

Foreign direct investment and institutional reform: evidence and an application to Portugal

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Abstract We examine the role of geographic, economic, and institutional factors in attracting Foreign Direct Investment (FDI) in Europe, using a cross-section of inward bilateral investments. We estimate and assess the expected benefits, the required reform efforts, and the efficiency of reform options corresponding to a convergence of Portuguese institutions to EU standards. We conclude that improving home institutions is likely to have a quantitatively very significant role in attracting FDI. Geographical and market size factors also play a role. Reforms promoting the independence of financial institutions and a leaner bureaucracy, lowering political

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risk and corruption, and improving the investment code may significantly affect the amount of bilateral inward FDI that is targeted to Portugal.

Keywords Foreign direct investment · Institutions · Institutional reform · Portugal · European union

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1 Introduction

Since the 1990s, Foreign Direct Investment (FDI) has gained importance in an increasingly globalized economy, for both developing and developed countries. The United Nations Conference on Trade and Development (UNCTAD) reports an increase in FDI stocks from 13 to over 30 percent of GDP in developing countries and from 9 to 32 percent of GDP in developed economies, in the period between 1990 and 2010. In 2008, prior to the financial crisis, developed economies hosted around 75 percent of the world's FDI, more than half targeted to the European Union (EU).¹ Both the enlargement of the EU to former planned economies of the East and the financial and economic crisis of 2008–2012 suggest the relevance of studying institutions as an attractor of FDI. Portugal, a small open economy in the western periphery of Europe, subject to high external indebtedness and a structural adjustment program since 2011, is particularly vulnerable to changes in FDI flows for both structural and cyclical reasons.

A large fraction of the increase in inward FDI from the 1990s follows the rising internationalization of multinational firms, along with a decrease in the costs of transferring the production abroad. A firm deciding to export is able to concentrate production in one place, benefiting from scale economies, but may have to incur large transaction costs, such as those related with transportation and licensing a product abroad. FDI lessens some transaction costs at the expense of raising others, namely those related with communication, personnel training, language, and unfamiliarity with the local business context, including government practices. FDI may also allow multinational firms to access natural resources and strategic assets, less expensive or more qualified labor, and more favorable regulations and business practices (Dunning 2008).² Recent worldwide developments, such as the reduction in intra-regional transaction costs and improvements in the institutional and legal framework, as well as in business practices, have markedly contributed to the expansion of foreign investments across the globe.

From the viewpoint of host countries, FDI also brings several advantages in addition to the direct effects on output and employment levels. FDI is often associated with technological transfer, the introduction of management skills and business culture, and changes in the productive structure of a country. In addition to the business

¹In 2010, that percentage fell to below 65 %.

²Horstmann and Markusen (1992) and Brainard (1997) develop a proximity-concentration model to explain multi-plant multinationals and two-way horizontal FDI, which arise when access to markets becomes less expensive relative to exporting.

environment, it may be a lever to improve local host country institutions (Larraín and Tavares 2004). As such, FDI may be more conducive to long-run growth and development than other forms of portfolio inflows or trade in goods and services (Barrell and Pain 1997; Borensztein et al. 1998). FDI may also impact the balance of payments, as multinational firms have a greater propensity to export than do domestic firms.

It is not surprising that a substantial amount of research has been devoted to explore the determinants of FDI. A first wave of research articles focused solely on economic and geographic determinants, including host-country market size, economic growth, openness, and the geographical distance between countries. More recently, a few articles have suggested that institutional and political risk factors have a role in explaining inward FDI. Better institutions promote FDI for a variety of reasons. First, good governance is associated with higher economic growth, itself an important driver of FDI. Second, better governance is usually associated with lower corruption and business costs. Finally, good institutions foster political stability and decrease political uncertainty. FDI is therefore expected to flow to countries with a stable economic environment and strong institutions, where, *ceteris paribus*, running a business is a more promising endeavor.

In this article we first evaluate the role of different economic and institutional factors in attracting bilateral FDI to a cross-section of European countries. We demonstrate that good institutions favoring economic freedom and low political risk are key driving forces of FDI. In particular, a strong and impartial legal environment, characterized by low corruption levels and the respect and protection of property rights, an independent financial system and a leaner bureaucracy, and a transparent and efficient foreign investment code, are major institutional drivers of inward FDI. We then measure the effects on inward FDI of reforming Portuguese institutions. We construct three indicators based on Tavares (2004) and Cavalcanti et al. (2008), measuring the benefit of reform in terms of FDI, the required reform effort, and the efficiency of the reform, i.e., the benefit per required effort of each reform. For those areas in which Portugal is lagging behind the EU, the most promising reforms consist in promoting the independence of financial institutions, lowering corruption, and improving the transparency and bureaucracy associated with the foreign investment code.

The article is organized as follows. The next section briefly reviews the literature. Section 3 presents the data collected and used in the empirical analysis. Section 4 introduces the econometric methodology, and Section 5 discusses the results. Section 6 analyzes the prospects for institutional reform in Portugal. Section 7 concludes.

2 Literature review

The empirical literature on FDI initially focused on economic and geographical factors.³ An increased awareness of institutional factors associated with regional

³See Blonigen (2005) and Caves (2007) for a survey of the literature.

integration agreements changed the panorama. As intra-regional transaction costs were reduced, national jurisdictions tended to rely more heavily on business facilitation measures that provide incoming firms with a suitable business environment. An institutional and beneficial “race to the top” takes place among jurisdictions (UNCTAD 1999).

Schneider and Frey (1985) were among the first to assess the empirical relevance of policy and institutional factors, uncovering a negative relationship between political instability and incoming investment. Biswas (2002) shows that both institutional and traditional factors are important determinants of FDI inflows, and Stevens (2000) and Bénassy-Quéré et al. (2007) present evidence that political and institutional factors explain FDI, after controlling for several economic factors. The inclusion of institutional variables often greatly diminishes the estimated impact of economic variables, such as taxation, on FDI (Hajkova et al. 2006). Wei (2000) and Wei and Shleifer (2000) conclude that corruption reduces inward FDI. If firms or individuals need to pay bribes in order to obtain permits, licenses, or access to other government services, the costs of doing business increase and inward FDI is discouraged. Larraín and Tavares (2004) show that, in addition to the detrimental effect of corruption on FDI, the opposite effect, whereby higher exogenous levels of incoming FDI decrease local corruption, is also present and is empirically relevant. Incoming FDI may be a better deterrent of corruption than openness to trade in goods and services. Several studies (e.g., Lee and Mansfield 1996; Knack and Keefer 1995) show that the composition of FDI inflows is positively affected by the degree of protection of property rights and intellectual property. FDI inflows also respond to the efficiency of the legal system (Buch et al. 2005) and to the extent of entry barriers (Alesina et al. 2005). Other studies, developed in the context of the Doing Business project, address the role of the legal system (Djankov et al. 2002), the regulation of entry (Djankov 2009), the regulation of labor markets (Botero et al. 2004), and investors’ protection (Djankov et al. 2008).⁴

3 Data

Our purpose is explaining inward FDI stocks from 86 source countries to 28 European host countries.⁵ Both source and host countries were selected according to data availability. Over 90 % of Europe’s inward FDI originates from the source countries included, and selection bias should therefore not be a major issue. The literature has advocated the use of FDI stocks relative to flows, as the former are based on accumulated flows—hence less volatile—and are the relevant decision variable for a firm in the long term. In addition, FDI stocks are a better measure of capital ownership

⁴As with economic factors, the literature is not consensual on the role of institutional variables in explaining FDI. For example, Bevan and Estrin (2004) and Wheeler and Mody (1992) find no significant impact of institutional risk on FDI into Eastern European transition economies and on the location of US foreign affiliates, respectively.

⁵See the [Appendix](#) for a detailed description of the data and for a list of countries covered.

(Bénassy-Quéré et al. 2007). We use a 3-year average for FDI stocks, a practice followed in the literature (Wei and Shleifer 2000; Stein and Daude 2007) to avoid the influence of sudden changes in FDI's valuation. The period analyzed is 2005–2007. As a check for robustness, we also produce estimates using net accumulated FDI over the same time period. Data were collected from the Eurostat database.

We explain inward FDI according to an augmented gravity-type model, using geographic, economic, and institutional regressors. As for geographical factors, we include the physical distance between host and source countries' capitals—which can be seen as a proxy for transaction costs, including transport and communication costs, and cultural and language barriers—and a border dummy variable, which takes the value of 1 only if source and host countries share a common border. A greater distance between source and host countries is expected to have a negative impact on FDI, whereas a common border should have a positive effect.

Our key economic variables are the host country's GDP (a proxy for market size), the GDP growth rate (a proxy for market growth), and labor costs.⁶ GDP and GDP growth are expected to have a positive impact on FDI.⁷ The role of labor costs is less straightforward, since they may reflect labor productivity.⁸ We also consider the degree of openness—the share of imports plus exports over GDP—as a measure of trade flows. Naturally, openness should have a positive effect on inward FDI.⁹

Our study also considers the role of education, measured by the mean years of schooling in each country. Some studies, including Altomonte and Guagliano (2003), argue that education has an ambiguous effect on FDI. On the one hand, more education implies higher labor productivity, but, on the other, education is associated with

⁶One cannot include *per capita* GDP and labor costs simultaneously in the model, as these variables are highly correlated. The role of growth on FDI would be more appropriately measured by a variable capturing expected future growth, but coherent estimates of GDP growth across countries are very hard to come by.

⁷Market size or market potential, usually measured as GDP, population, or economic growth, is the most extensively discussed economic determinant of FDI. Billington (1999) and Scaperlanda and Balough (1983) find that market size and growth have a statistically significant impact on FDI locations. Using a simultaneous equations model, Tsai (1994) also shows that domestic market size is a key determinant of FDI, while the role of growth is dubious. Janicki and Wunnava (2004) show that GDP positively affected FDI towards EU accession candidate countries. Other studies on the relationship between market size variables and FDI include Love and Lage-Hidalgo (2000), Barrell and Pain (1996), Wheeler and Mody (1992), Culem (1988), and Kravis and Lipsey (1982).

⁸While it may be expected that labor costs have a negative impact on inward FDI, as shown in Janicki and Wunnava (2004), Bevan and Estrin (2004), Barrell and Pain (1996), and Culem (1988), several other studies (e.g., Tsai 1994; Wheeler and Mody 1992; Kravis and Lipsey 1982) found insignificant or positive relationships. The mixed evidence is probably due to the role of labor productivity in FDI, which is positively correlated with—and often compensates for—labor costs.

⁹The degree of openness has been studied, *inter alia*, by Bajo-Rubio and Sosvilla-Rivero (1994) and Culem (1988), the former analyzing determinants of FDI in Spain, and the latter FDI inflows among six industrialized countries. Both studies conclude that the degree of openness affects inward FDI positively. Wheeler and Mody (1992), on the other hand, find no statistically significant relationship between openness and FDI, and Grubert and Mutti (1991) find mixed evidence on the effects of trade barriers on FDI.

higher wage costs.¹⁰ Finally, we include the Effective Average Tax Rate (EATR) as a measure of the tax burden.¹¹

GDP, growth, and openness were collected from the Eurostat database, and labor costs from AMECO. Mean years of schooling were taken from Barro and Lee's (2010) database, whereas the effective average tax rate was kindly provided by Michael Overesch.¹² Regressors are for the year 2004, with the exception of mean years of schooling, which was collected for 2005 due to data restrictions. We explain average incoming FDI for the 2005–2007 period using economic and institutional data for the year 2004 so that potential endogeneity issues are avoided.¹³

To obtain a characterization of the institutional environment that is as complete as possible, we use three distinct databases: the Index of Economic Freedom from the Heritage Foundation, the Political Risk Rating database from the Political Risk Services Group, and the Doing Business database from the World Bank.

Data for the Index of Economic Freedom cover the institutional framework in the second half of 2003 and in the first half of 2004. The Index of Economic Freedom is composed of ten different components: business freedom, trade freedom, fiscal freedom, government freedom, monetary freedom, investment freedom, financial freedom, property rights, corruption freedom, and labor freedom. It is expected that societies with better scores in terms of economic freedom attract higher levels of FDI, as they offer investors greater protection of property rights, lower tax burdens, fewer restrictive regulations, less bureaucracy, and less corruption.¹⁴

The Political Risk Rating, collected for the year 2004, comprises twelve indicators: government stability, socioeconomic conditions, investment profile, internal conflicts, external conflicts, corruption, military in politics, law and order, ethnic

¹⁰Walsh and Yu (2010) find that education has a negligible or slightly counter-intuitive negative effect on FDI, depending on whether one considers FDI toward industry or services. Altomonte and Guagliano (2003) find that education has a negative effect on a multinational's probability to invest in Central and Eastern European or in Mediterranean countries if investment is geared toward traditional industries, and a positive and significant impact for investment in services.

¹¹The statutory tax rate is the relevant variable for companies seeking to shift income towards low tax countries, whereas the effective average tax rate reflects the incentives (such as investment tax credits and accelerated depreciation) that are granted to firms when the investment occurs (Grubert and Mutti 1991). The effective marginal tax rate captures incentives to use new capital once the location choice has been made. Thus, the effective average tax rate should be the most important decision variable for multinationals seeking to invest abroad (Devereux and Griffith 1998). An extensive survey of the relationship between taxes and FDI is provided by de Mooij and Ederveen (2003). The empirical analysis of the effects of taxation on FDI dates back at least to Hartman (1984, 1985), who uncovered a negative relationship between the two variables. Using a panel approach, Cassou (1997) finds that host country corporate tax rates have a significant negative impact on investment flows. Related conclusions are shared by Grubert and Mutti (1991) and Devereux and Griffith (1998). Hines (1996) finds that state taxes significantly influenced the pattern of FDI in the United States.

¹²See Overesch and Rincke (2009).

¹³These are particularly important for GDP and GDP growth (Barrell and Pain 1997; Borensztein et al. 1998).

¹⁴The Index of Economic Freedom is available at www.heritage.org/index. Economic freedom is the right of every citizen to control his or her own labor and property. As put forward by the Heritage Foundation, "In a free society, individuals are free to make their own production and consumption decisions, protected and unconstrained by the state."

tensions, religious tensions, democratic accountability, and bureaucracy quality. Naturally, higher instability levels and economic as well as political uncertainty make investments riskier, leading to an expected decrease in incoming FDI.

Finally, the Doing Business database evaluates the cost of starting, operating, and closing a medium-sized firm in a given country, complementing the more generic information on business regulations reported by the Index of Economic Freedom. The data collected respect the 2006 report, which addresses business regulations as of June 1, 2005, and covers 33 variables in nine different areas—starting a business, dealing with construction permits, registering property, getting credit, protecting investors, paying taxes, trading across borders, enforcing contracts, and closing a business.¹⁵ For convenience, we converted each of the 33 variables into indexes, according to the min-max standardization method.¹⁶ To facilitate the interpretation of estimates, this conversion was made such that higher values are associated with better institutional performance. The resulting indexes were then summarized into the nine categories.

Economic Freedom, Political Risk, and Doing Business indicators are originally defined for different ranges. This diversity of indicators poses an additional difficulty when the aim is to interpret the magnitude of the estimated coefficients, as the distribution of each institutional variable depends on the indicators range and the methodology used to construct them. We used the raw factors to construct adjusted indicator variables, all ranging from 0 to 10. To ease comparisons across indicators and across econometric specifications, all indexes were rescaled by the standard deviation of the respective distribution. Higher scores always indicate better performance. It should be noticed that the dispersion of most institutional indicators is substantially large, even if circumscribed to European countries, and thus a one standard deviation change in an indicator is a very substantial change.

Ideally, one would explain FDI stocks, which are based on past accumulated flows, with institutional indicators well placed in the past. However, some institutional indicators that are used herein are available only since the mid-2000s (Doing Business) or mid-1990s (Index of Economic Freedom). As institutions tend to change slowly over time, we use institutional indicators for the mid-2000s as proxies for a country's level of institutional performance in earlier periods. A similar argument is used in Tavares (2004), who explains GDP growth between 1960 and 1995 with the institutional framework in the 1990s. Within the FDI literature, Wei (2000) and

¹⁵The Doing Business report is a co-publication of the World Bank and the International Finance Corporation, and the data are available at www.doingbusiness.org. Data for the nine different areas of Doing Business were first made available in the 2006 report.

¹⁶The min-max standardization method normalized to the 0–10 range implies that each variable is converted to an index according to the formula

$$\text{Score}_k = 10 \frac{\text{factor}_k - \text{factor}_{\min}}{\text{factor}_{\max} - \text{factor}_{\min}}$$

if higher factor values imply better performances (e.g., strength of legal rights, recovery rate when closing a business), or

$$\text{Score}_k = 10 - 10 \frac{\text{factor}_k - \text{factor}_{\min}}{\text{factor}_{\max} - \text{factor}_{\min}}$$

if higher factor values imply poorer performances (e.g., procedures, time, cost).

Bénassy-Quéré et al. (2007) also explain FDI stocks with institutional indicators that are not very distant in time.

In the final section we rely on more recent available institutional data—from the 2012 Index of Economic Freedom, the 2012 Doing Business report, and the 2006 Political Risk Rating—to evaluate institutional reform in Portugal.

4 Econometric methodology

The gravity model was first developed in the context of international trade (Eaton and Tamura 1995), but it has also been successfully applied to explain bilateral FDI (Wei 2000; Wei and Shleifer 2000). In its simplest formulation, the gravity model states that the larger the economic mass of the countries involved and the smaller the distance between them, the higher the predicted bilateral inward FDI. In this article we use an augmented version of the gravity model that takes into account other economic and institutional factors affecting incoming FDI. We use a cross-section specification. A panel setup requires a considerably long time span—3–4 time periods, each composed of a 5-year average, totaling 15–20 years of observations. The poor availability of institutional regressors for an earlier time period, as well as the number of missing FDI observations as one goes back in time, have dictated our choice. Also, the panel fixed effects model does not allow the estimation of time invariant regressors, such as geographic factors. Denoting by j the source country and by i the host country, we first estimate the following augmented gravity-type equation

$$\log(\text{FDI}_{ij}) = \alpha c_j + \beta_1 \text{DISTANCE}_{ij} + \beta_2 \text{ECO}_i + \beta_3 \text{INST}_i + \varepsilon_{ij} \quad (1)$$

where FDI_{ij} is the inward FDI stock from country j to country i , DISTANCE_{ij} is a vector composed of the physical distance between country j 's and country i 's capitals and the border dummy variable, ECO_i is a vector containing economic indicators for the host country—namely GDP, GDP growth, labor costs, the degree of openness, education, and the effective average tax rate—and finally, INST_i is a vector of institutional variables for the host country. Besides FDI_{ij} , the distance between source and host countries, GDP, and labor costs enter Eq. 1 in logarithmic form, which contributes to the homoscedasticity of the error term. Nonetheless, heteroskedasticity-consistent standard errors are reported. Furthermore, a double-log specification shows the best fit to the data, consistently delivering high values for the R^2 and more precise estimates for the coefficients, as suggested by Stein and Daude (2007). We implement a quasi-fixed effects model, i.e., we include source country dummies, represented in Eq. 1 by the vector c_j . These dummy variables are meant to capture all specific characteristics of the source country that affect the volume of outward FDI, such as the level of GDP, *per capita* GDP, or the institutional framework. Finally, ε_{ij} is an i.i.d. error term assumed to be normally distributed.

To estimate the double-log model in Eq. 1 by OLS, all zero-FDI observations have to be dropped, as the logarithm of zero is not defined. Around 37 % of our sample corresponds to zero-FDI observations. This results in a censored-sample problem, which can lead to inconsistency. A common way to deal with censored observations

is to use a Tobit model (Gao 2005; Stein and Daude 2007). This approach can be justified by considering that stocks below a certain threshold are incorrectly recorded as zeros, or that the desired level of investment is positive, but the presence of fixed costs of investing abroad leads to observed zero-FDI values when the desired investment is below a certain threshold.¹⁷ Thus, besides OLS estimation, we also estimate Eq. 1 using a Tobit model, in which the assumed threshold is $\log(1/3)$.¹⁸

The validity of OLS and Tobit estimates relies crucially on the assumption that ε_{ij} is statistically independent of the regressors. *A priori*, there is no reason for this assumption to hold, and thus both procedures may lead to inconsistent estimators. To deal with this issue, Silva and Tenreyro (2006) suggest estimating models such as Eq. 1 in multiplicative form, through a Poisson Pseudo-Maximum-Likelihood (PPML) estimator.¹⁹ The equation to be estimated becomes

$$FDI_{ij} = \exp[\alpha c_j + \beta_1 \text{DISTANCE}_{ij} + \beta_2 \text{ECO}_i + \beta_3 \text{INST}_i] \zeta_{ij} \quad (2)$$

where $\zeta_{ij} = \exp(\varepsilon_{ij})$. In addition to dealing with inconsistency, Eq. 2 rightly considers the existence zero-FDI values.

As a robustness exercise, we also estimate Eqs. 1 and 2 using net accumulated FDI in place of FDI stocks. Accumulated FDI should be mostly related with a country's current institutional performance, whereas FDI stocks should better reflect the long-term influence of institutions. However, besides the issues already described that make stocks preferable to flows, it should be noted that in the case of PPML estimation, we have to drop negative FDI accumulations—around 18 % of our observations—which may lead to less accurate estimates. With OLS estimation, the issue is even more severe, as one must also drop zero-FDI accumulations—around 31 % of the sample. In sum, the estimates with accumulated FDI are presented for reasons of completeness, and not as an alternative to the main specification with FDI stocks.

Another issue is the high degree of correlation among the different institutional indicators, which leads to problems of near multi-collinearity in the case of simultaneous inclusion in the regressions. Consequently, the resulting estimates have a low probability of being close to their true values, due to variance inflation (Hwang and Nettleton 2003). We tackle this issue through three distinct approaches. First, for each institutional database, we run a Principal Component Analysis (PCA), followed by a varimax rotation, in order to summarize the information in a smaller set of indicators.²⁰ The resulting components can, in most cases, be associated with

¹⁷In this case, desired FDI is the latent variable, equaling realized FDI for values above a certain threshold, but unobserved for values below that threshold. Some authors have proposed using $\log(1 + FDI_{ij})$ or $\log(a + FDI_{ij})$ (where a is a parameter to be estimated) instead of $\log(FDI_{ij})$ as the dependent variable in order to estimate Eq. 1 while retaining zero-FDI observations (e.g., Eichengreen and Irwin 1995; Wei 2000). However, this approach is completely *ad hoc*, and the results become dependent on the measurement unit.

¹⁸Chosen as the minimum value of the average of inward FDI stocks for the 2005–2007 period—1/3 million euros.

¹⁹We are extremely grateful to the editor for pointing out this approach to us.

²⁰This was preceded by the KMO and Bartlett's test of sphericity, which indicate whether the PCA is an appropriate approach or not.

an identifiable institutional area, though the resulting aggregation is sometimes too broad to extract specific conclusions about particular institutional indicators. Besides reducing the dimension of variables to be analyzed, the resulting score vectors are orthogonal to each other, diminishing by construction the correlations between institutional factors in our sample. The new summary institutional variables are then used in Eqs. 1 and 2 to measure the effects of institutions on FDI.

To assess the robustness of these results, we reduce the dimension of our database through an alternative method—the direct, unweighted, aggregation of variables. In other words, we use the information from the rotated factor loadings matrix to identify those indicators that are highly correlated among themselves, and which can therefore be aggregated into a new variable. The aggregation is done by taking the simple average across these indicators, and the resulting variables can be interpreted as factor-based scores.

The main disadvantage of the two approaches above is that, as the base correlation between institutional variables is high, the resulting aggregation is somewhat broad. An example: the effect of bureaucracy and corruption on FDI cannot be disentangled from one another. This may or may not be an issue, depending on the degree of detail we seek. The same is true for the effect of the costs of starting or closing a business.

As an attempt to evaluate the individual effect of institutions on inward FDI while avoiding problems caused by near multi-collinearity, we also estimate Eqs. 1 and 2 adding each institutional variable in succession—an empiricist approach widely followed in the literature (Chakrabarti 2001; Walsh and Yu 2010). We interpret these results with caution, as the coefficient from each institutional variable included may suffer from omitted variable bias.

5 Results

5.1 Economic determinants of FDI

Table 1 reports the results for the baseline specification, in which no institutional variable is included. Columns (1) to (3) present results for FDI stocks, and columns (4) to (6) for accumulated FDI. The coefficients obtained with OLS do not differ substantially from those for the Tobit model, suggesting that the censored-sample problem is not serious in our sample. On the other hand, coefficients obtained with PPML estimation differ considerably from those of OLS and Tobit estimation for some regressors, in particular for distance and labor costs. We focus our discussion on columns (3) and (6), as PPML can appropriately handle zero-FDI values and relies on weaker assumptions than the alternatives. Border effects affect inward FDI very significantly: according to column (3), the investment of a country in its neighbor is about 66 % ($e^{0.505} - 1$) higher than the investment in a similar country with which the source country does not share a common border.²¹ Distance is also a key determinant, as an increase of 1 % in the number of kilometers between source and host

²¹We report marginal effects for non-logarithmic regressors using the formula $\exp(\hat{\beta}) - 1$.

Table 1 Results for the baseline regression

	FDI stocks			FDI flows		
	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	TOBIT	PPML	OLS	TOBIT	PPML
border	0.710*** (0.210)	0.730*** (0.211)	0.505*** (0.115)	0.590** (0.261)	0.597** (0.254)	0.487** (0.228)
log distance	-1.362*** (0.137)	-1.427*** (0.139)	-0.637*** (0.102)	-1.164*** (0.153)	-1.208*** (0.151)	-0.513*** (0.167)
log GDP	1.090*** (0.071)	1.150*** (0.073)	0.980*** (0.100)	0.990*** (0.082)	1.039*** (0.082)	0.698*** (0.089)
GDP growth	0.213*** (0.050)	0.227*** (0.052)	0.196*** (0.065)	0.108* (0.060)	0.119** (0.059)	0.018 (0.067)
log labor costs	0.084 (0.105)	0.095 (0.107)	0.217** (0.091)	-0.139 (0.123)	-0.138 (0.122)	0.132 (0.139)
openness	0.010*** (0.002)	0.010*** (0.002)	0.006*** (0.002)	0.008*** (0.003)	0.008*** (0.002)	0.004* (0.002)
education	-0.065 (0.051)	-0.068 (0.051)	-0.056 (0.041)	-0.056 (0.061)	-0.064 (0.059)	-0.188*** (0.058)
EATR	-0.002 (0.012)	-0.004 (0.012)	-0.008 (0.014)	-0.025* (0.013)	-0.027** (0.013)	-0.034* (0.018)
Observations	1220	1220	1832	853	853	1366
adj R^2 /pseudo- R^2	0.719		0.906	0.647		0.804

White-robust standard errors in parentheses. *, **, and *** represent rejections at 10, 5, and 1 % significance levels, respectively. Source country dummies were included, but are not reported

countries reduces FDI by around 0.64 %. This effect is roughly half of that estimated by OLS and Tobit models. The level of GDP comes out as statistically significant, giving support to the market size hypothesis. Economic growth plays a positive role. Labor costs impact FDI positively, but only in the PPML estimation. This suggests that productivity gains, which are positively associated with labor costs, may overcome the negative effects of a higher wage bill. Another explanation is related with the omission of institutional factors: as better institutions are associated with higher income countries, where labor costs are higher, the coefficient of labor costs may be unintendedly capturing the effect of institutions on FDI. The coefficient on openness is statistically significant, with the expected sign: an increase in this variable by 1 percentage point boosts inward FDI by around 0.6 %. Finally, the effects of education and the effective average tax rate are non-significant.

Results for accumulated FDI in column (6) are somewhat different from those for FDI stocks. In particular, the coefficients for GDP growth, labor costs, and openness are no longer significant at the 5 % level. In the opposite direction, the coefficient for education is now significant, suggesting a negative association between years of schooling and FDI inflows.

5.2 Institutional determinants of FDI: principal components and factor scores

We now add the institutional dimension as a determinant of FDI, undertaking two alternative aggregate approaches: a Principal Components Analysis (PCA) and a factor-based scores analysis. Information on different institutional indicators is aggregated in a smaller set of variables, which can then be simultaneously included in the regressions with no risk of high collinearity. The disadvantage, which we seek to overcome with a third approach in the next subsection, is that information may become general and non-operative as to the best possible reforms.

5.2.1 A principal components analysis

We use the PCA to summarize the indicators from the Index of Economic Freedom, the Political Risk Rating, and the Doing Business into a smaller set of variables. We then run the specifications using the newly created variables to capture the institutional framework of a country.

Using the standard eigenvalue-based criterion, with a cut-off value of 1, we identify two components in the Index of Economic Freedom, jointly explaining 65 % of total variance. The rotated factor loading matrix associates the first component score—hereinafter “firms’ freedom”—with elements that influence the regular activity of business firms, potentially impacting their profitability. This component includes property rights, business freedom, and freedom from corruption (with factor loadings above 0.8); financial freedom and investment freedom (with factor loadings above 0.7); monetary freedom, labor freedom, and trade freedom (with factor loadings above 0.6). The second component score—which we term “public sector freedom”—measures the public sector effects on economic freedom (fiscal freedom and government freedom).

When applied to the 12 political risk variables from the Political Risk Rating, the PCA identifies three components, explaining more than 69 % of total variance. The first component is interpreted as “political risk,” and relates to political risk factors directly affecting firms. The rotated factor loadings associate this component with the quality of the bureaucracy, investment profile, and socioeconomic conditions (with factor loadings above 0.8); corruption, the presence of the military in politics, and democratic accountability (with factor loadings above 0.7); law and order, and the occurrence of internal and external conflicts (with factor loadings above 0.6). The second component reflects primarily religious and ethnic tensions, and to a lesser extent internal conflicts, and is simply termed “political tensions.” The last component relates to “government stability,” though it has a relevant correlation with democratic accountability as well. In this component, government stability loads with a positive value and democratic accountability with a negative value. Hence, higher values are associated with greater government stability, but lower democratic accountability.²² Some individual variables load into more than one

²²This may occur as a greater ability to stay in office is sometimes achieved at the expense of lower democratic accountability, e.g., in one-party states or autocracies. See Tavares and Wacziarg (2001) for the possible trade-off between democracy and stability.

component. This is the case of internal conflicts—with a factor loading of 0.6 in both the political risk component and the political tensions component—and democratic accountability—with a factor loading of 0.7 in the political risk component and of -0.5 in the government stability component. This is a natural outcome of the PCA methodology, and purportedly reflects the importance of the original variable to more than one institutional dimension of relevance.

The standard eigenvalue-based criterion applied to the nine areas of Doing Business identifies two factors, but factor loadings did not suggest a clear interpretation of the components. We opted to extract only one factor from the Doing Business database, interpreted as representing an overall measure of the cost of doing business. This component represents 45 % of total variance, and is positively correlated with all 33 individual Doing Business index variables.

Results for FDI stocks are presented in Table 2. As firms' freedom, political risk, and the doing business component are highly correlated, sharing similar base indicators, we opted not to include them simultaneously in the regressions. Coefficients for the Tobit model were similar to those from OLS, and are not presented. Columns (1) to (4) suggest that firms' freedom and political risk play a key role in FDI attractiveness. In the case of PPML estimation, firms' freedom and political risk have a positive effect on inward FDI, respectively of 41 % and 62 % for each standard deviation increase in the indicator.²³ However, the PPML estimation in column (6) does not support the hypothesis that the ease of doing business *per se* is relevant for inward FDI.

Fiscal freedom assesses the fiscal burden of a society, more freedom being associated with lower taxes. As it includes the top tax rate on corporate income, *ceteris paribus*, one should expect higher values in fiscal freedom to be associated with more FDI. Government freedom measures the level of government expenditures as a percentage of GDP, with more freedom being associated with lower expenditures. Theoretically, it is not clear whether this indicator should attract or repel FDI, as higher public expenditures may be associated with better infrastructure, more stable socioeconomic conditions, greater incentives for FDI, as well as with a higher future fiscal burden and fiscal uncertainty. In the PPML estimates, public sector freedom comes out with a negligible effect on FDI. Political tensions are also insignificant. Government stability affects inward FDI positively in the regression in column (2), but the effect is not robust to different specifications.

An estimated negative effect of labor costs on inward FDI in columns (2) and (4) is at odds with what was suggested in Table 1. This might be explained by the high degree of correlation between labor costs and institutional quality, as better institutions are associated with higher income countries, where labor costs are also higher. The effect of GDP growth comes as insignificant in columns (2) and (4). Results for geographic, as well as for the remaining economic variables in Table 2, largely corroborate those in Table 1.

²³We report marginal effects for institutional factors using the formula $\exp(\hat{\beta}) - 1$.

Table 2 Results for FDI stocks—PCA approach

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	PPML	OLS	PPML	OLS	PPML
border	0.742*** (0.208)	0.596*** (0.119)	0.707*** (0.211)	0.630*** (0.117)	0.691*** (0.212)	0.548*** (0.122)
log distance	-1.370*** (0.140)	-0.587*** (0.113)	-1.332*** (0.143)	-0.536*** (0.116)	-1.42*** (0.143)	-0.628*** (0.112)
log GDP	1.076*** (0.071)	0.905*** (0.090)	1.097*** (0.073)	1.092*** (0.101)	1.183*** (0.073)	1.030*** (0.099)
GDP growth	0.259***	0.110 (0.081)	0.306*** (0.068)	0.148* (0.078)	0.397*** (0.088)	0.282*** (0.105)
log labor costs	-0.611*** (0.226)	-0.466** (0.203)	-0.205 (0.211)	-0.541*** (0.186)	-0.088 (0.220)	0.251 (0.233)
openness	0.007** (0.003)	0.003 (0.002)	0.009*** (0.003)	0.005** (0.002)	0.021*** (0.004)	0.013*** (0.004)
education	-0.111* (0.061)	0.035 (0.055)	-0.202*** (0.063)	-0.110 (0.070)	-0.315*** (0.080)	-0.166** (0.078)
EATR	0.019 (0.014)	0.017 (0.015)	0.012 (0.014)	-0.007 (0.014)	0.028* (0.016)	0.014 (0.015)
Institutional factors						
firms' freedom	0.490*** (0.081)	0.340*** (0.101)				
public sector freedom	-0.370*** (0.094)	-0.070 (0.075)	-0.112 (0.088)	-0.019 (0.066)	-0.361*** (0.095)	-0.020 (0.083)
political risk			0.434*** (0.113)	0.481*** (0.119)		
political tensions	0.030 (0.056)	-0.016 (0.056)	0.037 (0.058)	0.013 (0.052)	0.029 (0.061)	0.033 (0.064)
government stability	0.023 (0.088)	0.238** (0.094)	-0.210*** (0.076)	0.091 (0.100)	-0.214*** (0.082)	-0.024 (0.111)
doing business					0.326*** (0.069)	0.039 (0.081)
Observations	1220	1832	1220	1832	1211	1768
adj R^2 /pseudo- R^2	0.730	0.910	0.724	0.913	0.732	0.910

White-robust standard errors in parentheses. *, **, and *** represent rejections at 10, 5, and 1 % significance levels, respectively. Source country dummies were included, but are not displayed. Institutional factors were rescaled by the standard deviation of the respective distribution

Results for flows in Table 3 confirm previous conclusions: firms' freedom and political risk are relevant factors in FDI attractiveness, while the ease of doing business plays a lesser role. In the case of PPML estimates, the indicator for government stability is significant when firms' freedom or political risk are included in the

Table 3 Results for FDI flows—PCA approach

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	PPML	OLS	PPML	OLS	PPML
border	0.589** (0.262)	0.579*** (0.220)	0.575** (0.265)	0.587*** (0.225)	0.560** (0.273)	0.601*** (0.217)
log distance	-1.187*** (0.157)	-0.452*** (0.169)	-1.152*** (0.159)	-0.404** (0.171)	-1.240*** (0.165)	-0.486*** (0.165)
log GDP	0.998*** (0.082)	0.701*** (0.098)	1.013*** (0.082)	0.864*** (0.108)	1.118*** (0.084)	0.866*** (0.102)
GDP growth	0.070 (0.081)	-0.201** (0.088)	0.110 (0.080)	-0.134 (0.085)	0.295*** (0.113)	0.094 (0.102)
log labor costs	-0.810*** (0.253)	-1.023*** (0.308)	-0.523** (0.235)	-0.945*** (0.235)	-0.205 (0.267)	0.107 (0.276)
openness	0.005* (0.003)	0.000 (0.002)	0.007** (0.003)	0.002 (0.002)	0.021*** (0.005)	0.014*** (0.004)
education	-0.023 (0.072)	-0.055 (0.064)	-0.081 (0.074)	-0.165** (0.069)	-0.272*** (0.101)	-0.278*** (0.082)
EATR	-0.015 (0.016)	-0.024 (0.020)	-0.019 (0.016)	-0.042** (0.019)	0.008 (0.020)	-0.017 (0.021)
Institutional factors						
firms' freedom	0.338*** (0.099)	0.349*** (0.118)				
public sector freedom	-0.253** (0.111)	-0.148 (0.114)	-0.076 (0.107)	-0.074 (0.100)	-0.276** (0.115)	-0.021 (0.121)
political risk			0.293** (0.142)	0.423*** (0.160)		
political tensions	0.086 (0.067)	-0.018 (0.066)	0.096 (0.069)	0.010 (0.064)	0.127* (0.075)	0.094 (0.072)
government stability	0.178* (0.101)	0.496*** (0.120)	0.017 (0.088)	0.342*** (0.109)	-0.072 (0.102)	0.155 (0.113)
doing business					0.152* (0.084)	-0.133 (0.088)
Observations	853	1366	853	1366	845	1312
adj R^2 /pseudo- R^2	0.651	0.816	0.648	0.817	0.655	0.816

White-robust standard errors in parentheses. *, **, and *** represent rejections at 10, 5, and 1 % significance levels, respectively. Source country dummies were included, but are not displayed. Institutional factors were rescaled by the standard deviation of the respective distribution

regression, hinting that long-standing governments, associated with lower uncertainty regarding fiscal policies, are advantageous for FDI inflows. Public sector freedom and political tensions seem to play no role.

5.2.2 A factor-based scores approach

We now use the information from the rotated factor loadings matrix to aggregate the variables that loaded into the same component. This robustness exercise allows us to overcome the caveat that PCA scores representing a given component have some residual correlation with other components, which may affect results. A potential disadvantage is that now weights are now chosen, and not optimally computed. The new variables are aggregated by taking the simple average across the indicators identified in PCA as loading into the same component.

Results for FDI stocks are presented in Table 4. In the case of PPML estimation, firms' freedom and political risk have a positive effect on inward FDI, respectively of 31 % and 76 % for each standard deviation increase in the indicator. Doing business remains insignificant, as before, and the same holds for public sector freedom and political tensions. Government stability seems to boost FDI, with an effect comprised between 14 % and 21 % for each standard deviation increase in the indicator. Results for FDI flows, in Table 5, corroborate these conclusions.

All in all, our results show a high degree of coherence regardless of the estimation methodology, or of whether one uses stocks or flows, suggesting that better institutions and lower political risk attract FDI. The quantitative magnitude of the effects is very important. In addition, investors seem to pay more attention to the country's overall institutional framework than to business regulations specifically.

5.3 Institutional analysis: breakdown

The analysis above focused on the effects of institutions on FDI at an aggregate level. It was silent as to the effects of specific institutions on FDI. We now re-estimate Eq. 2 by adding each institutional variable in succession to the baseline model. We rely solely on PPML estimation, as it is theoretically more robust and its results are, in general, confirmed by other methodologies.

Results are presented in Table 6. Variables are entered in the order of decreasing pseudo- R^2 in the regression for FDI stocks. Coefficients represent the impact on bilateral FDI of one standard deviation change in the corresponding institutional factor. Higher index values always indicate better performances. For reasons of parsimony, we do not report coefficients for control variables.

Among the indicators for the Index of Economic Freedom, corruption freedom, financial freedom, investment freedom, and property rights emerge as the main drivers of inward FDI. Corruption freedom assesses how the prevalence of corruption affects the perceived degree of uncertainty in the economy, as well as the pecuniary and non-pecuniary costs of operating a business. Lower corruption, corresponding to a 1 standard deviation increase in the freedom from corruption indicator, increases the stock of FDI by 47 %. Financial freedom measures the degree of independence of financial institutions from state control, being associated with higher competition and greater availability of services provided by financial intermediaries. Increasing the financial freedom indicator by 1 standard deviation increases the stock of FDI by 26 %. Investment freedom assesses the constraints on the flow of investment capital. A 1 standard deviation increase in this indicator raises the stock of FDI by around 32 %.

Table 4 Results for FDI stocks—factor-based scores approach

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	PPML	OLS	PPML	OLS	PPML
border	0.751*** (0.207)	0.598*** (0.119)	0.707*** (0.209)	0.626*** (0.117)	0.690*** (0.211)	0.538*** (0.120)
log distance	-1.372*** (0.139)	-0.591*** (0.113)	-1.342*** (0.143)	-0.539*** (0.114)	-1.430*** (0.144)	-0.676*** (0.100)
log GDP	1.029*** (0.069)	0.865*** (0.089)	1.062*** (0.070)	0.989*** (0.098)	1.152*** (0.071)	1.006*** (0.095)
GDP growth	0.220*** (0.064)	0.111 (0.077)	0.221*** (0.064)	0.113 (0.072)	0.304*** (0.078)	0.210** (0.085)
log labor costs	-0.569*** (0.181)	-0.264 (0.164)	-0.507*** (0.190)	-0.459** (0.186)	-0.278 (0.179)	0.098 (0.170)
openness	0.005** (0.002)	0.003 (0.002)	0.005** (0.002)	0.004** (0.002)	0.017*** (0.004)	0.011*** (0.003)
education	-0.077 (0.057)	0.023 (0.051)	-0.158*** (0.059)	-0.069 (0.061)	-0.210*** (0.072)	-0.089 (0.061)
EATR	0.021 (0.014)	0.013 (0.015)	0.015 (0.014)	0.001 (0.014)	0.028* (0.016)	0.015 (0.014)
Institutional factors						
firms' freedom	0.529*** (0.077)	0.273** (0.107)				
public sector freedom	-0.152** (0.070)	0.027 (0.058)	-0.066 (0.070)	-0.000 (0.058)	-0.266*** (0.075)	0.025 (0.066)
political risk			0.814*** (0.155)	0.564*** (0.171)		
political tensions	0.003 (0.032)	-0.018 (0.032)	-0.074** (0.037)	-0.059* (0.035)	0.028 (0.036)	0.053 (0.034)
government stability	0.056 (0.072)	0.189** (0.079)	-0.050 (0.069)	0.163** (0.077)	-0.045 (0.071)	0.132* (0.080)
doing business					0.360*** (0.064)	-0.002 (0.085)
Observations	1220	1832	1220	1832	1211	1768
adj R^2 /pseudo- R^2	0.730	0.910	0.726	0.912	0.729	0.911

White-robust standard errors in parentheses. * **, and *** represent rejections at 10, 5, and 1 % significance levels, respectively. Source country dummies were included, but are not displayed. Institutional factors were rescaled by the standard deviation of the respective distribution

Finally, a 1 standard deviation increase in the property rights indicator—which evaluates the ability of individuals to secure private property, the extent to which laws protect property, and the efficiency with which the judiciary system enforces those

Table 5 Results for FDI flows—factor-based scores approach

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	PPML	OLS	PPML	OLS	PPML
border	0.608** (0.261)	0.561** (0.227)	0.595** (0.265)	0.585** (0.231)	0.572** (0.271)	0.627*** (0.219)
log distance	-1.153*** (0.156)	-0.425** (0.183)	-1.128*** (0.159)	-0.372** (0.183)	-1.228*** (0.164)	-0.470*** (0.169)
log GDP	0.969*** (0.081)	0.658*** (0.098)	0.992*** (0.081)	0.764*** (0.102)	1.092*** (0.082)	0.866*** (0.103)
GDP growth	0.112 (0.077)	-0.112 (0.078)	0.123 (0.077)	-0.090 (0.075)	0.271*** (0.098)	0.095 (0.084)
log labor costs	-0.603*** (0.205)	-0.486** (0.224)	-0.548** (0.219)	-0.610** (0.242)	-0.282 (0.213)	0.127 (0.227)
openness	0.006** (0.003)	0.002 (0.002)	0.007** (0.003)	0.003 (0.002)	0.020*** (0.004)	0.015*** (0.004)
education	-0.053 (0.069)	-0.121* (0.068)	-0.098 (0.071)	-0.190*** (0.066)	-0.240*** (0.089)	-0.282*** (0.077)
EATR	-0.015 (0.016)	-0.031 (0.020)	-0.017 (0.016)	-0.039* (0.020)	0.010 (0.020)	-0.018 (0.020)
Institutional factors						
firms' freedom	0.317*** (0.097)	0.242** (0.112)				
public sector freedom	-0.166* (0.084)	-0.084 (0.094)	-0.114 (0.086)	-0.103 (0.092)	-0.258*** (0.091)	-0.034 (0.106)
political risk			0.471** (0.200)	0.500** (0.246)		
political tensions	0.021 (0.038)	-0.050 (0.040)	-0.018 (0.044)	-0.091* (0.051)	0.070 (0.044)	0.061 (0.040)
government stability	0.090 (0.083)	0.255*** (0.089)	0.020 (0.079)	0.226*** (0.082)	-0.020 (0.085)	0.158* (0.087)
doing business					0.178** (0.078)	-0.154* (0.084)
Observations	853	1366	853	1366	845	1312
adj R^2 /pseudo- R^2	0.651	0.809	0.649	0.811	0.655	0.816

White-robust standard errors in parentheses. * **, and *** represent rejections at 10, 5, and 1 % significance levels, respectively. Source country dummies were included, but are not displayed. Institutional factors were rescaled by the standard deviation of the respective distribution

same laws—raises also inward FDI by around 32 %. The remaining indicators have a negligible estimated effect on inward FDI.

As to the Political Risk Rating indicators, our results hint at an important effect of low political risk and good institutions on inbound FDI. The most important

Table 6 Results for the institutional determinants of FDI—a breakdown

	FDI stocks			FDI flows		
	coeff	st dev	Pseudo- R^2	coeff	st dev	Pseudo- R^2
Index of Economic Freedom						
corruption freedom	0.384***	0.113	0.911	0.104	0.161	0.804
financial freedom	0.231***	0.059	0.911	0.347***	0.079	0.817
investment freedom	0.274***	0.085	0.909	0.098	0.105	0.804
property rights	0.276**	0.135	0.908	0.046	0.145	0.804
government freedom	0.087*	0.053	0.907	0.019	0.083	0.804
labor freedom	-0.016	0.069	0.906	0.124*	0.069	0.806
business freedom	-0.023	0.079	0.906	-0.297***	0.104	0.810
monetary freedom	-0.022	0.075	0.906	-0.123	0.096	0.805
trade freedom	-0.017	0.073	0.906	-0.116	0.072	0.805
fiscal freedom	-0.006	0.080	0.906	-0.179	0.127	0.806
Political Risk Rating						
democratic accountability	0.320***	0.070	0.912	0.088	0.095	0.804
socioeconomic conditions	0.398***	0.125	0.910	0.512***	0.168	0.812
law and order	0.244***	0.082	0.910	0.045	0.111	0.804
bureaucracy quality	0.228**	0.093	0.909	-0.054	0.139	0.804
corruption	0.185**	0.074	0.909	0.078	0.100	0.804
government stability	0.217***	0.074	0.907	0.226***	0.087	0.806
external conflicts	0.076	0.074	0.907	0.302***	0.094	0.814
investment profile	0.099	0.098	0.906	-0.026	0.107	0.804
military in politics	-0.009	0.078	0.906	0.048	0.086	0.804
internal conflicts	-0.030	0.066	0.906	0.042	0.093	0.804
religious tensions	0.032	0.040	0.906	-0.054	0.054	0.805
ethnic tensions	0.023	0.076	0.906	0.019	0.085	0.804
Doing Business						
paying taxes	0.175**	0.089	0.911	-0.246*	0.129	0.817
trading across borders	0.123**	0.060	0.911	0.045	0.073	0.814
registering property	0.121**	0.051	0.911	0.159**	0.068	0.817
getting credit	-0.102**	0.047	0.911	0.028	0.064	0.814
starting a business	-0.106*	0.060	0.910	-0.038	0.078	0.814
closing a business	0.120	0.077	0.910	-0.086	0.104	0.814
construction permits	0.031	0.067	0.909	-0.136	0.089	0.815
enforcing contracts	0.020	0.046	0.909	-0.170**	0.066	0.819
protecting investors	-0.025	0.062	0.909	-0.146*	0.077	0.817

White-robust standard errors are reported. *, **, and *** represent rejections at 10, 5, and 1 % significance levels, respectively. Institutional factors were rescaled by the standard deviation of the respective distribution. Coefficients for control variables are omitted to save space

indicators are: socioeconomic conditions, which evaluate the extent to which social dissatisfaction constrains government action, with an effect of approximately 49 % in FDI for each standard deviation increase; democratic accountability, measuring the extent to which governments respond to citizens, with an impact of 38 %; law and order, measuring the strength and impartiality of the legal system and whether laws are widely respected, with an impact of 28 %; bureaucracy quality, which measures the strength, quality, and autonomy of the bureaucracy, with an impact of 26 %; government stability, which assesses the government's ability to stay in office, with an impact of 24 %; and corruption, with an impact of 20 %. The empirical results suggest that multinational firms direct their investments to stable and well-functioning democracies, with lean bureaucracies and lower corruption levels.

Doing Business indicators have a lesser impact on inward FDI. Table 6 puts into evidence that only some business regulations, namely those related with paying taxes, export and import activities, and property registration, affect FDI positively.

Specifications using FDI stocks yield higher pseudo- R^2 than specifications for FDI flows, suggesting that institutional determinants of FDI operate most clearly over extended periods of time. In the short run, issues such as special market opportunities, specific and lumpy investments, and sudden policy changes may take precedence over stable and efficient institutions, making flows more volatile and harder to predict.

6 Institutional reform in Portugal: some policy directions

We now strive to understand how institutional reform in Portugal may impact the country's ability to attract FDI. We examine and compare the impact of specific, item by item, reforms that bring Portuguese institutions to the same standard as that in the EU. We base our analysis on the latest institutional data we have access to, namely the 2012 Index of Economic Freedom, the 2012 Doing Business, and the Political Risk Rating for 2006. Our exercise closely follows Tavares (2004), who proposed three measures of institutional reform: the first assessing the benefits of reform in terms of a dependent variable of choice, the second the reform effort, given by some measure of distance between current institutions and the desired institutional status, and finally the ratio of the first by the second indicator, a measure of the efficiency of the reform effort.²⁴

We examine separately each institutional indicator for which Portugal is lagging behind the EU standard. The analysis takes both the EU-15 and the EU-27 as comparison benchmarks, as the latter includes several transition economies whose institutions are generally lagging and, at the same time, undergoing profound

²⁴ Another application can be found in Cavalcanti et al. (2008), where the potential of institutional reforms in Brazil is assessed.

changes.²⁵ Institutional indicators are normalized to the 0–10 range. The impact of reforming institution k to the EU level is

$$\text{Impact on FDI}_k = \exp\left(\frac{\beta_{3,k}}{sd(\text{INST}_k)}(\text{INST}_{EU,k} - \text{INST}_{P,k})\right) - 1 \quad (3)$$

where $\text{INST}_{i,k}$ denotes the institutional index of institution k in country i , $i = EU, P$ (where EU stands for the EU average and P for Portugal), $\beta_{3,k}$ is the respective coefficient, computed in the previous section, and $sd(\text{INST}_k)$ stands for the standard deviation of the institutional indicator.²⁶ Obviously, the higher the value of Eq. 3, the more promising are the prospects for reform in that area. This may occur for different reasons: either that institution has a large impact on inbound FDI, or Portuguese institutions have a lot of leeway for betterment, or both.

The “cost of reform,” i.e., the required effort to bring the Portuguese institutional index closer to that of the EU, can be proxied, albeit imperfectly, by

$$\text{Required reform effort}_k = \frac{\text{INST}_{EU,k} - \text{INST}_{P,k}}{\text{INST}_{P,k}} \quad (4)$$

Equation 4 measures the distance of the Portuguese institutional index relative to the EU average, i.e., the required institutional change needed for Portugal to bring itself onto a par with the EU. Higher values suggest that more effort has to be exerted in order for the reform to be successful.

The third measure of institutional reform evaluates the efficiency of the reform, i.e., the impact on FDI of each unit of effort put into the reform. In a sense, it gives the “bang for the buck” for each specific reform, computed as the ratio of Eq. 3 over Eq. 4

$$\text{Efficiency of reform}_k = \frac{\text{Impact on FDI}_k}{\text{Required reform effort}_k} \quad (5)$$

A value of 1 indicates a one-to-one relationship between inbound FDI and the reform effort. That is, any reform requiring a given percentage increase in the institutional indicator for convergence with the EU would give rise to exactly the same percentage increase in inward FDI. The higher the value of Eq. 5, the more promising is the reform in that area in terms of efficiency, that is, the higher the increase in FDI for each unit of effort put into the reform.

In Tables 7 and 8 we evaluate reform possibilities on the basis of PPML estimation and FDI stocks. As it only makes sense to evaluate the benefits of potential reforms for areas in which Portugal lags behind the EU average level, we ignore any indicators where the opposite holds. Any area whose coefficient in the above estimates is not statistically significant is ignored in the following exercise.

²⁵As data for Cyprus and Malta are not available in our database, the EU-27 actually comprises only 25 countries. In our computations, we take into account that a change in the Portuguese institutional index also changes the EU average institutional index.

²⁶Recall that $\beta_{3,k}$ evaluates the impact on inward FDI of one standard deviation change in the institutional indicator.

Table 7 Reforming Portuguese institutions: Impact on FDI, required reform effort, and efficiency of reform versus the EU-27

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	index	index	(2)-(1) diff	coeff/ sd	$e^{(4)(3)}-1$ impact on FDI (%)	(3)/(1) required reform effort	(5)/(6) efficiency of reform
	Portugal	EU-27					
Agg. institutional indicators							
firms' freedom**	6.82	7.38	0.57	0.27	16.8	8.3	2.0
political risk***	8.38	8.34	-0.05	0.46			
Index of Economic Freedom							
corruption freedom***	6.00	6.34	0.34	0.17	6.1	5.7	1.1
financial freedom***	6.00	7.00	1.00	0.14	15.5	16.7	0.9
investment freedom***	7.00	7.83	0.83	0.17	15.0	11.9	1.3
property rights**	7.00	7.13	0.13	0.13	1.7	1.8	0.9
government freedom*	2.55	2.83	0.28	0.05	1.3	10.8	0.1
Political Risk Rating							
democratic accountability***	10.00	9.62	-0.38	0.45			
socioeconomic conditions***	6.70	6.60	-0.10	0.25			
law and order***	8.33	8.24	-0.10	0.17			
bureaucracy quality**	7.50	8.02	0.52	0.12	6.3	6.9	0.9
corruption**	6.67	5.94	-0.72	0.09			
government stability***	7.12	6.57	-0.55	0.22			
Doing Business							
paying taxes***	6.77	6.73	-0.04	0.15			
trading across borders**	8.01	7.82	-0.19	0.11			
registering property*	8.49	7.03	-1.46	0.07			

*, **, and *** represent the variables which are significant at the 10, 5, and 1 % significance levels, respectively. The reform measures are only computed for the statistical significant variables in which Portugal has an inferior performance relative to the European Union. The index for the EU-27 excludes Portugal. Institutional indicators are normalized to the 0–10 range. Column (4) corresponds to the estimated coefficient, computed in the previous section, divided by the standard deviation of the institutional indicator

Table 7 shows that Portugal is lagging behind the EU-27 average mostly in the indicators for the Index of Economic Freedom. The most promising area for reform relates to restrictions to investment, i.e., investment freedom, due to the comparatively high efficiency and its large impact on FDI. This indicator considers restrictions on FDI and the degree of transparency of the foreign investment code. Raising the independence of the financial system from government control, i.e., financial freedom, to the EU-27 level also has a substantial impact on inward FDI, although at the expense of a higher effort. Lowering corruption levels, measured by the corruption freedom indicator, and improving the quality of the bureaucracy are

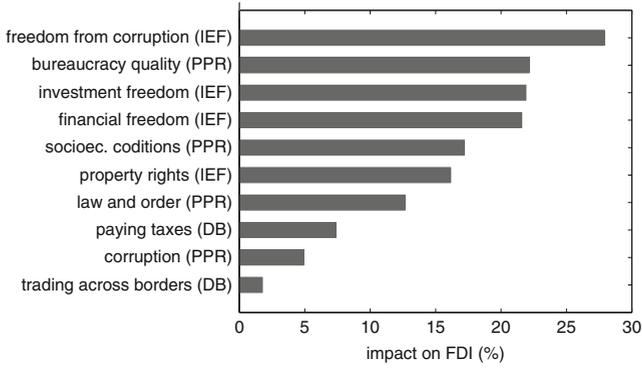
Table 8 Reforming Portuguese institutions: Impact on FDI, required reform effort, and efficiency of reform versus the EU-15

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	index	index	(2)-(1)	coeff/ sd	$e^{(4)(3)}-1$ impact on FDI (%)	(3)/(1) required reform effort	(5)/(6) efficiency of reform
	Portugal	EU-27					
Agg. institutional indicators							
firms' freedom**	6.82	7.77	0.96	0.27	29.9	14.1	2.1
political risk***	8.38	8.84	0.46	0.46	23.7	5.5	4.3
Index of Economic Freedom							
corruption freedom***	6.00	7.41	1.41	0.17	27.9	23.6	1.2
financial freedom***	6.00	7.36	1.36	0.14	21.6	22.6	1.0
investment freedom***	7.00	8.18	1.18	0.17	21.9	16.8	1.3
property rights**	7.00	8.14	1.14	0.13	16.2	16.3	1.0
government freedom*	2.55	1.94	-0.61	0.05			
Political Risk Rating							
democratic accountability***	10.00	9.85	-0.15	0.45			
socioeconomic conditions***	6.70	7.33	0.63	0.25	17.2	9.4	1.8
law and order***	8.33	9.05	0.71	0.17	12.7	8.6	1.5
bureaucracy quality**	7.50	9.20	1.70	0.12	22.2	22.6	1.0
corruption**	6.67	7.19	0.52	0.09	4.9	7.8	0.6
government stability***	7.12	6.81	-0.31	0.22			
Doing Business							
paying taxes***	6.77	7.26	0.49	0.15	7.4	7.2	1.0
trading across borders**	8.01	8.17	0.16	0.11	1.8	2.0	0.9
registering property*	8.49	6.66	-1.83	0.07			

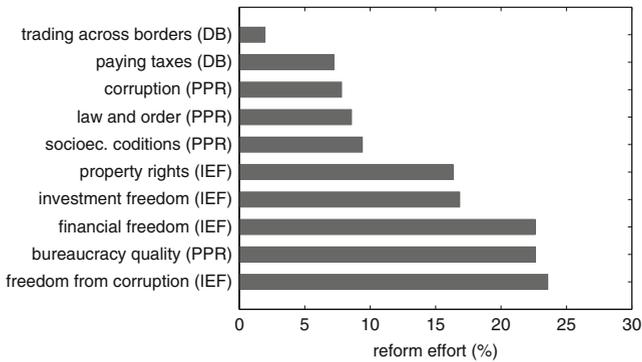
*, **, and *** represent the variables which are significant at the 10, 5, and 1 % significance levels, respectively. The reform measures are only computed for the statistical significant variables in which Portugal has an inferior performance relative to the European Union. The index for the EU-15 excludes Portugal. Institutional indicators are normalized to the 0–10 range. Column (4) corresponds to the estimated coefficient, computed in the previous section, divided by the standard deviation of the institutional indicator

also promising candidates for reform. Finally, a reform raising firms' freedom to the EU-27 level can boost inward FDI by around 17 %.

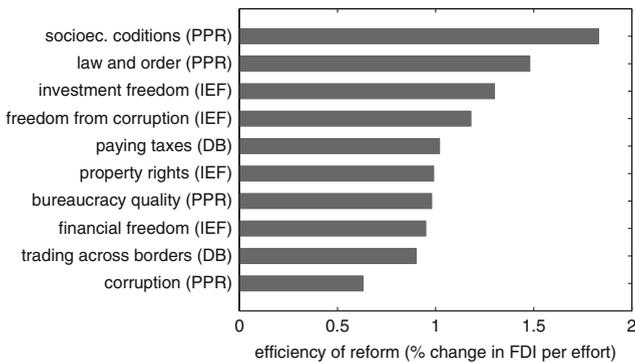
When Portugal is compared with the EU-15, in Table 8, the estimated impact of reforms is naturally higher. Figure 1 provides a graphical depiction of the effects of reforming Portuguese institutions to the EU-15 level. Among the indicators for the Index of Economic Freedom, investment freedom continues to be the most promising reform. One must also think of lowering corruption as an important reform, given the high impact on FDI and the reasonable efficiency ratio. Improving financial freedom and property rights also boosts inward FDI, albeit with higher impact-effort ratios. Results for Political Risk indicators suggest that socioeconomic conditions should be



(a) Impact of reform



(b) Effort associated with reform



(c) Efficiency of reform

Fig. 1 Reforming Portuguese institutions to the EU-15 level: impact, effort, and efficiency associated with reform options

the main target for reform, though these are endogenous to the economy and harder to change through government effort alone. Law and order and the quality of the

bureaucracy are sensible reforms to undertake. Among Doing Business indicators, reforming business regulations associated with tax payments and foreign trade both have a statistically significant effect on the FDI targeted to Portugal, even though the impacts, as well as the efficiency ratio, are modest.

7 Concluding remarks and policy implications

In this article we: (i) analyze the effects of economic and institutional factors on bilateral inward FDI; and (ii) investigate which institutional reforms in Portugal are most promising in terms of fostering FDI, as measured by the direct impact, the reform effort, and the efficiency of reform effort. Portugal here is used as an illustration: the chosen methodology can be applied to any specific country, with results that would also be country specific.

We add three distinct datasets to the traditional analysis of the determinants of FDI. These are the Index of Economic Freedom, the Political Risk Rating of the International Country Risk Guide, and the Doing Business. We find that countries with better institutions, in addition to better economic performances, are able to attract considerably larger amounts of FDI. Amidst institutional factors, the most important are associated with the legal and bureaucratic environment, the prevalence of corruption and the degree of protection of property rights, the independence of the financial system, restrictions on investment and the transparency of the foreign investment code, and the extent to which the government is accountable. Business friendly regulations, taken alone, do not seem to play an important role in FDI attractiveness.

As to the analysis of reform possibilities in Portugal, our results indicate that the country should focus on decreasing corruption and lessening restrictions on investment, namely those related with the transparency of the foreign investment code. Other areas to be addressed, albeit at the cost of a higher effort, are the protection of private property, the independence of the financial system, and the strength, quality, and impartiality of the bureaucracy.

In sum, our approach demonstrates the joint relevance of institutions as a means to attract FDI inflows, and uses a methodology that, for a given country, discriminates among several possible institutional reforms regarding their impact on FDI, the required reform effort, and the efficiency of the reform effort.

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Appendix A: Host and source countries

A list of countries used in the econometric model is provided in the following table.

Table 9 Host and source countries

Host countries	Source Countries
Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom	Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Australia, Austria, Bahamas, Bahrain, Barbados, Belarus, Belgium, Belize, Brazil, Bulgaria, Cameroon, Canada, Chile, China, Colombia, Cote d'Ivoire, Croatia, Cyprus, Czech Republic, Denmark, Egypt, Estonia, Finland, France, Gabon, Germany, Greece, Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Italy, Japan, Jordan, Kuwait, Latvia, Lebanon, Liberia, Libya, Liechtenstein, Lithuania, Luxembourg, Malaysia, Malta, Marshall Islands, Mexico, Morocco, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Panama, Philippines, Poland, Portugal, Qatar, Romania, Russia, Saudi Arabia, Serbia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Tunisia, Turkey, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Venezuela

Appendix B: Geographic and economic variables

The following geographic and economic variables are used.

FDI stock:	Bilateral inward FDI stocks in Millions of Euros. Source: Eurostat.
Accumulated FDI:	Bilateral FDI inflows in Millions of Euros. Source: Eurostat.
Border:	Dummy variable which takes the value of 1 only if the source and host countries share a common border. Source: Authors' calculations.
Distance:	Distance, in Kilometers, between source and host countries' capitals, calculated using the great circle distance. Data is freely available on the Internet.
GDP:	Gross Domestic Product in Millions of Euros at current market prices. Source: Eurostat.
GDP growth:	Real GDP growth rate (percentage) relative to the previous year. Source: Eurostat.
Labor cost:	Yearly nominal compensation per employee in thousands of Euros. Source: AMECO.

Openness:	Degree of openness, measured by the ratio of exports plus imports over GDP. Source: Eurostat.
Education:	Mean years of schooling. Source: Barro and Lee (2010).
EATR:	Effective average tax rate in the host country (percentage). The data was kindly provided by Michael Overesch (see Overesch and Rincke 2009).

Appendix C: Index of economic freedom

The Index of Economic Freedom is computed by the Heritage Foundation, and the data can be found on their website (www.heritage.org/index). The overall index of economic freedom is constructed by taking the simple average across 10 different indicators.

Business Freedom:	Measures the ability to start, operate, and close a business for a medium-sized company, thus representing the overall burden from regulation and government efficiency in the regulatory process.
Trade Freedom:	Composite measure of the absence of tariff and non-tariff barriers that affect imports and exports of goods and services. It is based on the trade-weighted average tariff rate and on non-tariff barriers.
Fiscal Freedom:	Measures the tax burden—on both individual and corporate incomes, and others—imposed by the government, as a percentage of GDP.
Government Freedom:	Assesses the level of government expenditures on GDP, higher expenditures being associated with lower scores.
Monetary Freedom:	Measures price stability (the weighted average inflation rate for the last three years) and price controls. More inflation and price controls yield lower scores.
Investment Freedom:	Evaluates a variety of restrictions imposed on investment, namely restrictions on FDI, transparency and bureaucracy in the foreign investment code, restrictions on land ownership, sectoral investment restrictions, expropriation of investments without fair compensation, foreign exchange controls, and capital controls.
Financial Freedom:	Measures bank security and the independence of the financial system from government control. This score comprises the extent of government regulation

in the financial system, the extent of state intervention in banks, the difficulty of operating financial services, and the government influence on the allocation of credit.

Property Freedom:

Assesses the ability of individuals to accumulate private property, secured by clear laws that are fully enforced by the state. It measures the extent to which laws protect private property, the degree of enforcement of those laws, the likelihood of expropriation, the independence of the judiciary system and the level of corruption within it, and the ability of individuals and business men to enforce contracts.

Freedom from Corruption:

Measures the degree of corruption within a country.

Labor Freedom:

Measures several aspects of the legal and regulatory framework of a country's labor market, such as regulations on the minimum wage, laws inhibiting layoffs, regulatory burdens on hiring, among others.

A higher score always indicates a better performance.

Appendix D: Political risk rating

The International Country Risk Guide computes 22 variables in three categories of risk: political, financial, and economic. The Political Risk Rating includes 12 variables, covering political and social attributes. Although some of them are more related with inward FDI than others, all are used in the principal components analysis, as explained in the main text.

Government stability:

Assesses the government's ability to carry out its declared program and to stay in office. It is constructed from three subcomponents: government unity, legislative strength, and popular support.

Socioeconomic conditions:

Assesses the pressures that could constrain government action or fuel social dissatisfaction. It is constructed from three subcomponents: unemployment, consumer confidence, and poverty.

Investment profile:

Assesses the risks to investment that are not covered by other economic, political, and financial risk components. It is constructed from three subcomponents: contract viability/expropriation, profile repatriation, and payment delays.

Internal conflict:

Assesses the political violence and its potential impact on governance. It is constructed from three subcomponents: civil war/coup threat, terrorism/political violence, and civil disorder.

External conflict:	Assesses the risk to the government from foreign action, originating from both non-violent and violent pressures. It is constructed from three subcomponents: war, cross-border conflict, and foreign pressures.
Corruption:	Assesses the level of corruption in the political system, including bribes, exchange controls, and tax assessments, among others.
Military in politics:	Measures the involvement of military in politics, which distorts government policy and diminishes democratic accountability.
Religious tensions:	Measures the involvement of religious groups—which often seek to replace civil laws with religious laws, thus distorting and constraining government action—in politics.
Law and order:	Measures the strength and impartiality of the legal system and the popular observance of the law.
Ethnic tensions:	Measures racial, nationality, and language tensions, which give rise to intolerance and unwillingness to make compromises.
Democratic accountability:	Measures the responsiveness of the government to its people. The score for this component is based on the following types of governance: alternating democracy, dominating democracy, <i>de facto</i> one-party state, <i>de jure</i> one-party state, and autarchy.
Bureaucracy quality:	Measures the institutional strength and quality of the bureaucracy, and the extent to which bureaucracy is autonomous from the political pressure and has a well-established mechanism for recruitment and training.

Appendix E: Ease of doing business

The World Bank's Doing Business database measures business regulations and thereby the cost of a firm operating in a country. More specifically, it provides quantitative assessment for starting a business, dealing with construction permits, registering property, getting credit, protecting investors, paying taxes, trading across borders, enforcing contracts and closing a business, in a total of 33 raw factors, described below. For the analysis, these factors were aggregated into nine indexes ranging from 0 to 10, each summarizing a specific topic of doing business. We proceeded as follows. First, we represented each raw factor by an index, ranging from 0 to 10, according to the min-max standardization method,

$$\text{Score}_k = 10 \frac{\text{factor}_k - \text{factor}_{\min}}{\text{factor}_{\max} - \text{factor}_{\min}}$$

if higher factor values imply better performances (e.g., strength of legal rights, recovery rate when closing a business), or

$$\text{Score}_k = 10 - 10 \frac{\text{factor}_k - \text{factor}_{\min}}{\text{factor}_{\max} - \text{factor}_{\min}}$$

if higher factor values imply poorer performances (e.g., procedures, time, cost).

This was done for all countries in the database. According to these formulas, all scores are organized such that higher values always indicate better performances. The topic score is the simple average of all factors that comprise that topic. An overall ease of doing business index is created by taking the simple average of the nine topic scores.

E.1 Starting a business

The starting a business index measures all procedures, costs, and time that are formally required for an entrepreneur to start up and formally operate an industrial or commercial business. It includes the following factors.

- Procedures:** Number of interactions of the company founders with external parties in order to formally start operating a business.
- Time:** Median duration in calendar days, indicated by lawyers, that is necessary to complete a procedure with minimum follow-up with government agencies and no extra payments.
- Cost:** All official fees and fees for legal or professional services if such services are required by law in order to start operating a business. It is recorded as a percentage of the economy's income per capita.
- Minimum Capital:** The amount that the entrepreneur needs to deposit in a bank or with a notary before registration and up to three months following incorporation in order to start operating a business. It is recorded as a percentage of the economy's income per capita.

E.2 Dealing with construction permits

The dealing with construction permits index measures all procedures required for a business in the construction industry to build a standardized warehouse, as well as the costs and time required to complete the procedures. It includes the following factors.

- Procedures:** Number of procedures required for a business in the construction industry to build a standardized warehouse.

- Time:** Median duration in calendar days that is necessary to complete the required procedures, as indicated by local experts.
- Cost:** All fees associated with completing the procedures to legally build a warehouse. The cost is recorded as a percentage of the economy's income per capita.

E.3 Registering property

The registering a property index records the necessary procedures that a businessperson must incur to purchase a property from another businessperson and to transfer the property title to his name, as well as the associated costs and time. It includes the following factors.

- Procedures:** Number of procedures that are legally or in practice required for registering a property.
- Time:** Median duration indicated by property lawyers, notaries, or registry officials to complete the procedures for registering a property.
- Cost:** All the necessary fees to register a property. This variable is recorded as a percentage of the property value.

E.4 Getting credit

The getting credit index measures the legal rights of borrowers and lenders with respect to secured transactions and the sharing of credit information. It includes the following factors.

- Strength of legal rights:** Index that measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending. It ranges from 0 to 10.
- Depth of credit information:** Index that assesses the rules and practices affecting the coverage, scope, and accessibility of credit information, regardless of whether this information is available through a public credit registry or through a private credit bureau. It ranges from 0 to 6.
- Public registry coverage:** Reports the number of individuals and firms listed in a public credit registry with information on their borrowing history over the past five years. It is measured as a percentage of adults aged 15 and above.
- Private bureau coverage:** Reports the number of individuals and firms listed by a private credit bureau with information on their borrowing history over the past five years. The

number is expressed as a percentage of the adult population aged 15 and above.

E.5 Strength of investor protection

The strength of investor protection index measures the strength of minority shareholder protection against directors' misuse of corporate assets for personal gain. It includes the following factors.

- Extent of disclosure:** Index that assesses who can approve related-party transactions and the requirements for external and internal disclosure in case of related-party transactions. It ranges from 0 to 10.
- Extent of director liability:** Index that measures the ability of shareholders to hold the interested party and the approving body liable in case of a prejudicial related-party transaction, the availability of legal remedies (damages, repayment of profits, fines, imprisonment, and rescission of the transaction), and the ability of shareholders to sue. It ranges from 0 to 10.
- Ease of shareholder suits:** Index that measures the documents and information available during trial and the access to internal corporate documents. It ranges from 0 to 10.

E.6 Paying taxes

The paying taxes index measures the tax burden and mandatory contributions that a medium-size company must pay in a given year, as well as the administrative burden of paying taxes and contributions. It includes the following factors.

- Payments:** Reflects the total number of taxes and contributions paid, including consumption taxes, as well as the method of payment, the frequency of payment, and the frequency of filing, for a company during the second year of operation.
- Time:** Measures the hours per year a company spends to prepare, file, and pay the corporate tax, the value added tax, and social contributions. It includes the time spent to collect information and to compute the amount payable.
- Total tax rate:** Measures all taxes and contributions (corporate taxes, social contributions, labor taxes, property taxes, and other taxes) paid by firms as a percentage of total profits.

E.7 Trading across borders

The trading across borders index measures procedural requirements for exporting and importing a standardized cargo of goods by ocean transport. It includes the following factors.

- Documents to export:** Number of bank documents, customs clearance documents, port and terminal handling documents, and transport documents required for exporting.
- Documents to import:** Number of bank documents, customs clearance documents, port and terminal handling documents, and transport documents required for importing.
- Time to export:** Time (in calendar days) to obtain all documents required for inland transport and handling, for customs clearance and inspections, and for port and terminal handling for exporting a standardized cargo.
- Time to import:** Time (in calendar days) to obtain all documents required for inland transport and handling, for customs clearance and inspections, and for port and terminal handling for importing a standardized cargo.
- Cost to export:** Measures the costs (in US dollars per container) of all documentation, inland transport and handling, customs clearance and inspections, and port and terminal handling for exporting a standardized cargo.
- Cost to import:** Measures the costs (in US dollars per container) of all documentation, inland transport and handling, customs clearance and inspections, and port and terminal handling for importing a standardized cargo.

E.8 Enforcing contracts

The enforcing contracts index measures the efficiency of the judicial system in resolving a commercial dispute. It includes the following factors.

- Procedures:** Number of procedures resulting from a commercial dispute, either between the parties or between them and the court officer. It comprises the steps to file the case, the steps for trial and judgment, and the steps to enforce the judgment.
- Time:** Number of calendar days, from the moment the lawsuit is filed in court until settlement. It includes the necessary time to file and serve the case, the time of the trial, and the time to enforce the judgment.

Cost: Average attorney fees, court costs (including expert fees) and enforcement costs a firm must bear if a commercial dispute goes to trial. It is measured as a percentage of claims.

E.9 Closing a business

The closing a business index measures the time, cost, and outcome of insolvency proceedings involving domestic entities. It includes the following factors.

Time: Calendar years required for creditors to recover their credit.

Cost: Court fees, fees of insolvency administrators, lawyers' fees, and assessors' and auctioneers' fees required to close a business. It is measured as a percentage of the debtor's estate value.

Recovery rate: Measures the percentage recovered by creditors, i.e., the present value of debt that can be recovered.

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