>
</tr>
<tr>
<td>Average party age, $t - 1$ to $t - 5$</td>
<td>-1.5E-04</td>
<td>0.001***</td>
<td>-0.002</td>
</tr>
<tr>
<td>School attainment, $t - 1$ to $t - 5$</td>
<td>0.009</td>
<td>-0.003</td>
<td>0.128</td>
</tr>
<tr>
<td>School attainment, $t - 1$ to $t - 5$</td>
<td>-0.002</td>
<td>0.025**</td>
<td>-0.013</td>
</tr>
</tbody>
</table>

Note: Results are for the first-stage of the instrumental variable regression in table 6. Only the results for the instruments are displayed. Each column represents one first-stage regression. The top part of the table shows the setup with the one period lag of the autocracy measure, while the bottom part gives the results of the approach using the average over the previous five periods.

Source: Authors’ analysis based on data described in the text.

Figure A-1. Political Regime Variables, 1962–2000

Source: Authors’ analysis based on Przeworski and others (2000), Alvarez and others (1996), Gurr and others (2003), and Freedom House (2006).
REFERENCES


