

Chapter 2

How Borders Affect the World

In 1989, rigged elections, an unprecedented wave of emigration and mass demonstrations eventually led to the collapse of the power structures of German Democratic Republic (or called East Germany as compared to West Germany—or formally called ‘Federal Republic of Germany’). After the resignation on October 18 of the head of state and of the communist party, Erich Honecker, the Berlin Wall came down. On November 9, 1989, the fifty-first anniversary of Hitler’s Crystal Night rampage against the synagogues, a most tricking event which symbolized the end of the Cold War era occurred in the Berlin Wall, as described later in Pond (1990, pp. 7–8):

At 7:00 p.m., Politburo member Gunter Schabowski told stunned reporters that East Germans could henceforth cross the border into West Germany... East Berliners, hearing the news, rushed to the exits to West Berlin that had been barred to them for twenty-eight years, and found them still barred. The crowds and the tension mounted over the next three hours. By 10:30 p.m., the East German border guards at four crossing points in the center of the city, still lacking instructions, did the unthinkable. These servants of the most rigidly prison code of obedience in the entire Soviet bloc took authority into their own hands and opened the gates... By 11:00 p.m., East Germany Interior Minister Frederick Dicker confirmed the desperate decision of the local commanders with an official order. The dike had been breached. It was no long possible to turn back the flood.

2.1 Good Border, Bad Border

Throughout history, physical terrain, political fiat, and conquest have divided the world into independent states and political entities as much as race, ethnicity, language and religion. The result is the man-made and sometimes arbitrary or even imposed boundaries.

2.1.1 Story 1

The territorial divisions of Germany after World War II by the Allies born an 1380 km long border line from Lubek to Hof, as well as two antagonistic neighboring states—East Germany and West Germany. Construction of the Berlin Wall in 1961 was a desperate—and effective—move by the East German authority to stop East Berliners escaping from the Soviet-controlled East German state into the West of the city, which was then occupied by the Americans, British and French. The former inner-German border region was characterized by a sinuous disregard for the realities of local topography, and daily patterns of social life and economic activity. Initially, during the short period of the inter-Allied cooperation and unrestricted cross-border movement, this was not considered to be so significant.

However, with the progressive intensification of the Cold War, the creation of separate currencies in 1948, and the foundation of the two German states in 1949, the boundary became a forbidden division between the two starkly different political and economic entities. In 1952, what then had become known as the *innerdeutsche Grenze* was sealed by East Germany against all but carefully supervised and controlled movement. It was at that time consolidated on the eastern side by the first rudimentary border fortifications, together with the creation of a 500 m wide ploughed “guard” strip. Bus and rail travel cross this border was curtained, and the East Germany began the process of tearing up road and railway crossings, eventually involving the disconnection of 32 railways, three autobahns, 31 main roads, 140 secondary roads, and innumerable minor roads and tracks (Bayerische 1981).

The inner-German separation which caused to the transportation network was severe, besides other ideological isolations. From the Shell Generalkarte 1:200,000 Sheet 14 (Geographischer Verlag), one may clearly discover the former frontier area which exacerbated its psychological impact and lengthened the reorientation of external communication links to new sources of supply and markets located elsewhere in West Germany or in foreign countries. For example, the extra distance created by the forbidden border amounted to a penalty of 150–200 km for industries in the Coburg-Hof salient of the northern Bavaria area (Braun and Maier 1983). The very limited number of crossing points along the frontier, coupled with the marked contrasts in the density of the road network, were also evident.¹

2.1.2 Story 2

In ancient times, a bad border was always defined as the one through which foreign military forces could easily invade or conduct harassing and wrecking activities. As a result, many of this kind of borders were fortified: for example, the Roman *limes* and the Great Wall of China. In the meantime, a larger territory that a ruler

¹ For details about what has happened since the removal of the inner-German border, see Case 2 at the end of this chapter.

occupies also implies a longer distance that its borders are from its ruler. This would undoubtedly result in higher costs that the ruler must pay for its establishment of those remote borders. In most unlucky circumstances, bad borders could eventually lead to the reduction of lifespan of an authoritarian regime.

In ancient China, compared with their predecessors, the Zhou dynasty (1046–221 BC), the Jin dynasty (AD 265–420), and the Song dynasty (960–1279), the Qin dynasty (221–206 BC), the Sui (AD 581–618), and the Yuan dynasty (AD 1279–1368) had enlarged their territories, respectively. However, they were also the short-lived dynasties in Chinese history (see Table 2.1). Historians have identified many exogenous factors that might lead to the collapses of these Chinese empires, which include, among others, the rulers' tyranny, harsh laws imposed on the lives of people, large expenditure on big projects (such as the Great Wall and the Grand Canal) and persecution of Confucianism. However, many of these factors could also be found in other, long-lived dynasties. Throughout history, Chinese political rulers have struggled to increase their territories through conquest. However, the enlarged territories (or, in other words, the increased distances that the borders are away from the rulers) per se are also an endogenous factor determining the lifespan of the Chinese regimes.

Table 2.1 A comparison of China's three short-lived dynasties and their predecessors. (Source: Guo 2013b, p. 269)

Indicator	Qin (221–206 BC)	Sui (AD 581–618)	Yuan (1279–1368)
Capital city	Xian'yang (near Xi'an)	Chang'an ^a ; Luoyang ^b	Dadu (Beijing)
Length of lifespan (years), which is	15	37	89
Less than that of its predecessor by	810 (556) ^c	118	230
Distance between capital and farthest frontier (km) ^d , which is	2000	3200 ^a ; 3100 ^b	4000
Longer than that of its predecessor (km) by	800 ^e ; 1050 ^f	–300 ^a ; 1100 ^b	2000 ^g ; 2300 ^h
Area of territory (million km ²) ⁱ , which is	3.6	8.4	16.8
Larger than that of its predecessor (million km ²) by	0.2	–0.8 ^a ; 6.1 ^b	12.2 ^g ; 12.8 ^h
Major force for collapse	Endogenous	Endogenous	Endogenous
Compared to that of its predecessor	Endogenous	Exogenous and endogenous	Exogenous

^aFrom AD 581 to 605, ^bFrom AD 606 to 618, ^cFigure within the parenthesis is based on that the Zhou dynasty does not include the “Warring States” period (from 475 to 221 BC), ^dEstimated by the author based on relevant maps of ancient China, ^eBased on the Western Zhou dynasty (1046 to 771 BC), ^fBased on the Eastern Zhou dynasty (771 to 221 BC), ^gBased on the North Song dynasty (AD 960 to 1127), ^hBased on the South Song dynasty (AD 1127 to 1279), ⁱAvailable at://bbs.zanba.com/message/122377/122377304.html

In fact, the direct cause of the Qin's collapse was initially connected with a failed, long-distance trip of border patrol led by Chen Sheng and Wu Guang. For example, the following was reported in Sima Qian's (145–87 BC, 1997) famous book *Shiji* (historical records):

In 209 BC, Huhai, the second emperor of the Qin dynasty, ordered 900 people in the region of Huaihe river to Yuyang (today's Miyun county in northeast Beijing) to serve as border patrol. Chen Sheng and Wu Guang were appointed leaders of the troop. When people arrived in Dazexaing (in southwest of today's Anhui province), due to heavy rain, the roads were damaged and their trip to the destination was delayed. According to Qin's penal code, those in military service would be executed if they failed to keep their appointments. Since Chen and Wu had long been dissatisfied with their poverty-stricken life, and now faced the treats of death, they decided to initiate an uprising to 'save' themselves. Soon, they established their own regime entitled Zhangchu. Later, Chen and Wu were murdered by their subordination. And the rest of the army was surrendered to Liu Bang and Xiang Yu. In 206 BC, the Qin dynasty came to an infamous end.²

2.1.3 Story 3

In some circumstances, a bad border can be transformed into a good border. At the end of December 29, 2011, Samoa—which was formerly known as Western Samoa and used Coordinated Universal Time (French: Temps Universel Coordonné, UTC) UTC-11 (UTC-10 during the summer)—decided to advance to UTC+13 (UTC+14 during the summer), by skipping December 30. Before that decision, Samoa was, in effect, losing two business days every week with the region by being on the eastern side of the International Date Line (IDL). For example, while it's Friday in Samoa, it's Saturday in New Zealand, and when the Samoans are at church on Sunday, Australians are already conducting business in Sydney and Brisbane.

Samoa is a country encompassing the western part of the Samoan islands in the South Pacific. It became independent from New Zealand in 1962. The Samoa Time Zone observes standard time by subtracting eleven hours from UTC-11, which means that Samoa is far frontier of the Western Hemisphere. The zone includes the US territory of American Samoa, as well as the Midway islands and the uninhabited islands of Jarvis, Palmyra, and Kingman reef. The zone is one hour behind Hawaii–Aleutian Time Zone, one hour ahead of Howland and Baker islands, and 23 h behind Wake island Time Zone.

While the time difference put Samoa 21 h behind eastern Australia and 23 behind New Zealand, the change has put it an hour ahead of Wellington and three ahead of Sydney. The decision to move Samoa east of the international dateline was made 119 years ago to bring the island closer in line with major trading partners in the United States and Europe. However, Samoa's trading partners have dramatically changed and today they do a lot more business with New Zealand and Australia, China and other dynamic economies in the southwest Pacific.

² Excerpted from Sima (104 BC, 1997, pp. 558–560)—translated by author based on the Chinese text.

As a matter of fact, Samoa was not the first nation to change the time zone. For many years the International Date Line (IDL), that for historic reasons bisected the Republic of Kiribati into two halves in the Pacific Ocean, had been viewed as an annoying economic nuisance. The western part of the republic was always 24 h ahead of its eastern part, and there were only 4 days in each week when official business could be conducted between both parts. To put an end to this situation, the sparse Kiribati announced that on January 1, 1995 the IDL would henceforth run along the many-cornered eastern boundary of the republic. Republic of Kiribati was authorized to modify its time zones, since the line is simply established by international agreement and there are not treaties or formal agreements associated with the line, but that didn't necessarily meant that everyone would accept the change, especially when the latter could yield negative effects on the rest of the world. While sites like WorldTimeZone.com embraced the change, MapQuest.com did not.³

2.2 Viewing Borders from Two Sides

2.2.1 *From Proximity to Adjacency*

As the clearest symbol to territorial divisions, political borders physically and politically serve as the divisions of the world. In general, the special political and economic mechanisms of border regions stem from two facts:

- i. Border regions are located in the geographical margins of their respective political units (such as independent dependent states, provinces, municipalities, counties, etc.) and are usually far away from the core regions;
- ii. Each cross-border region, which is usually a complete, contiguous geographical area, is under the jurisdiction of two or more political authorities.

Obviously, the first fact suggests that, locationally, it is always technically and economically inefficient for regions with proximity to political borders to conduct exchanges and cooperation with their remote heartlands; while the second fact implies that there always exist cross-border separations and fragmentations between any pair of adjacent political/administrative regions.

"Proximity" and "adjacency" are different geographical terms. Mathematically, proximity can be measured as a continuous variable (i.e., distance) but adjacency can only represented as a discontinuous variable (or dummy). In cross-border economic analysis, the two terms play differing roles. In clarifying how proximity and adjacency are distinguished to affect cross-border regions, Cattán and Grasland (1992) developed a framework in which the impacts of distance and borders were

³ For example, as noted by MapQuest.com, "To depict that Kiribati's date and time decisions are applicable to the vast oceanic reaches between its component islands, where it actually has no legal jurisdiction, is both inaccurate and misleading." (Rosenberg, 2008).

specified for two types of variables: state variables relating to the situation in certain places; and flow variables relating to the interaction between different places.

2.2.2 Pros and Cons of Borders

Indeed, sharing a common land border will always promote international trade and economic cooperation. For example, bilateral trade of France with the United Kingdom will be due to their proximity but with Germany will be further boosted by the effect of their common border in addition to their proximity. One of many ways to include ‘adjacency’ in the quantitative analysis of international trade is to treat it as a dummy variable. Following this analytical framework, Frankel et al.’s (1997a, p. 66) estimated coefficients on ‘adjacency’ range between 0.5 and 0.7. Because trade is specified in natural logarithmic form in their estimates, the way to interpret the coefficients on adjacency is to take the exponent: that is to say, two countries that share a common border will, *ceteris paribus*, increase their trade by about 65–101 % compared with two otherwise countries. Of course, all of this must be subject to the conditions that the trading partners on both sides of a border can mutually benefit from each other and that their common land border is an open one.

Political borders can lead to economic miracles. For the second half of the nineteenth and much of the twentieth centuries, Hong Kong and mainland China were separated by an international boundary marked by a river called Shenzhen (see Fig. 2.1). The Chinese characters, Shenzhen, mean a deep gutter. However, no one would have expected that the “gutter” had served as a forbidden frontier between the socialist China and the British Hong Kong in the mid-twentieth century, and have also served as a strong economic engine for Guangdong province since then. The proposal for establishing Special Economic Zones (SEZs) was finally approved by the National People’s Congress of China in 1980. Since then, in order to attract foreign investment, China and Guangdong province have enacted a series of “special” laws and regulations and favorable measures relating to the industrial and commercial registration, economic contract, technology import, labor and personnel, real estate, etc. for the Shenzhen SEZ.

Among the factors contributing to the rapid economic growth of Guangdong province, Guangdong’s geographical adjacency to Hong Kong and its cultural linkages to the dynamic economies in Southeast Asia are worthy of mention. As a coastal province, Guangdong has a huge number of natives and their descendants scattered in several dozens of countries and regions, particularly in Hong Kong and other Southeast Asian economies. During the past decades, especially since the handover of Hong Kong from the UK to China in 1997 and the implementation of the Closer Economic Partnership Arrangement (CEPA) in 2003, the development of Hong Kong has positively influenced that of Guangdong, and vice versa. On the other hand, the removal of the China–Hong Kong border has also generated some unwanted outcomes, resulting from different political or institutional systems that are adopted by both sides of the border (see Box 2.1).

**a****b**

Fig. 2.1 The Shenzhen river—a once-ever forbidden border between Hong Kong and mainland China. **a** The early 1980s. **b** The 2010s. (Source: <http://www.dsd.gov.hk>. Courtesy of HKSAR)

Box 2.1 Cross-Border Students in Hong Kong

The cross-border students (CBS) refer to those who were born in Hong Kong but live in mainland China. In every school day, they arrive in and exit from Hong Kong. In 2004, the number of the CBS was only 3803 (including kindergarteners and primary and secondary students); in 2012 it rose to 16,400. In the years to come, the number of the CBS will keep increasing.

At present, ways for the CBS to come to Hong Kong include the Cross Border School Coaches, nanny buses, and public transport. Since the pick-up/drop-off points at the current border control points are limited, students may

need to get on or off the coaches and nanny buses in crowded areas and are exposed to dangers of traffic accidents or kidnap.

There were only 620 Hong Kong-born Mainlanders (HKBM)s in 2001; however, the number has been 35,700 in 2011. According to a research report, 98 h of these HKBM)s will be living in mainland China till the age of six years old; and 41 o of them will return back to Hong Kong to pursue their school courses.

Language differences result in communication difficulty since many of the CBS are more fluent in Mandarin (the official language widely used in mainland China) than Cantonese (the official language used in Hong Kong). Thus, it is difficult for them to communicate with local students in Hong Kong. In addition, the difference between Hong Kong and mainland China's culture has led to difficulties for the CBS to adjust their identity. With a lack of understanding in Hong Kong's culture, systems and values, failure to naturalize in Hong Kong is common among the CBS.

(Source: Author based on Ling (2012) and Jia (2013).

However, 'borders' per se do have many negative effects. In the Lower Mekong Basin (LMB)—area that contains Cambodia, Lao PDR, north and northeast regions of Thailand and the Mekong delta of Vietnam, for example, water pollution is more serious in transnational border areas and than in other areas (see a case study at the end of Chap. 16 for a detailed analysis). In order to quantify the geographical effects of border on transnational water pollution, let us introduce a variable: "distance to the nearest border". According to the indicator of chemical oxygen demand (COD) of each water quality station and the distance between the station and the nearest international border site, we can find that the water pollution indicator tends to decrease with respect to the distance (see Fig. 2.2). Obviously, the above findings provide evidence in support of the view that water pollution is negatively related to the distance to the border.

2.2.3 *Views from Larger Extent*

Indeed, it is almost certain that sharing a common border is not good for cross-border environmental protection. In such circumstances, borders pose serious challenges to all stakeholders concerned. For example, even in the case of the US and Canada—two countries that share the longest undefended border in the world (in the sense of the absence of military forces)—efforts to jointly govern the water pollution of the rivers and lakes that either flow along or overlap their common border have required the negotiation of different treaties and agreements to date. Several international treaties deal with oceanic pollution, including the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter and the 1973 International Convention for the Prevention of Pollution from Ships. International controls and enforcement of the above treaties, however, are generally weak (Hart 2004). When fresh water and marine resources must be shared by unfriendly, authoritarian or even

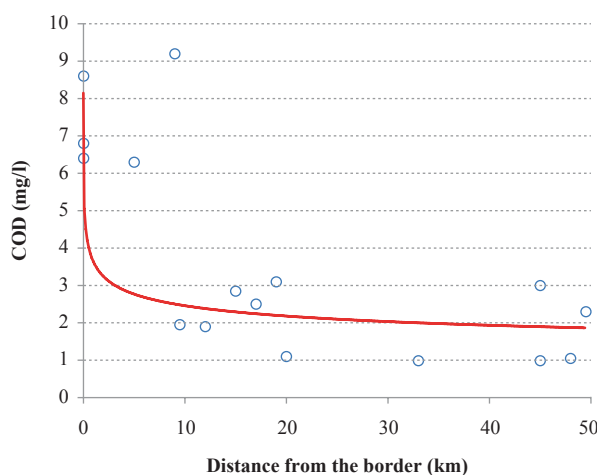


Fig. 2.2 The impacts of ‘distance’ on transnational water pollution. Notes: *COD* chemical oxygen demand, the unit of which are milligram per liter (mg/l). (2) The distance is measured by author on the basis of the map provided by the Mekong River Commission (MRC). (Source: Case study 16 of Chap. 16)

totalitarian nations, cross-border coordination in the exploitation and management of natural resources becomes an even more difficult—if not an impossible—task.

Usually, the socio-economic complexity of a border-area is positively related to the political level of the border(s) involved. For example, the higher the status of the border’s political level, the more complicated the structure of the border-area. A striking difference in the functions between international border-areas and intra-national border-areas is the nature of political dependence in the region. Unlike the situation in the dependent political units and other administrative subdivisions, no central administrative authority can enforce agreements between nations over the transnational issues.

In 1986 the West European nations amended the Treaty of Rome with the Single European Act. This Act provided for the removal of all remaining restrictions to the free flow of goods, services, capital and labor among member nations, so that the member nations became a single unified market at the beginning of 1993. This has produced substantial efficiency gains and other benefits for the European Union (EU). The static welfare benefits resulting from the formation of the EU are estimated to be 1 to 2% of GDP, while the dynamic benefits were estimated to be much larger (Cecchini 1988). The program also induced large amounts of foreign direct investment (FDI) from the other nations, especially the United States and Japan, in anticipation of a new increase in EU protectionism against outsiders. However, the efforts to unify all independent economies have not been successful in the entire territory of Europe. The Organization for Security and Cooperation in Europe (OSCE), including countries from at least three cultures (Eastern Orthodox, Islam and Western Christianity) with quite different values and interests, has faced major obstacles against its development of a significant institutional identity and a wide range of important activities.

2.3 Structural Complexity of Borders

A cross-border area is a geographical system governed by political rules and divided by two or more man-made boundaries. In this system, all sub-areas interact with each other. The elements of each sub-area, which include various political, economic and cultural factors, are correlated with each other in sequence. The whole geographical system provides a very complicated function with respect to the locations. The interactions between the various elements of all sub-areas are complex. In addition, cross-border areas are sometimes integrated and dynamic. The former emphasizes that all adjacent areas are geographically interdependent, whereas the latter describes the relationship between the state and time of systems.

2.3.1 Propositions

In order to examine the political and economic effects of borders, I assume that a geographical area is equally divided in size by N regimes, each of which has a different political system from the others. Furthermore, in order to make the analysis clearer and concrete, let us use the following assumptions:

1. All necessary production factors (such as labor force, capital, technology, natural resource, information, etc.) are both scarcely and unevenly distributed within the area.
2. The production factors can flow more freely within each sub-area than between the N sub-areas of the area when $N \geq 2$.
3. Each of the N sub-areas has at least one comparatively advantageous (or disadvantageous) sector over the other(s) when $N \geq 2$.
4. Transport and communication cost within each sub-area is too little to influence the preference of the sub-area in allocating its production factors.
5. The objective of each sub-area is to optimize its well being through the behavior of its agents.

In fact, Assumption 1 is not *ad hoc* in the real world. Assumption 2 is a basic law if border-related barriers exist. Since each sub-area is different and independent from the others, inter-area (cross-border) cooperation is more difficult and costly than intra-area cooperation. In the real world, Assumption 3 is the *sine qua non* for the sub-areas to develop cross-border cooperation after the border-related barriers are removed or reduced. Technically, Assumption 4, which is widely used in most spatial economic analyses, allows the intra-area cooperation to become profitable within each of the N sub-areas when N decreases (or, in other words, when the size of each sub-area increases). Finally, Assumption 5 serves as an indispensable condition under which the output of each sub-area and the total output of the area as a whole can be optimized, respectively.

Suppose that the degree to which a sub-area depends on the outside world is denoted by R and that the size of the sub-area is S (for simplicity, S is assumed to be expressed by πr^2 , where r denotes the average radius of the sub-area). Deriving the differential of R with respect to S , we have

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Guo, R.

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