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Abstract

Paraguay is one of the fastest growing economies in Latin America and the Caribbean. Despite solid growth and sound macroeconomic fundamentals, foreign direct investment flows remain sluggish. Since 2004, FDI flows amount on average to 1.3% of GDP per year, well below regional values. A puzzling question is why a country with solid macroeconomic fundamentals like Paraguay is not attracting larger flows of FDI. We tackle this issue by implementing an experiment designed to shed light into investors behaviors regarding FDI choices. Our results indicate that institutional variables have a strong effect on FDI decisions, even when controlling for other potential drivers. As it stands, Paraguay is 25% less likely to be chosen as an FDI host country when compared to similar countries with better perceptions about institutions.

Keywords: foreign direct investment, institutions, Paraguay

JEL codes: F2, H0, C9

1. Introduction

Conventional wisdom claims that foreign direct investment (FDI) flows benefit developing countries by brining technical know-how, increasing productivity, generating local business, and creating better paying jobs (Word Bank, 2017). Based on this, countries go to great lengths to make themselves attractive to potential investors. For example, the use of bilateral investment treaties, instruments through which states renounce part of their sovereignty, has become increasingly popular. Other countries offer investors generous fiscal incentives. Yet these measures are no guarantee that investors will come knocking at the door.

An immense body of literature exists around FDI flows into developing countries and its main determinants. Looking at 21 empirical studies conducted since 1985 with a focus on developing economies, we group the drivers of FDI flows into four categories (table 1): (i) macroeconomic conditions; (ii) microeconomic regulations; (iii) factor endowments; and (iv) institutional frameworks.[1]

Table 1. Determinants of FDI flows in the literature

	Macroeconomic conditions	Microeconomic regulations	Factor endowments	Institutional frameworks
Schneider and Frey (1985)	Real GNP (+) Inflation (-)		Skilled labor (+)	Sociopolitical instability / work hours lost (-)
Singh and Jun (1996)				Sociopolitical instability / work hours lost (-)
Pfeffermann et al (1999)	Inflation (-)	Tax rates (-)		Unpredictability in judiciary (-) Corruption (-)
Wei (2000)		Tax rates (-)		
Noorbakhsh et al (2001)			Years of schooling (+)	
Nunnenkamp and Spatz (2002)	GDP per capita (+)		Years of schooling (+)	Corruption (-)
Globerman and Shapiro (2002)	GDP growth (+)		Education expenditure (+)	Governance (+)
Addison and Heshmati (2003)	Openness to trade (+)			
Tuman and Emmert (2004)	GDP per capita (+)		Years of schooling (+)	Political instability (-) Property rights (+)
Asiedu and Lane (2004)		Capital controls (-)		

[1] Results vary depending on countries/regions, sectors, and time periods under analysis. Many studies also face econometric challenges related to reverse causality and identification.

Desai et al (2006)		Capital controls (-)		
Biglaiser et al (2006)				Social conflict (-) Expropriation risk (-)
Majeed and Ahmad (2008)			Health expenditures (+)	
Montero (2008)	Current account surplus (+)			
Demirhan and Masca (2008)	Inflation (-)	Tax rates (-)	Infrastructure expenditure (+)	
Walsh and Yu (2010)	Inflation (-) Openness to trade (+) Real exchange rate depreciation (+)		Infrastructure expenditure (+)	Independent judiciary (+)
Biglaiser and Staats (2010)				Effective court system/rule of law (+)
Hecock and Jepsen (2014)				Property rights (+)
Akiln et al (2014)				Corruption (+)
Petrou and Thanos (2014)				Corruption (+)
Asongu and Nwachukwu (2015)				Political stability (+) Government effectiveness (+)

Source: Authors' compilation.
Note: (+) denotes a significant positive impact on FDI flows; (-) indicates a significant negative impact on FDI flows. Several of the 21 studies identify multiple drivers of FDI.

Stable macroeconomic conditions are related to expected market growth which translates into higher potential returns on investment. The literature generally identifies three conditions conducive to macroeconomic stability and market growth potential: sustained economic growth, low inflation, and current account surplus.

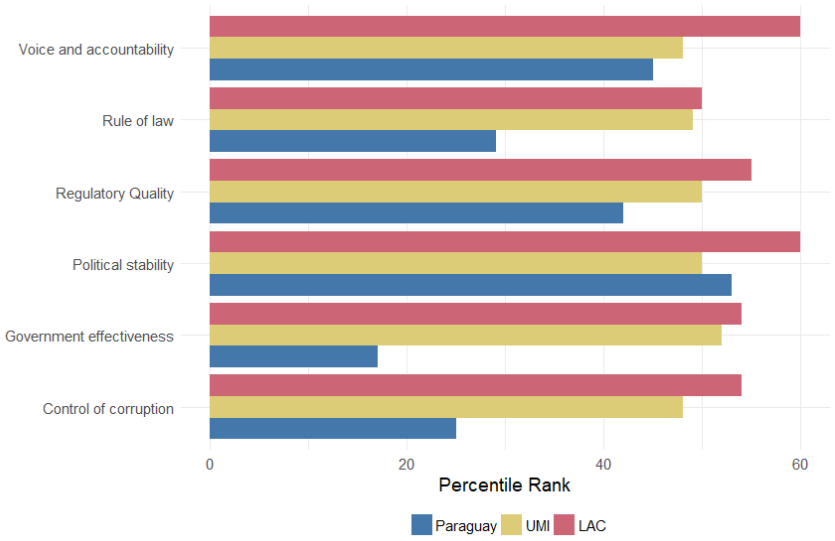
Microeconomic regulations correspond to public policies that may alter expected private production costs and revenues, and therefore, have an impact on private sector investment decisions. Most studies analyze the impact of tax regimes, trade agreements and capital controls. Although some studies indicate that economic liberalization reforms such as trade and tax reforms provide strong incentives for FDI, other analyses find that low taxes and/or tariffs do not, by themselves, encourage private investment. On the other hand, countries with stringent capital control mechanisms are generally less likely to attract significant FDI flows.

Factor endowments, i.e. natural, physical, and human capital stocks, are fundamental to assess a country's potential long-term growth and expected investment profitability. Some studies find that infrastructure, particularly in telecommunications and transportation, is significantly linked to higher levels of FDI. In addition, good quality infrastructure and a

healthy and educated labor force may encourage larger investments in high value-added sectors.[2]

Finally, institutional frameworks play a role in shaping suitable business environments for private investment. Several studies focus on the relationship between FDI and different governance indicators: political stability, property rights, judicial independence, and corruption. Overall, stronger institutions translate into higher foreign direct investment flows.

Figure 1. Governance indicators



Source: Kaufmann et al (2010).
Note: Values for 2016. UMI denotes upper-middle income countries. Percentile rank (0-100) indicates rank of country among all countries in the world. Lowest rank is 0, highest rank is 100.

The case of Paraguay is somehow puzzling, when contrasting its ability to attract FDI flows with the empirical evidence. Over the last decade Paraguay has become one of the fastest growing economies in Latin America and the Caribbean (LAC), it has modernized both its fiscal and monetary policy instruments, and overall has entered a period of economic stability and predictability.[3] In addition, the country's relative advantages in terms of preferential access to two of the largest markets in LAC (Brazil and Argentina), low energy costs, low taxation and a young labor force, are likely to reinforce current growth trends

[2] Cross-country evidence is scarce regarding the significance of natural resources on FDI flows (World Bank, 2011). For instance, Poelhekke and Van der Ploeg (2010) find that FDI linked to natural resources (subsoil assets) crowd-out non-natural resource FDI. The crowd-out effect dominates and total FDI is lower in resource-rich economies.

[3] Strong factor accumulation and traditional exports have driven economic growth. Since 2008, real Gross Domestic Product (GDP) has increased on average 4.9% per year, above LAC's 2.0% per year. Over the last decade, the country has strengthened its monetary and fiscal policy frameworks (inflation targeting regime, fiscal responsibility law), which has contributed to price stability (average annual inflation below 5.0% since 2008) and fiscal consolidation (average central government deficit of 0.6% of GDP since 2008).

(Almeida et al 2018). Nevertheless, FDI flows have not significantly improved. Since 2008 they represent, on average, 1.8% of GDP, about half the regional average of 3.3%.[4]

The lack of response from FDI flows indicates that other factors, beyond macroeconomic conditions, microeconomic regulations and factor endowments, may influence investment decisions in Paraguay. According to Almeida et al (2018), Paraguay can become one of the most dynamic economies on the global stage if it addresses development challenges linked to institutional frameworks (figure 1), among others. Given the economic, social, and political costs of addressing these issues, it is important to establish which factors matter the most for FDI decisions.

We do this by implementing an experiment on an original sample of international investors. To our knowledge this is the first time FDI flows are analyzed with this approach. Using an experiment circumvents issues with measurement[5], simultaneity, and endogeneity bias caused by a lack of high quality data necessary for robust statistical analysis.[6] Furthermore, our approach sheds light into investors behaviors regarding FDI choices in emerging economies, and hence may contribute to frame and prioritize policy responses accordingly.

Our results indicate that institutional variables have a strong effect on FDI decisions, even when considering the socioeconomic context of Paraguay. As it stands, Paraguay is 25% less likely to be chosen as an FDI host country when compared to similar countries with better perceptions about institutions. This effect grows stronger when we only consider respondents with experience in Latin America, which are Paraguay's main source of FDI. Moderate improvements in its institutional quality scores would bring Paraguay to the level of Costa Rica, Peru, Panama, and Guatemala, and have a considerable impact on its competitiveness to capture investors' attention.

The rest of the paper is organized as follows. Section 2 presents and discusses the experiment, the sample, and the statistical method used to analyze the data. Section 3 presents our main results, and section 4 concludes.

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[4] The U.S (25%), Brazil (19.5%) and other LAC countries (24%) account for almost 70% of total FDI flows to Paraguay since 2008. In terms of distribution at the productive level, most FDI flows have been directed to services (58%), followed by construction/manufacture (36%).

[5] Kerner (2014) and Hecock and Jepsen (2014) show that how FDI is measured has a strong effect on the results of any analysis. For instance, institutional features may gain or lose relevance depending on how FDI is measured. FDI flows can be measured as a yearly change, a stock, a ratio with respect to production, and a level variable. The definition of the dependent variable can have implications on the consistency of the results.

[6] For instance, fixed effect models are not sufficient to address simultaneity bias in cross-section analyses (Achen, 2000). Using the dynamics of the model as to control for endogeneity can introduce a new set of econometric challenges (Bellemare, Masaki, and Pepinsky 2015). The use of parametric and non-parametric approaches (Baccini et al, 2014; Barassi and Zhou, 2012) can help circumvent these issues, however their use relies on high quality data, not always available in developing countries.

2. Research Design

Conjoint analysis

Traditionally, experiments in the social sciences test only for a few factors due to limitations in field research (Gerber and Green, 2012). Testing for more features requires a larger sample than what researchers usually have at their disposal, yet FDI flows are influenced by several attributes.

To alleviate this issue, our experiment design is that of a conjoint analysis. A conjoint analysis consists of asking each subject to choose among several alternatives. Each alternative is characterized by a series of attributes whose values are selected at random. Then the same choice (task) is repeated n number of times for each subject, always randomizing the value of the attributes. In this case, subjects were asked to select among three hypothetical countries.

According to Johnson and Orme (1996), in conjoint analysis doubling the number of choice tasks per subject is about as effective as doubling the number of subjects in increasing the precision of the estimators. In practice, subject fatigue limits this assessment, but the fact remains that it is possible to compensate for a small sample by asking each subject several versions of the same randomized choice task. The data collected through this method can be used to estimate Average Marginal Component Effects (AMCEs). An AMCE enables us to simultaneously determine the causal effect of several attributes. Following Hainmueller et al. (2014), it can be defined as the marginal effect of an attribute, l, over the joint distribution of the remaining attributes:

$$\begin{aligned}\overline{\pi}(t_1, t_0, p(\boldsymbol{t})) \quad = \sum\nolimits_{(t,\boldsymbol{t})\varepsilon\tilde{T}} [[E[Y_{ijk}|T_{ijkl} = t_1, T_{ijk[-l]} = t, \boldsymbol{T}_{i[-j]k} = \boldsymbol{t}] \\ - \left[E\left[Y_{ijk}\middle|T_{ijkl} = t_0, T_{ijk[-l]} = t, \boldsymbol{T}_{i[-j]k} = \boldsymbol{t}\right]\right] \\ * p\left(T_{ijk[-l]} = t, \boldsymbol{T}_{i[-j]k} = t\middle|\left(T_{ijk[-l],\boldsymbol{T}_i[-j]k}\right)\varepsilon\tilde{T}\right)\end{aligned} \qquad (1)$$

Where l stands for attributes (variables of interest) for subject i in task k in profile j (the hypothetical countries). This "quantity equals the increase in the population probability that a profile would be chosen (Y) if the value of its lth component were changed from t_0 to t_1, averaged over all possible values of the other components given in the joint distribution of the profile attributes $p(\mathbf{t})$."

An example using the problem at hand would involve estimating the AMCE of corruption on the probability of selection of a country j. To get this value we first compute the probability that a country with high perception of corruption and x attributes is selected over an alternative country; we then compute the probability that an identical country, but with low perception of corruption, is selected over the same alternative country. Then we take the difference between both probabilities. This procedure is then repeated with a different set

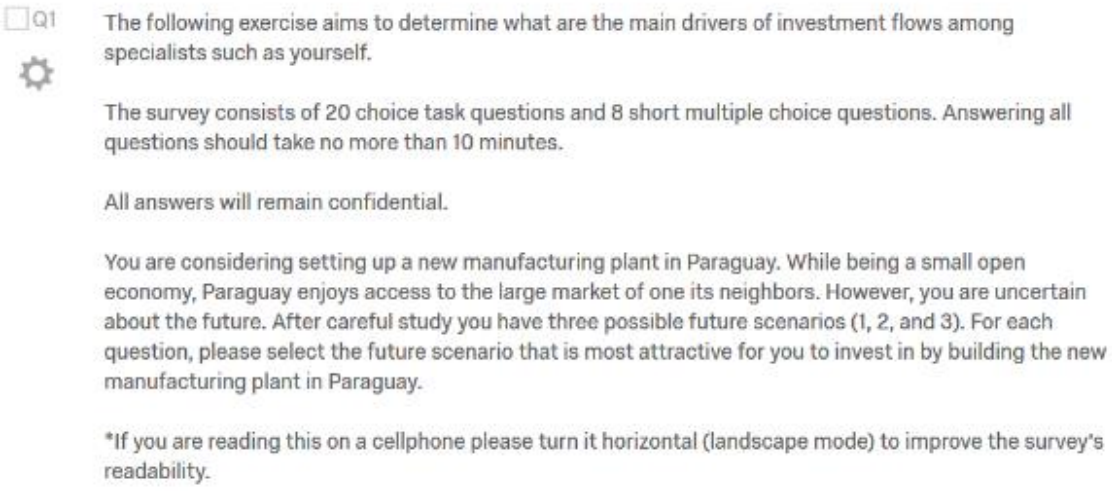
of attributes (holding the levels of perception of corruption constant). Finally, we take the weighted average of these differences over all possible combinations of the attributes according to the joint distribution. In this case, the AMCE of perception of corruption is the average effect of corruption (over the distribution of the attributes) on the probability of a country being selected for investment.

Notice that equation 1 shows why, through the randomized way of collecting data, a causal relation can be established. It makes no mention of the estimation method. In this sense, if all attributes have an equal probability of being selected, their effect on the probability of selection can be estimated through simple OLS. When the distribution of attributes is not uniform, OLS still works, but adjustments must be made to the results and standard errors (Hainmueller et al. 2014). In the present case, all attributes have an equal chance of being selected so this adjustment is not necessary.

The experiment

The experiment consists of a survey applied through Qualtrics. Subjects were told that they were weighing whether to invest in a developing country with a small open economy or not. For half the sample the prompt read Paraguay instead of a generic developing country. This design allows us to sidestep issues with respondents being overly familiar with a country, thus biasing their responses. Subjects were then asked to select a hypothetical country out of three possible scenarios. Figure 2 shows an example of a survey prompt.

Figure 2. Survey prompt



Source: Authors' characterization.

Building on the aforementioned empirical literature, we test eight potential drivers/attributes of FDI: property rights, judicial system and corruption, which are proxies for institutional frameworks; labor force and infrastructure which can be linked to factor endowments; tax structure and capital controls which correspond to microeconomic regulations; and macroeconomic outlook.

As in any experiment, treatment is limited by subjects' attention span and sample size. While it would be more realistic to include more attributes, this could lead to subject satisficing and attrition (Orme 2005). Similarly, an attribute cannot take on too many values without running into statistical inference issues. Thus, while a complex variable such as macroeconomic outlook would be better represented by several complex attributes, a simple categorical representation is an appropriate proxy within the limitations of the experiment.

Figure 3 shows an example of a choice task. Each choice task shows subjects three scenarios characterized by eight attributes. The attribute order is randomized per subject, while the attribute values are randomized for each choice task.

Figure 3. Choice task

Which of these choices do you prefer?

	Scenario 1	Scenario 2	Scenario 3
Independent judicial system (100 is more independent)	60	20	60
Property rights (100 is better property rights)	75	45	60
Quality of the labor force (100 is higher quality)	75	65	85
Infrastructure (100 is better infrastructure)	40	20	60
Corporate income tax rate	10%	10%	30%
Macroeconomic outlook	Stable	Stable	Positive
Corruption (100 is more corrupt)	60	40	60
Capital controls (100 is more controls)	25	45	45

Click to write scenario 1

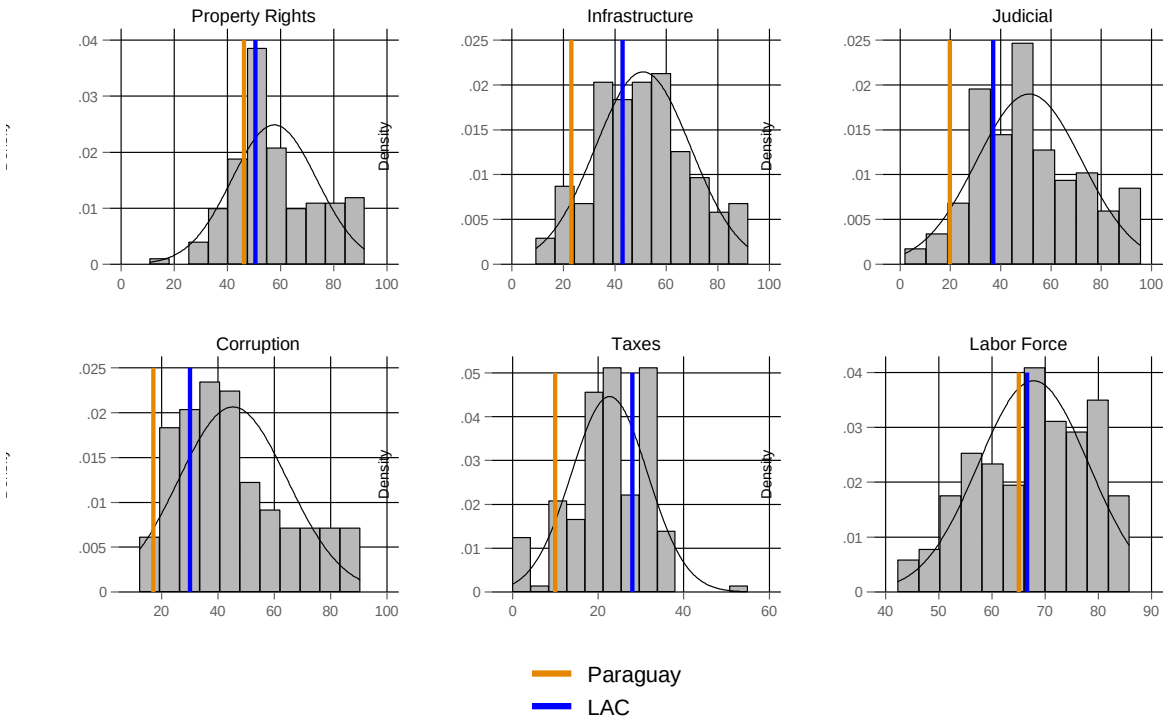
Click to write scenario 2

Click to write scenario 3

Source: Authors' characterization.

For the most part, the values used for each choice task are based on estimates from the World Economic Forum's Global Competitiveness Report (WEF 2016). The report scores countries on several attributes that influence competitiveness. While opinion data usually is too noisy for robust analysis, it is ideal for the present case. After all, we are interested on the impact of beliefs on investment decisions in Paraguay.

Figure 4. Attribute values



Source: Authors' calculations.
Notes: Estimates based on 138 countries. Scale of each variable is an index normalized from 0 to 100, where 100 represents a good opinion on the variable. Taxes represent the total corporate tax rate in each country.

Figure 4 shows the distribution for some of the variables used for the choice tasks. The orange line shows Paraguay's standing in the ranking, while the blue line shows the average for Latin America and the Caribbean. The values chosen for all attributes represent the value taken by Paraguay and the values that Paraguay would have if it moved 1 or 2 standard deviations on the distribution. Given these values, each investor is roughly exposed to the full range of values an attribute can take.

For example, the property rights indicator takes values of 45, 60 (+1 standard deviations), and 75 (+2 standard deviations). In the same vein, infrastructure takes values 20, 40, 60; judicial system takes values 20, 40, 60; and corruption takes values 20, 40, 60. Taxes (taking values of 30, 20, 10 derived from KPMGs corporate tax rates database) is constrained to the left side of the distribution to minimize the risk of investors focusing on uncommonly high tax rates over other attributes. On the other hand, labor force is constrained to the right side of the distribution (values of 65, 75, 85) to minimize the risk of respondents focusing on scenarios with uncommonly poor labor force quality. Capital control values (25, 45, 65) are based on scores developed by Chinn and Ito (2008). These scores reflect how open an economy is to capital inflows and outflows. Finally, we assign values "negative", "stable", and "positive" to the macroeconomic outlook, in line with standard assessments from international credit agencies.

Sample characteristics

The sample is composed of investment analysts from one of the ten biggest investment firms in the world (32), employees that partake in the investment decisions of multinational Chinese companies (12), and employees from companies with current operations in South America with experience in FDI (32). The investment analysts handle, on average, funds worth fifty billion dollars. These funds are invested across sectors and across countries. The rest of the sample is composed of subjects that regularly influence the investment decision of their firms. Most of them have experience with transnational investment or are planning to invest internationally.

Overall, our 76 respondents are 38 years old on average, while 58% is male. About 67% of respondents work in firms with FDI experience, and 70% are either mid or senior-level employees. The most common industries represented in the sample are manufacturing and financial services.

Regarding the size of the sample, as was previously explained, conjoint analysis asks each subject the same question (with randomized attributes) repeatedly. While in theory one could ask 1 person 1000 questions, this is practically unfeasible. Instead, researchers developed measures to estimate a sample size that gives sufficient information for statistical analysis. Orme (1998) proposes the following rule of thumb to determine the values of the components of a conjoint analysis:

$$\frac{nta}{c} \geq 500 \tag{2}$$

Where "n" is the sample size, "t" is the number of tasks, "a" is the number of alternatives per task, and "c" is the number of analysis cells. In this case, "c" is equal to the largest number of levels in one attribute. Orme considers that 500 is the minimum threshold of information that the conjoint must give (though he clarifies more is better). Our experiment comprises 76 subjects, 3 alternatives per task, 20 tasks[7], and a level of complexity of 3. Using equation 2 this gives a value of 1520. If we wish to test for interaction effects "c" becomes 9 and the value falls to 507. Both values are above Orme's suggested threshold. Our main model does not use interaction effects, but we do test for interactive terms in later specifications.

Alternatively, it could be argued that Orme's rule is designed for heterogeneous samples (of the kind common in marketing studies). A homogeneous sample, with lesser variance, could work with a lower "n". Tang et al. (2006) argue that, for example, heart surgeons are more similar to each other than a random sample of people picked from the street is to each other. They propose the following modified rule of thumb:

$$\frac{nt(1-c\%)a}{d.f.} \geq HLI \tag{3}$$

[7] Bansak et al (2018) determine through a series of experiments that conjoint designs with 30 tasks are robust. This means that respondents processed the conjoint profiles in similar ways and provided similar results.

"n" and "t" are still the sample size and the number of choice tasks. "c%" is the percentage of times constant alternatives are chosen by subjects. Our design does not have constant alternatives, so this parameter can be ignored. "a" represents the richness of information of each choice task. It can be argued that a simple multiple choice requires less thought than a question that forces subjects to rank choices or to grade them on a likert scale. The new "a" parameter aims to capture this disparity. Finally, d.f. represents the number of parameters to be estimated in the model. This change aims to capture differences in model complexity. A model with more variables will be punished more heavily than a model with less variables. HLI stands for Homogeneity/Logical Consistency Index and it measures the variability in the model from a general population sample. Tang et al. (2006) argue that a value of 500 is adequate when dealing with the general population, but that it can be lower when dealing with more homogeneous subjects. For these cases they suggest a value of 100.

This last point is important. Our sample can be divided into three big categories: investors in South America (n=32), investors in the United States (n=32), and Chinese investors (n=12). Using equation 3, where t=20, a=2.5 (we punish the simplicity of the multiple choice), and d.f. = 16 (number of coefficients to estimate), it can be shown that $n \geq 32$ makes HLI at least 100. The sample of US investors all work for the same firm, while the sample from South America have all expressed interest in Paraguay. Thus, besides the general result, we can also analyze if there is any behavioral difference in attitudes towards Paraguay between US investors and Latin American investors.

3. Results

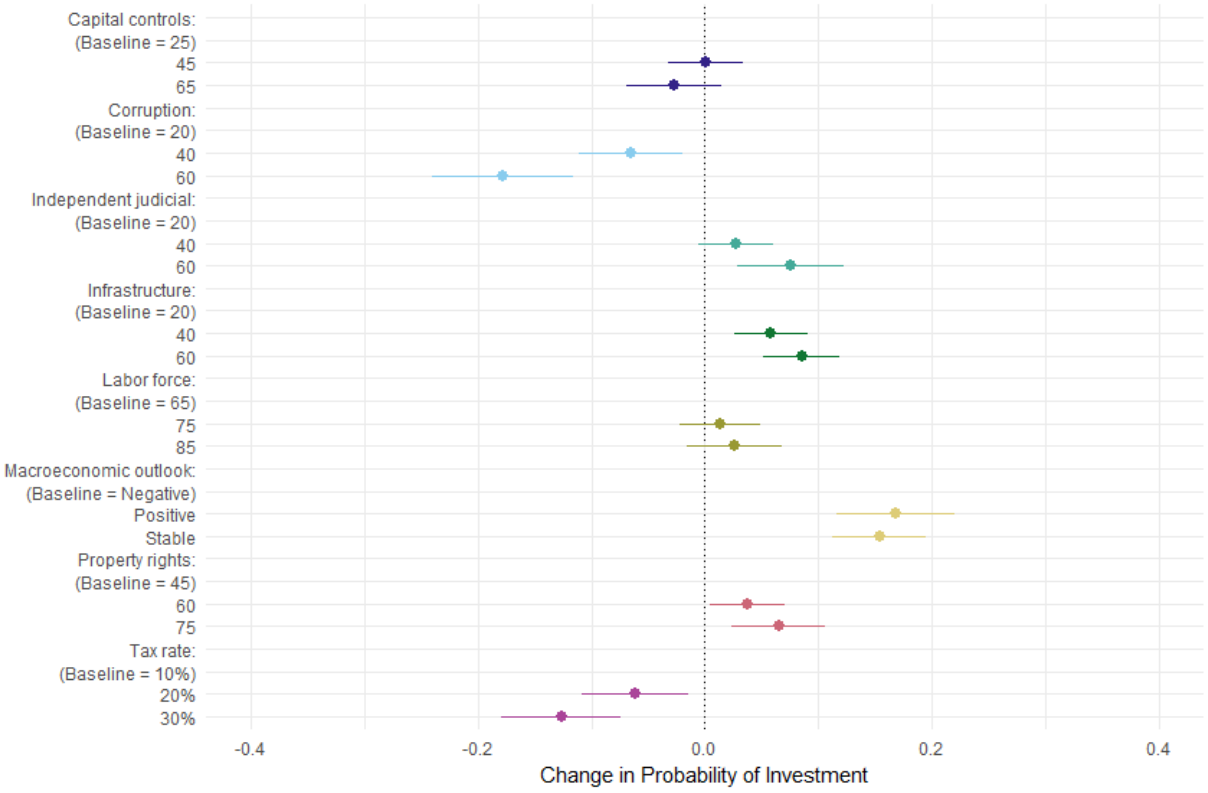
What do investors prioritize?

Figure 5 shows results on the whole sample.[8] Estimates indicate that capital controls and quality of the labor force are not influential in subjects' decision making. This is not entirely surprising. The former matter more when dealing with liquid assets that could easily be moved out of the country. The prompt for the exercise mentioned a manufacturing plant. These are fixed assets from which investors cannot easily dis-invest, regardless of the level of capital controls in the country. The latter reflects the type of manufacturing investment that subjects would have in mind when thinking of a developing economy. Investment characterized by reliance on low labor costs rather than labor force quality.

The most significant drivers of investment decisions are perceived level of corruption, tax rate, and macroeconomic outlook. It is not surprising that the tax rate and economic conditions matter; investors seek economic stability and generous tax incentives to generate returns. However, the importance of corruption is not straightforward. While Mathur and Singh (2013) and Biglaiser and Staats (2010) identified corruption as a determinant of FDI, they did not place it as the most important determinant. They considered economic variables and property rights as far more important than corruption.

[8] See Appendix for OLS and logit regression tables. As expected, estimates are almost identical.

Figure 5. Results of the main model (clustered S.E. at 95%, n=76x20)



Source: Authors' calculations.
Notes: Horizontal lines depict 95% confidence intervals.

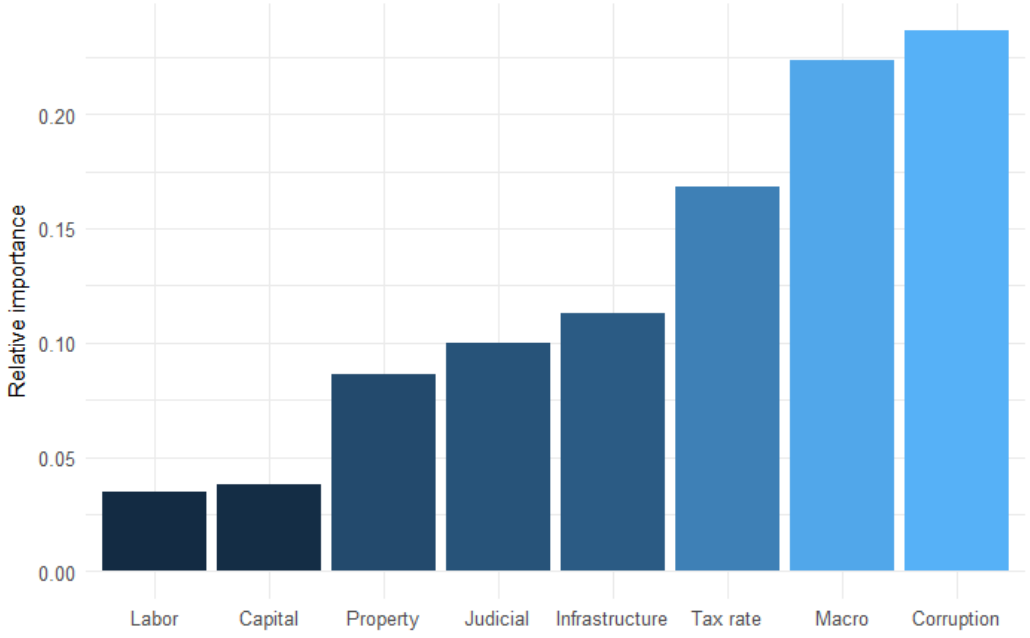
Our results show that, as the perception of corruption rises, investment becomes less likely. For example, a one standard deviation increase on the perception of corruption, lowers the probability of investment by 6.5%. In addition, a two standard deviations increase lowers the probability of investment by 17.8%. Furthermore, this effect is close to that of the macroeconomic outlook and tax rates. A country can benefit from favorable macroeconomic and microeconomic conditions and still face stagnant FDI flows if perceived corruption is high.

The other three attributes, infrastructure, judicial independence, and respect of property rights have lower but still substantive effects. In descending order of potential impact (two standard deviations), quality of infrastructure increases the probability of investment by 8.5%, while more judicial independence and property rights enforcement increases the odds of FDI flows by 7.5% and 6.5%, respectively.

Figure 6 presents the relative importance of each attribute in the investment decision-making process. Following Orme (2005), the "utility" of an attribute can be approximated by getting the min-max difference of each attribute, summing them, and then estimating the weight of each attribute in the sum. Under this approach, the importance of corruption becomes clearer. Another interesting outcome is how little weight property rights carry. Previous work, such as Li and Resnick (2003) or Jensen et al (2012), see property rights as

an essential institution for the attraction of FDI flows. Results indicate that policies that tackle issues related to perceptions of corruption may have a larger impact, in terms of FDI attraction, than policies aimed at safeguarding property rights.

Figure 6. Relative importance of attributes (clustered S.E. at 95%, n=76x20)



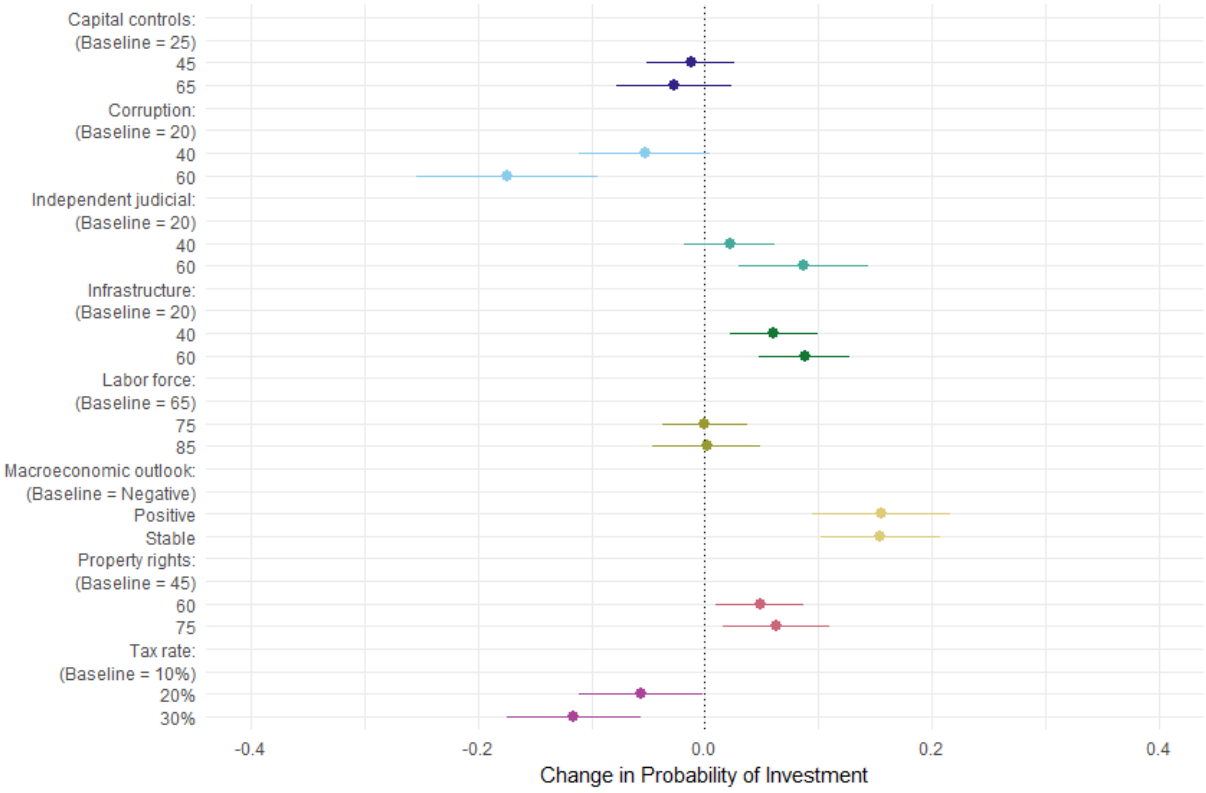
Source: Authors' calculations.

These results provide strong evidence for the importance of institutional factors in Paraguay. The country's performance is average in terms of property rights, and below average in terms of perceptions of corruption and judicial independence (figure 4). When the country competes to attract FDI flows, it is 25% less likely to be as successful as countries with similar economic outcomes but better perceptions about institutions. Nonetheless, a one standard deviation improvement in perceptions of corruption would place Paraguay at the same level of China, Costa Rica and Panama. It could also translate into an 11% increase in the probability of being selected for investment. Similarly, a one standard deviation improvement in perceptions of judicial independence (at the level of Peru, Guatemala, and El Salvador) could increase the odds of attracting FDI by 3%.

Influential vs. non-influential respondents

Figure 7 presents the AMCE estimates using only subjects that self-identify as high-level employees in their firms. Results are remarkably similar to those derived for the entire sample (figure 5). This reduces concerns about the possibility that subjects without influence in a firm's investment decision-making process may bias the results.

Figure 7. Results from a sub-sample of high-level employees (clustered S.E. at 95%, n=56x20)



Source: Authors' calculations.
Notes: Horizontal lines depict 95% confidence intervals.

Furthermore, most of the subjects that self-identify as junior employees are from the investment firm located in the United States. All subjects from this firm manage assets worth billions of dollars and are influential in the operations of the firm. Despite their self-identification, it can be assumed that they are all knowledgeable enough for the exercise.[9]

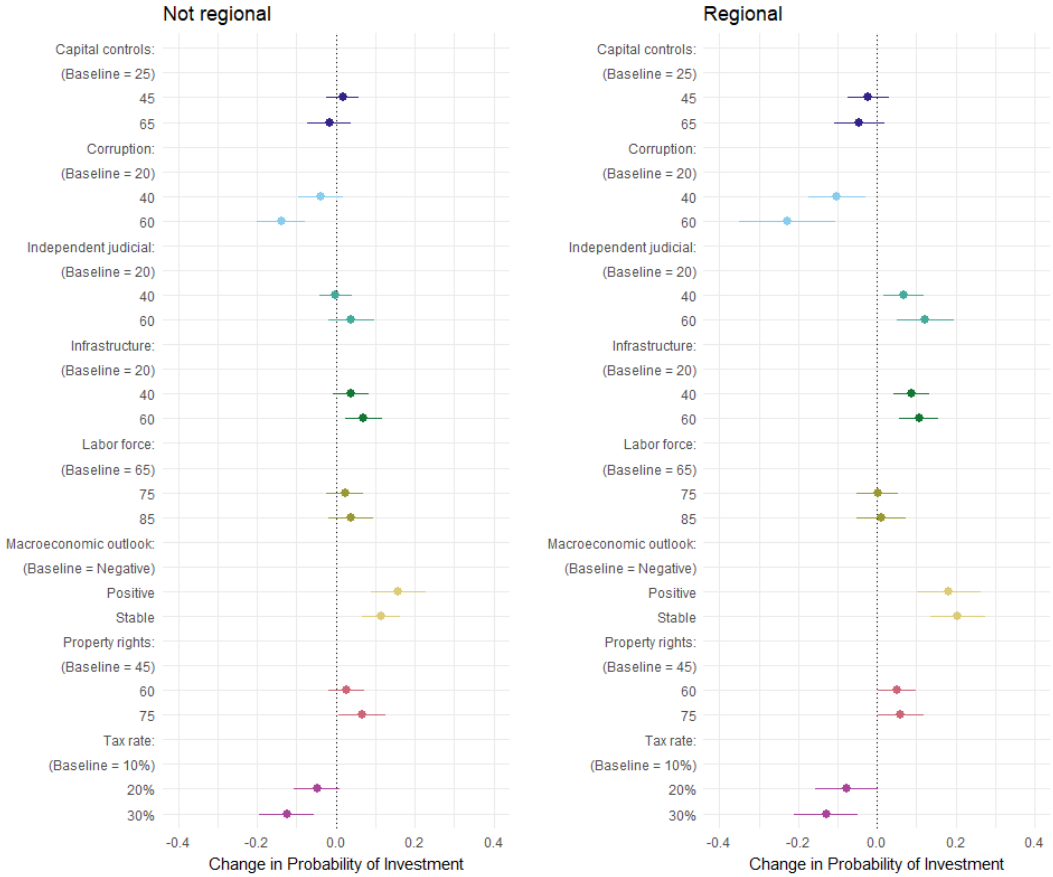
Regional vs. extra-regional respondents

Figure 8 shows the AMCE sub-setting the data between respondents that have experience in LAC and those that do not have experience in the region. We notice that results are consistent with our main findings (figure 5) and roughly similar among sub-samples. For instance, estimates are similar for capital controls, quality of the labor force, property rights, and taxation.

[9] A final concern is whether the macroeconomic outlook may condition respondents' tolerance for corruption. We estimated the AMCEs conditional on several levels of macroeconomic outlook and find no significant results. We also estimated the model conditioning on respondents' experience in foreign investment, results were also inconclusive.

However, the models differ in some attributes. For example, corruption is more important for regional respondents. Perceptions of corruption (two standard deviations) reduce the likelihood of investment by 13% among extra-regional subjects, while it reduces the same likelihood by 21% among regional subjects. In the same vein, judicial independence is not statistically significant for surveyed subjects outside the region, but it is significant among regional respondents. We identify similar effects for infrastructure and the macroeconomic outlook. These results indicate that ALC investors, Paraguay's biggest source of FDI, are more sensitive to institutional factors than extra-regional subjects.

Figure 8. Results from sub-samples of regional (n=32x20) and non-regional (n=44x20) respondents (clustered S.E. at 95%)



Source: Authors' calculations.
Notes: Horizontal lines depict 95% confidence intervals.

4. Final remarks and policy implications

Over the last decade Paraguay has become one of the fastest growing economies in LAC, it has modernized both its fiscal and monetary policy instruments, and overall has entered a period of economic stability and predictability. However, FDI flows have not significantly improved. Since 2008 they represent, on average, 1.8% of GDP, about half the regional average of 3.3%. The lack of response from FDI flows indicates that other factors, beyond

good economic conditions influence investment decisions in Paraguay. It is therefore crucial to establish which factors matter the most for FDI decisions.

We do this by implementing an experiment on an original sample of international investors. Using an experiment lends internal validity to the results and helps circumvent issues with measurement errors and endogeneity, usually found in standard macro-econometric analyses. Furthermore, our empirical approach sheds light on investors behavior vis-à-vis FDI decisions in emerging economies, and therefore may contribute to frame and prioritize policy responses accordingly.

Our results indicate that institutional variables, i.e. corruption and independence of the judicial system, have a strong effect on FDI decisions, even when controlling for other potential drivers. As it stands, Paraguay is 25% less likely to be chosen as an FDI host country when compared to similar countries with better perceptions about institutions. Moderate improvements in its institutional quality scores could have a considerable impact on its competitiveness to capture investors' attention.

Our analysis highlights the following policy implications for Paraguay:

1. Good macroeconomic performance and fiscal incentives are not enough to attract FDI flows. Paraguay has outperformed its neighbors in economic matters and could increase the inflow of FDI. Results indicate that institutions weigh as much as economic variables in the mind of investment decision-makers. Roughly speaking, institutional variables represent 40% of the importance investors assign to separate country attributes or drivers. These results hold for both regional and extra regional investors.

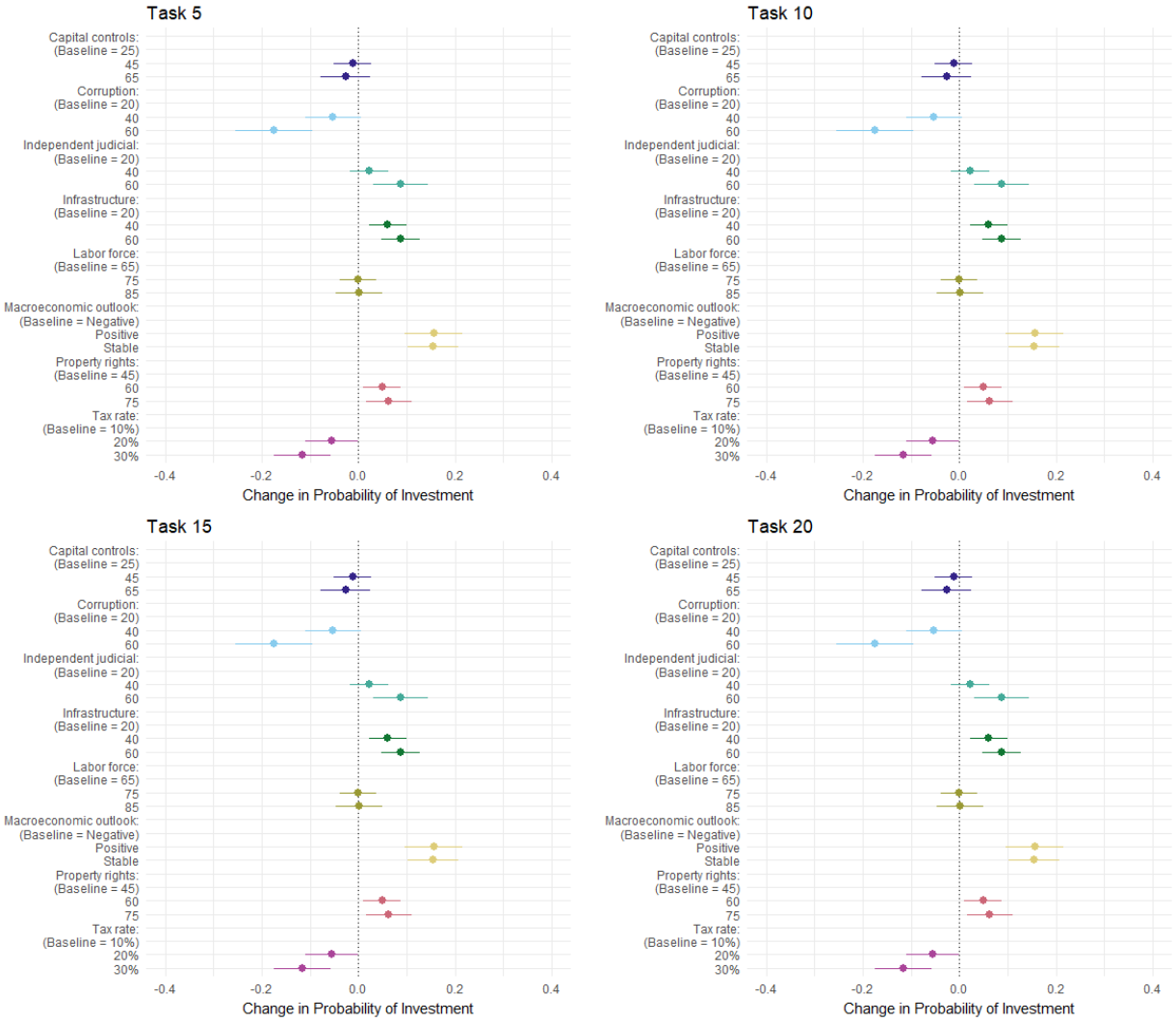
2. Improving institutions takes time, but policy actions can have significant short-term impacts on FDI flows. For example, a one standard deviation improvement in perceptions of corruption could increase the probability of receiving FDI flows by 11%. Such an improvement would be equal to reaching the levels of Costa Rica, China, or Panama. A one standard deviation improvement in the perception of judicial independence would place Paraguay at the level of Peru, Guatemala, or El Salvador. This would improve the probability of investment by at least 3%.

Going forward, the analysis can be repeated using a bigger sample. While hard to do, gaining access to a larger set of respondents would allow more elaborate designs (test more interactions, variables), testing for differences between investor groups, and tackling the potential issue of "home country bias", i.e. whether decision makers prefer to remain close to home when investing abroad (Moskowitz, 1999).

Appendix

Assumption 1 (Carryover effects)

Figure A1. Carryover effects



Source: Authors' calculations.
Notes: Horizontal lines depict 95% confidence intervals.

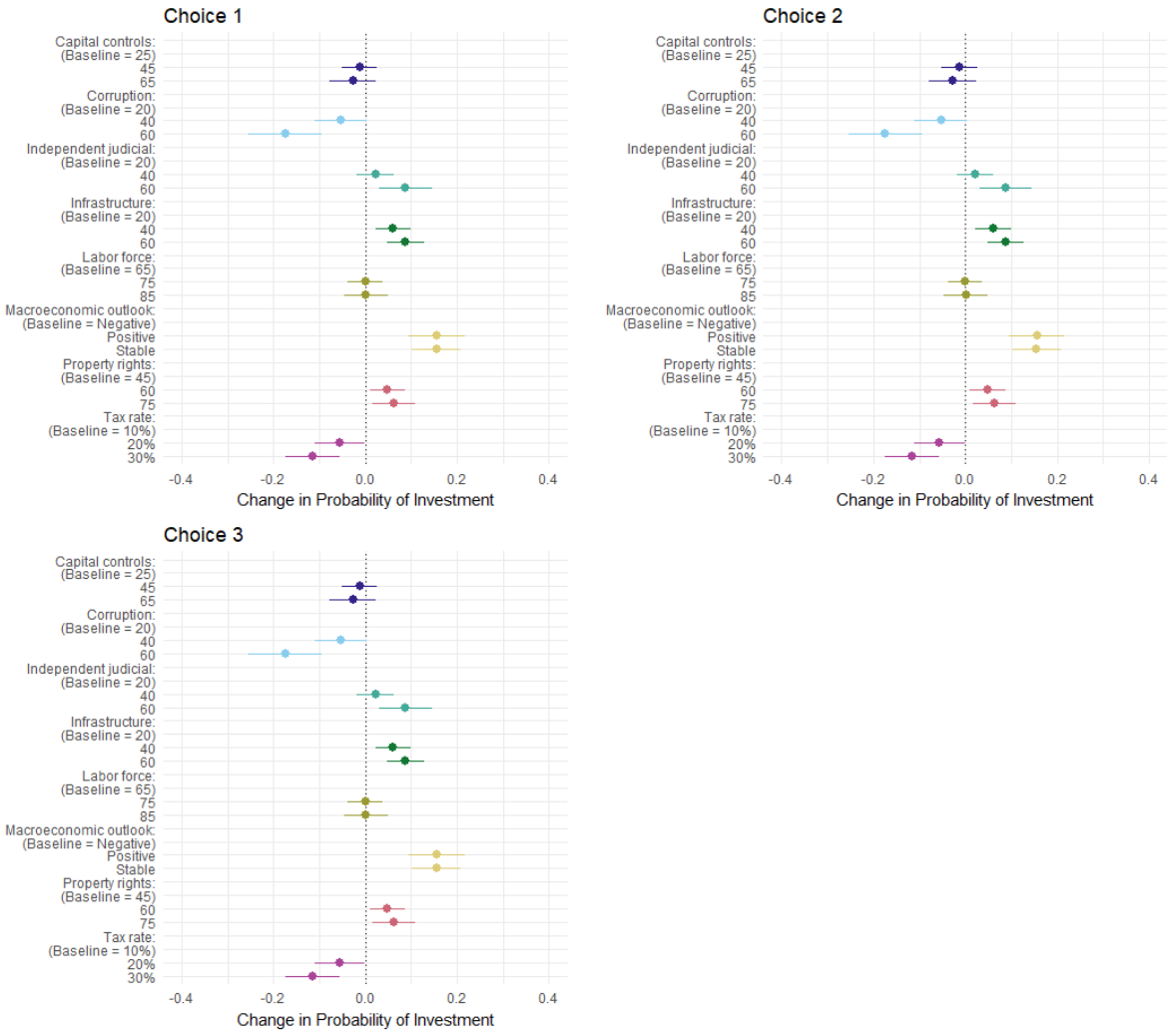
Conjoint analysis relies on the assumption of no carryover effects. This assumption requires that potential outcomes always take on the same value as long as all the profiles in the same choice task have identical set attributes. In other words, this assumption implies that a subject's response to a choice task will not be influenced by profiles that were presented in previous choice tasks or by profiles that will be presented in future choice tasks.

A way of testing if this assumption holds involves assessing if results from later tasks differ from results obtained in the first tasks. Figure A1 presents the AMCE for four subsets of the data: the fifth, the tenth, the fifteenth, and the twentieth choice task. Most of the attributes

hold similar values to each other and to that of the estimation for the pooled data. Note that each plot is done using only one answer from each subject, so the estimates are based on 75 data points. This has increased the standard errors of each estimate and explains why some estimators lose statistical significance (although the estimated parameter remains similar). The two attributes that appear to flip around across tasks are capital controls and quality of labor. However, these two attributes lack statistical significance even when using the whole sample, so it is not surprising for their coefficients to fluctuate around 0. In general, the test supports the "no carryover" assumption necessary to establish causality.

Assumption 2 (Profile order effects)

Figure A2. Order effects



Source: Authors' calculations.
Notes: Horizontal lines depict 95% confidence intervals.

Conjoint analysis also relies on the assumption that profile order has no effect on the findings. This assumption requires subjects to ignore the order in which profiles are

presented in a choice task. If, for example, subjects always picked the first profile, the results would be biased. This assumption can be tested by verifying if the AMCE is similar no matter on which profile the assumptions take place. This is equivalent to estimating the AMCE for a subset of data for each profile position. Figure A2 shows the AMCE for each profile of data. As can be seen, the coefficients are similar across choices. This indicates that subjects did not pick an option out of convenience, but rather applied their decision-making process consistently throughout the survey.

A final assumption is that profiles were assigned at random. This assumption holds by design. As previously explained every element of the survey was randomized before giving it to a subject. Nevertheless, this assumption was tested by checking whether the attributes can predict individual covariates such as sex, age, or the seniority of subjects. In all instances the attributes are not statistically significant.

Main model (OLS) results and logit model

AMCE using OLS compared to Logit

	(1) OLS		(2) Logit	
40.independentjudicial	0.0275	(0.0168)	0.0266	(0.0167)
60.independentjudicial	0.0753**	(0.0238)	0.0752**	(0.0238)
40.corruption	-0.0649**	(0.0232)	-0.0649**	(0.0231)
60.corruption	-0.178***	(0.0318)	-0.178***	(0.0318)
45.capitalcontrols	0.000954	(0.0168)	0.00162	(0.0167)
65.capitalcontrols	-0.0275	(0.0212)	-0.0273	(0.0212)
positive.econ	0.168***	(0.0265)	0.168***	(0.0264)
stable.econ	0.154***	(0.0213)	0.153***	(0.0212)
20.taxratenum	-0.0611*	(0.0239)	-0.0618*	(0.0240)
30.taxratenum	-0.127***	(0.0268)	-0.126***	(0.0269)
75.laborforce	0.0133	(0.0179)	0.0141	(0.0180)
85.laborforce	0.0262	(0.0213)	0.0270	(0.0211)
60.propertyrights	0.0374*	(0.0170)	0.0382*	(0.0169)
75.propertyrights	0.0649**	(0.0212)	0.0652**	(0.0212)
40.infrastructure	0.0584***	(0.0166)	0.0572***	(0.0165)
60.infrastructure	0.0851***	(0.0173)	0.0840***	(0.0171)
_cons	0.250***	(0.0382)		
N	4560		4560	

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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