Do Democracies Attract More Foreign Direct Investment? A Meta Regression Analysis [*]

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Abstract

Do more democratic countries attract more foreign direct investment (FDI)? To answer this question, academic research has unfortunately produced competing arguments, heterogeneous designs, and mixed evidence. We use meta regression to provide a rigorous quantitative assessment of the cumulative evidence–276 model estimates in 41 studies. We find no compelling evidence to support the belief in the democratic advantage. Our analysis also demonstrates the presence of publication bias, significant differences in the data generation process of two key FDI measures that are often treated as conceptually equivalent, evidence for and against existing theoretical mechanisms, and the strong impact of study design features. Our analysis has important policy implications and raises some significant challenges for empirical research based on observational studies.

1 INTRODUCTION

> The stronger you make your
> democracy, the more FDI you will
> attract.
>
> *John Bruton, former Prime Minister*
> *of Ireland, March 12, 2014*

Do more democratic countries attract more foreign direct investment (FDI)? Answers to the question could affect the location choices of international businesses, as well as public policies of national governments that actively compete for foreign production capital. If democracies have a clear advantage over non-democracies in attracting FDI, future investors may use regime type as a way to aid investment decisions. National governments may have to consider the impact of their political system on foreign investment, making policy adjustments accordingly. Indeed, some prominent policymakers like John Bruton believe in the democratic advantage,[1] exhorting the developing countries to democratize in order to attract FDI.

Academic research, unfortunately, has produced competing arguments and mixed evidence. Scholars have failed to reach consensus on the theoretical mechanisms by which regime type influences FDI. Empirical analyses often utilize different measures, samples, model specifications, statistical methods, and even data sources. As a result, adding one more study using previous empirical approaches is unlikely to produce any clearer answer to the question. The present challenge lies in how to adjudicate competing arguments and mixed evidence in different journal articles, all of which have gone through a rigorous peer review process.

In this paper, we seek to provide some clarifying answer to the important question through a rigorous quantitative assessment of the literature. We employ a novel research strategy–meta regression analysis (MRA)–to systematically summarize existing empirical evidence and explain variations in reported findings. Model estimates of the effect of democracy on

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[1]Chinwo 2014.

FDI from previous empirical studies become data points in meta analysis. Traditionally, meta analysis has been applied to experimental studies in psychology and medicine. It has become increasingly used to analyze observational studies in economics and business, though much less so in political science and rarely in international relations.[2] Meta analysis based on randomized experiments in psychology and medicine differ from that based on observational studies in economics, business, and political science. While the former focuses almost exclusively on estimating the effect of interest in the population, the latter also has to be concerned about how differences in model specification, data, measurement, method, and publication bias shape estimated effects.[3]

In order to answer the research question with meta regression analysis, we first take stock of our cumulative theoretical knowledge and identify the causal mechanisms proposed in the literature. This allows us to test empirically whether there is support for each mechanism that serves as intermediary between democracy and FDI in the meta regression analysis. We further examine and evaluate alternative measures of FDI as the dependent variable in the literature and the impact of study attributes on heterogeneous prior findings. Finally, we test and correct for publication bias. Once taking all these issues into consideration, we use meta regression as a platform to estimate the net effects of democracy under different study conditions that might otherwise be incommensurable.

We analyze over 276 model estimates of the effect of regime type on FDI from 41 empirical studies. Our central findings can be briefly summarized as follows. The simple naive publication bias-corrected average effect of democracy on the level of FDI net inflows is positive, significant, and small in size, and the estimated partial correlation ranges from -0.3 to 0.4 under different study conditions. In contrast, the simple naive publication bias-corrected average effect on the share of FDI in GDP is statistically insignificant, and the estimated partial correlation ranges from -0.16 to 0.24 under varying configurations of study attributes. Overall, there is no compelling evidence that more democratic countries attract more FDI, a conclusion of important implications for governments and firms.

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[2]The meta analysis of the relationship between democracy and growth by Doucouliagos and Ulubaşoğlu 2008 is an excellent example of application in political science. See also Ahmadov 2014 and Efendic, Pugh, and Adnett 2011.

[3]Stanley 2008; Stanley and Doucouliagos 2012.

We also find evidence of publication bias in prior empirical studies, which is negative among FDI level studies but positive among FDI share studies. In addition, among FDI level studies, meta regression provides supporting evidence for existing theoretical arguments on the mediating role of property rights, political constraints, growth, and exchange rate volatility, but meta regression also produces evidence against existing expectations regarding domestic political risk, regime duration, labor costs, trade openness, and capital controls. In contrast, among the covariates in FDI share studies, only growth, domestic political risk, and regime duration appear to influence the effect of democracy on FDI share. This sharp contrast in results between the level and share studies supports our expectation that the two measures capture conceptually different questions and have distinct data generation processes.

More broadly, our research exposes how study design features often drive the findings in observational studies, alerting us to the risk of over-confidence in generalization based on a single estimate from a single model using a single sample in a single observational study. For political science, economics, and related fields, model estimates from observational studies tend to vary with sample, method, measurement, and model specification. As a result, relative to those in experimental studies, model estimates based on observational studies are much less commensurable and more noisy. However, in reviewing previous research, scholars tend to draw misleading generalizations from often times incommensurable studies. Meta regression analysis helps to systematically quantify the sources of mixed findings with respect to heterogeneity in study attributes and publication bias.[4] Once these sources are pinned down, analysts can estimate the effect of the key variable of interest under different study conditions. Therefore, in contrast to traditional meta analysis, which emphasizes the estimation of one overall effect size, meta regression analysis of observational studies should always produce a range of estimated effects under different study conditions.

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[4]e.g. Stanley and Doucouliagos 2012.

2 STATE OF CUMULATIVE KNOWLEDGE

Before conducting meta analysis, we will first take stock of the cumulative knowledge, both theoretical and empirical, on the research problem. Scholars have offered many arguments on why democracies may or may not attract more FDI than autocracies. We review these arguments briefly below to set the stage for our meta analysis of the empirical evidence. We then summarize the state of cumulative empirical evidence from the literature.

2.1 Theoretical Knowledge

According to the literature, democracies attract more FDI than autocracies for several reasons. First, more democratic countries provide better and more credible property rights protection, reducing risks and transaction costs for foreign investors. For one reason, democracies have to pay higher political audience costs for reneging on contracts with foreign investors; for another reason, democracies have more checks and balances and veto players to prevent appropriative behaviors.[5] Second, more democratic countries have more veto players, resulting in greater policy stability foreign investors find appealing.[6] Third, by protecting individual rights and constraining state predatory behaviors, democracies have better growth prospects and reduce expropriation risks, helping to attract both horizontal and vertical FDI.[7] Fourth, democracies have more media openness, allowing the beneficiaries of FDI to punish leaders who renege on agreements with foreign investors.[8] Fifth, democracies have lower political and economic uncertainty.[9] For one reason, regular elections, press freedom, and transparency of political decisions in democracies help; for another reason, democratic economies are more predictable over the long run and address exogenous shocks more effectively. Finally, democracies are more open to FDI and can curtail domestic anti-FDI interests because democratic politics empowers workers, who benefit from FDI inflows, more

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[5]Jensen 2003; Li and Resnick 2003; Resnick 2001.
[6]Ahlquist 2006; Jensen 2003.
[7]Doces 2010.
[8]Choi and Samy 2008.
[9]Azemar and Desbordes 2009.

than rent-seeking, anti-FDI local businesses.[10]

In contrast, democracies may attract less FDI than autocracies for other reasons. First, democracies have more stringent antitrust regulations to limit the oligopolistic or monopolistic behaviors of multinational enterprises more than autocracies.[11] Second, democracies are more likely to shield domestic businesses from foreign competition than autocracies.[12] Third, democracies are more constrained than autocracies in offering generous financial and fiscal incentives to foreign investors.[13] Fourth, autocracies, interested in the economic benefits from FDI, are more likely to shield multinational enterprises from popular pressures for higher wages and stronger labor rights.[14] Fifth, democracies endowed with rich natural resources attract less FDI than resource-rich autocracies.[15] MNCs in extractive industries prefer to avoid democratic regimes, which are associated with more frequent government turnovers and arguably a less stable business environment, and instead, prefer autocratic ones, where it is easier to cultivate ties with governments and gain access to natural resources. Finally, foreign investors care about economic freedoms including property rights protection, capital mobility, and trade openness, but developing country democracies are often unable to carry out necessary economic reforms to provide those freedoms.[16]

Table 1 provides a summary of the causal mechanisms underlying the positive and negative effects of democracy on FDI. The state of our theoretical knowledge highlights three important issues. First, although scholars fail to agree on the specific mechanisms by which democracy influences FDI, no effort has been made to produce a coherent theory that unifies or debunks the different mechanisms. Hence, the state of cumulative theoretical knowledge is less than satisfying.

The second notable issue is that as illustrated in Table 1, the effect of democracy on FDI is not direct, but via mediating variables such as regulatory policies or investment environment. Hence, we should use caution in interpreting the coefficient estimate of democracy

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[10]Jakobsen and Soysa 2006.

[11]Li and Resnick 2003.

[12]Li and Resnick 2003.

[13]Li and Resnick 2003; Zheng 2011.

[14]O'Donnell 1988; Resnick 2001.

[15]Asiedu and Lien 2011.

[16]Mathur and Singh 2013.

Table 1: List of Causal Mechanisms for Positive and Negative Effects of Democracy

	Mechanism	Effect
1	Enhancing property rights protection	+
2	Enhancing policy stability via veto players	+
3	Providing better growth prospects	+
4	Providing more media openness	+
5	Reducing political and economic uncertainty	+
6	Labor-oriented democratic politics	+
1	More stringent anti-trust regulation	-
2	More protection to host domestic firms	-
3	Less generous tax incentives to foreign investors	-
4	Autocracies shield MNEs from domestic popular pressures	-
5	Resource-rich autocracies favor MNEs more than resource-rich democracies	-
6	Developing country democracies offering less economic freedom	-

in a given model. When no mediating variable is controlled fo, the coefficient estimate of democracy represents the net effect of all the different mechanisms; when all mediating variables are controlled for, the coefficient estimate represents the residual effect of democracy unaccounted for by existing arguments; when some mediating variables are controlled for whereas others are not, then the coefficient estimate represents the net effect of those mediating variables excluded from the model. Ideally, each mechanism in the literature is empirically evaluated. It is not feasible, however, to do so because many mediating variables are unobserved. Since unobserved mediating variables can not be controlled for in a model, we should always consider the coefficient estimate of democracy as representing the net effect of all the mechanisms not directly controlled for. Since this issue has important implications for our analysis, we will belabor the point with an example.

Suppose the following two FDI models, where X_k represents a vector of control variables unrelated to the mediating factors in Table 1, are identical in all aspects except for the inclusion of property rights:

$$FDI = \beta_0 + \beta_1 Democracy + \beta_2 Property\ rights + \beta_k X_k + e \qquad (1)$$

$$FDI = \beta_0^* + \beta_1^* Democracy + \beta_2^* \times 0 + \beta_k^* X_k + e^* \qquad (2)$$

Since Equation 1 controls for property rights protection and Equation 2 does not, β_1

and β_1^* have different interpretations. β_1 represents the net effect of democracy via all mechanisms *except for* its positive effect through property rights; β_1^* represents the net effect of democracy via all mechanisms *including* its positive effect through property rights. Thus, the two models produce two different estimates of the effect of democracy. All else equal, if the property rights mechanism works as theorized, we should expect *a priori* the following: $\beta_1 < \beta_1^*$. Meta regression allows us to test this expectation. The theoretical implication of this test is: If this inequality holds across studies, then the property rights mechanism is empirically supported. We discuss this issue further in research design.

Finally, all existing arguments have only made predictions about the direction, rather than the size, of the effect of democracy on FDI. Hence, to the extent that regime type exerts competing effects with unknown magnitude, the net effect of democracy on FDI is *a priori* ambiguous.

2.2 Empirical Evidence

Meta analysis is a tool for a systematic quantitative review of an existing body of empirical estimates. Thus prior studies on the impact of democracy on FDI are the source of our data collection. We first searched for and identified all relevant empirical studies. Our search, as detailed in the supplementary appendix, first produced a list of 2,854 studies, which were then screened for inclusion in the analysis based on a set of criteria. For inclusion in our analysis, a study must examine country level FDI as the dependent variable, include democracy or regime type as an independent variable, and report sufficient statistical information (at a minimum, a coefficient and t-statistic or standard error for democracy). And the sample must be cross-national and monadic.[17] We ended up with 276 coefficient estimates in 41 studies.[18]

The first noteworthy feature among those studies is how FDI, as the dependent variable, is

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[17]We limit our analysis to articles written in English. See the appendix for details.

[18]We excluded one outlier model estimate with a *t*-statistic of -173. It is likely to be an error because the reported standard error associated with -173 is orders of magnitude smaller than other standard errors reported in the same regression table. We also excluded models that are strict replications of previous models.

Table 2: Distribution of Measures of FDI

	No log % (N)	Log % (N)	Row Total % (N)
Net inflows	16.30 (45)	23.55 (65)	39.86 (110)
Net inflows per capita	0.00 (0)	5.43 (15)	5.43 (15)
Net inflows/GDP	40.22 (111)	1.81 (5)	42.03 (116)
Net inflows/World inflows	0.72 (2)	0.00 (0)	0.72 (2)
Stock	0.00 (0)	3.62 (10)	3.62 (10)
Stock/GDP	7.25 (20)	1.09 (3)	8.33 (23)
Column Total	64.49 (178)	35.51 (98)	100.00 (276)

Cell percentages, with numbers of observations in parentheses.

measured in a variety of manners. Table 2 demonstrates the distribution of the FDI measures in 41 studies.[19] Among the 276 models in 41 studies, 39.9% employ net FDI inflows, whereas 42.0% use net inflows as a share of GDP. Together, they account for roughly 82% of all the models, with the remainder employing net inflows per capita, net inflows as a share of global inflows, inward FDI stock, and inward stock as a share of GDP. Between the two most frequently used measures, the level of net inflows is logged in 65 of 110 models; in contrast, the share of net inflows in GDP is logged in only five models out of 116.

Scholars have debated which measure is more appropriate for evaluating the effect of regime type on FDI.[20] Between the level of net inflows and the share of net inflows in GDP, it is argued that the former reflects the net amount of foreign production capital flowing into a country (after divestment, hence the net amount), whereas the latter reflects how important net foreign production capital inflows are to national economy or how open the economy is to FDI. Thus, they appear to address two different questions: (1) Do more FDI flows go to more democratic countries? (2) Do FDI inflows occupy a larger share in the

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[19]The sources of FDI data are the World Bank or the United Nations Conference on Trade and Development (UNCTAD). The World Bank data are measured by net FDI inflows but UNCTAD data may be net FDI inflows or stocks.

[20]Choi 2006; Kerner 2014; Li 2009.

national economy in more democratic countries? Although both questions are important and related, they are conceptually distinct. Causal mechanisms that apply to one question may not be applicable to the other. The two dependent variables are likely to have different data generation processes.

To further strike home the point, we may think about the difference between trade openness, measured by (exports+imports) divided by GDP, and total trade volume, measured by (exports+imports). No researcher would use these two measures interchangeably. For one simple example, the United States is the largest trading economy in the world according to trade volume and yet, it is not the most open economy according to trade openness. Likewise, China is one of the largest recipients of FDI inflows, but the relative importance of FDI to its national economy is not nearly as high as in Singapore or Trinidad and Tobago.[21]

Despite their conceptual distinctions, FDI scholars often conflate the level and share measures, interpreting the estimated effects of democracy on them in the same way as if they are conceptually equivalent and address the same research question. It is worth noting that when FDI scholars proposed the causal mechanisms listed in Table 1, they almost always had in mind the question, "Do more FDI flows go to more democratic countries?", rather than the one regarding the openness to or importance of FDI. Given their conceptual distinctions, we should analyze the effects of democracy with respect to the two outcomes separately.

What does the distribution of cumulative evidence look like? Table 3 reports the distribution of model results by direction and statistical significance at the 5% level, for three groups of models: all models, models of net inflows, and models of FDI share.[22] In column 1 of Table 3, of the entire set of 276 coefficient estimates, 48.2% are positive and statistically different from zero at the 5% level; an additional 25.0% are positive but are statistically insignificant; 11.2% are negative but statistically insignificant; and 15.6% are negative and statistically significant. The distribution of evidence clearly indicates the lack of consensus

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[21]Li 2009.

[22]Significance levels are based on p-values calculated from t-statistics and the number of degrees of freedom, with corrections for country fixed effects. In one study, only the α levels are reported, and neither t statistics nor standard errors are. We employed the reported α levels to impute the t statistics and standard errors.

findings on the effect of democracy on FDI.

Table 3: Distribution of Empirical Findings

	All measures	Inflows only	
		Level	Share
	1	2	3
Positive & significant	48.19	41.82	44.83
	(133)	(46)	(52)
Positive but not significant	25.00	23.64	30.17
	(69)	(26)	(35)
Negative but not significant	11.23	9.09	17.24
	(31)	(10)	(20)
Negative & significant	15.58	25.45	7.76
	(43)	(28)	(9)
Total	100.00	100.00	100.00
	(276)	(110)	(116)

Statistical significance at the 5% level.
Column percentages with # observations in parentheses.

Arguably the results in column 1 of Table 3 could be an artifact of the different ways scholars measure the dependent variable. Columns 2 and 3 present the results for the level and share measures, respectively. We observe roughly similar patterns as in column 1, with slight variations. In sum, the consistent pattern in Table 3 is that there is no consistent evidence among 276 models in 41 studies to support the claim that more democratic countries attract more FDI.

An important weakness of Table 3 is that a somewhat arbitrary cutoff for the significance level is employed to categorize findings, potentially producing mis-classifications. To correct for this weakness, we present a box plot of t-statistics by study in Figure 1, which also demonstrates within-study variations. Each box plot illustrates the distribution of the t-statistics for the democracy variable across all the relevant models in each study, with the dark bar inside a box indicating the median t-statistic within a study, the lower and upper boundaries of a box representing the first (25th) and third (75th) quartiles, the short horizontal lines outside the box representing the minimum and maximum values excluding outliers, and the dots representing outliers 1.5 times larger than the upper quartile or 1.5 times less than the lower quartile.

As shown, a significant amount of variations exists in the reported t-statistics for the

democracy variable across models, both within and between studies. Consistent with the pattern in Table 3, the results in Figure 1 exhibit little consensus about the direction or significance of the effect of democracy on FDI.[23]

Figure 1: Box and Whiskers Plot of t Statistics by Study
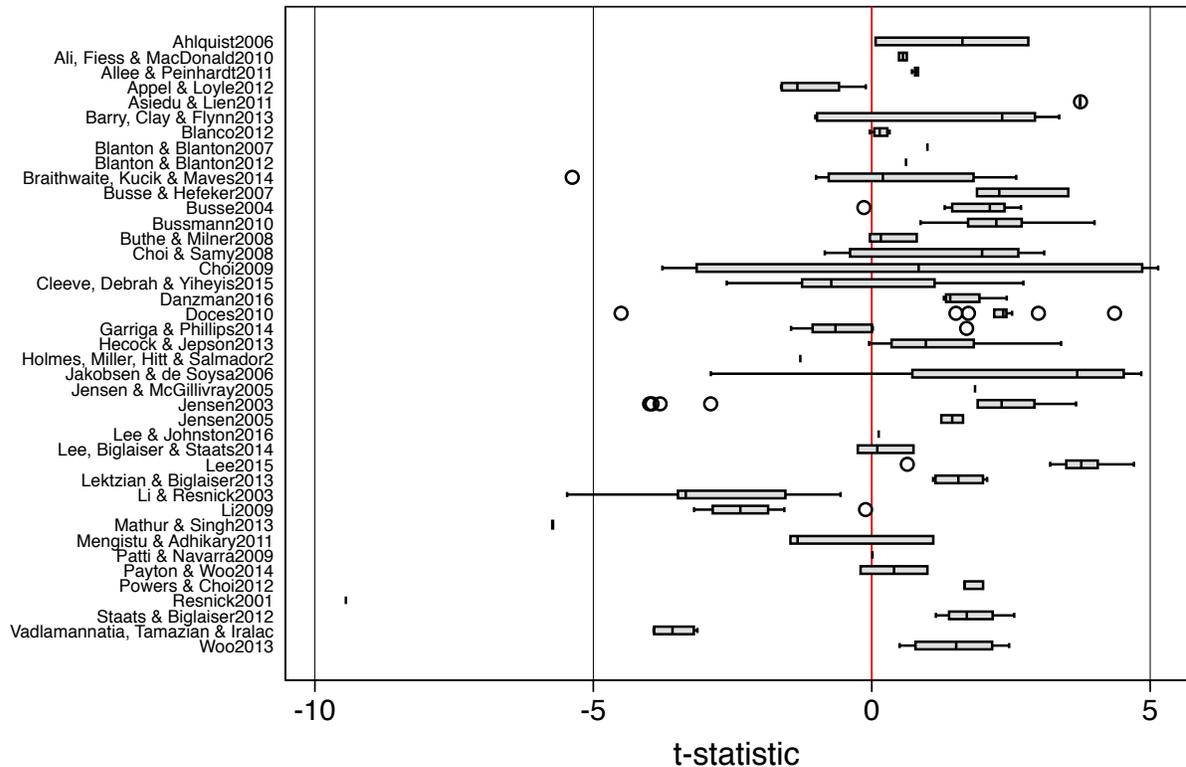
3 METHODOLOGY

In this section, we will discuss key research design issues, including how we render the effect of democracy on FDI comparable in scale between studies, how to understand and test for publication bias, how to perform meta regression to uncover sources of variations in prior

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[23]In the supplemental appendix, we present the list of studies included in our analysis, along with the mean and range of t-statistics, the number of models estimated, and the sample period in each study. Most studies estimate more than one model, and the reported t-statistics range from -9.443 to 5.143.

empirical findings, and how to estimate the net effects of democracy under different study conditions.

3.1 Measuring Empirical Effects using Partial Correlations

A direct comparison of the coefficient estimates or t-statistics across original studies is not appropriate because of differences in the scale and unit of measures.[24] A common approach in meta analysis is to convert coefficient estimates or t-statistics from original models to some standardized measure to make them comparable in scale. The most common measure is the partial correlation coefficient, which is calculated as follows:

$$r_{ij} = \frac{t_{ij}}{\sqrt{t_{ij}^2 + df_{ij}}}$$

where t_{ij} is the t-statistic for democracy in model j of study i, df_{ij} is the corresponding degree of freedom, and r_{ij} is the partial correlation between democracy and FDI from model j in study i.

Why is r_{ij} comparable in scale across studies, but not the β coefficient from a conventional regression model? To understand the difference, consider Equation 1 as an example. One textbook definition of β_1 is that it is the coefficient of democracy from a partial regression; that is, the residual from a regression of FDI on all other covariates (except democracy) in Equation 1 is regressed on the residual from a regression of democracy on all other covariates in Equation 1. The corresponding r_{ij} in this case is simply the correlation coefficient between the residual of FDI and the residual of democracy. Hence, the partial correlation, r_{ij}, is unit free and ranges from -1 (perfect negative association) to +1 (perfect positive association). Even though β_1 is not comparable across models, the unit-free and standardized r_{ij} is. Of course, unlike β_1, r_{ij} does not represent the marginal effect of democracy on FDI holding all other variables constant, but it does reflect the strength and direction of the *ceteris paribus*

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[24]Doucouliagos and Ulubaşoğlu 2008; Stanley and Doucouliagos 2012, In other words, it is not advisable to perform meta analysis on coefficient estimates directly when dependent and independent variables utilize different measures and scales.

effect of democracy on FDI.[25]

Just like any coefficient estimate, the partial correlation also has some uncertainty around it, which is measured by its standard error. The standard error of the partial correlation is equal to $se_{ij} = \sqrt{\frac{(1-r_{ij})^2}{df_{ij}}}$.[26]

3.2 The Distribution of Partial Correlations and Publication Bias

In meta analysis, the funnel plot is an effective way for demonstrating the distribution of estimated effects and investigating possible publication bias in those reported estimates as well.[27] Figure 2 presents two funnel plots for the level and share measures. The partial correlation (the effect size) is on the horizontal axis and an indicator of the estimate's precision (measured by the inverse of the estimate's standard error, i.e., $\frac{1}{se_{ij}}$) is on the vertical axis.

Both plots in Figure 2 indicate that there is a wide distribution of results, regardless of which FDI measure is used. While more estimates are positive in both plots, there is a significant portion of negative estimates, particularly in the level plot. In addition, a large number of estimates cluster around zero in the share plot, indicating the absence of any effect. The mean partial correlation between democracy and the level is -0.0007, with a standard deviation of 0.117 and a range from -0.402 to 0.225. The mean partial correlation for democracy and the share is 0.053, with a standard deviation of 0.115 and a range from -0.215 to 0.431.

While these mean estimates seem to suggest the lack of a strong relationship between democracy and FDI, they tend to be unreliable in the presence of publication bias. The typically ubiquitous publication bias in academic papers undermines the ability of meta analysis

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[25]When we use the partial correlation as a standardized measure of the effect of democracy on FDI, we limit the sample to only non-interactive models because the coefficient of democracy in an interactive model cannot be compared to non-interactive effects. For a model controlling for country fixed effects, we adjust its degree of freedom downward according to the number of countries reported in the sample. The partial correlation appears robust to small adjustments in the degree of freedom Stanley and Doucouliagos 2012.

[26]Stanley and Doucouliagos 2012, 25.

[27]Stanley and Doucouliagos 2012.

Figure 2: Funnel Plots Based on Two FDI Measures
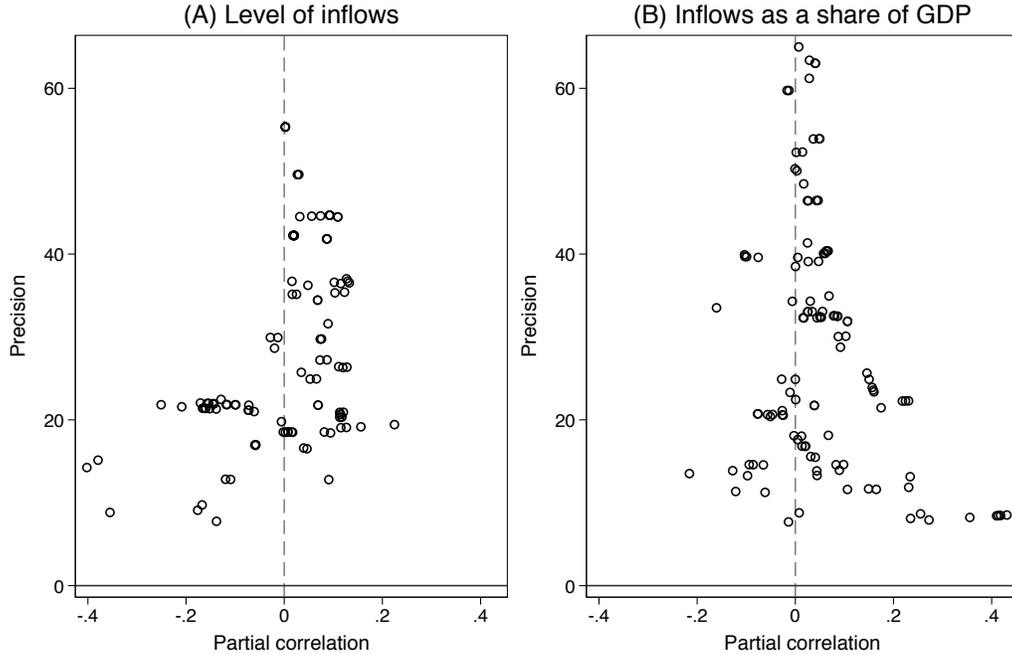
to identify the true effect from past empirical estimates.[28] Publication bias occurs when a certain type of academic research is more likely to be published than other types. For example, journal referees and editors may prefer to accept research manuscripts that demonstrate statistically significant findings; hence, studies finding null results are less likely published, and authors may pursue statistically significant results and discard their own null findings. As another example, reviewers who give conventional wisdom undue credit may be reluctant to accept any study that challenges the conventional wisdom. Consequently, in either example, published research is unrepresentative of the population of all available evidence (both published and unpublished). Without identifying and correcting for publication bias, meta analysis can not find the true effect even from the accumulated body of empirical estimates because publication bias inflates the estimated average effect.

As a first step, we can examine the funnel plots for evidence of publication bias. Without publication bias, the estimated effects should be randomly and symmetrically distributed around the true effect, with less precise estimates widely dispersed at the bottom of the plot

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[28]Stanley and Doucouliagos 2012.

and more precise ones concentrated at the top.[29] In the presence of publication bias, a funnel plot will become asymmetric, suggesting that empirical estimates that prove a certain type of effect (positive or negative) are more likely to be published.

In Figure 2, the estimates are clearly skewed toward negative values in the level plot, and yet clearly skewed toward positive values in the share plot. In neither plot can we conclude that the estimates are symmetrically distributed around the central tendency of partial correlation estimates. Thus publication bias appears to exist in the democracy-FDI literature, though the direction and strength of the bias might differ between the two FDI measures.

3.3   Estimating Publication Bias and Bias-Corrected Average Effect

While the funnel plot in Figure 2 demonstrates the possible presence of publication bias, it cannot provide definitive evidence proving the bias. For more rigorous analysis, we must turn to meta regression. The following model allows us to both test for publication bias and estimate the publication bias-corrected effect:[30]

$$r_{ij} = \alpha_0 + \alpha_1 SE_{ij} + u_{ij} \tag{3}$$

The dependent variable, r_{ij}, is the partial correlation r from study i and model j. It is regressed on a constant, the estimate's standard error SE_{ij}, and an i.i.d. random error u_{ij}. If there is no publication bias, then the effect r_{ij} and its standard error SE_{ij} should be uncorrelated. Hence, α_1 measures the size of publication bias. If α_1 is statistically indistinguishable from zero, then there is no publication bias; if α_1 is statistically significant, then there is publication bias.[31]

Because publication bias is controlled for in the model, α_0 is an estimate of the publication

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[29]According to Stanley and Doucouliagos 2012, the symmetry of a funnel plot is determined by the symmetric distribution of the statistical estimates; for the computed t values, the coefficient estimates are independent of their standard errors.

[30]Stanley and Doucouliagos 2012.

[31]Stanley and Doucouliagos 2012 refer to this test of publication bias as the funnel-asymmetry test (FAT).

bias-corrected average effect.[32] It is the average of numerous democracy estimates like β_1 in Equations 1 and β_1^* in Equation 2, while holding publication bias constant.

There is a caveat to this estimated effect. Recall that β_1 represents the net effect of democracy via all mechanisms except for property rights, and β_1^* the net effect of democracy via all mechanisms. As a result, α_0 is based on a meta regression model that ignores all the differences in study attributes, and it is therefore essentially an average of different types of effects of democracy. It should be considered as a naive and noisy estimate of the publication-bias corrected average effect of democracy.

3.4 Evaluating Sources of Heterogeneity in Estimated Effects

Once we estimate Equation 3 and test for publication bias, we can employ a full blown meta regression model to test the effects of different study attributes, evaluate the effects of mediating variables, and compute the net effect of democracy on FDI. To accomplish these tasks, we expand Equation 3 and estimate the following model:

$$r_{ij} = \alpha_0 + \alpha_{se}SE_{ij} + \alpha_k M_{ij} + \alpha_q Z_{ij} + u_{ij} \tag{4}$$

The dependent variable is the partial correlation coefficient as before. On the right hand side, M_{ij} is a vector of variables for mediating factors in previous studies, and Z_{ij} is a vector of variables indicating other study characteristics of previous studies. A list of all the variables in Equation 4 and their definitions are provided in Appendix Table A1.

3.4.1 Study Attributes

Estimates in previous research may vary systematically because of differences in research design and study attributes. Thus it is important to test the effect of each study attribute. Z_{ij} include a number of dichotomous and continuous variables for important study attributes.[33] First, we include dummy variables for whether the sample is cross-sectional instead of a

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[32]Stanley and Doucouliagos 2012 refer to the test $\alpha_0 = 0$ as the precision-effect test (PET). Hence, Equation 3 is referred to as the FAT-PET model.

[33]Following the recommendation of Stanley and Doucouliagos 2012.

panel and whether the sample includes only developing countries or all countries. We also include the median year of the sample period in a study (centered) to capture the impact of the sample period. Second, we control for several characteristics of the dependent variable, using a dummy variable to indicate the use of UNCTAD instead of World Bank FDI data and a dummy variable for whether the dependent variable is logged or not. Third, we control for whether the democracy measure is based on a non-Polity data source such as Freedom House or not. Fourth, we control for estimation choices, including whether the model includes country fixed effects or not and whether the lagged dependent variable is included or not. Finally, we include the publication year of an article to control for the possibility that empirical estimates in previous research may change over time. This variable is centered.

3.4.2 Mediating Variables

Equation 4 can help us to evaluate the validity of causal mechanisms listed in Table 1. For clarity, Table 4 expands Table 1 to include possible mediating variables for each mechanism. Although we do not perform a mediation analysis per se[34], we use the term mediating variables to refer to the fact that the mechanisms listed are possible indirect channels through which democracy affects FDI. As noted earlier, some mediating variables are unobserved or excluded in previous empirical models, and they are denoted by asterisks in Table 4. Other mediating variables or their proxies listed in Table 4 have been controlled for in previous studies. These variables include property rights[35], growth, domestic political risk[36], regime duration, exchange rate volatility, labor rights, labor strength, labor cost, trade openness, and capital control liberalization. In Equation 4, each of these variables is included as a dummy variable, coded one for its presence in a previous empirical model and zero otherwise.

Based on existing theoretical arguments and Table 4, we formulate the following expectations regarding the mediating variables in Equation 4: (1) property rights, political constraints, growth, domestic political risk, regime duration, and exchange rate volatility

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[34]e.g. in the vein of Imai, Keele, and Tingley 2010.

[35]Property rights is equal to one if the researcher controls for corruption, rule of law or bureaucratic quality.

[36]Domestic political risk is equal to one if the researcher controls for political instability, domestic political shocks, civil war, terrorism, domestic conflict, political terror, etc.

Table 4: Causal Mechanisms Controlled for by Mediating Variables in Prior Studies

	Mechanism	Effect	Possible Mediating Variables
1	Enhancing property rights protection	+	Property rights
2	Enhancing policy stability via veto players	+	Political constraints
3	Providing better growth prospects	+	Growth
4	Providing more media openness	+	Press freedom*
5	Reducing political and economic uncertainty	+	Domestic political risk
			Regime duration
			Exchange rate volatility
6	Labor-oriented democratic politics	+	Labor rights
			Labor strength*
1	More stringent anti-trust regulation	-	Anti-trust regulation*
2	More protection to host domestic firms	-	Industrial policies*
3	Less generous tax incentives to foreign investors	-	Tax policy*
4	Autocracies shield MNEs from domestic popular pressures	-	Labor cost
			Labor rights
			Labor strength
5	Resource-rich autocracies favor MNEs more than resource-rich democracies	-	Interaction of resource and regime type*
6	Developing country democracies offering less economic freedom	-	Trade openness
			Capital control liberalization

* Mediating variable is not controlled for in empirical models of democracy and FDI in our sample.

should take on a negative sign, because each of them in a previous empirical model controls for some positive effect mechanism of democracy on FDI; (2) labor rights and labor strength could be negative or positive, depending on which mechanism one believes in; (3) labor cost, trade openness, and capital control liberalization should take on a positive sign, because each of them in a previous empirical model controls for some negative effect mechanism of democracy on FDI.

We also use dummy variables to control for the presence of some most common variables in previous FDI models, including GDP and GDP per capita. The literature does not offer any argument about how democracy might affect GDP and GDP per capita and then influence FDI, though their potential links are not inconceivable. We will not elaborate on this issue since it is beyond the scope of this paper.

3.4.3 Calculating the Net Effect of Democracy

Based on the estimated meta regression models, we can compute the net effects of democracy. The presence of publication bias, heterogeneous study designs, and competing multiple causal

mechanisms, all make it likely that the answer to the question depends on how these factors combine in different ways to produce a range of most probable values, rather than a single estimate. With that caveat in mind, we can use model estimates in Equations 3 and 4 to identify three types of estimated effects of democracy to answer our research question. The first type is the estimate of β_0 in Equation 3, referred to as the naive publication-bias corrected average effect of democracy for reasons discussed earlier.

A second and third type of estimated effects of democracy can be computed by utilizing the estimated parameters in Equation 4 for substantively meaningful scenarios.[37] For both types of estimates, we set the standard error equal to zero as a means to filter out any publication bias. We set the variables in Z_{ij} to take on various values to mimic design differences such as whether the dependent variable is logged or not, the data source for FDI, etc.. Next, for the second type of estimated effects of democracy, we set all statistically significant mediating variables in M_{ij} to one, i.e., the condition for which all the relevant observed mediating variables are controlled for. This type of estimated effects represents the predicted net effect of democracy through unobserved intermediaries theorized in Table 4 as well as some possible untheorized direct effect of democracy.

In contrast, for the third type of estimated effects, we set all statistically significant mediating variables in M_{ij} to zero, i.e., none of the observed mediating variables is controlled for. This type of estimated effects represents the predicted net effect of democracy via all possible mechanisms. The exercise is more like an out of sample thought experiment of the most extreme effect of democracy. By excluding those mediating variables, we essentially assume that each excluded variable only affects FDI because of its intermediary role between democracy and FDI. This assumption is apparently wrong for many of those variables such as property rights, economic growth, etc.. By omitting those variables, we essentially attribute their democracy-unrelated effects to democracy, which is the typical omitted variable bias.

While one may view the second and third types of estimates as the best estimates from the existing literature,[38] they are not without shortcomings. As noted, the second type of estimate does not represent the total net effect of democracy. The third type of estimate,

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[37]Stanley and Doucouliagos 2012, 98.
[38]Askarov and Doucouliagos 2013.

while conceptually appealing, extrapolates outside the sample of empirical studies. In spite of their own shortcomings, the three types of estimated effects of democracy, collectively, may prove to be informative. They give us a range of estimated effects. Even though we may not obtain a single estimate of the effect of democracy to answer our research question, we know the true effect is likely to exist in that range covered by the three types of estimated effects.

3.5   Estimation Methods and Robustness Tests

We estimate both Equations 3 and 4 with weighted least squares (WLS) instead of ordinary least squares (OLS). Even though r_{ij} is approximately normally distributed and independent of other estimates, its variance and by implication, the variance of u_{ij} are not constant among estimates. Heteroskedastic error variance makes OLS inappropriate. To correct for the influence of heteroskedasticity, WLS is applied, with Equations 3 and 4 weighted by the inverse of each estimate's variance.[39]

The WLS approach is uncommon in the traditional meta analysis literature, which primarily emphasizes fixed and random effects methods of estimating weighted average effect sizes.[40] Here, the terms fixed- and random-effects mean something different in meta analysis than they do in the context of conventional panel data analysis, in spite of identical names. Neither the fixed nor random effects meta analysis estimators are likely to be appropriate for political science research for a number of reasons. The fixed effects estimator assumes one true effect and thus implies that all differences between studies are due to sampling error.[41] In other words, this assumes that studies use the same measures of variables, the same population of subjects, etc. This is never likely to be the case in political science research in general, and for us specifically. Moreover, a fixed effects meta analysis estimator is biased in the presence of publication bias.[42] In contrast, the random effects meta analysis estimator assumes that the true effect varies across studies and the goal is to summarize the mean of

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[39]Stanley and Doucouliagos 2012.

[40]Stanley and Doucouliagos 2012.

[41]Borenstein et al. 2010; Harbord and Higgins 2008; Stanley and Doucouliagos 2012, e.g.

[42]Stanley and Doucouliagos 2012, 64. Furthermore, fixed effects meta analysis regression is never recommended Harbord and Higgins 2008, 496.

the distribution of effects. This approach assumes that the sample of studies included in the meta analysis is a random sample from the distribution of effects, which is not true in the presence of publication bias. Given publication bias, the random effects meta analysis estimator is biased because of the correlation between the random effects and the standard error of the estimate.[43] A series of research papers demonstrates convincingly that WLS is superior to both random and fixed effect meta analysis estimators, especially in the presence of publication bias.[44]

Our estimation of Equation 4 requires additional clarification. First, even though we have a clear logic guiding our model specification as discussed above, data limitations make it difficult to include all the variables we would like to include. For one reason, there is significant heterogeneity in model specifications in the literature such that some variables appear only in a few models. We present the number of models including each variable in the first column of each table of results for the level and share respectively. When independent variables vary for only a few observations, controlling for them in meta regression becomes difficult. For another reason, extremely high multicollinearity tends to occur in large meta regression models so that inferences are unlikely to be reliable. We apply the general to specific strategy in model estimation:[45] The first general model includes all variables identified above, and the second specific model only those with t statistics above 1.0.[46] This approach also allows us to model heterogeneity as comprehensively as possible, while maintaining degrees of freedom.

Second, we carry out several additional robustness tests.[47] As shown in the supplemental appendix, different studies include varying numbers of models. As a result, multiple model estimates from one study are unlikely to be uncorrelated. Hence, we also estimate WLS with clustered robust standard errors to account for dependence within studies. Furthermore,

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[43]Stanley and Doucouliagos 2012, 82.

[44]Doucouliagos and Stanley 2009; Stanley and Doucouliagos 2014, 2015; Stanley 2008.

[45]Following the recommendation of Stanley and Doucouliagos 2012.

[46]This is calculated using stepwise regression, in which variables are removed one at a time, starting with the least significant, until all variables have a t statistic of 1 or more. An F-test of coefficients on variables excluded from the specific estimation further demonstrates that the null hypothesis that all coefficients are jointly equal to zero fails to be rejected.

[47]Following Stanley and Doucouliagos 2012.

although WLS is generally insensitive to outliers, we also estimate robust regression to further ensure our model results are not an artifact of outliers.

Finally, in the supplemental appendix, we estimate the main models including only studies that use only the POLITY data for democracy to maximize homogeneity and comparability. It turns out that these results do not differ in any important way from other models for FDI level studies, but do differ among FDI share studies.

4 RESULTS FOR FDI LEVEL STUDIES

In this section, we report the results for the level studies in Table 5. We first discuss results for evidence of publication bias. Next, we present the results from the expanded meta regression using multiple estimators. Based on these estimates, we examine the sources of heterogeneity in previous findings in the literature, discuss the evidence for the causal mechanisms in Table 4, and compute the net effects of democracy.

4.1 Evidence of Publication Bias

In Table 5, Model 1 shows that without correcting for publication bias, the average effect of democracy on FDI is 0.031, which is positive and statistically different from zero. Model 2 based on Equation 3, however, provides strong evidence that there is severe publication bias in the literature using the level measure.[48] The coefficient α_1, as an estimate of the publication bias, is -2.45, and is statistically significant at the 1% level. This means that there is severe publication bias in favor of reporting smaller positive (or larger negative) effects of democracy on the level of FDI inflows. The naive bias-corrected average effect of democracy now rises to 0.106 and still remains statistically significant.

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[48]According to Doucouliagos and Stanley 2013, when β_1 is greater than 1 but less than 2, there is substantial selectivity, and if it is greater than 2, there is severe selection bias (320).

Table 5: Analysis of level studies

	# models	Weighted Least Squares Robust SEs					Cluster SEs	Robust Reg.
		1	2	3	4	5	6	7
Constant		0.031***	0.106***	0.205***	0.145**	0.148***	0.177***	0.148***
		(0.007)	(0.019)	(0.038)	(0.057)	(0.048)	(0.020)	(0.048)
Publication Bias:								
Std. error of r_{ij}			-2.453***	-3.081***	-2.079**	-2.163***	-2.636***	-2.163***
			(0.589)	(0.568)	(0.850)	(0.611)	(0.198)	(0.652)
Mediating Variables:								
Property rights	60			-0.053	-0.057	-0.065**	-0.061***	-0.065***
				(0.036)	(0.037)	(0.027)	(0.011)	(0.014)
Political constraints	7			-0.023	-0.035	-0.036**	-0.024*	-0.036**
				(0.025)	(0.028)	(0.016)	(0.015)	(0.016)
Growth	92			-0.073*	-0.084**	-0.076**	-0.083***	-0.076*
				(0.038)	(0.042)	(0.035)	(0.014)	(0.040)
Domestic political risk	77			0.123***	0.105***	0.104***	0.097***	0.104***
				(0.021)	(0.025)	(0.020)	(0.010)	(0.012)
Regime duration	65			0.063**	0.054*	0.041**	0.058***	0.041**
				(0.025)	(0.029)	(0.018)	(0.010)	(0.017)
Exchange rate volatility	68			-0.204***	-0.178***	-0.177***	-0.174***	-0.177***
				(0.024)	(0.034)	(0.027)	(0.012)	(0.030)
Labor rights	1			0.276***				
				(0.050)				
Labor costs	28			-0.188***	-0.132*	-0.122***	-0.171***	-0.122***
				(0.060)	(0.070)	(0.038)	(0.017)	(0.038)
Trade openness	49			-0.094***	-0.077***	-0.078***	-0.070***	-0.078***
				(0.024)	(0.028)	(0.019)	(0.010)	(0.016)
Capital controls/openness	60			-0.009	-0.042	-0.048*	-0.030**	-0.048**
				(0.036)	(0.042)	(0.026)	(0.012)	(0.021)
Additional Controls:								
GDP per capita	95			0.071**	0.091***	0.092***	0.053***	0.092*
				(0.028)	(0.033)	(0.032)	(0.015)	(0.046)
GDP	82			-0.004	-0.009			
				(0.025)	(0.027)			
Study Attributes:								
UNCTAD data	43			-0.053*	-0.010			
				(0.028)	(0.039)			
DV logged	65			0.074***	0.073***	0.072***	0.068***	0.072***
				(0.013)	(0.013)	(0.012)	(0.009)	(0.021)
Only developing	92			0.033**	0.031**	0.033**	0.051***	0.033*
				(0.015)	(0.015)	(0.013)	(0.012)	(0.017)
Country fixed effects	35			-0.004	0.010			
				(0.013)	(0.019)			
Lagged dependent variable	37			0.013	0.009			
				(0.015)	(0.015)			
Non-polity democracy	9			-0.010	-0.017	-0.019	-0.005	-0.019
				(0.014)	(0.016)	(0.016)	(0.015)	(0.014)
Median year in sample				-0.008**	-0.006*	-0.006**	-0.009***	-0.006**
				(0.003)	(0.003)	(0.003)	(0.001)	(0.002)
Publication year				0.000	0.000			
				(0.003)	(0.003)			
Observations		110	110	110	110	110	110	110
Adjusted R^2		0.00	0.14	0.81	0.79	0.80	0.94	0.80

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

4.2 Meta Regression Results

The remaining models in Table 5 present the results of our expanded meta regression models for FDI level studies based on Equation 4. First, to provide context, we present the number of models that include each covariate in column 2 (out of 110 total model estimates in the sample). We find that the mediating variable "labor rights" is included in only one model in the sample. Therefore, we first estimate a full model (Model 3), which includes the 21 variables that are identified in the research design section. Then, because labor rights has only one estimate,[49] we drop it from the specification in Model 4. We use Model 4 as our general specification and then proceed to estimate the specific, pared down specification in Model 5. Models 3-5 are estimated using WLS with robust standard errors. Model 6 is Model 5 re-estimated using WLS with robust standard errors clustered over study and Model 7 is Model 5 re-estimated using robust regression.

Before we discuss the evidence regarding study attributes and mediating variables, several general features about the results in Table 5 are worth noting. First, the fully specified Models 3 and 4 suffer from a large degree of multicollinearity among the independent variables, with ten variables reporting a variance inflation factor (VIF) above 10 (with some as high as 17). Multicollinearity is much less serious in Model 5; no variables have a VIF above 10. Second, the Wald tests confirm the redundancy of the variables in Model 4 that are excluded from Model 5. Third, in general, the meta regression performs well in terms of explaining variations in model estimates from previous studies. All the models explain at least 79% of the variation in the dependent variable. The robust regression performs especially well, reaching an adjusted R^2 of 0.94.[50] Fourth, all the meta regression models in Table 5 present strong evidence of severe publication bias, according to the coefficient estimates for the standard error of the partial correlation variable. Finally, the results for the variables in Table 5 are generally robust across all models. Overall, these patterns give us confidence in the validity of the results of meta regression for FDI level studies across different possible violations of regression assumptions.

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[49]Blanton and Blanton 2012.

[50]Note that robust regression utilizes a different weight than the WLS estimates.

4.2.1 Impact of Study Attributes

The results in Table 5 demonstrate the impact of different study attributes on the heterogeneity of empirical findings in the democracy-FDI literature. We focus on the results of the pared down model estimated with cluster robust standard errors, presented in Model 6, again noting that the results are robust to alternative estimators. In particular, models using the log of FDI inflows find significantly larger positive effects of democracy than those using an unlogged dependent variable. Models based on samples limited to developing countries find significantly larger positive effects of democracy than those using global samples. Similarly, controlling for GDP per capita leads to significantly larger effects of democracy. Studies using samples of more recent data report significantly smaller positive or more negative effects of democracy, as suggested by the negative and statistically significant coefficient on the median year of sample period. Finally, controlling for GDP, using country fixed effects, including a lagged dependent variable, the sources of FDI and democracy data, and the publication year do not appear to influence the estimated effects of democracy on FDI.

4.2.2 Evidence on Mediating Variables and Causal Mechanisms

Across Models 5-7, we find robust evidence that property rights, political constraints, growth, exchange rate volatility, labor cost, trade openness, and capital controls/openness have negative and statistically significant coefficients. This means that an FDI model with one of these variables will produce a smaller positive or larger negative partial correlation between democracy and FDI than a model of FDI without the variable, all else equal. Hence, these mediating variables contribute to the positive association between democracy and FDI. In other words, FDI models that do not control for these mediators will report a larger positive effect of democracy.

With respect to the expectations in Table 4, we find that the results for property rights, political constraints, growth, and exchange rate volatility are consistent with previous theoretical arguments in the literature. By enhancing property rights, political constraints, promoting economic growth, and reducing economic uncertainty, democracies attract more FDI. The results for labor costs, trade openness and capital controls, however, run contrary

to the expectations in previous studies. The findings do not support the ideas that democracies attract less FDI because they could not keep labor costs as low as repressive autocracies or that developing democracies offer less economic freedom important to foreign investors. On the contrary, by ensuring higher wage rates and reducing trade and capital barriers, democracies may actually become more attractive to foreign investors.

The coefficients on domestic political risk and regime duration are positive and statistically significant in Table 4, suggesting that including these variables leads to larger partial correlations between democracy and FDI. This is contrary to the expectations laid out in Table 4. Substantively, it means that democracies may not be able to reduce domestic political risk or prolong regime duration, thus inducing more FDI.

4.2.3   Estimated Effects of Democracy on Level of FDI

As discussed in the research design section, we now estimate the range of possible estimated effects of democracy on the level of FDI. The naive estimate, reported in Model 2 of Table 5, is 0.106, with a 95% confidence interval ranging between 0.069 and 0.143.[51] Recall that this is a naive estimate in the sense that it ignores sources of heterogeneity uncovered in the meta regression. Considering the partial correlation ranges from -1 to +1, the naive estimate appears to represent a very small positive effect of democracy on FDI.

To compute the second and third types of estimated effects, we utilize the estimates from Model 6 of Table 5 because they control for dependence among model estimates from the same empirical study. More specifically, we set the basic scenario as FDI studies using POLITY data for democracy, whose mean sample year is 1993 (the mean of all studies included in the estimation), including GDP per capita, and suffering from zero publication bias. We then vary the study attributes of sample composition - developing countries only or all countries - and whether the dependent variable was logged or not. Based on these configurations, Table 6 presents four point estimates and confidence intervals each for the second and third types of estimated effects.

The second type of estimated effect, when all relevant observed mediating variables are

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[51]A more conservative naive estimate, based on the PEESE model Stanley and Doucouliagos 2012, is 0.062, with a 95% confidence interval of [0.045, 0.079].

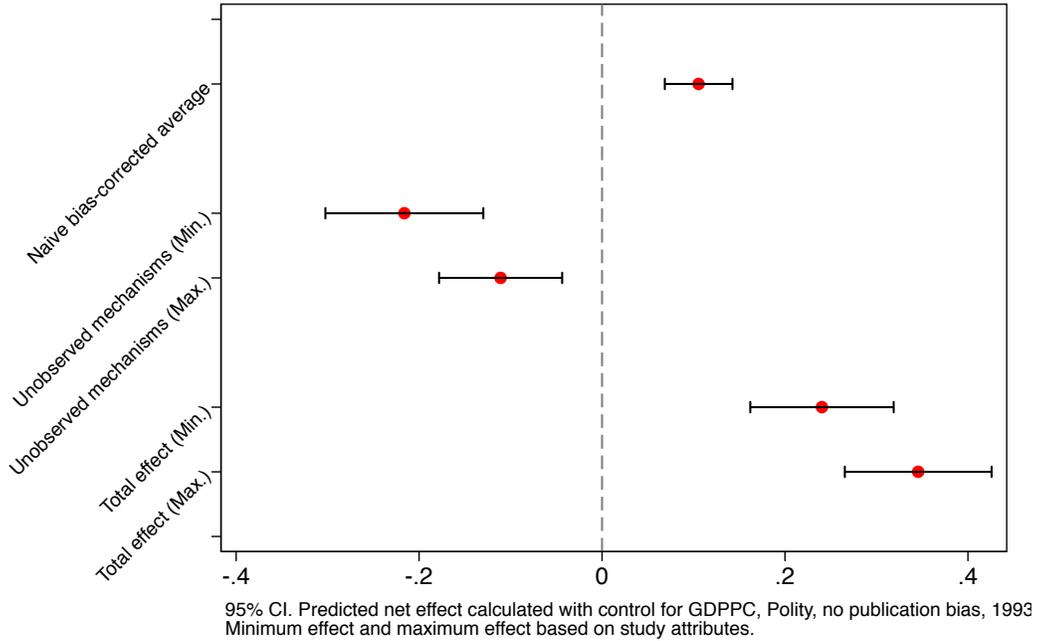Table 6: Estimated net effect of democracy in level studies

Scenario	Predicted Effect	95% Interval Lower	Upper
Unobserved mechanisms: All mediators equal to one			
Develop, no log	-0.183	-0.260	-0.107
Develop, log	-0.111	-0.178	-0.044
All, no log	-0.216	-0.302	-0.130
All, log	-0.144	-0.225	-0.063
Total net effect: All mediators equal to zero			
Develop, no log	0.273	0.200	0.347
Develop, log	0.346	0.265	0.426
All, no log	0.240	0.162	0.319
All, log	0.313	0.226	0.400

controlled for, are negative and statistically different from zero for all combinations of study attributes. These estimates represent the effect of democracy on FDI through unobserved mechanisms. As shown in Table 6, the effect size among the four point estimates ranges from -0.216 to -0.111. The 95% confidence interval could be as low as -0.295 at the lower bound and as high as -0.059 at the upper bound. Thus, when multiple observable channels through which democracy can influence FDI are controlled for, the estimated effect of democracy on FDI inflows is negative and statistically different from zero. The effect sizes are larger than the naive estimates, but they remain relatively small.

The third type of estimated effect, when none of the relevant observed mediating variables is controlled for, represents an the total net effect of democracy on FDI inflows through all channels (observed and unobserved). As shown in Table 6, the effect sizes among the four point estimates ranges from 0.240 to 0.346, all of which are larger than the maximum partial correlation of 0.225 observed among all previous FDI level studies. The 95% confidence interval is only as low as 0.161 at the lower bound and as high as 0.437 at the upper bound. One could say the total net effect of democracy could range from small to moderately large.

In sum, the net effect of democracy on the level of FDI inflows may be positive or negative depending on the mediating variables controlled. The size of that effect could range from being minuscule (based on the naive estimates) to being moderately large at most (based on the over-estimated and unrealistic scenario). We present a summary of these net estimated

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Figure 3: Estimated Net Effect of Democracy on FDI for Level Studies

95% CI. Predicted net effect calculated with control for GDPPC, Polity, no publication bias, 1993
Minimum effect and maximum effect based on study attributes.

effects in Figure 3. We plot the naive bias-corrected average effect, and the effects for the minimum estimated effect (all countries, no log) and maximum estimated effect (developing countries only, log) for both the case of the effect of unobserved channels (when all mediators are set equal to one) and the total net effect (when all mediators are set equal to zero).

5 RESULTS FOR FDI SHARE STUDIES

In this section, we present the results for FDI share studies. We follow a similar as format for the level studies.

5.1 Evidence of Publication Bias

The results of the test for publication bias are presented in Table 7. In Model 1, we report the naive average effect of democracy among the FDI share studies, which shows that without correcting for publication bias, the average effect of democracy on FDI share is 0.029 and statistically different from zero. In Model 2, the publication bias-corrected average effect of democracy, however, becomes statistically insignificant, with a coefficient of -0.0002. This

means that the positive effect of democracy on FDI share could be driven by publication bias in the naive case.

5.2 Meta Regression Results

The remaining models in Table 7 present the results of the expanded meta regression model. Again the number of models including each covariate is in column 2. We note that compared to level studies, there is significantly less "consensus" in terms of the variables that are included in models of FDI as a share of GDP. We find that the variables "political constraints" and "labor rights" are only included in one and two models, respectively.[52] Therefore, we first estimate a full model (Model 3), which includes the 21 variables identified in the research design section. Then, because political constraints and labor rights have so few estimates, we drop them from the specification in Model 4. We use Model 4 as our general specification and then proceed to estimate the specific, pared down specification in Model 5. Models 3, 4 and 5 are estimated using WLS with robust standard errors. Model 6 is Model 5 re-estimated using WLS with robust standard errors clustered over study, and Model 7 is Model 5 re-estimated using robust regression.

Several features in the results are worth mentioning. First, the general specifications in Models 3 and 4 have fewer variables affected by multicollinearity than the level models (only three variables have a VIF above 10); however, the VIFs are nearly double those in the level results. Second, Wald tests again confirm the redundancy of variables excluded in the pared down model. Third, in contrast to the level results, the explanatory power of the meta regression is much lower in all specifications. Models 3-6 have an adjusted R^2 of 0.41, while the robust regression in Model 7 reports an adjusted R^2 0.59. Finally, and most notably, the results presented in Table 7 are not robust across estimators. In particular, notice differences between Models 5, 6 and 7, which are the same model estimated using three different estimators.

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[52]Appel and Loyle 2012 and Payton and Woo 2014, respectively.

Table 7: Analysis of share studies

	#	Weighted Least Squares Robust SEs					Cluster SEs	Robust Reg.
		1	2	3	4	5	6	7
Constant		0.029***	-0.0002	0.211***	0.183***	0.191***	0.191***	0.161***
		(0.005)	(0.010)	(0.055)	(0.054)	(0.026)	(0.026)	(0.037)
Publication Bias:								
Std. error of r_{ij}			1.056***	0.894	0.474	0.319	0.319	1.372***
			(0.352)	(0.601)	(0.516)	(0.439)	(0.917)	(0.318)
Covariates:								
Property rights	25			0.012	0.031	0.021	0.021	0.022
				(0.041)	(0.040)	(0.020)	(0.026)	(0.021)
Political constraints	1			-0.072				
				(0.094)				
Growth	110			-0.132***	-0.133***	-0.138***	-0.138***	-0.142***
				(0.028)	(0.029)	(0.020)	(0.008)	(0.035)
Domestic political risk	42			0.058**	0.040*	0.043**	0.043	0.047*
				(0.023)	(0.023)	(0.018)	(0.027)	(0.026)
Regime duration	16			0.144*	0.088*	0.036*	0.036**	0.130***
				(0.073)	(0.049)	(0.018)	(0.015)	(0.042)
Exchange rate volatility	15			-0.144*	-0.073	-0.029	-0.029	-0.160***
				(0.084)	(0.052)	(0.025)	(0.042)	(0.042)
Labor rights	2			0.095				
				(0.058)				
Labor costs	6			-0.028	-0.019			
				(0.067)	(0.068)			
Trade openness	79			-0.030	-0.002			
				(0.035)	(0.026)			
Capital controls/openness	37			-0.020	-0.019	-0.018	-0.018**	0.018
				(0.025)	(0.024)	(0.016)	(0.007)	(0.022)
GDP per capita	114			-0.010	0.002			
				(0.027)	(0.032)			
GDP	78			-0.020	-0.007			
				(0.026)	(0.023)			
Study Attributes:								
UNCTAD data	23			-0.060**	-0.025	-0.023	-0.023**	-0.050**
				(0.029)	(0.018)	(0.017)	(0.010)	(0.023)
DV logged	5			-0.045	-0.046			
				(0.043)	(0.042)			
Only developing	71			-0.003	-0.001			
				(0.024)	(0.023)			
Country fixed effects	59			-0.039***	-0.041***	-0.042***	-0.042**	-0.056***
				(0.012)	(0.012)	(0.012)	(0.018)	(0.018)
Lagged dependent variable	69			-0.007	0.000			
				(0.018)	(0.017)			
Non-polity democracy	32			-0.062***	-0.064***	-0.071***	-0.071**	-0.085***
				(0.020)	(0.020)	(0.014)	(0.028)	(0.022)
Median year in sample				-0.001	-0.001			
				(0.002)	(0.002)			
Publication year				-0.005	-0.003	-0.003	-0.003	-0.009***
				(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
Observations		116	116	116	116	116	116	116
Adjusted R^2		0.00	0.05	0.37	0.36	0.41	0.41	0.59

Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

5.2.1 Impact of Study Attributes

The results presented in Table 7 demonstrate the impact of different study attributes on the heterogeneity of empirical findings in the literature. Three key factors appear to influence the estimated effect of democracy on FDI share. First, the source of democracy data matters. The coefficient of non-polity data is negative and statistically significant, suggesting that models based on non-polity measures report significantly smaller positive or more negative estimated effects of democracy than those using polity. Second, the inclusion of country fixed effects negatively influences the effect of democracy, suggesting that the estimated effects of democracy from models with country fixed effects are significantly smaller or more negative than those that do not. Third, the coefficient on UNCTAD as the source of FDI data is negative and statistically significant in three of the five models, suggesting that studies using UNCTAD data may be more likely to find smaller positive or more negative effects than those using World Bank FDI data. There is no effect of logging the dependent variable or whether the sample includes only developing countries, nor of the year of the sample or the publication year.

5.2.2 Heterogeneity Based on Covariates in Model

As discussed above, the FDI level and FDI share capture two different concepts. Because the theoretical development in the literature (even in studies using the share measure) tend to focus on the effect of democracy on the amount of FDI, we do not have strong theoretical expectations about how democracy should influence the importance of FDI in national economy or a country's openness to FDI. Therefore, we do not claim that the same theoretical mechanisms operate the same way in the relationship between democracy and the FDI level as the relationship between democracy the FDI share. Instead, we simply examine whether the inclusion of these covariates in the original study is a source of heterogeneity in the estimated effect of democracy on FDI share.

We again focus on the results of the pared down specifications, estimated in Models 5-7. The coefficient on growth is negative and statistically significant in all models, which is consistent with the level analysis. This means that a model of FDI as a share of GDP

that includes growth will produce a smaller or more negative partial correlation between democracy and FDI than a model without this variable, all else equal. The coefficients on domestic political risk and regime duration are positive and statistically significant in two and three, respectively, of the pared down model specifications presented in Models 5-7, which suggests that including these variables leads to a larger partial correlation between democracy and FDI as a share of FDP. This is also consistent with the findings in the level analysis.

However, the remaining variables are not robustly statistically significant. The coefficients on exchange rate volatility and capital controls/openness are negative, but statistically significant in only one of the three models, suggesting that statistical significance depends on the choice of estimator. Thus we are less confident in these estimates. Additionally, the coefficients on property rights, trade openness and labor costs are not statistically significant in any model specification. It is worth noting that these patterns do not appear to result from publication bias nor serious multicollinearity.

5.2.3 Estimated Effects of Democracy on FDI Share

Our approach to estimating the effect of democracy on FDI share differs in a few ways from that for FDI level studies. Still, as above, we estimate the naive publication bias-corrected average effect. However, because we do not feel confident claiming that the same mechanisms mediate the relationship between democracy and FDI share, and because there are large differences in results across estimators, we instead estimate the net effect of democracy when all significant variables (both in terms of covariates and study attributes) in the meta regression are equal to one (a case with many controls), and the net effect when all significant variables are equal to zero. We estimate these effects for Models 5-7 due to differences across these estimators.

The naive estimate, reported in Model 2 of Table 7, is -0.0002, with a 95% confidence interval ranging between -0.020 and 0.020. Recall that this is a naive estimate in the sense that it ignores sources of heterogeneity uncovered in the meta regression and the mixture nature of the estimates from the literature.

Table 8: Estimated net effect of democracy in share studies

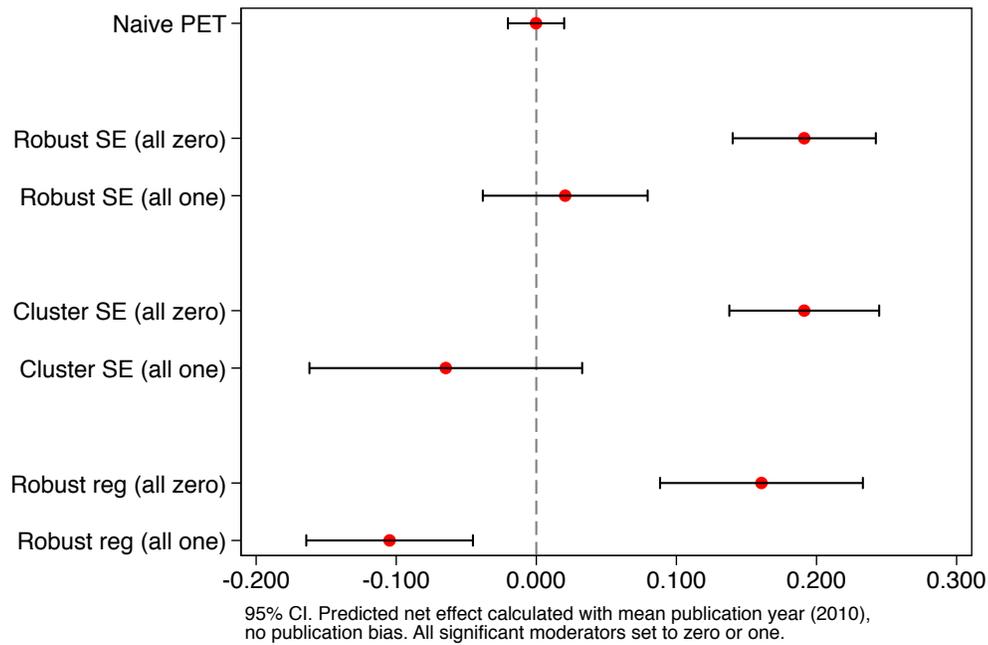| Scenario	Predicted Effect	95% Interval Lower	Upper
Naive effect	-0.000	-0.020	0.020
Robust SEs			
All moderators equal zero	0.191	0.140	0.242
All moderators equal one	0.021	-0.038	0.079
Cluster robust SEs			
All moderators equal zero	0.191	0.138	0.245
All moderators equal one	-0.065	-0.162	0.033
Robust regression			
All moderators equal zero	0.161	0.088	0.233
All moderators equal one	-0.105	-0.164	-0.045

We next present the results Model 5, estimated with robust standard errors. First, all significant variables set equal to one (assuming a model with many controls): growth, domestic political risk, regime duration, inclusion of country fixed effects and non-polity measures of democracy. The net effect is 0.021. Second, when all of these variables are set equal to zero, the net estimated effect is 0.191. The 95% confidence interval can be as low as -0.038 and as high as 0.242.

For Model 6, the meta regression estimated with cluster robust standard errors, we estimate the net effect when growth, regime duration, capital controls or liberalization, UNCTAD data, country fixed effects and non-polity measures of democracy are equal to one. The estimated effect is -0.065. When all are set to zero, the effect is 0.191. The 95% confidence interval can be as low as -0.162 and as high as 0.245.

Finally, for Model 7, the robust regression, we estimate the net effect when growth, domestic political risk, regime duration, exchange rate volatility, UNCTAD data, country fixed effects and non-polity measures are equal to one. This gives a net estimated effect equal to -0.105. When all are set to zero, we get a net estimated effect of 0.161. The 95% confidence interval can be as low as -0.164 and as high as 0.233.

We present a summary of these net estimated effects in Figure 4. As the figure suggests, the net effect of democracy on FDI as a share of GDP is most likely not different from zero.

Figure 4: Estimated Net Effect of Democracy on FDI for Share Studies

95% CI. Predicted net effect calculated with mean publication year (2010),
no publication bias. All significant moderators set to zero or one.

6 CONCLUSION

In this paper, we applied meta regression to address the debate over whether more democratic countries attract more FDI. Our analysis covers 276 model estimates from 41 studies. We reach two primary conclusions that have important implications for the field. First, after estimating a range of effects of democracy on FDI, we find no compelling evidence to support the belief in the democratic advantage. Second, the results highlight the importance of study design in shaping estimated effects, which suggests the need for greater awareness of how these choices can shape findings in an empirical literature.

Specifically, our analysis produces several notable findings. First, previous FDI research suffers from publication bias. FDI level studies suffer from a severe negative publication bias, whereas FDI share studies have a small positive publication bias. Second, after controlling for publication bias, the estimated partial correlation between democracy and either the level of FDI inflows or the share of FDI in GDP ranges from -0.3 to 0.4 for the former and from -0.16 to 0.24 for the latter, under varying configurations of study attributes. In a nutshell, there is no compelling evidence that more democratic countries attract more FDI. Third, divergent findings among different FDI models are attributable to how the dependent

variable is measured and other research design choices. Finally, among FDI level studies, causal mechanisms related to property rights, political constraints, growth, and exchange rate volatility as identified in the literature appear to be empirically supported. But proposed arguments related to domestic political risk, regime duration, labor cost, trade openness, and capital liberalization have significant effects that are against prior expectations, an issue that is worth further exploration. In contrast, among the covariates in FDI share models, only growth, domestic political risk, and regime duration appear to influence the effect of democracy on FDI share, and none of the other substantive covariates does. This appears to confirm our expectation that the data generation process for FDI share is very different from that for FDI level. They simply address two very different research questions.

This research produces useful insights that a traditional empirical study would not be able to. It alerts us to the presence of publication bias in previous research, the significant impact of concept operationalization, the influences of research design choices, the validity or lack of validity of existing arguments, and the relatively small impact of democracy on FDI. Returning to the policy implication of the research question highlighted at the beginning of the paper, we should tell national governments: "Do not expect your country to become a magnet of foreign production capital just because you have raised your democracy score!" Governments ought not to rely on using democracy as a reliable signal of the attractiveness of a country to foreign investors. Foreign investors should also exercise caution in using information on a country's political regime type to aid their decisions over location choices. The practical value of knowing the effect of democracy on FDI is that there is no reliable and robust effect of democracy.

For scholars, our research has raised some important questions and challenges. The existing literature offers competing mechanisms via which democracy affects FDI. We lack a coherent, unifying theory that allows us to reject *a priori* certain mechanisms and tie together others. In the absence of a coherent theory, we can not generate sound theoretical expectations as to which mechanisms should and should not work. Since there is not a bench mark theoretical model from which the empirical specification is generated, the degree of cumulative progress is poor in empirical studies as well. The lack of a strong common theoretical foundation has led to several problems in empirical research. For one example,

a large number of empirical model specifications has been produced in a relatively *ad hoc* manner, as reflected in the descriptive data in our supplementary appendix and the lack of a common set of core control variables. For another example, even when it comes to the simple question of what is our theoretically relevant dependent variable, scholars have failed to seek and reach consensus. As it turns out, this simple question has enormous implications for our empirical research and theoretical development. Studies of FDI net inflows as a level and those of FDI net inflows as a share of GDP are more distinct from each other than we have previously recognized. The models for these two dependent variables are more different than similar. The mechanisms linking democracy and each of the two FDI measures are very different. In the absence of a bench mark theoretical model, the search for the population empirical model may just be too illusive for scholars of the effect of democracy on FDI. The situation reflects an important underlying theoretical weakness.

Our meta regression, to the best of our knowledge, is the first application of this technique in international relations. Meta regression is well-suited for summarizing and explaining diverse findings in inherently heterogeneous observational studies in a systematic quantitative manner. It is a particularly useful tool for adjudicating competing arguments, heterogeneous research designs, and mixed findings in any research program that has a large number of empirical studies on the same research question. As demonstrated in our analysis, meta regression allows us to test and correct for publication bias, pin down the exact influences of different design choices, triangulate evidence to test causal mechanisms via mediating variables, and produce a range of estimates of the effect of interest. It can lead to new knowledge beyond the capacity of a conventional empirical model and therefore, should be more widely applied than it currently is in our field.

APPENDIX

Table A1: Meta regression data Characteristics

Variable	Variable Description
Mechanisms	
Property Rights	=1 if model controls for property rights
Political constraints	= 1 if model controls for political constraints (POLCON)
Growth	=1 if the model controls for economic growth
Domestic political risk	=1 if model controls for domestic political risk
Regime duration	=1 if model controls for regime duration
Exchange rate volatility	=1 if model controls for exchange rate volatility
Labor rights	= 1 if model controls for labor rights
Labor costs	= 1 if model includes labor compensation/costs
Trade openness	=1 if model controls for trade openness
Capital account liberalization	=1 if model controls for capital account liberalization
FDI Variables	
UNCTAD	=1 if dependent variable source is UNCTAD
	=0 if dependent variable source is World Bank
DV Logged	=1 if FDI variable is logged
Democracy Variables	
Non-polity democracy measure	=0 if data source is Polity
	=1 if data source is Freedom House or other
Methodology and data	
Std. error of partial correlation	Measure of publication bias
Cross-Section	=1 if model uses cross-sectional data
Developing country only	=0 if both developed and developing
	=1 if only developing
Lagged Dependent Variable	=1 if model includes a lagged dependent variable
Country fixed effects	=1 if model uses country FE
Median year of sample period	Median year in data set
Publication year	Year published
Additional controls	
GDP per capita	=1 if model controls for GDP per capita
GDP	=1 if model controls for GDP

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