Economic Dependence and Support for Political Independence
Evidence from Cross-Strait Relations

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Abstract

It was unclear for either side of the Taiwan Strait what trade integration would imply for cross-strait relations. In this paper we investigate an unconventional type of "China Shock" in the context of Taiwanese export surge to mainland China. Exploiting the unique nature of China-Taiwan relations, we aim to link trade shocks with changes in political preferences among Taiwanese. Our preliminary findings suggest that regions in Taiwan with 10% larger increase in export share to China experienced 2% less of an increase in pro-independence vote shares during 2000-2016. We argue that the effects of trade on political outcomes are likely due to a combination of labor market response to trade as well as direct deterring effects from overall trade dependence.

1   Introduction

It perhaps strikes many as a surprise that there are technically "two Chinas" in the world we are living in: the People's Republic of China as well as the Republic of China, with the latter more commonly referred to as Taiwan. The controversial political status of Taiwan has its long historical roots tracing back to the Chinese Civil War (1927-1949), which resulted in the

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Chinese Communist Party (CCP) taking over mainland China while the defeated Chinese National Party (Kuomintang or KMT) fleeing to Taiwan. Geopolitical tensions across the Taiwan Strait continue post-war. In 1971, the United Nation switched recognition from ROC to PRC as the only legitimate representative of China in the UN.[1] Thereafter most countries in the world started establishing diplomatic relations with the rising PRC, which by nature excludes any formal diplomatic ties with Taiwan.[2] In the meantime, Beijing has been advocating for the "One-China Principle"[3], which insists that both mainland China and Taiwan are inalienable parts of a single China, and refutes any claim that refers to Taiwan as a sovereign nation. The conflict between the two is further amplified by their distinct political regimes, as Taiwan matured rapidly as a democracy ever since its democratic reforms in the late 1980s. The 2016 Taiwan presidential election witnessed a transition of power from Kuomintang to the Democratic Progressive Party (DPP), where the former is viewed as pro-reunification with mainland China while the latter is viewed as pro-independence.

Meanwhile economic-wise the past two to three decades have witnessed an unprecedented growth in trade relations between mainland China and Taiwan, especially following the accession to WTO of China in 2001, and Taiwan just one month later. Back in 1999 China took over the U.S. to become Taiwan's largest trade partner, thanks mostly to the contribution from Hong Kong and Macao SARs. As of 2014, however, mainland alone accounts for up to 26 percent of Taiwan's total export, with the number hitting 40 percent if Hong Kong is included. In 2010, a landmark preferential trade agreement (Economic Cooperation Framework Agreement, or ECFA) was passed under the efforts of the then Ma Ying-jeou-led KMT government, which is thought to be disproportionately structured to the benefits of Taiwan. However, ECFA and its ensuing agreements on service trade have also sparked a heated debate among Taiwanese public regarding their economic and political implications. As polls show[4], many Taiwanese worry that growing economic dependence on mainland China will exacerbate Taiwan's

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[1]See the United Nations General Assembly Resolution 2758.

[2]Today 14 out of 193 UN nations have full diplomatic relations with Taiwan, although many other UN members maintain unofficial relations via representative offices and consulates.

[3]The current policy of the PRC government is the "1992 Consensus", a modified version of "One-China Principle". Under this consensus both governments acknowledge there is only one China. In reality the governments disagree regarding which of the two is legitimate.

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bargaining position regarding its future political status. Overall speaking, the phase of accelerated cross-strait trade integration coincided with a rise of Taiwanese nationalism and increasing support for *de jure* independence from mainland China. This is the main motivation for the initiation of this project.

To put in a more specific way, this paper aims at understanding whether increasing economic dependence on mainland China affects the preference for political independence as well as national identity of Taiwanese. Cross-strait relations prove as a unique setting to study the relationship of between-nation economic dependence and support for political independence. We argue that *a priori* the effect of trade integration on political preferences is ambiguous. On one hand cross-strait trade has become vital for Taiwan's economic growth and prosperity over the years, on the other hand growing trade dependence on mainland potentially poses a threat to Taiwan's *de facto* independent status. As mainland China explicitly intends to draw on its burgeoning economic resources as a way of promoting unification, what worries Taiwanese is how Taiwan's sovereignty could be infringed upon in growing trade interdependence. The convoluted and conflicting nature of cross-strait trade relations is also mirrored in Taiwan's oscillating economic policies towards the mainland, and has always been in the center of debate among its political coalitions.

We follow the existing literature on globalization and the rise of China and evaluate the political response to rising export exposure to mainland China among Taiwanese commuting zones. To give a preview of our main results at the time being, we find that despite the overall growing sentiment of independence from mainland, increasing export exposure to China actually has a mitigating effect on the rise of support for independence in regions of Taiwan. We utilize the notion of Commuting Zones (CZs) as the unit of analysis and measure regional pro-independence level both in terms of vote shares for pro-independence parties and self-reported attitudes collected by social surveys. To put in numbers' term, we find that places with a 10% increase in export share to China saw about 2% reduction in the increase of pro-independence vote shares during the period pf study 2000-2016. 2SLS estimates using contemporary exports to mainland China from other high income countries as an instrument suggest the effects are likely causal. We also look at other related outcomes such as identification with a Taiwanese national identity but find no significant effects.

We intend to provide evidence on potential mechanisms. Consistent with existing literature on the political consequences of globalization, we argue that labor market consequences of trade is one likely channel where workers

affected by trade shocks shift their political views or beliefs. Different from existing literature, we investigate the possibility of direct deterring effects of trade shocks on political attitudes that are potentially unrelated to labor market features. We intend to decompose potential mechanisms and highlight aspects neglected by the literature in our future work.

Our paper is most closely linked to the empirical "China Shock" literature, which analyzes the impacts of rising Chinese exports to the U.S. and Europe (Autor et al., 2016; Caliendo et al., 2019). Alongside the overall gains from global trade expansion are substantial distributional consequences and adjustment costs, with existing empirical evidence on manufacture employment and wages both on the local labor market and on the individual level (Autor et al., 2013; Autor et al., 2014). Moreover, studies have shown that these labor market consequences of "China shock" often further translate to electorial outcomes such as polarization in politics in the U.S. (Dorn et al., 2020), vote for Brexit (Colantone and Stanig, 2018), vote shares for the extreme-right in Germany (Dippel et al., 2020) etc. In a developing country context, Dell et al. (2019) looks into how job displacement resulting from China import competition gave rise to violent crimes and drug trafficking in Mexico. Our paper joins this literature and investigates how increasing trade interactions between two ethnic similar societies like China and Taiwan could potentially affect people's political preferences as well as national identity. We contribute to this literature by looking at the flip side of the conventional China trade shock, given Taiwan's trade relations with China is characterized by a large trade surplus. We also shed light on alternative channels of the effects of trade exposure on political preferences other than the one through the labor market.

Our findings also complement existing studies on identity and nation building. There exists an extensive empirical literature exploring what affects identity choice and nation building, including language use (Clots-Figueras and Masella, 2013), education (Bandiera et al., 2019; Fouka, 2020), migration and inter-regional contact (Bazzi et al., 2019; Cáceres-Delpiano et al., 2021) etc. For the case of Taiwan in particular one study (Chen et al. 2020) has examined how a curriculum reform on history textbooks contributed to the rise of a Taiwanese as opposed to Chinese identity, although they find no significant effects on the support for independence from mainland China. We instead look at rising export exposure to China, and find mitigating effects for the support for political independence yet no significant effects on changes in Taiwanese identity. In addition, a theoretical paper by Grossman and Helpman (2021) incorporates preferences for identity alignments in a simple trade framework and uses it to illustrate how changes in social

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identity patterns can induce changes in trade policies, with the example of the rise of populism and protectionism. While their model assumption focuses on social identity categorization within a single society, we examine a distinct empirical setting where two ethnic-similar societies are faced with politically-incentivized trade deals.

Finally, we contribute to the small literature on conflict and trade (Polachek 1980; Heilmann, 2016). Nations with political conflicts do trade, often times owing to geographic proximity and irresistible market forces. In this paper in particular, we bring together cross-strait issues, which remain largely a geo-political debate, under the lens of economic reasoning. The nature of cross-strait relations allows us to explore the unique question on how economic dependence affects the support for political independence. Moreover, the findings help us better understand the effectiveness of politically-motivated economic policies towards each other for both China and Taiwan. Although China-Taiwan relations have its own long twisted history, cross-strait trade also signifies more broadly trade relations between two distinct types of political regime: autocracies and democracies. Thus our results potentially point at more factors to weigh in shaping future trade relations with China for western democracies, particularly in light of recent politically-motivated trade disputes such as the one between China and Australia.[5]

The paper is organized as follows. In the following section, we provide a brief background introduction of cross-strait relations in both political and economic spheres. In section 3, we briefly describe the data and their sources. In section 4 we examine the political consequences of rising Taiwanese export to China and discuss possible mechanisms. Section 5 concludes.

2 Overview of Cross-Strait Relations

2.1 Political Disputes

The term "Cross-Strait Relations" typically refers to the relationship between the two political entities across the Taiwan Strait: the People's Republic of China, commonly referred to as China or mainland China, along with the

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[5]In June 2021, China took action through the WTO follows Australia's own twin challenges against Beijing's imposition of tariffs on Australian barley and wine, amid deteriorating relationship over a range of issues including Australia's early public calls for an international investigation into the Covid-19 origins and its criticism of China over the crackdown on dissent in Hong Kong and human rights abuses in Xinjiang (Hurst, 2021).

Republic of China, commonly known as Taiwan. The complex relationship between the two and the controversial political status of the latter can be dated as far back as the end of the World War II.

As a result of the First Sino-Japanese War (1984-1985), the islands of Taiwan and Penghu, then under the rule of Qing dynasty of China, were ceded to the Empire of Japan under the Treaty of Shimonoseki. This initiated the Japanese colonization of Taiwan for the following half-century (1895-1945), until Japan's defeat in the World War II. However, the transfer of the administration of Taiwan back to China happened among the turmoil of the Chinese Civil War. With the Chinese Communist Party eventually gaining control of the mainland, the opposing Chinese Nationalist Party, or Kuomintang, retreated to Taiwan and established their provisional capital in Taipei.

The forced relocation of Kuomintang-affiliated military and business communities resulted in a complete cutoff across the Taiwan strait in the ensuing three decades, characterized by military tensions and hostility in the early years. Both sides claimed to be the only legitimate government representative of China, while internationally ROC was replaced by PRC in 1971 for its seat as "China" in the United Nations. Most countries in the world have subsequently adopted the "One-China Policy", under which the PRC is theoretically the sole legitimate government of China.

Facing setbacks in the international sphere as well as growing pro-democracy movements at home, Taiwan underwent a sequence of democratic reforms starting the late 1980s. New parties such as the Democratic Progressive Party sprang up, eventually winning the 2000 presidential election and ending more than five decades of KMT rule over the island. The politics of modern Taiwan takes the form of a semi-presidential constitutional republic and matured rapidly as a democracy.[6] Its multi-party system can be generally characterized by the collision between the so-called pan-blue and pan-green coalitions, with the former being led by KMT who favors closer links to mainland China, and the latter being led by DPP who favors Taiwanese nationalism.

Independence movements have gained momentum in Taiwan post KMT martial law period. In contrast to 1989, when one survey[7] documented that 52% of the respondents reported themselves as Chinese, major polls (ESC 2014, for instance) from 2010 onward show that the majority of the

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[6]Taiwan was rated the 11th place as a "full democracy" by the Economist Intelligence Unit in 2020.

[7]*United Daily News*, Nov. 30, 1989, 6. [In Chinese]

public have viewed themselves as Taiwanese. The same trend is observed on support for independence from mainland as opposed to unification, albeit less dramatic. According to Taiwan's population census in the early 21st century, more than 95% of population in Taiwan are Han Chinese of East Asian ethnicity, while less than 3% are Taiwanese aborigines. During KMT's defeat and retreat period in 1945-1949, an influx of approximate 1.2 million KMT-affiliated soldiers and civilians landed in Taiwan. They are later referred to as *waishengren* or mainlanders as opposed to *benshengren*, which refers to ethnic Chinese that arrived in earlier waves of migration, mostly composed of Hoklo and Hakka people that had lived under the Japanese colonization. Given Taiwan's historical links with mainland and its ethnic composition, we deem identity choice as one of the crucial factors in understanding rising Taiwanese nationalism and wish to understand whether trade with mainland played a role.

Despite the claim by PRC that Taiwan is a breakaway province, the former has never exercised sovereignty over the Taiwan island. Disputes continue, with the PRC seeking to end the *de facto* independence of Taiwan through reunification, and claiming to do so by military force if necessary. While for Taiwan, especially after its democratic reforms in the 1980s, the question regarding its political status has shifted from striving for recognition as the legitimate Chinese government, towards the choice between political unification with the mainland or formal declaration of *de jure* independence. In Chinese this political standing over Taiwan's future national status (FNS) is simply labeled as the standing of *tongdu*, which literally means unification or independence. This, as we will discuss later, would be another key outcome of interest in our subsequent analysis.

2.2   Economic Integration

In the meantime, with the mainland under economic reform in the late 1970s and Taiwan lifting the KMT martial law in the year 1987, cross-strait economic exchanges have become increasingly close. In 1991 Taiwan began allowing direct investment to mainland, taking advantage of the latter's decision to set up special economic zones in coastal cities. However, cross-strait trade and investment didn't really start to take off until China's accession into WTO in December 2001 and Taiwan following one month later in 2002.[8]

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[8]It is documented that China was preventing Taiwan from joining international organizations like WTO. An the end of the negotiation Taiwan was able to join WTO under the name of "Chinese Taipei" (Cho, 2005).

The period of study in this paper is 2000-2016, which incorporates the period where cross-strait trade integration accelerated post WTO accessions. To the benefit of measuring our outcomes of interest, it also nicely coincides with two eight-year presidency terms in Taiwan, with the first half under Chen Shui-bian of the DPP and the second half under Ma Ying-jeou of the KMT. Although Taiwan's economic policies towards mainland during this period have been characterized as oscillatory between liberalization and restriction (Lin, 2020), overall speaking the past two decades have seen an unprecedented economic integration between the two. In 2014, trade values between the two sides reached US$130 billion, with exports from Taiwan to the mainland counted up to US$82 billion.

It is perhaps also worth noting that cross-strait economic integration is characterized by a disproportionate trade dependence of Taiwan on mainland as marked by a large trade surplus, rather than economic interdependence. While in 2014 cross-strait trade accounts for around 22 percent of Taiwan's total foreign trade and up to 30 percent is Hong Kong is included, this is contrasted by a mere 3 percent of Taiwan's share of China's total trade in the same year. Moreover, since 1999 China (combined with Hong Kong) has replaced the United States as Taiwan's top export market. As of 2014 Taiwan's exports to mainland have grown dramatically from none to 26 percent of Taiwan's total exports, or nearly 40 percent if Hong Kong is included (**Figure 1**). As China rises to the global economic powerhouse it has established a far more diversified international trade and investment base than Taiwan, leaving the latter with few alternatives to hedge against economic and political risks posed by the former.

It is no surprise that economic relations with the mainland remains the core debate among Taiwanese parties. Pro-unification KMT argues for economic liberalization to boost Taiwan's economy while pro-independence DPP precautions against the potential political threats posed by increasing economic dependence. Although it is worth noting both parties have modified their stances over the years for broader support. In 2010 the Economic Cooperation Framework Agreement (ECFA) was signed in Chongqing, which is a landmark-type preferential trade agreement that aims at reducing tariffs and commercial barriers between the two sides. However, further attempts for trade liberalization in services by the KMT government were met with prevalent public dissent, which culminated in the 2014 Sunflower Student Movement.[9] Moreover, with the landslide victory of DPP in the 2016 presi-

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[9]The Sunflower Movement is a protest movement led by Taiwanese students and civic groups against KMT's decision to pass the Cross-Strait Service Trade Agreement (CSSTA)
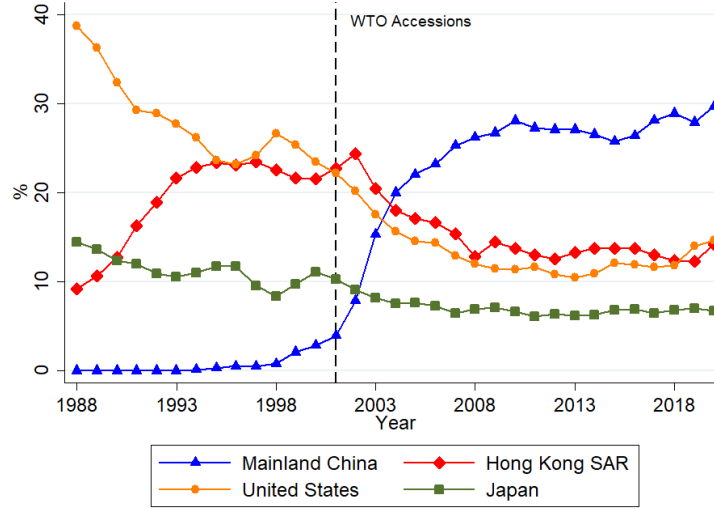
FIGURE 1: TAIWAN EXPORT SHARE BY MAIN DESTINATIONS

dential election and the following one in 2020, cross-strait relations continue to deteriorate. Taiwanese export share to China remains high, yet more calls are heard from the public to address this high export concentration issue out of national security concerns (Lee, 2021). China's decisions in January and April 2021 to block Taiwan's pork and pineapple imports based on arbitrary quarantine reasons related to COVID-19 pandemic are recent examples that support this argument. In addition, tourism-wise the mainland stopped issuing individual travel permits to Taiwan in August 2019, claiming that the decision is spurred by current cross-strait relations.

3 Data and Measurement

3.1 The China "Export" Shock

The data on cross-strait trade volumes are obtained from the trade statistics database of Taiwan's Ministry of Finance. To capture the potential exogenous forces for cross-strait trade integration, we focus on the period with sudden increase in Taiwan's export share to mainland China post WTO accessions (2000-2016). To pin down an industry-level index measuring Taiwan's export "exposure" to China we simply look at the changes in export share:

without consulting the public opinions. It is considered the most severe protest over economic policy in Taiwan's history and successfully halted the government's move.

$$\Delta ES_{k\tau}^{TC} = ES_{kt_1}^{TC} - ES_{kt_0}^{TC} \tag{1}$$

where $\Delta ES_{k\tau}^{TC}$ stands for the change in export share from Taiwan to mainland China (excluding Hong Kong or Macao) as a fraction of all Taiwanese exports to the world. The superscripts indicates the direction of trade while the subscripts stand for industry k over a certain period τ during the entire time span 2000-2016. At the time being our trade data are aggregated at the level of about 23 manufacture industry categorizations in Taiwan. It would be later more desirable to look at trade statistics at a more disaggregated level, with new data at hand (Appendix Part C). A main difference here compared to previous studies such as Autor et al. (2013) is that they typically use export values divided by industry value-added as the source of variation. We argue that in this particular case of cross-strait trade, export shares better grasp the sense of overall economic dependence and thus are more desirable for interpretation purposes. Nonetheless we should look at alternative measures such as changes in export values for robustness checks.

Given there are plausibly spillover effects of trade across industry, the subsequent analysis would be done on the local labor market level to capture the net effects of trade integration. We borrow the concept of Commuting Zones for local labor markets mimicking the example of the U.S. (Tolbert and Sizer, 1996; Dorn, 2009). As illustrated in the Appendix Part B CZs for Taiwan are derived with the canonical implementation of a Hierarchical Cluster Algorithm on commuting patterns of Taiwan obtained from the National Travel Survey.[10]

Taking into account there might be substantial geographic variations in industry specialization, we convert the industry-level export exposure to a regional-level one in the following way:

$$\Delta ES_{j\tau}^{TC} = \sum_k \frac{L_{jkt}}{L_{jt}} \Delta ES_{k\tau}^{TC} \tag{2}$$

where similar in the spirit of Autor et al. (2013), the regional trade exposure is measured using the changes in industry export shares to China, weighted by regional industry specialization. This essentially resembles a "shift-share" structure, where the "shares" L_{jkt}/L_{jt} are the shares of industry k in CZ j's total employment while the "shifts" are simply industry-level China export

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[10]Annual transportation mode survey collected by Taiwan Ministry of Transportation during 2010-2016, with around 20,000 working age population surveyed each year including questions on place of residence and place of work.

shares from equation (1). We collect the information on employment from the Taiwan Industry and Services Census at the beginning of the study period in 2001.

One of the most salient endogeneity concerns of the treatment variable listed in (2) is that there could be industry-specific supply shocks that simultaneously shift exports to China as well as employment in Taiwan. Again following the literature on China import competition (Autor et al., 2013; Dippel et al., 2020) we implement an IV strategy using contemporaneous China export shocks to places that went through similar experiences to Taiwan. To be more specific, we single out the demand side shock stemming from the rise of China and construct the shift-share instrument below using export shares to China from seven other high-income countries[11] during the same period and similarly repeat the process for import shares:

$$\Delta E S_{j\tau}^{OC} = \sum_k \frac{L_{jkt}}{L_{jt}} \Delta E S_{k\tau}^{OC} \tag{3}$$

$$\Delta I S_{j\tau}^{OC} = \sum_k \frac{L_{jkt}}{L_{jt}} \Delta I S_{k\tau}^{OC} \tag{4}$$

It is worth noting that in Autor et al. (2013) these shift-share instruments are constructed using 10-year lagged employment shares for the U.S. The caveat here is that contemporary employment shares might be affected by anticipated trade shocks, and thus lead to simultaneous bias in our estimates. We are, unfortunately, unable to closely examine this concern in our paper as we do not have access to employment shares further back in time for Taiwan. However, this issue is addressed in Borusyak et al. (2018) for the case of the U.S. and using lagged employment shares does not seem to alter the qualitative results significantly.

The same set of trade statistics with China for these other countries are obtained via the UN Comtrade Database at the two-digit Harmonized System (HS) product level. We then convert the product level trade statistics to the SIC industry level using concordance charts provided by the World Integrated Trade Solution (WITS), so that they would be parallel to the trade data we obtain for Taiwan. It is still worth noting here that exact same set of trade statistics for Taiwan is not separately available on the Comtrade Database due to political reasons.[12] Thus a uniform source of trade data

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[11]U.S., Canada, Japan, South Korea, Singapore, Australia and New Zealand.

[12]In the UN Comtrade database statistics for Taiwan are included under the shared entry of *Other Asia*, *nes*, which in principle includes trade volumes for Taiwan as well as any other trade flows without specific reference to origins or destinations.

to construct the treatment and the instrumental variables is desirable yet unfeasible.

Finally, we obtain regional industry employment shares among other demographic and industrial characteristics from various published version of Taiwanese censuses, including the the Industry and Services Census (2001, 2006, 2011 and 2016) as well as the Population and Housing Census (2000 and 2010). We also await additional data sources listed in the Appendix Part C to continue working on the paper.

3.2 Measuring Outcomes

We now move on to our main outcomes of interest. Given the nature of cross-strait relations, we are primarily interested in changes of the regional pro-independence versus pro-unification tendency among Taiwanese commuting zones as a response to changes in mainland export shares.

A natural proxy for this tendency one could think of is the voting outcome. As we've illustrated in the background section, the standing on *tongdu* remains one of the most fundamental cleavages between Taiwanese parties. Thus the first outcome we are evaluating is the vote share for the pro-independence Democratic Progressive Party. Specifically, we obtain township-level vote shares for every Taiwanese presidential election (every four years between 2000-2016) from the Election Study Center (ESC) at the National Chengchi University. There are currently 368 townships in Taiwan, which is the lowest administrative units where vote data are publicly available. To our favor, few changes in terms of administrative boundaries happened throughout our period of study.[13]

To address the concern that vote shares could incorporate various party differences other than attitude towards the mainland, we also look at self-reported political standings collected by various individual surveys in Taiwan. The data on political attitudes and national identity of Taiwanese we are currently using are from the Taiwan National Security Survey (TNSS).[14] The TNSS is a repeated cross-sectional telephone survey conducted by the National Chengchi University under the auspice of the Program in Asian Security Studies (PASS) at Duke University. The sample size ranges from

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[13]In 2004, West District and Central District merged together to form West Central District in the county of Tainan. All other changes are confined to a mere change of names of townships.

[14]Program in Asian Security Studies (https://sites.duke.edu/pass/taiwan-national-security-survey/).

1000 to 1500 every year, and survey data are available for the following years: 2002, 2004, 2005, 2008, 2011-2017 and 2019-2020.

We are most interested in the answers to these two core questions asked in the surveys: one on Taiwanese versus Chinese identity,

> *Some people in our society claim they are Taiwanese, some claim they are Chinese and some believe they are both. Do you consider yourself to be Taiwanese, Chinese or both?*

and one on Taiwan's Future National Status (FNS),

> *Which of the following statements comes closest to your point of view about Taiwan's relationship with the Mainland?*

with possible answers to the latter question including unification as soon as possible, maintain status quo and move towards unification later, maintain status quo indefinitely or decide later, maintain status quo and move towards independence later and independence as soon as possible.

For the question on identity we construct a binary variable that equals 1 if one reports herself as exclusive Taiwanese (Taiwanese and only Taiwanese) and 0 otherwise. For the question on FNS we assign possible answers with a scale of 1-5, with larger number indicating stronger preference for independence, and then normalize to 0-1. The respondents of the TNSS are nicely geo-coded to the township level, which enables us to aggregate individual responses and arrive at a regional average response in accordance with how we observe vote shares. To give some sense of how the political attitudes evolve over time: in 2002, the earliest survey year available, across all townships the average share of Taiwanese surveyed who identify themselves as Taiwanese but NOT Chinese is around 35%. A vast majority still recognized their Chinese decent. By the year 2016 this number has risen to 61%, after adjusting by survey sample size. Similarly in 2016 the share of those who lean towards independence (either choose maintain status quo and move towards independence later, or independence as soon as possible) accounts for about 43%, almost doubling from 23% in the year 2002. Naturally we are primarily interested in understanding what role cross-strait trade played in this rise of nationalist sentiments among Taiwanese during this period.

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4 Specifications and Results

4.1 CZ-Level Analysis

We begin by exploiting the regional variation of China export exposure. Specifically we investigate the regional impacts of exposure to trade integration in the following specification:

$$\Delta Y_{dj\tau} = \alpha_\tau + \beta \Delta ES_{j\tau}^{TC} + \gamma \mathbf{X}_{dj\tau} + \epsilon_{dj\tau}, \tag{5}$$

where $\Delta Y_{dj\tau}$ is the change in the outcome of interest for time period τ that corresponds to township d in commuting zone j in Taiwan, including presidential vote shares for DPP as well as aggregated survey outcomes. We estimate the model both in a long-difference fashion spanning out the entire period 2000 to 2016, and in a stacked-difference way separating two eight-year periods for 2000 to 2008 and 2008 to 2016.[15] For the stacked-difference model we include separate time dummies for each eight-year period in α_τ, otherwise it would simply be a constant term.

We then instrument for the potential endogenous Taiwanese export share to China $\Delta ES_{j\tau}^{TC}$ using contemporary export shares to China from seven other high-income countries as listed in equation (3). The underlying identifying assumption here is that the common within-industry component of rising Taiwanese as well as other high-income countries' exports to China is due to China's rising comparative advantage and falling trade barriers post WTO accession.

In Table 1 we present our baseline results on the effects of trade exposure on pro-independence vote shares. We report results for the long-difference model in columns (1)-(2) and those for the stacked-difference model in columns (3)-(5), respectively. For each set of models we start with a parsimonious OLS regression, followed by 2SLS using instruments given in equation (3) and (4). Overall speaking we obtain more precise estimates in stacked-difference models where we are able to include a time dummy for the period 2008-2016. This renders an important insight as Taiwanese were under the rule of opposite parties for presidential terms during 2000-2008 and 2008-2016, and unsurprisingly faced distinctive economic policies towards the mainland. We thus attribute more credibility to the stacked-difference specifications.

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[15]Stacked-difference models resemble a three-period fixed effect with slightly less restrictive assumptions made on the error term (Wooldridge, 2010). We implement with both first-difference and fixed-effect regressions to double-check.

We observe the vote shares at the township level while the treatments are at the CZ level, which is a combination and reorganization of townships. Column (3) presents simple OLS results, where increasing export share to mainland China across CZs has a mitigating effect on DPP vote shares. We use the word "mitigating" to describe the effects given overall these periods saw a steady rise of pro-independence vote shares. The estimates remain statistical significant in both OLS and 2SLS estimations. In Column (5), our most preferred specification with additional controls regarding start-of-period demographics and industrial characteristics, the coefficient for export share to China is about -0.22. The way we interpret this estimate is the following: for a township located in a CZ that experienced an average 10% increase during an eight-year period throughout 2000-2016 we would expect about 0.22×10% = 2.2% less of an increase for DPP vote shares in the corresponding township. It is worth noting that the difference in terms of export exposure for a representative CZ at the 75th versus the 25th percentile is about 13.6%. This, multiplied by our estimate -0.22, translates to about -3% difference in changes of pro-independence vote shares between these two representative regions.

Meanwhile opposite signs are observed for estimates of imports, which is consistent with results shown in Dippel et al. (2020) for the effects of China shock on extreme-right vote shares in Germany. The results here are only informative since the instruments are very likely correlated with each other. Nevertheless the distinct signs suggest that labor market responses to import competition and export opportunities are plausibly relevant channels through which trade shocks translate to political outcomes. Note that despite the magnitude of the effects from imports appearing to be much larger, overall during this period Taiwan saw little increase in terms of imports shares from mainland: a mere 1.77% when one calculates the change in import shock using the difference between 75th and 25th percentile. The parallel statistics for export shares is 13.6%. This is partly due to much more stringent regulations and cautious bans from Taiwanese authorities when it comes to importing goods from mainland. Thus the net effects we observe are mitigating effects of export opportunities, rather than radicalizing effects of import penetration.

We then move to the second set of outcomes aggregated from the TNSS survey response, as presented in Table 2. Due to time limitation of survey years, the earliest starting year available is now 2002. We adjust our subsequent analysis slightly on two asymmetric periods: 2002 to 2008 and 2008 to 2016. Consistent with pro-independence vote shares, we observe negative estimates for regional self-reported support for independence. In our most

preferred specification in column (5) with full controls, the estimate is -2.48, which with 13.6% of increase in export shock translates to -2.48×13.6% = -0.34. of change in the pro-independence index. Note that the effect is fairly large when compared with the average change of pro-independence index across CZs (0.04). One possible explanation for this is that for aggregated survey outcomes we end up with much fewer observations, since an annual sample size around 1000 leaves many townships with no respondents. We are therefore left with less than 200 observations in the stacked-difference models and a slightly less disperse distribution of the treatment variable. Taking that into account, under the same fashion of interpretation comparing the CZ at 75th versus 25th percentile of export exposure, the number translates to -2.48×11.2% = 0.28. Still the magnitude of the effect seems fairly large and hard to interpret. In the next step we intend to use other sources of social survey (Appendix Part C) and see if a different and potentially larger sample can help bring more insights to this puzzle.

Finally in column (6) we present an alternative way of constructing the standard errors following recent literature that criticises shift-share instruments such as Adão et al. (2019). The main concern from their paper is the potential correlation between regression residuals across CZs with similar sectoral shares that are independent of their geographic locations. We argue that our qualitative results from previous analysis, which uses the conventional approach of clustering the standard errors at the CZ level, remain valid.

The coefficients for a more exclusive Taiwanese identity are also negative yet not statistically significant in any specification. Overall the results in Table 2 match with previous estimates for pro-independence vote shares, despite having fewer observations due to limited survey coverage. In addition, the fact that the coefficients for identity choice are less precisely estimated is in line with our perception that compared to political attitudes on *tondu*, identity choices are stickier and less sensitive towards economic shocks such as trade.

4.2 Individual-Level Analysis

So far we've examined the effect of China export exposure on the CZ level, consistently for both voting patterns as well as survey outcomes. In principle we can also investigate the effects of trade integration on individuals, at least for responses recorded in the social surveys. We link the TNSS survey respondents to CZ level export shocks based on information on which township, and subsequently which CZ they reside in. As mentioned before, the survey

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incorporates various years between 2002 and 2020, from which 2002, 2008 and 2016 are included in our analysis to be consistent with the previous section. We would later check for how robust our results are when all survey years are included. For the sample of individuals surveyed we can observe their age, gender, family income level, education level, political affiliation as well as responses to a wide range of questions on their engagement and attitudes in politics.

However, since TNSS does not follow respondents over time we are unable to include individual fixed effect in subsequent analysis. We instead include CZ fixed effects as well as CZ-specific time trends to account for differential trajectories across regions. The first specification we consider below estimates the average effect of predicted export shock on individuals in a given CZ:

$$Y_{ijt} = \alpha_t + \alpha_j + \theta_j Time_t + \beta \overline{ES}_{jt}^{TC} + \mathbf{X}_{it}^{'}\Gamma + \epsilon_{ijt}, \tag{6}$$

where Y_{ijt} stands for the outcome for individual i in CZ j in survey year t, including the same questions on identity choice and FNS as listed in section 3.2. The sample includes all survey respondents with a valid response to these two questions, while in the meantime can be geo-located to a township in a certain CZ. Using the same logic of IV we include the predicted level of export exposure $\overline{ES}_{jt}^{TC}$ as the regressor. α_t and α_j stand for survey year and CZ fixed effects, respectively. Lastly, equation (6) incorporates a vector of covariates $\mathbf{X}_{it}^{'}$ that comprises of age, age^2, gender as well as their interactions. In some specifications we also try to include CZ-specific linear time trends $\theta_j Time_t$ to help alleviate the concern of the coarseness of the CZ fixed effect as opposed to individual fixed effect.

An additional major advantage of tracking down individuals instead of aggregate response is that it's handy to analyse effect heterogeneity. To further look at how the effects potentially differ for distinct socioeconomic groups we simply include an interaction term for the treatment and the indicator variable $\mathbf{I}_i^{young}$ for individuals that belong to a certain socioeconomic cohort (younger cohorts born after 1984[16], in this case):

$$Y_{ijt} = \alpha_t + \alpha_j + \theta_j Time_t + \beta_1 \overline{ES}_{jt}^{TC} + \beta_2 \overline{ES}_{jt}^{TC} \times \mathbf{I}_i^{young} + \mathbf{X}_{it}^{'}\Gamma + \epsilon_{ijt}, \tag{7}$$

where the overall effect of export exposure here would be $\beta_1 + \beta_2$. While β_1 simply measures the effect of increasing export share within a region on

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[16]Borrowed from the results in Chen et al. (2020), where Taiwanese born after September 1984 (13 years old in 1997, the year of the reform) are exposed to a different high school curriculum on Taiwanese history.

individuals born before 1984, β_2 itself indicates how younger cohorts react differently to export shock as opposed to their older counterparts.

We report our individual level estimates in Table 3. The magnitude of baseline estimates for the support for independence presented in column (1) is in line with our CZ level estimates. The estimate -1.83 here translates to -1.83×11.2% = -0.20 average change in pro-independence beliefs of individuals located at regions exposed to the 75th versus 25th percentile of China export shock. This is again fairly large when compared with mean change of the pro-independence index across all interviewees, which is 0.13. However, once we've included the CZ-specific time trends the average effect becomes imprecisely estimated and not statistically different from 0. One explanation for this is that assuming differential linear time trends across CZs is too stringent of an assumption, and little variation remains once these are controlled for. We abstract from adding this CZ-specific time trends and leave it for discussion later. Nevertheless in the following columns we present estimates from equation (7) without including the $\theta_j Time_t$ term, where we investigate how the effects potentially differ across birth cohorts, education level as well as initial political affiliation.

Our estimates in column (3)-(5) suggest that younger cohorts born after 1984, people with college level education or above as well as people initially self-reported as being in the pan-green coalition (pro-independence parties) are less sensitive to the impacts of trade exposure. As a contrast we find the opposite signs for people reportedly as being in pan-blue coalition (pro-unification parties) and reassuringly, no differential effects for those who report as non-partisan. Take estimates from column (5) for instance, the combined effects for the pan-green group is -1.75+0.55 = -1.2, contrasted by -1.75-0.34 = -2.09 of their pan-blue counterparts. Once we take into account the average change in export share exposure (still in the 75th versus 25th percentile fashion), this partisan effect heterogeneity further translates to (-2.09-(-1.2))×11.2% = -0.10 in terms of changes in pro-independence index. To put in simpler words, people who initially reported as pro-unification are almost twice (1.74 times) as sensitive to the China export trade shocks compared to those who are initially pro-independence.

We also repeat the exercise in equation (6) for identity choice and find similar results for differential effects (β_2), yet no significant effects on average (β_1). Overall, the patterns we obtain in this section are mostly congruent with our estimates at the CZ level. In addition to that, the large differential impacts we observe for distinct socio-economic groups point at potential non-labor market related channels of how trade impacts political preferences.

4.3 Discussion of Potential Mechanisms

In this section we present some preliminary evidence on what might be the mechanisms through which trade shocks affect political preferences. In Table 4 and Table 5 we report 2SLS estimates of China export shock on Taiwan's labor market outcomes using the same IV strategy as before. We look at local labor market response to growing exports to China in terms of sectoral employment shares, number of employed persons as well as wages. Only the long-difference models are implemented here in light of limited availability of corresponding census survey years. The estimates obtained with coarse data are puzzling and hard to interpret at this moment, yet overall they do indicate that trade integration with mainland China impacted Taiwan's trajectory of economic development. We want to stress that the results here are preliminary and intend to polish this part when additional data are at hand (See Appendix Part C).

Note that here we are overlooking potential bias resulting from trade data aggregation as well as compositional effects. As we've mentioned before the trade statistics we are utilizing are aggregated at the level of mere 23 manufacture industries. As a result we are unable to distinguish further between exports and re-exports, final goods trade and intermediate trade etc. Neither do we have information from aggregated censuses on workers' education or skills, so as to get a sense of the distributional consequences of trade and how it hits workers differently. Finally, another important issue we are neglecting here is potential channels other than labor market response of trade, such as the direct deterring effect of trade dependence we've mentioned previously. This could prove hard to disentangle and it would be troublesome for our strategy as it might introduce other sources of endogeneity. We intend to work on it in the following step.

5 Concluding Remarks

The nature of cross-strait relations have provided us with a unique setting to study "China Shock" from an unconventional perspective. In less than two decades post WTO accessions, Taiwan's economy has been more dependent than ever on their powerful yet intimidating neighbor, marked by a large trade surplus. In the meantime, historical disputes and contemporary geopolitical tensions add to the complexity of their trade relation. As Taiwan might be presented with irresistible market forces to mingle with a rising China, the latter has long been seeking for political unification with the

former, ending its *de facto* independence. Taiwanese government and people are thus faced with a "China dilemma" when debating how to form economic relations with the mainland.

Methodology-wise we follow the local labor market approach of coping with trade shocks resulting from the rise of China. By defining and analyzing Taiwanese commuting zones that are subject to differential trade shocks according to initial patterns of industry specialization, our analysis contributes to understanding how trade dependence affects political preference for political independence. Results from our baseline estimates suggest that increasing export dependence has a mitigating effect on increasing local support for political independence. Our estimates point to a 3% less of an increase in pro-independence vote shares when comparing Taiwanese commuting zones that are subject to 75th versus 25th percentile of China export shock.

Pinning down exact mechanisms that explain the effects export shocks on political preferences is key in the next step. By obtaining more detailed level data (Appendix Part C), we aim to understand how cross-strait trade impacted Taiwanese population in distinct ways. We believe the overall costs or benefits of trade fall disproportionately on people from different walks of life, and this would be crucial to understand why some people shift their political beliefs as a response to trade shocks, more or less compared to some others.

Appendix

A. Tables

Table 1: The Effect of Trade Exposure on Pro-Independence Vote Shares

	Dependent Variable: Δ DPP Vote Share				
	Long Difference: 2000-2016		Stacked Differences: 2000-2008 and 2008-2016		
	(1)	(2)	(3)	(4)	(5)
Δ *Export Share*	-0.18^{*} (0.10)	0.09 (0.40)	-0.26^{***} (0.05)	-0.26^{***} (0.08)	-0.22^{**} (0.11)
Δ *Import Share*	0.17^{*} (0.08)	0.49^{***} (0.17)	0.15^{**} (0.05)	0.34^{***} (0.12)	0.57^{***} (0.19)
Estimation method	OLS	2SLS	OLS	2SLS	2SLS
R^2	0.25	0.25	0.19	0.20	0.29
Mean of Dep Var	0.17	0.17	0.08	0.08	0.08
2008-2016 dummy			Yes	Yes	Yes
Start-of-period controls					Yes
Obs.	368	368	736	736	736

Note: Number of observations = 368 townships × number of periods. Included in the controls are start of the period demographic and industrial characteristics. In 2SLS specification both import shares and export shares are instrumented by predicted import/export shares respectively. Standard errors (in parentheses) are clustered at the level of 134 commuting zones. *,**,*** signify significance at the 10%, 5% and 1% level.

TABLE 2: EXPORT SHARE TO CHINA AND POLITICAL OUTCOMES: TOWNSHIP-LEVEL

| Dependent Variables: | Long Difference: 2000/2002-2016 | | Stacked Differences: | | | |
| | | | 2000/2002-2008 and 2008-2016 | | | |
	(1)	(2)	(3)	(4)	(5)	(6)
Δ **Support for independence**	−1.46*	−0.84	−1.39***	−2.28**	−2.48**	−3.41**
	(0.88)	(1.79)	(0.45)	(1.00)	(1.05)	(1.34)
R^2	0.07	0.07	0.07	0.06	0.09	
Mean of Dep Var	0.06	0.06	0.04	0.04	0.04	0.04
Δ **Taiwanese identity**	−0.67	−6.84	−1.44	−5.82	−5.85	−5.74*
	(1.72)	(7.42)	(1.01)	(3.85)	(3.95)	(2.93)
R^2	0.15	0.10	0.12	0.09	0.10	
Mean of Dep Var	0.24	0.24	0.12	0.12	0.12	0.12
Estimation method	OLS	2SLS	OLS	2SLS	2SLS	2SLS
F-Stat first stage ($t_0 = 2000$)		4459.1		4222.3	2521.9	
F-Stat first stage ($t_0 = 2002$)		1466.1		2858.6	1564.6	
2008-2016 dummy			Yes	Yes	Yes	Yes
Start-of-period controls					Yes	Yes
Obs.	198	198	396	396	396	396

Note: For aggregated survey outcomes in panel B, the initial period is 2002 instead of 2000 due to time availability of the TNSS surveys. Number of observations = 198 townships × number of periods. Included in the controls are start of the period demographic and industrial characteristics. Standard errors (in parentheses) are clustered at the level of 135 commuting zones (except for column (6), which is adjusted according to Adão, Kolesár and Morales, 2019). *, **, *** signify significance at the 10%, 5% and 1% level.

Table 3: Export Share to China and Political Outcomes:
Individual-Level 2SLS Estimates

| | *Sample*: Survey Years 2002, 2008 and 2016 | | | | |
| | *Dependent variable*: Support for Independence | | | | |
	(1)	(2)	(3)	(4)	(5)
$\overline{ES}$	−1.83**	0.60	−1.96***	−2.01**	−1.75**
	(0.89)	(1.88)	(0.62)	(0.92)	(0.88)
$\overline{ES} \times Young$			0.19**		
			(0.09)		
$\overline{ES} \times College$				0.24**	
				(0.11)	
$\overline{ES} \times Green$					0.55***
					(0.07)
$\overline{ES} \times Blue$					−0.34***
					(0.06)
$\overline{ES} \times Middle$					0.03
					(0.06)
R^2	0.09	0.09	0.10	0.07	0.18
Mean of Dep Var	0.13	0.13	0.13	0.13	0.13
Demo. controls	Yes	Yes	Yes	Yes	Yes
Survey year FE	Yes	Yes	Yes	Yes	Yes
Commuting zone FE	Yes	Yes	Yes	Yes	Yes
Period-by-CZ FE	No	Yes	No	No	No
Obs.	2944	2944	2944	2913	2944

Note: Observations are at the individual level. Included in the controls are individual characteristics such as age, age^2, sex, education level, ethnic background and their interactions. Standard errors (in parentheses) are clustered at the level of 134 commuting zones. *,**,*** signify significance at the 10%, 5% and 1% level.

| Dependent Variables: | Long Difference: 2000-2010 | | | |
| | Δ Export Share | | Δ Import Share | |
	(1)	(2)	(3)	(4)
Δ *Manufacture Empl Share*	0.78**	0.68**	0.64**	0.76*
	(0.32)	(0.30)	(0.30)	(0.40)
R^2	0.19	0.28	0.07	0.01
Mean of Dep Var	0.03	0.03	0.03	0.03
Δ *Agriculture Empl Share*	0.82*	0.90**	0.19	0.49
	(0.37)	(0.38)	(0.38)	(0.47)
R^2	0.02	0.01	0.01	0.05
Mean of Dep Var	-0.03	-0.03	-0.03	-0.03
Δ *Service Empl Share*	−1.16***	−1.47***	−1.27***	−1.70***
	(0.35)	(0.41)	(0.33)	(0.42)
R^2	0.01	0.001	0.001	0.001
Mean of Dep Var	-0.02	-0.02	-0.02	-0.02
Δ *Unempl Share*	-0.42	-0.07	0.46	0.47
	(0.53)	(0.59)	(0.41)	(0.51)
R^2	0.03	0.22	0.001	0.03
Mean of Dep Var	0.02	0.02	0.02	0.02
Start-of-period controls		Yes		Yes
Obs.	368	368	368	368

Note: Data from Taiwan Population and Housing Census (2000, 2010). Observations are at the township level. Included in the controls are initial demographic and industrial characteristics. Standard errors (in parentheses) are clustered at the level of 134 commuting zones.

<div align="center">

Table 5: Cross-Strait Trade and Changes in Employment and Wages: 2SLS Estimates

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Dependent Variables:	Long Difference: 2006-2016			
	Δ Export Share		Δ Import Share	
	(1)	(2)	(3)	(4)
Δ Ln Manufacture Workers	-0.05	0.68	-0.15	-0.76
	(1.26)	(1.45)	(1.91)	(2.13)
R^2	0.006	0.004	0.007	0.01
Mean of Dep Var	0.07	0.07	0.07	0.07
Δ Ln Non-manufacture Workers	−2.24**	-1.52	2.23**	-0.25
	(0.89)	(1.25)	(0.90)	(0.76)
R^2	0.01	0.03	0.03	0.04
Mean of Dep Var	0.18	0.18	0.18	0.18
Δ Ln Manufacture Wage	−1.27**	−1.87**	-0.82	-0.80
	(0.56)	(0.76)	(0.90)	(0.96)
R^2	0.03	0.01	0.01	0.01
Mean of Dep Var	0.04	0.04	0.04	0.04
Δ Ln Non-manufacture Wage	−3.31***	−1.85**	6.67***	3.14***
	(0.70)	(0.90)	(1.62)	(1.19)
R^2	0.01	0.01	0.03	0.02
Mean of Dep Var	0.05	0.05	0.05	0.05
Start-of-period controls		Yes		Yes
Obs.	368	368	368	368

Note: Data from Taiwan Industry and Service Census (2006, 2016). Observations are at the township level. Included in the controls are initial demographic and industrial characteristics. Non-manufacturing industries exclude agriculture. Standard errors (in parentheses) are clustered at the level of 134 commuting zones.

B. Delineating Taiwan's Commuting Zones

The analysis of local labor markets is motivated by the notion that employers and workers interact within a space bounded by places of work and places of residence (Dorn, 2009). In our case it is furthered motivated by the prior belief shaped by previous literature that local market consequences of trade shocks matter. They matter both in terms of capturing the net effects of trade exposure by taking into account geographic spillovers, as well as in terms of affecting secondary outcomes such as political preferences and beliefs.
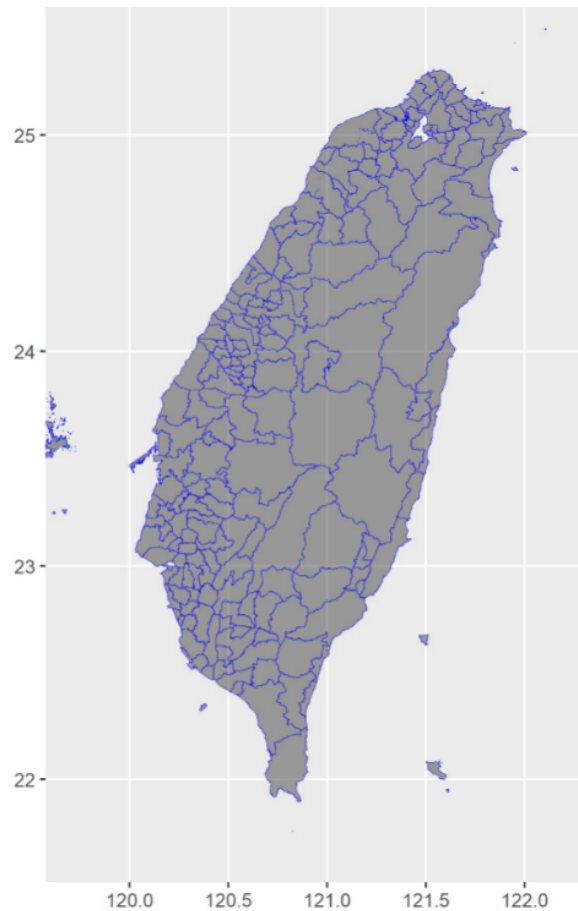
APPENDIX FIGURE 1: TAIWAN COMMUTING ZONE DELINEATION

The way we delineate local labor markets for Taiwan largely follow the case of Commuting Zones (CZs) in the U.S. The U.S. commuting zones are clusters of counties that are characterized by strong commuting ties within CZs, and weak commuting ties across CZs. They have been defined by

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[Tolbert and Sizer](1996) with the explicit goal of creating geographic units that capture the economic notion of local labor markets. To the best of our knowledge it is the first time commuting zones are being defined in the Taiwan context, which is made possible by the National Travel Survey (2010-2016) that collects commuting information for a representative sample of the Taiwanese working population annually.

Specifically, CZs in Taiwan are computed using township-level commuting data from the National Travel Survey following a fairly standard cluster algorithm. The strength of commuting ties between township i and township j are defined as:

$$T_{ij} = \frac{c_{ij} + c_{ji}}{\min(r_i, r_j)}$$

where c_{ij} refers to number of all workers residing in location i but work in location j, r_i is the number of all workers residing in location i. CZs are further derived using a clustering algorithm for average linkage that starts by grouping the township pair with largest value of T_{ij} and subsequently forms clusters of interrelated township. The general rule of thumb is that the average value of T_{ij} for the county pairs in a given CZ is above 0.02.

The final results are 134 CZs in Taiwan (Appendix Figure 1), which is a combination of 368 townships, the third-level administrative subdivisions of counties in Taiwan. It is worth noting that ideally one would need CZ delineation prior to the outcome period of 2001, so as to alleviate concerns that CZ boundaries have adapted over time as a result of the trade shocks. However this is not feasible for the Taiwan case since the earliest commuting data available are from 2010. We take it as a caveat. If there were indeed substantial changes in commuting patters between 2000 and 2010 this would likely bias our estimates towards zero.

C. Prospective Data

Taiwan Trade Statistics: disaggregated trade statistics from Taiwan customs to be purchased[17], which are available at the 11-digit HS Commodity code level.

Taiwan Industry Census: in application, with potential information on employment and wages available at the plant level.

Other Social Surveys: other than TNSS, we are also investigating other social surveys that cover similar questions on political attitudes as well as the

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[17]Customs Administration, Taiwan Ministry of Finance.

possibility of merging for more observations: the Taiwan's Election and Democratization Study (TEDS) conducted by the National Chengchi University as well as the Taiwan Social Change Survey (TSCS) based at Academia Sinica.

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