

Chinese Development Aid and Finance: Effective Soft Power Tool or Public Diplomacy Liability? A Spatial Study of Project Influence

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Abstract

China has risen to become a significant donor of foreign aid and assistance in recent years. As with other major donors, such economic flows in the provenance of China are tied to the latter's strategic aims. Specifically, the use of economic outlays as a tool of soft power and public diplomacy has been identified as a key motivation in Chinese disbursement decisions. However, studies examining the empirical success of Chinese foreign aid and assistance in acting as such have, so far, come to diverging conclusions. This study offers an investigation of the spatially diffused effects of infrastructure project sites tied to Chinese funding sources on local public opinion in Ecuador, a country that offers an interesting case showcasing the effects of the unfolding great power competition on local public opinion. We find, that controlling for socio-economic and ideological individual characteristics holding the potential to affect survey respondents' views on China, project influence is significantly and negatively correlated with levels of trust in the Chinese government. These results suggest that the frequently mediatized negative local spillover effects of Chinese-funded or financed infrastructure projects make it unlikely for China's foreign aid and assistance to achieve

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its envisioned purpose of furthering the country's soft power and positive image beyond its borders.

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1. Introduction

Foreign aid and development finance have long been used as strategic tools by issuing countries. Beyond humanitarian and economic objectives, strategic considerations such as alliance-building, elite rapprochement, and soft power expansion have been central to decisions on the issuance and distribution of such forms of assistance. Public diplomacy has become an important tool for great powers seeking to further their influence abroad. As a result of their potentially positive impacts on the lives of local populations and the often-high visibility of officially sponsored aid and investment projects in recipient countries, such ventures have become key tools of public diplomacy for countries seeking to expand influence and soft power around the world.

China has, in recent years, become a particularly important player in this regard. Since the domestic adoption of its Belt and Road Initiative in 2013, the country has become one of the world's largest development financiers, surpassing the World Bank in terms of lending in all years from 2013 to 2017, despite a decline in its commitments since then (Ray & Simmons, 2021). While the type of projects funded, the actors involved on the Chinese side, and the dynamics surrounding financing agreements exhibit significant heterogeneity, strategic motivations such as the desire to promote a positive image of China abroad have been recognized as motivators behind the Belt and Road Initiative and associated initiatives.

This has raised significant international concern in today's context defined by growing hegemonic competition between China and the United States. Due to the lack of political conditionality attached to Chinese development finance, its potential of providing authoritarian governments shunned by traditional lenders a financial escape line has been highlighted by many. The lack of transparency surrounding Chinese development finance has also been argued to be problematic, with the possibility of recipient countries' elites capturing the benefits of the project while putting in place

economically self-interested political alliances with China. Finally, concerns related to levels of indebtedness, employment dynamics, and environmental concerns tied to BRI projects have become contentious political issues in many recipient countries.

Despite the burgeoning literature on the question in recent years, the effectiveness of Chinese development finance as a tool of public diplomacy remains little understood given the rising political importance of the issue. Studies on the question have indeed come to varying conclusions, with significant heterogeneity having been found based on the region and precise type of flow being considered (Wellner et al., 2022). Different methodological approaches to studying the above topic have also yielded conflicting conclusions. To adopt a positioning in such a debate, this article espouses the view that, despite parallel concerns related to elite capture, economic dependence, and socio-environmental shortcomings in recipient states, the effects of development finance on public opinion represent a key determinant of the success of such projects in the medium to long term. In a global environment showcasing deteriorating views on China among most national populations, political leaders in all but the most autocratic countries will likely perceive public opinion as a constraint on their embrace of both present and future projects funded by China should such projects be negatively perceived by local populations. In many states, such constraints have already motivated the cancellation of previously pledged Chinese-financed projects. As a result, the medium and long-term success of the BRI in terms of both geopolitical and economic objectives hinges strongly on a positive perception of projects associated with it by local populations.

This article contributes to the understanding of the effects of projects tied to Chinese foreign aid and developmental finance on the perception of China among populations of recipient countries. Adopting a quantitative methodology and using a spatial dataset of geo-localized Chinese-financed development projects and AmericasBarometer surveys conducted by the Latin American Public Opinion Project (LAPOP), it examines the impact of proximity to project sites on voters' trust in the Chinese government in Ecuador, a country having received among the largest financing inflows from China in Latin America in recent years. As a country holding no consistently strong levels of foreign alignment with either the United States or China but having been actively courted by the two (Jepson, 2022), Ecuador represents an interesting case of the effectiveness of Chinese development finance in the

context of the increasing rivalry between the two great powers. After having controlled for various political typologies and demographic characteristics which could play a part in shaping voter stances on such questions, we find a negative effect of geographical proximity to project sites on individuals' trust in China. These findings contribute to the increasing body of literature investigating the effectiveness of China's development finance as a tool of public diplomacy both by narrowing on a national case noteworthy in the salience of the great-power rivalry unfolding within its borders, and by offering a new methodological approach to investigating the effects of the above flows on the perceptions of China held by local citizens.

2. Foreign Assistance as a Strategic Tool of Influence

Scholars have long argued for the existence of a strategic dimension to decisions related to foreign aid and investment allocation by issuing states. While a humanitarian and developmental logic behind such decisions is recognized, the recognition of such outlays as a foreign policy tool has increased since the latter half of the 20th century (Bandyopahyay & Vermmann, 2013). Many studies have investigated causal relationships responsible for the allocations of foreign aid and have quantitatively demonstrated the role played by strategic geopolitical considerations (Canavire et. al., 2006; Kaufmann & Wang, 1995).

The strategic effects of foreign aid and developmental finance can be divided into two distinct categories. First, such outlays can directly influence foreign policy decisions made by the leaders of recipient countries in ways that benefit the interests of the issuing state. Links between increased voting alignment in international organizations between the recipient and issuing countries have been illustrated by existing literature (Kuziemko & Weker, 2006; Lai & Morey, 2006; Griffin, 2004). Beyond purely political realms, foreign aid and development finance have also been shown to be linked to more favorable economic policies in recipient countries from the perspective of issuing states (Younas, 2008; Bandyopahyay & Vermmann, 2013). Secondly, flows of foreign aid and developmental assistance can also lead to better perceptions of the issuing state among recipient populations, indirectly leading to increased influence by the former (Blair et. al., 2022; Alexander, 2018). This is closely tied to the concept of soft power developed by Nye (2004), and increasingly playing a part in foreign policy formulations. Several studies have furthermore identified concrete mechanisms through

which populations in recipient countries gain exposure to donor-funded projects. Blair et al. (2019), for example, argue such groups can become exposed to such projects either by being their direct beneficiaries or by indirectly gaining knowledge about them through media or word of mouth. They will then develop positive or negative views about the involved donor based on their assessment of the quality of aid provided and the procedural fairness through which it was distributed (Blair et al., 2019). While the literature on this type of indirect influence remains nascent, it is clear that both direct influence over government officials and benefits obtained through public diplomacy play an important role in strategic considerations tied to the allocation of foreign aid and development finance.

3. Characteristics and Aims of Chinese Foreign Aid and Developmental Finance

With the growth of its economic power since the beginning of the 21st century, and particularly since the inception of the BRI in 2013, China has emerged as one of the largest providers of foreign aid and development finance (Ray & Simmons, 2021). The categorization of Chinese foreign economic flows tied to international assistance into categories of aid, assistance, finance, and investment is notoriously difficult (Ang, 2019). Authors such as Rudyak & Chen (2021) have, in recent years, categorized China's outlays in the above category as comprised mainly of foreign aid loans made up of zero-interest or concessional loans, non-foreign aid official loans handed out mainly by the Chinese Eximbank and China Development Bank, and commercial loans given by private banking institutions. Many BRI agreements contain a mixture of different types of assistance. This article will focus its analysis on the former two categories. While it is recognized that this definition excludes the significant portion of Chinese economic outlays made up of commercial loans and Foreign Direct Investment by state-owned or private firms, such portion is difficult to capture by existing data sources due to the complexity of disentangling commercial and political motivations lying behind them. In addition, such loans are usually not publicized as being tied to China to the same extent as foreign aid loans and non-foreign aid official loans, which would limit the ability of local populations to identify them as tied to their issuer. In addition, this article has made the conscious decision to omit funding stemming from the Asian Infrastructure Investment Bank (AIIB) from its

scope. While it is true that such funding has helped support BRI projects, the AIIB's nature of being a multilateral development bank makes it problematic to study it in line with China's sovereign development lending. While China possesses the biggest share and voting power in the institution, it cannot be assumed that funding emitted by it is tied to China's political considerations to the same extent as sovereign lending over which the country has full authority. Finally, the AIIB has, so far, been little involved in Ecuador, the country of interest to this analysis. While a \$50 million credit line was approved in 2022, it was tied to Covid-19 relief efforts and does not constitute a site-specific project, making it inadequate for inclusion in the article's quantitative analysis for reasons outlined in the sections below.

Chinese development finance differs considerably from traditional forms of development assistance provided through the OECD's Development Assistance Committee (DAC) frameworks (Rudyak & Chen, 2021). One significant difference lies in the absence of political conditionality in the terms of Chinese aid and development finance agreements. Assistance provided through DAC frameworks indeed commonly attempts to influence the behavior of recipient regimes by making itself conditional on the adoption of practices deemed democratic or respectful of human rights. In contrast, in line with its long-standing statement of support for the principle of non-interference in the domestic affairs of sovereign states, China has long emphasized that its assistance does not include such formal requirements (China State Council Information Office, 2014). However, the formal absence of conditionality in Chinese assistance agreements does not mean that the country's assistance is unconditional on political considerations (Dreher & Fuchs, 2015). Indeed, the allocation of Chinese development finance is strongly tied to the recipient country's stance on the One China Principle, with the use of Chinese labor and technology in funded projects also oftentimes required (Santino & Regilme, 2021). Chinese *de facto* conditions on the provision of international assistance hence hinge on more narrow definitions of Chinese self-interest but leave more leeway to recipient states relative to Western sources on issues or behavior falling outside of such scope. In addition, the concessionality considered to be an inherent component of DAC aid provisions is often not included in flows categorized by China as development finance (Dreher et al., 2022). From the above, a picture emerges in which Chinese aid is no less bound by political considerations than those issued by competing powers, and it is motivated

by different categories of behavior and issues over which the donor seeks influence.

While often portraying the BRI and its provisions of international assistance as an illustration of mutually beneficial cooperation between developing states, several strategic dimensions can be tied to Chinese foreign aid and development finance. Chinese scholars have sometimes argued that China's aid is motivated by factors stretching beyond national interests (Wang, 2015). However, many authors have identified strategic interests lying between the country's decisions on where and how to allocate foreign assistance (Holt, 2020). Especially, in the Indo-Pacific region, China has primarily been seeking to ensure its security in terms of state, economy, and regime (Holt, 2020). Beyond this region, desires to increase the country's international influence have also been identified as motivators (Wei, 2019). Tied into the traditionally strong emphasis among China's leaders to promote a positive image of China abroad, Chinese international assistance has also been argued to hold the expansion of the country's soft power as a primary motivator (Tursanyi & Kachlikova, 2020). In short, Chinese assistance can be considered similarly motivated and defined by self-interest as that stemming from alternative sources. Among its motivations, assurances of security and the promotion of both geopolitical influence and soft power can be identified as primary motivations.

4. Public Responses to Chinese International Assistance

If considering the strategic considerations behind Chinese assistance outlined above, public attitudes towards China in recipient countries are key to the success of initiatives such as the BRI from China's perspective. Public animosity towards China and, more specifically, opposition to Chinese economic involvement among recipient countries' populations indeed has the potential to derail the strategic objectives motivating Chinese international assistance. Despite its obvious negative effects on China's soft power, such negative public opinion could constrain the political choices of leaders and make adherence to new Chinese foreign aid and development projects politically unviable. While we expect such effect to be the strongest in democratic regimes, it will likely play a partial effect on determining governmental stances towards China in all but the most totalitarian regimes. The above constraints on leaders would threaten China's other strategic objectives tied to international assistance by limiting its hard influence

abroad and limiting the dependence of other states on it. It becomes clear that most of the Chinese strategic objectives tied to the BRI, and the provision of development finance more generally, depend on relatively positive perceptions from recipient populations.

Research examining the effects of Chinese development finance on recipient populations' attitudes has significantly expanded since the mid-2010s. However, no consistent theoretical or methodological paradigm has emerged providing consensus on how to effectively approach the study of such a relationship. As a result, existing studies have largely devised approaches deemed appropriate for the specific bounds of their analyses, whether in terms of geography or assistance type. Such studies have adopted widely different methodologies in instrumentalizing populations' exposure to Chinese-funded development aid and assistance and have yielded highly diverging results. While overall public opinion on China has worsened substantially since 2016 and can now be described as strongly unfavorable in most regions, significant regional variations remain (Silver & Huang, 2021), with Latin America standing out in terms of having the most positive perceptions (Armony & Velasquez 2016). Eichenauer et al. (2018) find that when instrumentalizing China's aid flows by their lagged national totals, such flows have no significant overall impact on the country's image throughout the region. However, effects were found to vary based on respondents' age, wealth, and educational status. In Peru, Ratigan (2021) finds weak evidence of a slightly negative effect of Chinese extractive projects, including ones undertaken on a commercial basis, on local perceptions of the country when instrumentalizing exposure through residence in the region in which the project takes place. Blair et al.'s (2022) study of same question in Africa, undertaken by comparing the differences in opinion of the population living within 30 kilometers of the sites of projects funded by Chinese aid and those living further afield, concludes that Chinese aid has no, and sometimes negative effects, on affinity for China. Also in Africa, and when employing a similar instrumentalization of exposure to aid flows, Chen & Han (2021) conclude that interactive effects between Chinese aid projects and recipient populations' party affiliation in shaping their opinion of the donor. Positive images of the donor were found to depend on whether individuals were affiliated with the party in power nationally, as such elites were likely to divert some of the benefits from funded projects for private gains (Chen & Han, 2021). Examinations of BRI approval in Europe

were largely conducted based on media analysis and focused on perceptions of overall foreign aid and development finance programs divorced from the impact of concrete projects tied to it, (Gaspers & Lang, 2016; Turscanyi et al., 2019). From the above review, it becomes clear that existing studies investigating the effectiveness of Chinese aid flows as a tool of public diplomacy employ a large array of methodological approaches and have, so far, not arrived at a unified conclusion, with results varying vastly based on the region and population being considered as well as the approach being used to instrumentalize such population's exposure to the economic flows of interest. Given the importance of determining the future success or failure of Chinese initiatives such as the BRI, further research investigating the effects of Chinese international assistance projects on perceptions of China among recipient populations is crucial. Through this article, we hope to contribute to such understanding by focusing on a country representing a battleground in the US-China competition for global influence and by employing a novel methodology aimed at measuring populations' exposure to specific aid sites more accurately.

5. Chinese foreign aid and development finance in Ecuador

For our analysis, Ecuador was chosen as the subject of the study. Ecuador has been one of the Latin American countries seeing large inflows of Chinese foreign aid and development finance in recent years. Indeed, according to Ray et al. (2023), it has received the third most such inflows in the region since 2012, surpassed only by Venezuela and Brazil in such a measure. This fact is especially noteworthy given the small size of Ecuador's economy relative to other regional states such as Argentina and Brazil. Furthermore, unlike some of the other countries exhibiting the above characteristic such as, for example, Cuba or Venezuela, Ecuador cannot be said to possess any kind of consistent and solid geopolitical alignment with China. Instead, the country has been actively courted by both China and the United States, with its foreign policy depending largely on the composition of the government in power (Jepson, 2022). On one hand, Ecuador stands as one of only two in the region to have become a full member of the Asian Infrastructure Investment Bank and a signatory to the BRI (Lang, 2021). Under the leftist administration of Rafael Correa, who came to power in 2007, Ecuador signed agreements leading to a total debt of \$8.1 billion to China in the period going from 2008 and 2016 (Palma, 2021), with a large majority

of such flows tied to the China Development Bank and the China Export-Import Bank. Much of what is owed is due in the form of discounted oil sales (Palma, 2021). During the above period, economic interdependence between the two countries grew rapidly, with trade (mainly in seafood, copper ore, and crude petroleum) reaching historically record amounts by the late 2010s (Monni & Serafini, 2017). The largest development assistance projects in China include the \$1.7 billion Coca-Codo Sinclair hydroelectric dam and the \$570 million Sopaladora hydroelectric dam, both of which were financed by the China Export-Import Bank. As illustrated, the largest share of these flows is tied to the country's power generation infrastructure. During the tenure of the Correa administration, Ecuador also distanced itself from the US on geopolitical issues. Illustratively, Correa forced the closure of the only US military base in the country in 2009, calling it an affront to national sovereignty (Mercopress, 2009). However, the latter's economic dependence on China combined with record levels of indebtedness has since emerged as a concern. Following the ascendance to power of center-right president Guillermo Lasso in 2021, the Ecuadorian government has once again sought to make the country attractive to traditional investors and has aligned closely with the US on international issues such as the war in Ukraine. Following concerns related to dependence on and indebtedness to China, Lasso has also argued for the need to renegotiate Ecuador's debt with the latter, opening the door to a potential shift in relations. In the Fall of 2021, the US announced plans to invest in significant projects in the country in an attempt to offer an alternative to the BRI (Hunnicut, 2021). Developments in the country will hence likely serve as an interesting case study of the dynamics surrounding the effects of the emerging great-power competition on developing states. Central to the question is the public opinion surrounding the issue. While a strong partisan divide has consistently existed on questions of foreign policy alignment in Ecuador and has remained constant during the respective Correa and Lasso administrations, specifically understanding the effects of exposure to Chinese-funded infrastructure projects on local respondents of diverse ideological orientations remains a crucial area of inquiry.

In addition to its relevance as a case study of the effectiveness of foreign aid in an environment of great-power rivalry, the choice to focus on Ecuador yields several methodological advantages. Firstly, the small size of administrative cantons in the country allows for the relatively precise geolocalization of individual survey respondents, which represents a crucial

requirement of our modeling approach, as will be outlined in the sections below. The country has also seen the development of enough project sites tied to Chinese aid and investment to provide the basis for a statistically meaningful study. No comprehensive empirical work has so far investigated the links between the many Chinese foreign aid and development finance projects in Ecuador and the opinions of its citizens on questions related to China. This article will undertake such a task, in an attempt to both provide clarity on the future geopolitical alignment of the country and to contribute to the growing understanding of the effectiveness of foreign aid and development finance as a tool of public diplomacy in the context of great power competition.

6. Hypotheses

Using public opinion data measuring respondents' trust in the Chinese government, we will uncover the different factors that affect responses to such questions among Ecuadorians. This question provides an adequate tool for assessing the overall perception of China and its actions among the country's citizens. Numerous scholars have indeed highlighted the importance of political trust as a key component of legitimacy (Turper & Aarts, 2015). Voters are also likely to assign more trust to governments seen as acting in their interests or along personally approved lines.

As our primary aim relates to assessing the effects of Chinese foreign aid and development finance on public opinion of the country among Ecuadorean citizens, our first hypothesis posits the impacts of projects funded by such development assistance on individuals' appraisal of the Chinese government. While not all foreign aid and development finance provided by China to Ecuador is tied to specific projects, with some for example disbursed in the form of discretionary grants to firms such as Petro Ecuador (Ray et al., 2021), this analysis will focus only on flows tied to geo-localizable infrastructure projects. We contend that such projects are indeed likely to hold the largest influence over public opinion as a result of their observable impact on populations and a usually high degree of mediatization, especially in the case of residents of nearby regions. This is further true as a result of the large-scale and politicized nature of most of the included projects. Half of them are indeed tied to hydroelectric dam projects, with the others representing highway, thermoelectric, wind farm, and knowledge city projects. The analysis will furthermore be restricted to

projects funded by the two main vehicles of China's official developmental assistance, the China Development Bank and the China Export-Import Bank. According to Rudyak & Chen (2021), these two bodies are responsible for the vast majority of China's foreign aid loans and non-foreign aid official loans, the two categories on which this article chose to focus for the reasons outlined above. While the exact breakdown of Chinese development aid and finance by source varies significantly from year to year, the above two organizations have been shown to account for about 80% of China's total outflows in recent years (Chen, 2020). In addition to being the largest two providers of foreign aid and development finance to Ecuador, projects funded by these organisms tend to be large, highly visible, and explicitly tied to the Chinese state goals. Unlike in the case of some previous studies on the topic (see Ratigan, 2021), investments made by Chinese State-Owned Enterprises are excluded from the analysis, as they typically receive less political and media attention and may not always be easily attributed to actions of the Chinese state by survey respondents. In addition, while funding provided through China's development banks typically results from highly political motives, both strategic and economic interests likely play a role in shaping SOE investments, making them imperfect vehicles to assess the potential of the country's development assistance in meeting its geopolitical objectives. While the exclusion of these projects could lead to omitted variable bias in our model if their location was spatially correlated with included project sites, we find this to be highly unlikely. Indeed, much of China's commercial FDI in the country has been tied to extractive industries (Gonzalez-Vincente, 2013), while included projects mostly consist of energy generation ones. Because of the different geographic bases of the two sectors, we assess it to be implausible for China's commercial FDI in the region to be tied to the sites of projects funded through its foreign aid and development assistance. To assess the potential of Chinese foreign aid and development finance to meet its self-proclaimed aims as a strategic tool of influence abroad, we hypothesize that residents living closer to projects funded by Chinese foreign aid and development finance hold the same degree of trust in the Chinese government that those living further away from project sites. This hypothesis will be falsified if the potential of Chinese foreign aid and development finance as a tool of public diplomacy and a vector of soft power expansion is realized, or if negative effects of foreign aid and development finance on local public opinion are demonstrated.

Null Hypothesis 1: Ecuadorians residing close to projects funded by Chinese foreign aid and development finance hold the same degree of trust in the Chinese Government as those residing further away.

7. Data and Measurement

The study bases itself on AmericasBarometer surveys conducted in Ecuador by the Latin America Public Opinion Project (LAPOP) and includes the previous 3 waves of the survey (2014, 2017, 2019) in its analyses. While data from previous waves were available, a decision was made not to use it as a result of the quickly evolving nature of global public opinion regarding China in recent years. Evaluations of China have indeed turned significantly more negative in countries around the world (Silver & Huang, 2021) since the mid-2010s, with evidence also pointing to changes in population-based dynamics shaping individuals' appraisal of the country in many countries throughout the world. As a result, we believe that including data from survey waves before 2014 would risk reducing the applicability of the findings to the current reality of the Chinese global provision of foreign aid and development finance.

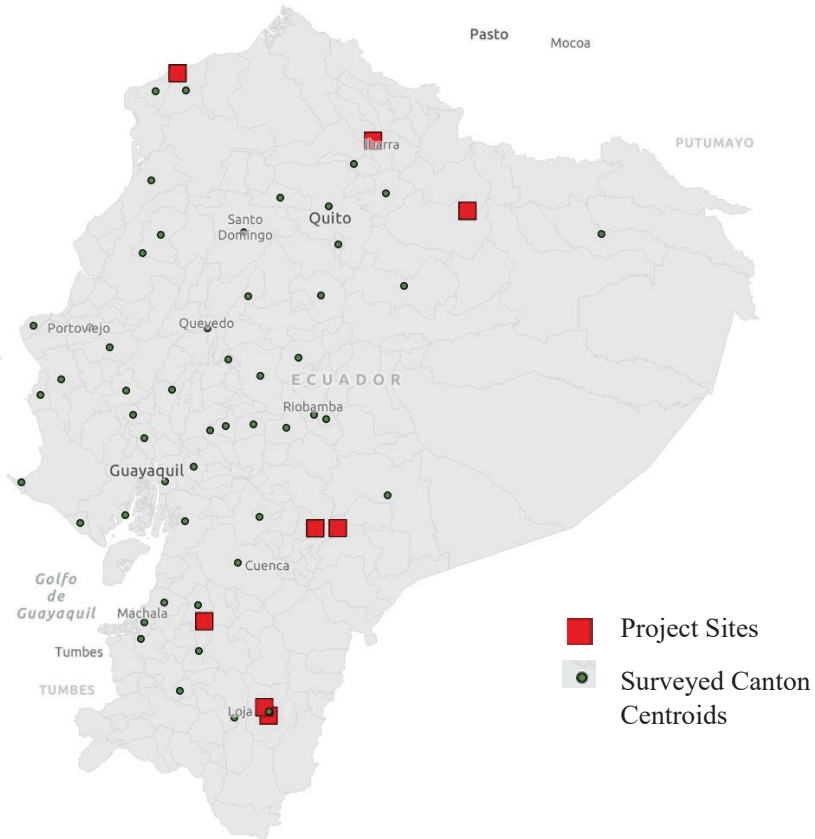
The main survey question used to assess individuals' favorability towards China for the dependent variable is phrased as "In your opinion, is the government of China very trustworthy, somewhat trustworthy, not very trustworthy, not at all trustworthy, or no opinion?" in all three waves of the survey included in the analysis. A decision was made to convert the 4-point Likert scale resulting from this question into a binary variable taking the value of 1 for the answers "very trustworthy" and "somewhat trustworthy", and a value of 0 for the answers "not very trustworthy" and "not at all trustworthy". This was decided on the basis that foreign relations, and trust in the Chinese government more specifically, likely represents an issue of low salience for a vast majority of the population who possess relatively little knowledge on the issue. As a result, we believe that the distinction in views between those expressing general trust or mistrust in China holds more empirical relevance than consideration of differing expressed degrees of trust or mistrust. This reality is likely further strengthened as a result of the political polarization and highly binary views on the question prevalent on the Ecuadorian political scene.

Exposure to projects funded by Chinese development assistance was measured through the distance of each respondent to sites of projects funded

by Chinese foreign aid and development finance. As mentioned earlier, such projects were limited to those tied to formal official finance provided by China's main two providers of such funding, the China Development Bank and the China Export-Import Bank. Furthermore, funding not geographically tied to specific project locations was excluded. Locations and characteristics of projects fitting the above characteristics were obtained from Ray et al. (2021). An exposure variable was then calculated based on a postulated linear relationship between the distance from a project and the resulting exposure to it. It was further assumed that proximity to projects involving a larger amount of Chinese finance led to a higher degree of exposure, as such projects typically receive more publicity and diffuse more benefits locally. The exposure resulting from any given project was hence assumed to take on the total dollar amount of Chinese foreign aid and development finance disbursed to such project at its exact location and to decrease linearly as distance from the project increases, before reaching a value of 0 at a distance of 100km from the project. This distance represents our assumption of the distance at which individuals' opinions are no longer significantly affected by proximity to project sites. It was obtained using previous research examining the effects of spatial proximity to political events on the formulation of political opinions in the United States (Wallace et al., 2014), and adjusting such estimates based on road network quality and resulting transit times using data from the World Economic Forum (2019). The localization of survey respondents was done based on the "Municipio" variable included in all three waves of the LAPOP survey used. This represents the lowest level of geographic identifier used in the survey, with a resulting classification of respondents into one of 221 Ecuadorian cantons. As the precise location of respondents within their canton remained unknown, all were assigned to the centroid of the polygon representing the canton in question. The value of the above-described exposure variable at such centroids was then obtained and applied to all survey respondents assigned to the centroid in question. It is important to note that the exposure of individuals does not necessarily stem from only one project. Often, the final exposure score assigned to a respondent represents the sum of exposure scores from several projects, each within a 100km radius of them. The location of the infrastructure sites tied to Chinese foreign aid and development finance included in the research, as well as the centroids of cantons containing surveyed individuals in relevant waves of LAPOP are

shown in Figure 1. Summary statistics of the resulting exposure variable, “Project Influence”, are shown below in Table 1.

Figure 1. Chinese-financed sites (Red) and Surveyed Canton Centroids in Ecuador (Green)



We believe that the above approach to representing exposure from projects tied to Chinese foreign aid and development finance represents a significant methodological improvement compared to previous studies having been undertaken on the question. In much of the past literature, exposure has indeed been represented with a binary variable taking a value of 0 if the respondent is located outside of a certain national political subdivision or beyond a certain distance from a project site, and a value

of 1 if they are located within it (Ratigan, 2021; Chen & Han, 2021; Blair et al., 2022). This does not account for the fact that, even within such subdivisions, which are often geographically expansive, individuals residing near project sites likely incur significantly higher exposure than ones residing at a significant distance from them. Neither does it allow for the consideration of the combined effects of distance and the magnitude of Chinese disbursement in influencing local populations' exposure to Chinese foreign aid and development finance, leading to the effects of larger projects tied to larger financing being unrealistically represented as similar to those linked to less significant ones. The method used in this paper instead offers a more realistic assessment, based on both distances from a project and such project's magnitude, of the varying exposure of local populations to site-specific Chinese foreign aid and development finance. This approach also allows for a more targeted consideration of influence effects tied to specific project sites compared to methods employed in some past studies that measured variations in national total disbursements over time (see Eichenauer et al., 2018). It is recognized that one limitation of our approach lies in that influence scores for respondents located very close to project sites might be distorted, as the impact of such sites on individuals likely decreases at a greater rate in their immediate proximity, likely at distances below five kilometers. This is however unlikely to alter results since none of the canton centroids fell within such a short distance of project sites.

In attempting to control for the role of ideological and socio-economic characteristics in affecting individuals' favorability towards China, several additional variables from the LAPOP survey were used. To measure respondents' income, the question asking, "In which of the following ranges does the monthly income of your family fall, including remissions from abroad and the income of all the adults and children working?" was used. The resulting variable is categorical, with 16 possible income ranges included, in addition to the "Do not know" and "Do not wish to answer" options. To measure respondents' educational attainment, a question asking, "What was the ultimate year of education that you completed?" was used. Responses are once again categorical, with 19 possible levels of educational attainment in addition to "Do not know" and "Do not wish to answer" options. Finally, to measure the extent to which favorability towards the United States is tied to lower favorability towards China, a question asking about respondents' level of trust towards the United States

government was used. This question was phrased as “In your opinion, is the government of the United States very trustworthy, somewhat trustworthy, not very trustworthy, not at all trustworthy, or no opinion?”. Responses were categorized on a 4-point Likert scale including the answers “very trustworthy”, “somewhat trustworthy”, “not very trustworthy” and “not at all trustworthy”. All of the above survey questions did not vary in wording or terms of response scales between included survey waves.

Variables controlling individual characteristics were also included in the model. A gender variable was included, which took the value of 1 if the respondent was male and a value of 2 if they were female. An age variable taking the age of the respondent in years as its value was also included. Personal ideology was also controlled through the inclusion of a question asking respondents to rank themselves on a scale ranging from 0 signifying “left” and 10 signifying “right” in terms of political vision. A satisfaction variable was also included, asking the extent to which a respondent is satisfied with the state of democracy in their country. Responses to this question consist of a four-point Likert scale containing the options “Very Satisfied”, “Satisfied”, “Unsatisfied” and “Very Unsatisfied”. Finally, the degree of respondents’ interest in politics was also controlled through the inclusion of a question asking, “How much interest do you hold in politics: A lot, some, little, or none?”. In addition to such four categories, “Do not know” and “Do not wish to answer” options were included in possible responses. Summary statistics for all included variables are included in Table 1.

Table 1. Summary Statistics of Included Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Trust in China	2,340	2.516667	.872444	1	4
Project Influence	4,567	90.26086	167.863	0	731
Gender	4,558	1.502633	.5000479	1	2
Age	4,551	38.73259	16.39708	16	96
Political Orientation	4,008	5.343812	2.572834	1	10
Educational attainment	4,511	11.1953	3.982805	0	18
Satisfaction with Democracy	4,388	2.500912	.7586589	1	4
Interest in Politics	4,558	2.879772	.9399474	1	4
Income	4,245	7.697527	4.824332	0	16

8. Estimation

As a result of the binary nature of the dependent variable measuring individuals' trust in the Chinese government, a logistic regression strategy was adopted. Our primary explanatory variable consists of our instrumentalization of the influence of nearby projects funded by Chinese foreign aid and development finance. A set of demographic control variables including age and gender was also included. The formal equation of the adopted model is shown in Equation 1.

Equation 1: Model Regression Equation

$$\ln\left(\frac{P(Y_i = 1 | X_i)}{1 - P(Y_i = 1 | X_i)}\right) = \beta_0 + \beta_1 Project_Influence_i + \beta_2 Income_i + \beta_3 Education_i + \beta_4 Trust_In_US_i + \beta_5 \gamma_i$$

In the above equation, $Y_i = 1$ refers to an outcome where an individual expresses trust in the Chinese government and X_i to a vector including the measured characteristics of each individual i . Control variables tied to individual socio-economic, demographic and ideological characteristics are included in the form of a row vector γ_i , with β_5 representing the corresponding column vector of effect coefficients.

9. Results

Odds Ratios derived from the estimation of the above model on a final sample of just over 2,300 observations are shown in Table 1. Independent variables were added over several model iterations to test the robustness of the coefficients of interest. In addition, one model iteration (Model 7) was included for the same reason despite heteroskedastic model residuals not representing a violation of unbiased regression assumptions in logistic regression. The direction of the effects demonstrated by our model, as well as the significance of such effects, was found to be highly robust across model iterations, providing a high degree of confidence that they represent meaningful empirical findings.

Regression output was not separated by survey wave for several reasons. While the overall public opinion of China has decreased significantly over the period for which data is included, with the dependent variable experiencing a decrease from 0.57 out of 1 in 2014 to 0.46 in 2019, no

evidence seems to imply that the effects of the different independent variables included in our study would experience meaningful changes in either direction or magnitude. In addition, the 2019 wave of the survey contains significantly fewer observations than ones conducted in previous waves. As a result of our wish to preserve a sufficient sample size for all years, the decision to pool data from the three waves was made. Finally, while projects included in the analysis were signed before the conduction of the first wave in 2014, their influence over respondents can be argued to be occurring throughout all the waves. However, their stage of planning or construction might differ between such waves. As a result of the fact that we do not distinguish between the influence of such projects in planning, construction, and completed phases, the decision to pool the available data allows for differences between such types of influence to be smoothed out. We believe that this strategy allows us to best capture the average effects of the projects over their planning, construction, and recent post-completion phases. It also likely helps exclude small shocks tied to the above phases. For example, it is likely that certain periods during large infrastructure projects' construction lead to outsized local disruption which could temporarily affect residents' assessments of them. However, this analysis does not aim to capture such temporary effects tied to project implementation. We however acknowledge that expanding the understanding of how the influence of projects on public opinion varies across the above phases remains a welcome area of future research.

Table 2. Logistic Model Regression Results

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 6
Influence	0.999*** (0.001)	0.999*** (0.001)	0.999*** (0.000)	0.999*** (0.000)	0.999** (0.029)	0.999** (0.027)	0.999** (0.030)
Gender	0.765*** (0.001)	0.757*** (0.002)	0.736*** (0.001)	0.749*** (0.002)	0.778** (0.013)	0.786** (0.021)	0.786** (0.021)
Age	0.989*** (0.000)	0.991*** (0.002)	0.993** (0.018)	0.993** (0.019)	0.993** (0.045)	0.994* (0.073)	0.994* (0.075)
Income		1.013 (0.181)	1.013 (0.231)	1.012 (0.256)	1.018 (0.107)	1.019 (0.105)	1.019 (0.105)
Eudcation		1.032** (0.015)	1.023* (0.097)	1.018 (0.202)	1.015 (0.309)	1.027* (0.077)	1.027* (0.076)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 6
Trust in US			0.715*** (0.000)	0.720*** (0.000)	0.718*** (0.000)	0.703*** (0.000)	0.703*** (0.000)
Political Interest				0.854*** (0.002)	0.865*** (0.007)	0.866*** (0.009)	0.866*** (0.009)
Ideology					0.945*** (0.004)	0.943*** (0.003)	0.943*** (0.004)
Satisfaction with Democracy						0.671*** (0.000)	0.671*** (0.000)
N	2335	2157	1958	1958	1738	1689	1689
Standard Errors Robust	Standard	Standard	Standard	Standard	Standard	Standard	Standard

Exponentiated coefficients; p-values in parentheses

* $p < .10$, ** $p < .05$, *** $p < .01$

Our discussion of results will focus on Model 6, which represents the model iteration containing all independent variables. To refute Null Hypothesis 1, we would need to establish that individuals influenced by projects funded through Chinese development assistance programs hold either significantly less or significantly more trust in the Chinese government than those less influenced. Our model finds significant evidence that the influence of projects financed by Chinese foreign aid and development finance is negatively tied to the level of trust expressed by individuals towards the Chinese government. An individual perceiving a 1-unit higher influence from such projects indeed has 0.999 times the likelihood of expressing trust towards the Chinese government than one perceiving a 1-unit lower degree of influence. While this effect might seem small, it must be considered given the continuous nature of the influence variable, which contains values ranging from 0 to 731. These findings constitute significant evidence that Chinese development assistance tied to specific projects negatively influences nearby residents' trust in the Chinese government, allowing us to refute Null Hypothesis 1.

Many of the other control variables included in the model were also found to hold significant effects on the likelihood of an individual expressing trust toward the Chinese government. Older individuals, as well as female respondents, were found to be less likely to be favorable towards the latter,

with the latter effect stronger in significance. Political ideology was also found to hold significant effects through several variables. Individuals identifying themselves as holding more right-wing ideologies were found to be less likely to express favorability towards China. In parallel, those expressing higher degrees of satisfaction with the state of democracy in Ecuador were similarly less likely to express trust in the Chinese government. Both of these effects were strongly significant. Those stating one higher degree of interest in politics were also 0.866 times as likely to express such trust as those expressing lower degrees of interest on the same measure. Educational attainment was found to have a weakly significant, but positive effect on the likelihood of individuals expressing trust toward China's government. Individuals having attained one more year in education have 1.027 times the likelihood of expressing such trust than ones having spent a year less. In contrast, income was found to have no significant effect on the likelihood of an individual expressing such trust. Respondents expressing one level of higher trust towards the U.S. government on the four-point Likert scale containing responses to the relevant survey question were indeed found to have 0.703 times the likelihood of expressing trust towards the Chinese government relative to ones expressing a one-degree lower trust towards the former. This likely reflects the fact that the two countries often represent competing influences and developmental visions in much of the developing world.

10. Local Impacts of Chinese-funded Projects

The local impacts of projects funded through Chinese foreign aid and development finance must be examined to explain their negative impacts on the favorability expressed towards China by nearby populations. The developmental aspects of such projects remain the subject of contentious scholarly debate. Some authors highlight the many positive opportunities brought to receiving countries by Chinese foreign aid and development finance funding under programs such as the BRI, arguing the latter to be a leading example of win-win international cooperation (Khan et al., 2018). Others have adopted more skeptical approaches, showcasing the self-interested and market-seeking nature of Chinese development assistance, and pointing out its limited benefits for local populations (Venkateswaran, 2020). Specifically, the lack of local labor participation and capture by local elite interests represent common complaints identified as having been voiced

in opposition to projects funded by China. Finally, some scholars adopt a middle-ground approach, pointing out the divergent outcomes tied to Chinese infrastructure investment (Chen & Li, 2021). Regardless of the above divide, clear empirical evidence exists regarding local opposition to BRI projects (Parepa, 2020). Our results provide additional support for the existence of such opposition.

In the context of Ecuador, it is clear that individuals living near the site of a project funded by official Chinese foreign aid and development finance express less trust in the Chinese government. This can, at first glance, be surprising given the nature of such projects. Out of the nine projects included in the analysis, seven pertain to energy generation infrastructure, with one consisting of transportation infrastructure and one tied to the development of a university campus (Ray et al., 2021). Among the ones tied to energy generation, the majority of funding was used to build hydroelectric dams and generating stations. These projects in particular are associated with significant sustainability challenges and have been shown to cause large-scale disruption to local communities. In addition, even in the country's rural regions, a near totality of Ecuadorians possess access to electricity, with only a limited increase in recent years (World Bank, 2021). While Ecuador's power generation capacity has increased substantially as a result of generation projects funded through Chinese foreign aid and development finance (Energy Information Agency, 2021), benefits tied to this may not have been directly perceptible to local populations.

In contrast, negative local effects from the above projects have been apparent and have sometimes led to significant opposition from local populations. Specifically, localized protests have erupted several times as a result of perceived environmental degradation surrounding projects (Carvalho, 2019). Further areas of local grievance include uncompensated land grabs and unmet promises concerning local employment and development (Carvalho, 2019). These concerns about the lack of opportunities and positive spillover provided by projects for local populations reflect ones expressed globally about BRI projects and Chinese foreign aid and development finance. In the case of Ecuador, our results suggest that they overpower the perceived benefits of the infrastructure developed. In such a case, while it remains possible that Chinese development assistance remains an attractive tool for national political and economic elites, it seems unlikely that it can fulfill its envisioned role as a

vector of broad-based influence and public diplomacy.

11. Diverging Elite Opinions

Our findings showcased that the effects of income on support for the alternative political and development model represented by China and its activities in the country failed to meet our significance threshold. However, educational attainment was significantly tied to an increased likelihood of expressing favorable opinions toward China. This likely reflects the diverging perception of Chinese development assistance among economic and political elites. Much existing research has identified the outsized support from the economic and political elites of recipient countries towards Chinese development assistance. The lack of oversight and regulation associated with such funding has indeed allowed some elites to engage in rent-seeking behavior (Hillman & Sacks, 2021). In addition, attracting Chinese BRI projects has been used to further the political legitimacy of Latin American leaders by helping them perform well on metrics such as economic growth (Oliveira & Myers, 2021). As a result of such factors, projects such as the BRI have been argued to socialize the national elites of recipient countries towards the acceptance of Chinese norms and behavior (Tudoroiu, 2020). In addition to the above benefits, elites do not necessarily reside in proximity to relevant project sites, leading them to be further removed from the negative local impacts outlined in the above section. It is important to note that political and economic elites do not only include nationally prominent politicians and businessmen. Instead, benefits from Chinese foreign aid and development finance can trickle down to a large number of individuals with ties to government or business entities. Although the positive effect of income on favorability towards China did not meet our significance threshold, the success of the above socialization efforts help explains our results.

The academic sector has been another area of intense outreach for the Chinese state. Indeed, attempts to foster closer ties with academic institutions in many countries around the world have been seen as a way to foster positive perceptions among future influential individuals (Yang, 2021). In Latin America, such activities have included the development of many Confucius Institutes promoting the Chinese language and culture in universities around the continent (He, 2019). We suggest that the higher likelihood of individuals with higher educational attainment expressing trust

towards the Chinese government likely, at least partially, reflects the success of such initiatives targeting specific demographic groups identified by the Chinese governments as potential vectors of political influence.

12. Ideology and Competing Developmental Visions

Our results provide significant support for the view that the United States and China provide alternative development paths and visions in the eyes of many residing in developing countries. Individuals expressing higher degrees of trust towards the U.S. government indeed express significantly lower trust in the Chinese one. This effect is noteworthy both for its high degree of significance and its size. Extensive texts have identified the above two states as engaged in significant competition for influence across Latin America (Paz, 2012), and specifically in Ecuador (Ordonez, 2021). The above result provides evidence for the internalization of such a situation by local populations in the latter country. To respondents in the LAPOP survey, favorability for one of the powers was seen through a zero-sum lens with support for the other.

Personal political orientation was further found to hold a significant effect on expressed trust for the Chinese government. While the ideology variable was included as a control in our model, it is interesting that it represented one of the most significant variables associated with one of the largest effect sizes. Specifically, individuals self-identifying as more politically right-wing were less likely to express favorable views of China. In Ecuador, this is likely linked to the strong ties between the leftist administration of Rafael Correa, which was in power until 2017, and China. Towards the later years of this administration, opposition voices raised their criticism of such ties, arguing that indebtedness towards China was reaching dangerous levels (Kraul, 2018). Guillermo Lasso, the right-wing president of Ecuador elected in 2021, further continued such criticism and has attempted to re-orientate his country towards its traditionally strong ties with the U.S. (Dube, 2021). As a result, political ideology and favorability towards the US have likely worked in mutually reinforcing manners in Ecuador. Individuals expressing right-wing political positions and trust in the US government are likely critical of both the leftist Correa administration and China. Evidence from our model provides strong support for such a suggestion.

13. Conclusion

Our findings suggest that Chinese development assistance, which has become increasingly prominent as a result of the BRI, lacks the potential to act as a significant vector of Chinese influence and public diplomacy in Ecuador, a country representing a case of a key battleground in the current competition for influence between the great powers. Characteristics tied to such projects, such as their lack of oversight and regulation have likely led to opposition towards them, and a resulting loss of favorability towards China, from local populations. Our findings suggest that, as the distance to a relevant project decreases, such opposition becomes stronger, as a result of the stronger diffusion of negative externalities tied to the projects combined with disillusionment tied to unmet promises. This is likely particularly significant in infrastructure projects such as dams which are often tied to significant local disruption and environmental challenges. In contrast, our findings suggest that individuals with high educational attainments and higher incomes do not share such distrust of the Chinese government. This suggests the relatively higher success of Chinese outreach efforts tied to elite socialization and educational outreach. Finally, we find support for the hypothesis that populations of countries recipient of Chinese foreign aid and development finance view the U.S. and China as providing competing political and developmental models. It is important to note that the different mechanisms through which the observed results occur should not be considered in isolation, but rather constitute mutually contributing factors explaining them. As a result of the complexity of concepts such as soft power and favorability, a search for a single causal pathway is likely to be a fruitless endeavor.

The main limitation of this study stems from the high rate of nonresponse (49%) to the survey item examining trust towards China. While this likely reflects the relative lack of knowledge and opinion of the question from many Ecuadoreans as a result of the relatively recent rise in the importance of China in the country, respondents omitting to answer the question may differ in significant ways from those providing answers to it. An investigation of the differences between the above two groups of individuals represents an avenue for further research. Despite this, our research suggests that concerns surrounding the potential of programs such as the BRI to act as Chinese soft power tools are overstated. Instead, to better understand Chinese political influence, future researchers and

policymakers should focus on the vectorial nature of Chinese outreach targeting the academic sectors and politico-economic elites.

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