

Win-Win? The China-Pakistan Economic Corridor and its Impacts on the Pakistani Economy

David Landry

Abstract

Chinese mammoth investment projects abroad, and especially those under the Belt and Road Initiative (BRI) umbrella, are receiving heavy scrutiny in academic and policy circles. However, there is insufficient empirical evidence to evaluate their impact. This paper employs a difference-in-differences approach and a pair of new datasets on government spending and economic activity compiled by the World Bank to examine the local impacts of the Chinese-Pakistan Economic Corridor in Pakistan. It finds that the 2013 announcement of CPEC was accompanied by a disproportionate increase in government spending in CPEC districts. However, in the six years after it was first announced, CPEC has not directly contributed a significant increase in economic activity in the districts along its path.

Keywords: Development Finance; Foreign Direct Investment; Public Spending; Economic Development; China; Pakistan

Win-Win?
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Pakistani Economy**

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Foreword

While the past decade has witnessed a dramatic increase in analysis of China’s capital flows to developing countries, a persistent disconnect exists between the ways these flows are characterized within China and abroad. In China, state media consistently emphasizes the development impact of Chinese loan and investment flows to developing countries. In the United States, academic and media discourse on Chinese capital outflows tend to emphasize their debt and geostrategic implications, often neglecting the ground-level impact that these flows have on recipient-country spending, infrastructure, and economic activity.

Nowhere is this disconnect more pervasive than in the case of Pakistan. Ever since China first announced the China Pakistan Economic Corridor (CPEC)—a USD 62 billion infrastructure investment plan aimed at linking Western China to the Pakistani port city of Gwadar—Chinese media has billed the project as a “cornerstone for growth in Pakistan.”¹ But while external analysts have produced no shortage of literature decrying the geostrategic impact of China’s massive spending on Pakistani infrastructure, China’s claims regarding the economic impact of this spending have gone largely unexamined.

This study, commissioned by CGD and authored by Dr. David Landry, seeks to address this gap in the literature. Using a difference-in-differences approach on two new World Bank datasets, Dr. Landry provides a descriptive analysis on how CPEC’s announcement impacted both Pakistani spending and economic activity at the sub-national level. The author finds that while the Pakistani government spent significantly more on CPEC-adjacent districts following the project’s announcement in 2013, little of said spending has resulted in economic activity gains to date.

These findings raise several key questions that will require further analysis in the coming years. Why did China’s announcement of infrastructure trigger such a shift the Pakistani government’s domestic spending habits? How have non-CPEC-adjacent districts fared following this shift in Pakistani government spending? And why have the prospects of increased Pakistani and Chinese government investment failed produce economic activity gains in CPEC-adjacent districts? While this study offers little more than a glimpse into the localized effects of Chinese foreign development initiatives, it provides a novel model with which to investigate the impact of Chinese development finance on recipient countries at the sub-national level. Moreover, it provides a framework for engaging China’s own narrative of international development, focusing on the actual recipients of Chinese development spending, rather than its geopolitical context.

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¹ <https://www.globaltimes.cn/page/202104/1221462.shtml>

1. Introduction

Chinese mammoth investment projects abroad, particularly under the aegis of the Belt and Road Initiative (BRI), are receiving heavy scrutiny in academic and policy circles alike. Many have asserted that the BRI's developmental impacts in partner countries will be minimal, but that it will saddle these countries with unsustainable debt levels. While much has been hypothesized with regards to China's incentives for undertaking these projects, and their consequences for its counterparts, little empirical research on the topic exists. This paper helps fill this gap by investigating the local implications of Chinese economic engagement in Pakistan. More specifically, it explores the local impacts, at the district level, of the announcement of China-Pakistan Economic Corridor (CPEC) on government spending and economic activity.

CPEC is a collection of Chinese projects in Pakistan that fall under the umbrella of the Belt and Road Initiative and constitute a critical cog in Beijing's vision for it. The China-Pakistan Economic Corridor was first agreed upon during a visit of Chinese Premier Li Keqiang to Pakistan in May 2013 (Macfie, 2013). CPEC primarily aims to link the Pakistani port of Gwadar and the Chinese city of Kashgar. CPEC includes projects as diverse as highways, railways, fiberoptic networks, and a deep-water port in Gwadar. According to an announcement by the Sindh Governor in April of 2017, investments under the CPEC umbrella are eventually supposed to total USD 62 billion (Rafiq, 2017). While some of the announced projects are already finished, others exist purely on paper (Hillman and McCalpin, 2020).

Though CPEC, Islamabad aims to improve Pakistan's infrastructure to generate economic growth (Mardell, 2020), while solidifying its ties with a key regional actor. Just before a meeting with Chinese President Xi Jinping in early-2014, Pakistani President Mamnoon Hussain said: "Friendship with China is the most important pillar of our foreign policy and security policy" (Tiezzi, 2014). For Beijing, CPEC brings more direct access to the Arabian Sea in addition to the political advantages derived from an improving security environment in a close ally (Mardell, 2020). There is little doubt that the Chinese government also sees CPEC as an opportunity to expand its influence over Pakistan. Another key consideration for Beijing in undertaking CPEC—much like the BRI as a whole—is domestic overcapacity. Chinese industrial output exceeds domestic demand. By investing in large-scale infrastructure projects abroad, China can funnel idle capital into projects that can help solve this issue.

As China's investments around the world continue to grow—especially as part of BRI—there is a growing gap in research on the impacts of Chinese projects abroad. Thanks to two new datasets on subnational government spending and economic activity in Pakistan produced by the World Bank, this paper helps bridge this gap. Through a better understanding of the economic impacts of CPEC in Pakistan, this research makes a significant contribution to the existing literature. It adds to the literature on Chinese economic engagement abroad and the wider debates on the impacts of this engagement on government spending and economic activity. It also contributes to the broader literature on the determinants of government spending, the drivers of economic development at the

subnational level, and the links between the two. Finally, this paper is among the first to make use of two unique and innovative datasets—on subnational government spending and economic development—recently published by the World Bank.

The key finding of this research is that the announcement of CPEC was associated with a shift in Pakistani government spending towards districts along the corridor in the year after it was first announced. This implies that, as resources are limited, government spending prioritized CPEC districts over the rest of the country during the fiscal year that followed the corridor's announcement. In total, CPEC districts saw a 21 percent greater increase in total government spending than their non-CPEC counterparts between 2012-13 and 2013-14. The difference was particularly large with regards to infrastructure spending—at 95 percent. These spending shifts might have been aimed at facilitating the development of CPEC projects through complementary infrastructure spending, or simply to spur local support for the corridor. With regards to economic activity, this paper does not find that CPEC districts experienced any significant boost in economic activity compared to their non-CPEC counterparts after the corridor was announced in 2013. While CPEC districts fared better economically than their counterparts after 2013, this effect becomes negligible after controlling for government spending.

Pakistan is a particularly apt case to explore questions of subnational government spending, given that tensions between Pakistan's central government and its provinces over the distribution of authority and resources date back to the country's inception, and have prompted some of its most traumatic upheavals, including the 1971 secession of Bangladesh. Many of the country's leading political parties have long demanded increased autonomy for the provinces. Finally, in 2010, the Pakistani National Assembly unanimously passed the 18th Constitutional Amendment, which devolved most of the country's tax revenues and expenditures to the province- and district-levels, into law (Beyer and Landry, 2018). While data on total sub-national spending is limited, in Pakistan, provincial spending alone accounts for roughly a quarter of total public expenditure (Mehmood and Sadiq, 2010).²

The next section of the paper discusses the wider literature on government spending and economic development in addition to that on the development effects of Chinese economic engagement abroad. The following sections introduce the paper's research questions and hypotheses and the data and methodology used to test them. The results of the paper follow, along with an in-depth case-study of Mansehra district and the Suki Kinari Hydropower Project. Finally, the concluding section discusses avenues for future research in this field and the implications of this research for scholars and policymakers.

2. Literature review

The empirical literature on the local impacts of Chinese economic engagement is relatively limited. While rich case studies going back decades explore the effects of Chinese projects worldwide, only recently have scholars begun to employ quantitative approaches to explore

² As a comparative basis, across the OECD, for example, it makes up a total of just over 40 percent of total public expenditure—and the share is even higher among federal countries (N. A., 2018-2).

these questions. Brazys et al. (2017) find that Chinese aid projects are associated with increased local reports of corruption in Tanzania, while Isaksson and Kotsadam (2018) report similar findings for the African continent as a whole. Drawing on a difference-in-differences (DID) approach used by Lenz et al. (2017) to explore the local impacts of the roll-out of an electrification project in Rwanda, Tang and Shen (2019) explore the social welfare impacts of Ghana's Chinese-financed Bui Dam. They find that, while electrification in areas around the dam increased after the project's completion, the benefits were concentrated in relatively wealthy and urban areas. Finally, through the use of a similar DID approach, Matonaro et al. (2020) find that Chinese development projects in Africa have a positive impact on local education and child mortality but no impact on child nutrition.

While the literature on the development impacts of Chinese economic engagement abroad has grown substantially in recent years, it does not yet address the impacts of Chinese economic engagement on government spending at the host country level. Furthermore, no empirical works explore the impacts of Chinese projects on local areas' economic outcomes.

An extensive literature explores the drivers of government spending—in terms of both size and pattern. A broad range of variables have been hypothesized to impact government spending at the national level—78 variables, which explore 23 explanations, according to Facchini (2018). The factors most commonly linked to government spending are economic development (Mueller, 1989; Persson and Tabellini, 1998; and Rehman et al., 2007) and regime characteristics (Cameron, 1978; Persson et al., 1998a and 1998b; and Plumper and Martin, 2003). Much of the literature on the determinants of sub-national government spending highlights the importance of domestic politics, including electoral politics, and finds that governments tend to spend more on politically salient regions (Lindbeck and Weibull, 1987; Svensson, 1997; Lizzeri and Persico, 1998; Polo, 1998; Persson and Tabellini, 1999; and Veiga and Veiga, 2013). The literature on the determinants of subnational government spending is particularly relevant for this work given that, as outlined in the next section, the mechanism through which CPEC is expected to impact district-level government spending is political.

Another pertinent literature explores the drivers of economic development, with an added focus on government spending patterns. Debates on the relationship between government spending and economic development persist, but there is evidence that suggests that a positive link between the two holds in the case of Pakistan (Farooq, 2016). That said, not all government spending is equal. Recent literature finds that fiscal decentralization is conducive to growth. This is rather unsurprising, as decentralization can bring services closer to their intended beneficiaries, move the decision-making process itself closer to the people, and help people hold government accountable for dysfunctional service delivery. The relationship appears to hold with regards to both federalism (Brueckner, 1005; Hatfield, 2015) and decentralization writ large (Martínez-Vasquez and McNab, 2003; Iimi, 2005). Finally, it also appears to hold in the case of Pakistan (Malik, Hassan, and Hussein, 2006; Faridi, 2011; Faridi and Nazar, 2013).

3. Research questions and hypotheses

Given the widespread speculation about the developmental impacts of Chinese economic engagement in the developing world, surprisingly little empirical research explores this question. This is particularly salient given the fact that China is poised to spend upwards of a trillion USD on projects linked to the BRI in the near- to medium-term. To contribute to filling this critical knowledge gap, this paper explores the impacts of CPEC on economic activity. Before doing so, it also explores the impacts of CPEC on district-level government spending in Pakistan. Given the central role of CPEC in Islamabad's vision for development, it would be unsurprising if government spending in Pakistan had been reallocated towards areas where the corridor will run—either to increase popular support for the initiative or to lay the groundwork for CPEC projects in the form of complementary infrastructure development.

- Question 1: Has a district's location along the path of CPEC been associated with an increase in government spending following the announcement of the initiative in 2013?
- Hypothesis 1: The CPEC announcement is expected to be positively associated with government spending at the district level. More specifically, districts that are part of CPEC are expected to have benefitted from a significant boost in government spending between the 2012-13 and 2013-14 fiscal years compared to their counterparts. This relationship is expected to be especially marked at the federal spending level, given that CPEC fundamentally represents a national development endeavor, and with regards to spending on infrastructure, due to the nature of CPEC.
- Question 2: Have districts located in CPEC's path experienced a larger boost in economic activity, measured using nightlight data, than their counterparts in the years that followed the corridor's announcement?
- Hypothesis 2: Being located along CPEC is expected to be positively associated with district-level economic activity in Pakistan. In other words, districts located along the corridor are expected to have experienced a larger uptick in economic activity than their counterparts in the years that followed the corridor's 2013 announcement.

4. Data and methodology

Exploring the economic impacts of projects like CPEC is generally challenging due to the issue of selection bias. As Angrist and Pischke (2009) explain, parsing out pre-existing differences between treatment and control groups (in this case, CPEC and non-CPEC districts) to ensure that an appropriate evaluation of the treatment can be conducted poses particular challenges, especially in cases where individuals or groups can self-select into the treatment. However, as Lenz et al. (2017) explain, a DID approach can help control for unobserved differences between units of observation. This paper employs such an approach

with regards to CPEC. The DID models presented in this paper explores the relationship between a district's location along the path of CPEC and local government spending and economic activity. In other words, the models compare how these variables differed in CPEC and non-CPEC districts before and after the announcement of the flagship initiative.

While the results of some papers featuring DID approaches can be interpreted as causal (Lenz et al., 2017, Matonato et al., 2019), it is important to note that this is not the case for this work. This partly primarily because of data limitations—and especially the fact that both the government spending and economic activity are limited in terms of the time periods they cover. This is also due to the fact that selection bias cannot be ruled out with regards to how CPEC was envisioned. It is very possible that the districts selected to be included in CPEC had common economic or political features differentiating them from their counterparts.

The government spending models presented in this paper can be estimated because of the timing of the initial announcement of CPEC on May 22nd, 2013 (Hameed, 2018), which falls shortly before the July 1st start of the 2013-14 fiscal year. The government spending data source used as part of this paper, the World Bank's Subnational Public Expenditure Database (SPED), covers the 2012-13 and 2013-14 fiscal years—both by spending categories and at different levels of government. It translates expenditure items into meaningful categories of critical public service sectors: debt servicing, education, health, social protection, infrastructure, operational expenses, and others. It combines unprecedented spatial granularity with a relevant and easily understandable taxonomy of expenditure categories, highlighting expenditures in Pakistan by category and by source. The SPED database was created as part of a World Bank pilot project aimed at building a reliable source of information on Pakistan's fiscal decentralization and subnational spending.

This paper also uses a new dataset on subnational economic activity in Pakistan compiled using nightlight data collected through the use of satellites. More specifically, the data, which was compiled at the World Bank by Beyer et al. (2018), uses Visible Infrared Imaging Radiometer Suite (VIIRS) nightlight intensity data to approximate Pakistan's subnational economic activity at an unprecedented level of geographic granularity. Thanks to that dataset, which spans from 2012 to 2019, it is possible to compare the economic trajectories of CPEC and non-CPEC districts using pre-CPEC economic activity as a baseline. It is worth noting that while this data is superior to that collected using traditional satellite imagery (Elvidge et al., 2013), it remains imperfect. A high degree of correlation holds between nightlight intensity and GDP, including at the subnational level, but this correlation is stronger in the cases of manufacturing and services than for agriculture (Beyer et al., 2018). The adjustment of the data carried out by Beyer et al.—as part of which outliers are removed from the sum of lights data and the remaining observations are divided by total geographic area—helps address this limitation (ibid.).

This analysis covers the 110 Pakistani districts for which the data on both subnational public expenditure and nightlight intensity is available. The key predictor variable used in this research is a dummy that captures whether individual Pakistani districts are located along the Kashgar-Gwadar route of CPEC, which was the first reported iteration of the project (see

Figure 1).³ If a district sits along the corridor as envisioned in 2013, the CPEC variable takes a value of one; otherwise, it takes a value of zero. A total of 27 of these 110 districts meet the criterion discussed above. See Appendix A for a table of all districts included in this analysis.

Figure 1. China-Pakistan Economic Corridor



Source: British Broadcasting Corporation (N. A., 2015-3)

Equation 1:

$$\delta y_{it} = \alpha x_i + \beta z_{it} + \gamma x_i * z_{it} + \delta_{it} + \varepsilon_i$$

Where:

- δy_{it} represents the outcome of interest—government spending (log) or economic activity at the district-level.
- αx_i is a dummy variable representing the treatment group—whether a district was located along the path of CPEC as it was envisioned in 2013.
- βz_{it} is a dummy variable reflecting the treatment time—whether an observation took place after the announcement of CPEC.

³ This specific map was produced by the British Broadcasting Corporation (N. A., 2015-3). However, it is based on a map that had circulated for the previous two years and was first published in India Today (Abbas, 2013), and shortly thereafter, in Pakistan Today (N. A., 2013).

- $\gamma x_i * z_i$ is the treatment effect—an interaction term that captures whether a district was part of the announced CPEC path and if the observation took place after its 2013 announcement.
- δ_{it} is a control variable—included in some of the economic activity models—that denotes government spending.
- ε_i is the error term

Table 1. Summary statistics of the data

Variables	Obs.	Mean	SD	Min.	Max.
1. Log Total Spending, 2012-13 (PKR)	110	23.52	1.17	21.20	28.34
2. Log Total Spending, 2013-14 (PKR)	110	23.68	1.13	20.96	28.35
3. Log Social Spending, 2012-13 (PKR)	110	22.05	1.20	19.82	27.21
4. Log Social Spending, 2013-14 (PKR)	110	21.21	4.79	0	27.42
5. Log Infrastructure Spending, 2012-13 (PKR)	110	20.50	3.76	0	26.60
6. Log Infrastructure Spending, 2013-14 (PKR)	110	20.08	4.33	0	25.73
7. Log Federal Spending, 2012-13 (PKR)	110	19.40	3.28	0	25.79
8. Log Federal Spending, 2013-14 (PKR)	110	19.12	3.44	0	25.79
9. Log Provincial Spending, 2012-13 (PKR)	110	18.26	8.96	0	26.73
10. Log Provincial Spending, 2013-14 (PKR)	110	20.62	6.62	0	26.81
11. Log District Spending, 2012-13 (PKR)	110	11.97	11.20	0	28.31
12. Log District Spending, 2013-14 (PKR)	110	7.42	10.71	0	28.33
13. Log SOE Spending, 2012-13 (PKR)	110	21.99	3.88	0	26.32
14. Log SOE Spending, 2013-14 (PKR)	110	22.27	3.91	0	26.20
15. Log VIIRS Nightlight Intensity per KM ² , 2012 (NW)	105	0.69	0.84	0	5.26
16. Log VIIRS Nightlight Intensity per KM ² , 2015 (NW)	109	0.64	0.77	0	3.68
17. Log VIIRS Nightlight Intensity per KM ² , 2017 (NW)	109	0.71	0.82	0	3.99
18. Log VIIRS Nightlight Intensity per KM ² , 2019 (NW)	109	0.72	0.83	0	4.00
23. CPEC (Dummy)	110	0.25	0.43	0	1

Note: The methodology used by Beyer et al. (2018) to compile the 2012 data differed slightly from that employed in the subsequent years included in this dataset, which explains why average economic activity at the district level for 2012 is higher than that of 2015.

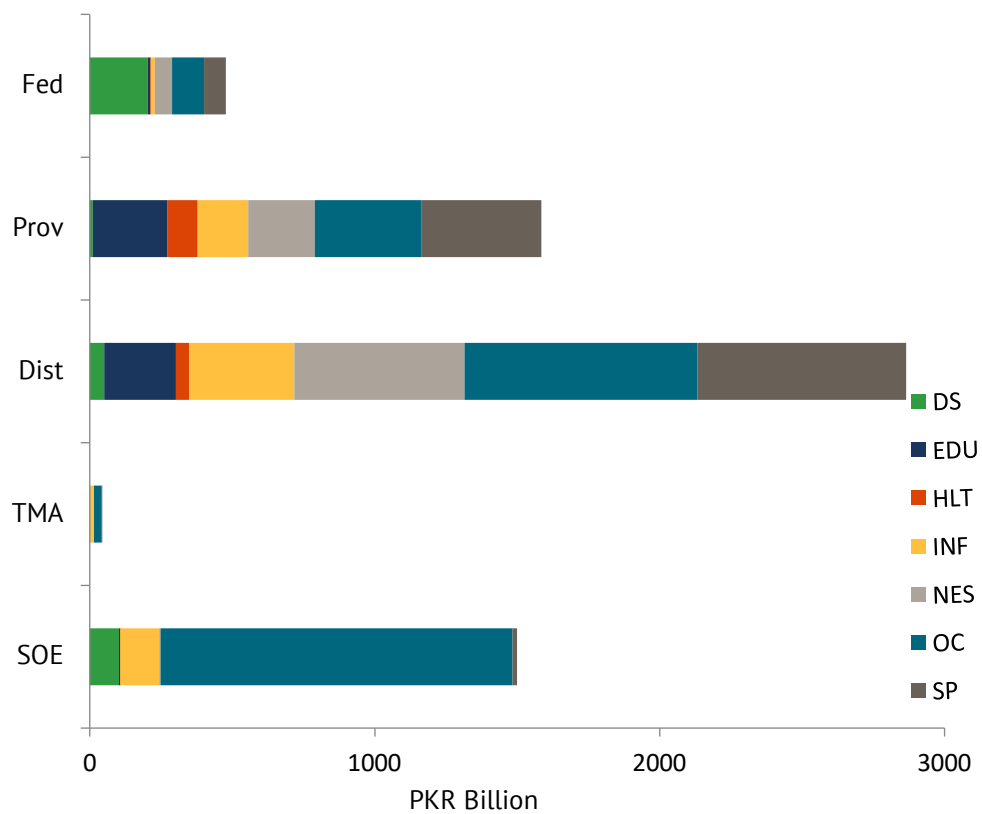
5. Results

5.1 Government spending

Before exploring the relationship between the CPEC announcement and district-level government spending changes in Pakistan, it is worth considering the breakdown of district-

level spending. Federal government spending in Pakistan remains large. According to the Pakistani government, in 2015, it totaled PKR 3,762 billion (roughly USD 3.7 billion), while provincial government expenditures totaled PKR 1,899 (roughly USD 1.8 billion). However, Islamabad does not directly account for a large share of spending at the district-level. The devolvement of fiscal authority in Pakistan, particularly with the 18th amendment, has resulted in province- and district-level spending occupying the lion’s share of the total. State-owned enterprises—both federal and provincial—also account for a substantial slice of district-level spending. See Figure 2 for a breakdown of district-level government spending in Pakistan.

Figure 2. Subnational public expenditure database (2013-14)



Source: Beyer and Landry (2018)

**Results Table 1. District-level government spending by sector
2012-2013 to 2013-2014**

	Total Spending (Log)	Current Spending (Log)	Development Spending (Log)	Infrastructure Spending (Log)
Treatment dummy (CPEC)	0.760*** (0.279)	0.817*** (0.279)	0.996*** (0.345)	1.820*** (0.546)
Year dummy (2013-2014)	0.119* (0.0675)	0.186*** (0.0462)	-0.562** (0.283)	-0.570* (0.290)
Treatment*year	0.187** (0.0914)	0.0946 (0.0763)	0.659** (0.325)	0.666** (0.314)
Observations	220	220	220	220
R-squared	0.109	0.112	0.069	0.056

Robust Standard Errors in Parentheses (Clustered by District)
*** p<0.01, ** p<0.05, * p<0.1

The results presented in Results Table 1 suggest that the announcement of CPEC distorted Pakistan’s government spending at the district level in a variety of ways. More specifically, the announcement of CPEC was associated with a disproportionate increase in total government spending in districts located along the path of the corridor. In other words, government spending disproportionately increased in CPEC districts, compared to their non-CPEC counterparts, between the 2012-13 and 2013-14 fiscal years. Districts located along the originally planned CPEC route saw a 21 percent greater increase in government spending than their counterparts between the 2012-2013 and 2013-2014 fiscal years, all else equal (statistically significant at the five percent level).⁴ The impact of CPEC on government spending varied by spending category. While no noticeable trend emerged with regard to current spending, CPEC districts received a 93 percent greater boost in development spending than non-CPEC districts (statistically significant at the five percent level). Finally, all else equal, CPEC districts saw a 95 percent greater increase in infrastructure spending

⁴ The implied change is computed as $e(\beta_{\text{treatment*year}}) - 1$.

than their counterparts between the 2012-13 and 2013-14 fiscal years (again, statistically significant at the five percent level). Overall, the analysis presented in Results Table 1 points to a realignment of government spending towards districts located along the initially envisioned corridor in the aftermath of CPEC's 2013 announcement, in line with the paper's first hypothesis.

**Results Table 2. District-level government spending by level
2012-2013 to 2013-2014**

	SOE Spending (Log)	District Spending (Log)	Provincial Spending (Log)	Federal Spending (Log)
Treatment dummy (CPEC)	1.560*** (0.518)	4.343* (2.440)	1.725 (1.892)	-1.053 (1.106)
Year dummy (2013-2014)	0.261*** (0.0487)	-5.234*** (1.037)	2.247* (1.224)	-0.555** (0.271)
Treatment*year	0.103 (0.0907)	2.806 (1.711)	0.492 (1.886)	1.122 (0.766)
Observations	220	220	220	220
R-squared	0.033	0.094	0.034	0.011

Robust Standard Errors in Parentheses (Clustered by District)
*** p<0.01, ** p<0.05, * p<0.1

According to the models presented in Results Table 2, the relationship between the CPEC announcement and government spending is not statistically significant when the latter is disaggregated by level. Therefore, the positive association between the CPEC announcement and federal spending predicted in the paper's first hypothesis is not borne out in the models. While, as expected, all the coefficients for all levels of government spending are positive, none of them are statistically significant. That said, the coefficients of interest vary significantly—a seemingly unrelated regression model run using the equations presented in Results Table 2 rejected the null hypothesis that their respective coefficients of interest (treatment*year) were not statistically different. As the results presented in Results Table 2 suggest, the impact of CPEC on federal spending (which has a coefficient of 1.122 with p-value of 0.146) and district spending (2.806; 10.4) is larger than that on provincial spending (0.492; 0.795) and SOE spending (0.103; 0.261). This does align with the national nature of CPEC.

5.2 Income

**Results Table 3. District-level economic activity
2012 to 2015, 2017, and 2019**

	Economic Activity 2012 to 2015		Economic Activity 2012 to 2017		Economic Activity 2012 to 2019	
Treatment dummy (CPEC)	0.429** (0.191)	0.0331 (0.141)	0.429** (0.191)	0.0147 (0.140)	0.429** (0.191)	0.0101 (0.141)
Year dummy	-0.0698** (0.0327)	-0.140*** (0.0499)	-0.0163 (0.0336)	-0.0901* (0.0511)	-0.00741 (0.0329)	-0.0820 (0.0511)
Treatment*year	0.109** (0.0437)	0.0225 (0.0552)	0.177*** (0.0545)	0.0864 (0.0662)	0.186*** (0.0569)	0.0947 (0.0668)
Total government spending (log)		0.515*** (0.0773)		0.539*** (0.0761)		0.545*** (0.0762)
Observations	214	214	214	214	214	214
R-squared	0.071	0.561	0.077	0.584	0.078	0.588

Robust Standard Errors in Parentheses (Clustered by District)
*** p<0.01, ** p<0.05, * p<0.1

The paper's second hypothesis states: "Being located along CPEC is expected to be positively associated with district-level economic activity in Pakistan". The results presented in Results Table 3 fail to confirm that hypothesis. While economic activity, as measured by the VIIRS nighttime database, increased more in districts along the corridor than in other districts after CPEC was announced in 2013, this appears to have been driven by changes in government spending. This suggests that while CPEC districts did not benefit from CPEC itself, they did benefit economically from a boost in government spending that other areas did not receive. While CPEC's lack of direct economic impact fails to support the paper's second hypothesis, the positive link between government spending and economic activity is not surprising. As outlined above, government spending is an important determinant of economic growth in Pakistan. This finding also has important political implications, as government resources are finite. If a government decides to shift spending from one geographical area to another, it can have drastic consequences for millions of people. That is all the more noteworthy because many CPEC districts were comparatively

well-heeled to begin with—as the coefficients of the treatment dummy (CPEC) variable presented in Results Table 3 clearly demonstrate.

6. Case study: Mansehra District and the Suki Kinari Hydropower Project

Of the 110 districts considered in this paper, 27 are located along the corridor as it was initially envisioned. They differ widely in terms of wealth, demographics, and geography. For instance, the district of Lahore, home to the eponymous megacity and its population of about 11 million, has a population density almost 700 times larger than Chagai District, the largest district in terms of total area (44 thousand km²). In order to examine the impact of CPEC in more detail, this research explores the case of a particular district located in the corridor in a more direct and granular way. Mansehra District was chosen for this case study because it is, in many ways representative of districts along the corridor—and will house one of CPEC's early megaprojects, the USD 1.35 Billion Suki Kinari Hydropower Project. Located in the northern Pakistani province of Khyber Pakhtunkhwa, Mansehra is perhaps best known as a popular tourist destination for outdoor enthusiasts. In the context of CPEC, the district is most commonly associated with the Thakot-Havelian section of the Karakoram Highway, which runs right through the district (N. A., 2020-1).

The Suki Kinari Hydropower Project, which is expected to be completed in 2022, only broke ground in 2018. The project is located about 265 km north-east of Islamabad in Mansehra's Kaghan Valley (N. A., 2020-2). It is one of CPEC's "Early Harvest" projects, which are poised to come to fruition as quickly as possible (Zaman, 2020). According to the project's own website, the run-of-the-river Suki Kinari dam will increase Pakistani power generation capability substantially while posing "minimal environmental and social impacts" (N. A. 2020-5)." If past hydropower projects are any indication (see Egge and Milewski, 2002; Bothelo et al., 2017), the reality will be more complicated.

Suki Kinari project was first envisioned in 1960 but had been on the rocks ever since (Zaman, 2020). Finally, it was revived by a Chinese loan commitment of USD 1.35 billion announced in 2014 (Dreher et al., 2017), which was closed three years later (N. A., 2017). Once completed, the Pakistani government will buy electricity at a fixed price from the Sino-Pakistani consortium running the project, which is owned by Chinese SOE China Gezhouba Group Limited and Haseeb Khan Limited (N. A., 2020-4). The project, which is projected to cost a total of USD 1.8 billion (Zaman, 2020), will be operated on a build, own, operate basis (N. A., 2017). After three decades, it will be transferred to the government for the symbolic price of 1 rupee (N. A., 2019). As a megaproject with a planned capacity of 870 MW (N. A., 2017), Suki Kinari has garnered national attention in Pakistan. Over the summer, Prime Minister Imran Khan publicly praised its progress (N. A. 2020-3).

Suki Kinari is located in a remote area of Mansehra (and Khyber Pakhtunkhwa), which is partly why it is such an attractive location for a large hydropower project. That said, the fact that it is located far from urban centers, along with its importance for the government, and the fact that it is Chinese-financed, makes it both attractive and vulnerable to terror attacks.

Khyber Pakhtunkhwa, which shares a long border with Afghanistan, has struggled with terrorism for years, and flagship projects like Suki Kinari are at heightened risk. According to Rehman (2020), CPEC projects are a particularly “attractive” target for jihadists because the economic and political consequences of an attack could be severe.

How did government spending and economic activity change in Mansehra District after the announcement of CPEC? The results are mixed. First, for the fiscal year after the announcement of CPEC, Mansehra experienced a three percent increase in government spending, largely the result of the nine percent boost in SOE spending it received. On the other hand, Mansehra did not experience economic development in the years that followed CPEC’s announcement. It is possible that CPEC helped change Mansehra’s fortunes only after the period covered in this paper’s data (the VIIRS nightlight database only extends to 2017, the year before construction on Suki Kinari started). However, the benefits might not trickle down to households in Mansehra. Even if they do, they may come with an important ecological price tag.

7. Policy implications and recommendations

Pakistan remains mired in a challenging economic situation, and some analysts have argued that CPEC is contributing to the country’s distress (see for example Mardell, 2020 and Hillman et al., 2020). Hillman et al. (2020, p. 1) outline the challenges as follows: “By 2018, Pakistan was again facing unsustainable debt levels and sought assistance from China, Saudi Arabia, and the United Arab Emirates. In 2019, Pakistan received a bailout from the International Monetary Fund, and its economy mostly appeared to be moving in reverse: growth slowed to 3.3 percent, inflation hit a five-year high, and deficits soared. The CPEC is not responsible for all Pakistan’s troubles, of course, but it has exacerbated long-standing challenges.” While that point of view cannot be proven without observing the long-term impacts of CPEC on Pakistan’s economy, the findings presented in this paper do suggest that CPEC has yet to have positive spillovers for Pakistan’s economy.

To boost the positive impact of CPEC and mitigate its negative effects, the Pakistani government needs to put the “well-being of Pakistani citizens at its heart, rather than treat it as expendable in the pursuit of mega-development” (Kovrig, 2017). In too many instances, local livelihoods have taken the backseat in CPEC projects. Fishermen in Gwadar, for example, have reportedly been denied access to the sea (Kovrig, 2018). That would be problematic anywhere, but Gwadar is located in Pakistan’s poorest province, where separatist movements have been active since Pakistan gained independence. Therefore, it is especially pertinent. To make matters worse, when faced with CPEC-related grievances in the past, the Pakistani government has often “opted to respond through crackdowns of anti-CPEC protests, an overbearing security presence, and harassment and intimidation of local residents” (ibid.). The Pakistani government must also pay more attention to the ways in which CPEC might exacerbate economic inequality. CPEC districts were already substantially richer than their counterparts when the corridor was announced in 2013. These districts subsequently got a disproportionate boost in government spending and massive

investment inflows from Beijing. Left unchecked, this risks contributing to acrimony among the regions that were left behind.

The Chinese government views CPEC through a “win-win” prism—President Xi Jinping himself has described it as such (N.A., 2015-2). CPEC is meant to help China resolve the issue of domestic overcapacity and to give Beijing more political clout in Islamabad. Beijing expects Pakistan to benefit from CPEC. As Mardell (2020) puts it, “Chinese wisdom holds that state-driven investment in infrastructure creates economic growth, social stability and an improved security environment.” If Chinese engagement fails to have a positive material impact on the Pakistani economy, however, ordinary Pakistanis might well decide that the conditions that come with the investments are not worth it. To that end, Beijing should “engage the full spectrum of Pakistani stakeholders, from competing elites to the grassroots, as CPEC projects are identified and/or implemented and prioritize job creation for locals” (N. A., 2018-1). That is especially important because there has already been significant opposition to CPEC in Pakistan. This could also lead to more deterioration in Pakistan’s security environment—especially for Chinese actors. In the past year alone, terrorists attacked three Chinese-related projects (Mangi, 2020). In the same vein, Beijing also runs the risk of broader public backlash against China in Pakistan. Anger over the consequences of individual CPEC projects or resentment towards Islamabad over potential disparities could easily turn to broader anti-China sentiment. As Kovring (2018) puts it: “anti-Chinese sentiment is rising in step with suspicions of Beijing’s intentions”. Beijing must also do a better job of ensuring that the corridor brings about positive change for Pakistanis.

8. Avenues for future research

This research examines the impact of Chinese investments on Pakistan’s government spending and economic activity. The results have critical implications for our understanding of Chinese economic engagement abroad, Pakistan’s economy, and development writ large. Broadly speaking, the paper’s results suggest that, as of 2019, CPEC had not succeeded in its objective of stimulating economic activity along the corridor. It also appears as though government spending shifted as a result of the announcement of the corridor and that the economic gains made by CPEC districts were driven by government spending increases.

As discussed in the introduction, little empirical work explores the impacts of Chinese economic engagement abroad. Barring data constraints, it would be interesting to compare the impact of CPEC on Pakistan’s economy to that of Chinese engagement in other countries, and BRI signatories in particular. Given availability of relevant data, a comparative study could be implemented with relative ease. This could help both researchers and policymakers better understand which of the findings presented in this paper are unique to Pakistan and which are more broadly applicable. Other promising research avenues are also available within Pakistan itself. In a first step, researchers could examine whether has not lifted ordinary Pakistanis’ incomes. Furthermore, future research could explore the impact of CPEC on political sentiment, towards either Islamabad or Beijing, among ordinary Pakistani citizens. While the previous section outlines anecdotal episodes of backlash against CPEC or Chinese engagement more broadly, no empirical research explores this link. Additionally, if

enough iterations of the SPED database, the VIIRS nightlight intensity database, and even the Pakistani Social and Living Standards Measurement (PSLM) survey become available, future studies of this kind might be able to confidently identify causal mechanisms. Furthermore, a variation of the analysis presented here could be implemented to explore the impact of proximity to different “routes” of the China-Pakistan Economic Corridor—and beyond—on government spending and economic growth. A variety of CPEC projects are planned outside the original corridor and examining the impact of those projects, especially in comparison to the impact of projects along the original Kashgar-Gwadar route, would be interesting, especially given that that projects outside the original corridor might pose additional challenges (Mohammad, 2017). Finally, as more data becomes available, project completion rates, or Chinese finance figures could be used as an independent variable in future research.⁵

9. Conclusion

There has been much speculation about Belt and Road projects, but little literature empirically explores their impacts. The China-Pakistan Economic Corridor has outsized importance for public perception of China’s Belt and Road Initiative. It is also a key component of bilateral relations between China and Pakistan. The Pakistani government sees CPEC as an opportunity to develop its infrastructure while generating economic growth and employment. To Beijing, it is a way to amass soft power while alleviating domestic overcapacity. This paper presents an analysis of the impacts of the corridor on the economy of Pakistan, particularly with regards to how its announcement related to government spending patterns and whether, subsequently, it contributed to increased economic activity along its path.

Did CPEC’s announcement move government spending to districts along the corridor? Did it stimulate economic activity? To explore these questions, two new data sources compiled by the World Bank were used: the Subnational Public Expenditure Database and Visible Infrared Imaging Radiometer Suite nightlight intensity data collected through the use of satellites to approximate Pakistan’s subnational economic activity. It is worth noting, again, that the results identified in this paper are descriptive in nature, and should not be identified as causal.

This paper finds that the announcement of CPEC was positively associated with aggregate government spending—especially on development and infrastructure. However, CPEC’s announcement was not accompanied by significant increases in specific levels of government spending. Furthermore, CPEC failed to directly spur economic activity in CPEC districts in the years that followed its announcement. While economic activity has increased more in CPEC than non-CPEC districts since 2013, the divergence appears to have been driven by changes in government spending. That is a potential concern for policymakers in Pakistan. The diversion of government spending from non-CPEC to CPEC districts risks fueling

⁵ As of 2020, only 32 of CPEC’s 122 announced projects had been completed, with significant variation between provinces (Hillman et al., 2020). Project completion rates are highest in Punjab (47 percent) and Sindh (45 percent) and lowest in Azad Kashmir, Gilgit Baltistan, and the Federally Administered Tribal Areas, at zero percent (Hillman et al, 2020).

public resentment against CPEC or even the government more generally. That is all the more relevant given that many initial CPEC projects are located in areas of the country that were comparatively prosperous to begin with.

These concerns are likely not unique to Pakistan. While this analysis focuses on the China-Pakistan Economic Corridor, public support is critical to the success of megaprojects worldwide—the same is true in Pakistan, Indonesia, and Madagascar. The true extent of the wider problem might not become apparent immediately, as many of the countries that signed up to BRI suffer from democratic deficits. That said, popular discontent almost inevitably becomes apparent sooner or later. When implementing and managing CPEC projects, Islamabad needs to put the needs of ordinary Pakistani citizens first. Beijing, meanwhile, needs to ensure that projects truly lead to local prosperity—otherwise, “win-win” might be a pipe dream.

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Appendix A. CPEC Districts

District	Province	CPEC
Abbottabad	Khyber Pakhtunkhwa	1
Attok	Punjab	0
Awaran	Balochistan	0
Badin	Sindh	0
Bahawalnagar	Punjab	0
Bahawalpur	Punjab	1
Bannu	Khyber Pakhtunkhwa	0
Barkhan	Balochistan	0
Battagram	Khyber Pakhtunkhwa	0
Bhakkar	Punjab	0
Bolan	Balochistan	0
Bunair	Khyber Pakhtunkhwa	0
Chagai	Balochistan	0
Chakwal	Punjab	0
Charsadda	Khyber Pakhtunkhwa	0
Chitral	Khyber Pakhtunkhwa	0
Dadu	Sindh	0
Dera Bugti	Balochistan	0
Dera Ghazi Khan	Punjab	0
Dera Ismail Khan	Khyber Pakhtunkhwa	0
Faisalabad	Punjab	0
Ghotki	Sindh	1
Gujranwala	Punjab	1
Gujrat	Punjab	1
Gwadar	Balochistan	1
Hafizabad	Punjab	0
Hangu	Khyber Pakhtunkhwa	0
Haripur	Khyber Pakhtunkhwa	1
Hyderabad	Sindh	0
Islamabad	ICT	1
Jafarabad	Balochistan	0
Jakobabad	Sindh	0
Jamshoro	Sindh	0
Jhal Magsi	Balochistan	1
Jhang	Punjab	0
Jhelum	Punjab	1
Kalat	Balochistan	0
Karachi City	Sindh	0
Karak	Khyber Pakhtunkhwa	0

Kashmore	Sindh	0
Kasur	Punjab	1
Kech	Balochistan	0
Khairpur	Sindh	1
Khanewal	Punjab	1
Kharan	Balochistan	0
Kholu	Balochistan	0
Khushab	Punjab	0
Khuzdar	Balochistan	1
Kohat	Khyber Pakhtunkhwa	0
Kurram	Khyber Pakhtunkhwa	0
Lahore	Punjab	1
Larkana	Sindh	1
Lasbela	Balochistan	1
Layyah	Punjab	0
Lodhran	Punjab	1
Loralai	Balochistan	0
Lower Dir	Khyber Pakhtunkhwa	0
Malakand	Khyber Pakhtunkhwa	0
Mandi Bahauddin	Punjab	0
Mansehra	Khyber Pakhtunkhwa	1
Mardan	Khyber Pakhtunkhwa	0
Mastung	Balochistan	0
Matiali	Sindh	0
Mianwali	Punjab	0
Miran Shah	Khyber Pakhtunkhwa	0
Mirphurkhas	Sindh	0
Mohmand	Khyber Pakhtunkhwa	0
Multan	Punjab	1
Musakhel	Balochistan	0
Muzaffargarh	Punjab	0
Nankana Sahib	Punjab	0
Narowal	Punjab	0
Nasirabad	Balochistan	0
Naushahro Firoz	Sindh	0
Nowshera	Khyber Pakhtunkhwa	0
Okara	Punjab	1
Pakpattan	Punjab	0
Panjgur	Balochistan	0
Peshawar	Khyber Pakhtunkhwa	0
Pishin	Balochistan	0
Qilla Abdullah	Balochistan	0
Qilla Saifullah	Balochistan	0

Quetta	Balochistan	0
Rahimyar Khan	Punjab	1
Rajan Pur	Punjab	0
Rawalpindi	Punjab	1
Sahiwal	Punjab	1
Sanghar	Sindh	0
Sargodha	Punjab	0
Shaheed Benazirabad	Sindh	0
Shangla	Khyber Pakhtunkhwa	0
Sheikhupura	Punjab	1
Shikarpur	Sindh	1
Sialkot	Punjab	0
Sibi	Balochistan	0
Sukkur	Sindh	1
Swabi	Khyber Pakhtunkhwa	0
Swat	Khyber Pakhtunkhwa	0
Tando Allahyar	Sindh	0
Tando Muhammad Khan	Sindh	0
Tank	Khyber Pakhtunkhwa	0
Tharparkar	Sindh	0
Thatta	Sindh	0
Toba Tek Singh	Punjab	0
Tor Ghar	Khyber Pakhtunkhwa	0
Umerkot	Sindh	0
Upper Dir	Khyber Pakhtunkhwa	0
Vehari	Punjab	0
Zhob	Balochistan	0
Ziarat	Balochistan	0