

# The impact of riots on hotel revenue performance

Master Thesis

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## **Abstract**

By using a sample of 10 European cities over the period of the first quarter 1996 to the fourth quarter 2005, this thesis explores the impact of riots on hotel revenue performance. The connection between destination image and tourism industry is illustrated to help explain the results generated with a number of variables about riots. The research uses fixed effect models with cluster standard errors to control for autocorrelation and heteroskedasticity in panel data. It is found that riots as a whole do not have a significant influence on hotel revenues. But when further categorizing riots by their different features in terms of type, duration and location, a significant negative impact can be observed in riots triggered by disruptive states acts and riots recorded with specific locations. Limitations and recommendations for further research are also provided.

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# 1 Introduction

“Lots of people have come in here and asked me whether it is safe to go to the Eiffel Tower. This is really hurting the city’s image,” this voice comes from Jhon Diaz, the owner of a 14 years old souvenir shop near Notre Dame Cathedral, and he is just one of many people who expressed the same concern about the riot burst in and around Paris in 2005 (Kerstin Gehmlich, 2005). As a world-famous tourist city, Paris is proud of its rich tourism & cultural resources and complete service industry chain together as a never-fading city card. And tourism as a pillar industry for the French social economy could be sensitive to the outbreak of terrible city events like this. In response to the tourist-oriented urban development strategy, the concept of city image is introduced to attract and retain more visitors to improve the economy. While in the process of building, transforming and enhancing the urban image, outbreaks of city-level riots are often considered as “unplanned events” which could pose challenges to the government’s image-crisis management. Taking what Getz (2008) described for “planned city events” such as Expos and Olympic Games as a reference, negative events like riots share some common features: they bring social interactions across the context, people and management systems; they never happen for the same reason and seldom unfold in a single mode. However, in contrast with the tourism potential lying in planned events (Getz, 2008), riots could jeopardize the development of tourism industry by for example assaulting tourists/visitors, damaging city landmarks and shrinking accommodations.

During the past century, research has proved that the analysis of riots can not exist independently without considering other fields in terms of economy, politics and demography. The problem is that there was too much study centered around triggers of commotions while too little on how countries or cities would respond under the circumstances (Wilkinson, 2009). Most of the time, sizable riots are just subsumed under urban large-scale events to analyze, which leads to a vague and sketchy understanding of their influences on specific socioeconomic sector.

This thesis will explore the relationship between riots and one of the important economic sectors, namely, tourism industry. The key research object of tourism is lodging industry, which is in general recognized as one of the three pillars of tourism. We take hotel revenues as the indicator of hotel industry’s performance as it is quite intuitive for people to see the rise and fall on the market (Jang, Hu and Bai, 2006). Meanwhile, we will shed some light on the concept of tourism destination image at first. In fact, there has been a long discussion between tourism and city image. Early research by Hunt in 1975 has started to analyze the role of image in tourism development. In more detail, he emphasized the effect of city image on tourist decisions related to accommodation, food, services and so on. However, research challenge lying in tourism destination image makes relevant study be beset with difficulty. An essential problem is the conceptual vagueness of destination image. Together with other examples of ethnic identity and national pride, tourists’ image of certain place can be a typical concept hard to be quantified or with a high risk of containing untested assumptions. Therefore, we can see tourism destination image as a “black box”, which

processes external stimulus on tourist industry and makes the result to be reflected through tourists' consumptive behavior. As a result, by analyzing tourist behavior we can see the impact of external factors on different aspects of the tourism industry.

Accordingly, the external stimulus in this thesis is riots and the corresponding result is the change in hotel revenues. Hypotheses are tested by observing 10 European cities during a ten-year period, using data from 1996 to 2005 by quarter. GDP per capita and quarterly dummies are included in models to control for the economic conditions and seasonality. These four hypotheses are made not only to question whether the occurrence of riots can influence hotel revenues but also to have a deeper analysis on riots classified by different dimensions (e.g. event type, location and duration). It is found that there is no significant evidence that the happening of riots has an impact on hotel revenues. But once riots are further classified, more information can be told: the expected negative impact on hotel revenues is found from riots triggered by disruptive states acts. And riots occurred in specific locations such as road, public monument and residential property also decrease hotel revenues significantly. However, riots in densely populated areas lead to higher hotel revenues, which is a very interesting result worth discussing. Lastly, we can not find any influence differences between riots last one day and riots continue for more than one day. And neither of their impacts is significant on hotel revenues. There is no variable of tourism destination image included in the models. Instead, we will use the mechanism behind it to explain why the impact of riots on hotel revenues is selective and not as negative as expected. As a result, this study may make some contribution to destination image crisis management in tourism.

The remaining parts of this thesis are organized as follows. This section has briefly introduced the research being conducted in this thesis. The next section provides background literature concerning about tourism destination image, riots and hotel performance respectively. Additionally, several determinant factors that are highly related to revenue performance are mentioned. The third section gives a description of the data collected and methodology used in empirical tests for the hypotheses. Results of the analysis are shown in the fifth section, which is followed by the discussion on the results via taking into account tourism destination image in the sixth section. Finally, the last part points out some limitations of the thesis as well as recommendations for further research directions.

## 2 Literature Review

This section will provide an overview of the existing literature on tourism destination image, riots and hotel performance. The first part of this section will introduce the concept of tourism destination image and its impact on subsequent tourism behavior. Factors that can influence destination image will also be listed. Among studies about these factors, the literature on negative events will be discussed specifically so as to examine whether and how they can alter tourist behavior through influencing tourism destination image. The second

part will talk about one typical type of negative events, namely, riot. This part will not only discuss its definition but also briefly introduce several main categories of riots based on various causes or incentives. Subsequent research on the impact of riots has been stretched to many aspects such as politics and culture while the sector of tourism has not been thoroughly probed. More specifically, with a limited number of papers on tourists' response to riots, we would like to further discuss how could the lodging industry be affected. The third part showed results of existing literature on hotel performance evaluation. Hotel revenues as a typical determinant of hotel financial performance could be highly affected by factors such as Gross Domestic Product growth and disposable income. Based on that, the incidence of riots is considered as the main factor to be analyzed and hypotheses about the impact of riots on hotel revenues will be established in the following section.

## 2.1 Tourism destination image

With the ever-growing importance of tourism industry for international economic development in last decades of the 20th century (Judd and Fainstein, 1999), more and more city administrators have made great efforts to market urban tourism image to attract as many visitors as possible. They have realized that in order to get considerable economic and social benefits brought by tourists, a successful city tourist image is so crucial that it can evoke tourists' expectations and increases the possibility of visitation (Leisen, 2001). According to Gartner (1989), tourists are used to examining their acquired information about a destination before making the decision to go. And diverse information sources could result in different levels of the destination image. According to Gunn (1972), general human geography information from books and reports forms the organic image, which makes people who have never been to a place keep some basic information in mind. But whether individuals can become the potential tourists depends more on the induced image. Information containing in this image is more tourism-specific and leave a mark of conscious marketing efforts from destination planners. Once such induced image successfully convinces people to set off, it can be speculated that the tourism destination image is closely matched with travelers' anticipations (Gartner, 1989). Thus by prompting destination image, the likelihood of visitation can be increased (Goodrich, 1978). But travelers' actual feelings and experience over there might bring changes on the existing image, which can further influence other tourist behavior such as recommendation (Tasci, 2008). Hence, a relatively integrated destination image would be a combination of the information itself and tourists' affections interacting with information received.

However, to define the nature of tourism destination image requires a more in-depth research on the subjective side. As mentioned by Reynolds (1965, p. 75): "different people will have different images of the same product". And most of the time, these different images are a reflection of their various value judgments, motives and life styles. For tourism destination itself, there is no absolute positive and negative (Davidoff and Davidoff, 1983). What matters is whether tourists' affective association about a destination can trigger the willingness to visit. If yes, the destination image chosen is usually more positive in tourists'

mind than images of other places being given up (Woodside and Lysonski, 1989). Another possible reason for tourists to not put a place on the waiting list is they do not recognize this place as a tourist destination at the very start. Instead, People might go there for business or education. Woodside and Lysonski (1989) claimed such weak awareness of tourism image as a kind of neutral perception, which can be quite insensitive to market strategy aiming for more tourists or natural/ man-made disasters jeopardizing tourism resources.

From the perspective of city marketers, if they have considered how personal factors can contribute to tourism destination image, it will not be difficult to realize that managing tourism image is not just showing what the destination has, but also giving tourists what they want. According to Bonham, Edmonds and Mak (2006), among all the concerns about a destination, personal safety is always the primary one for the majority of travelers. When terrible events such as terrorist attack, natural disaster and disease outbreak occur in a destination, people's willingness to travel can greatly decline or transfer to other alternative low-risk places (Bonham, Edmonds and Mak, 2006). But do tourists from everywhere have the same level of negative emotion towards one incident? According to Huang et al. (2013), because of a higher degree of familiarity with geography and culture, local and neighboring visitors of the destination usually have a more comprehensive and always up-to-date destination image than international travelers do. Therefore, they could generate the same negative attitudes when facing terrible events, but destination image for them will not be distorted so badly. And thus their subsequent tourist behavior would not be modified very much as well. That is to say, visitors from proximate areas who are attracted by city central landmarks will not easily cancel their trips for an unrest happened in the outskirts. While international travelers are more likely to stop or postpone their plans even if the origin of such event has little to do with tourism. Hence, the impact of negative events on tourism is obvious, but the extent of the impact on different visiting groups' destination images remains to be changeable, which leads to various degrees of tourist behavior modification.

It can be found that among a substantial amount of literature studying the link between negative events and tourism, terrorist attacks is one of the most frequently analyzed types. For instance, Pizam and Fleischer (2002) found a positive correlation between the frequency of terrorist incident and the durability of its negative impact on tourism demand. Kosova and Enz (2012) proved that the influence of terrorist attack 9/11 on hotel occupancy drop is sudden and substantial. As well, Bonham, Edmonds and Mak (2006) claimed that the shock of 9/11 to tourism has not just been shown at New York but to the entire America, which makes a large proportion of international tourism flows transfer from the mainland to Hawaii. Apparently, unfavorable destination image caused by terrorist attacks brings impact on many aspects of tourism.

The existing research findings on terrorist attacks provides a reference to the study on another type negative event: riots. In fact, the impact of riots on tourism destination image and subsequent tourist behavior has not been deeply explored thus far. But as an issue in the context of urban safety and stability just like terrorist attacks, riots also deserve some discussions. And the following part will give a brief review about the concept of riots and



its research status.

## 2.2 The concept of riot and its influence

How to define riots is always a controversial topic in the majority of existing literature about riots. Due to different search background and demand, it is very difficult for researchers to reach an agreement on defining the evaluation criteria. For instance, the law of India specifies the definition to five or more people taking violent actions with the purpose of certain common aim (Wilkinson, 2009). While things are a bit different from the perspective of social scientists. Most of them extended the definition by also considering practical consequences of riots. An example can be found from Bohstedt (1988), who studied English riots in the eighteenth century and claimed that a riot should be defined as “an incident in which a crowd of fifty or more people damaged or seized property, assaulted someone or forced a victim to perform some action”. Debates also exist in recognizing violent forms that can be covered by riots, and sometimes other similar terms like “disturbance”, “commotion” and “unrest” are used as substitutes (Solomos, 2011).

This conception mismatch makes many scholars become very cautious about defining riots too generally. Instead, they prefer to explain such unrest through analyzing the causes. And based on various triggering factors, several common types of riots are classified. For instance, people struggling to feed themselves are thought to be a vulnerable group. Their discontent with food insecurity and food price surge often trigger food riots (Bush, 2010; Holt-Giménez 2008, 16). Sports riots often closely follow big sports events such as football league and Super Bowl. Simons and Taylor (1992) described such events as intended destructive phenomenon that results from disagreement or resentment between different team spectators. And Russell (2004) noticed that some fundamental factors such as religion and economy behind sports riots are nothing special but the same as factors for other social conflicts. Another type of riots is race riots. According to Olzak, Shanahan and McEneaney (1996), residential segregation and racial competition are critical factors to make people with different ethnic backgrounds take violent actions. And Solomos (2011) also pointed out the close link between political inclusion/exclusion and collective violence. A more complex form of commotion is urban riots. In general, most of their occurrences are related with many signs of city decline like discrimination, housing inadequacy, poor education and police abuse (Welch, 1975). And sometimes such riots could be consequences of policy failures. For example, Wihtol de Wenden (2006) exemplified the root of France urban riots in 2005 was partly due to unwise immigration policy trying to exclude minority ethnic from main society.

The effort to classify riots indicates a wide range of possible influences on corresponding aspects of politics, economics and culture. When types of riots can be traced back to different purposive behaviors, examining their impacts is more like answering if rioters’ demands and grievances are satisfied or placated. According to Welch (1975), city expenditures would

rise because of the occurrence of riots, and this increased part is usually generated from controlling demands and penalizing rioters.

But even if riots can become signals of policy reforms or motives to advance social changes, the primary pursuit for tourists' when they travel is not to share those achievements that are significant for local residents or citizens. By contrast, they focus more on the undeniable objective evidence of violence during riots, which closely relate to the sense of security and stability. For example, in Mucchielli's (2009) study on 2005 France riots, he recorded damages of private cars, public buildings and public transportation system by rocks and fire. And Hundreds of businesses were interrupted. More notably, because such riots stemmed from citizens' death as a result of police actions (Newburn, 2016), forces later sent from authorities to put down the insurgents became the main target as well. In another riot happened in England in 2011, 5 deaths and more than 5000 crimes were recorded including arson, burglary and public violence. Thousands of people suffered losses in terms of properties and business with a cost of over half a billion pounds (Riots Panel, 2011). What worths noting is that in most cases, the common way for tourists to get information about riots is through modern media, but this could even intensify their fears. According to Mucchielli (2009), modern media indeed help the spread of news about riots, but such news usually would not touch too much upon the origin of unrest or the following actions that rioters would take. Instead, pictures of burning vehicles and buildings on TV could even trigger rioters to compare their outcomes with each other, which might lead to an escalation of violence. All this are not what travelers expect from an ideal tourist place, and the negative perception of safety can scare them off even if other aspects of tourism destination stay strong. As a consequence, the decrease of arrivals makes pillar items of tourism such as hotel industry suffer heavy losses.

### **2.3 Hotel performance and its determinant factors**

While riots are the main focus, hotel performance depends on many others factors as well. These are discussed briefly below.

Hotel industry as one of the key sub-sectors of tourism is considered to be responsible to provide hospitality services (Clancy, 1998). In the last few decades, the increased demand from travelers successfully stimulated a surge in the supply side correspondingly, which leads to a fierce competition among hotel organizations (Kandampully and Suhartanto, 2000). As a result, businesses have been expanded on a global scale quickly in order to gain more market shares and profits under such circumstance (Ritchie, 2004). But according to Jessop (1999), such expansion also brings one hidden trouble, namely an increased likelihood for the tourism industry of getting involved in a wider range of risks. These risks could be crises generated within the industry and disasters happen unexpectedly from outside (Faulkner, 2001). It is generally recognized that what tourists concern most when they travel outside

is health and safety (Kozak, Crotts and Law, 2007). Holjevac (2003) also claimed that "humans as travelers want to feel safe, free and at home, no matter where they are." Once a negative feeling of security in a certain place is built, related impact on hotel performance could appear very soon and last for a long period of time (Chen et al., 2005).

Hence, the measure and control of industry performance have great importance. It not only reviews previous results but also underlies future control and decision (Harris and Mongiello, 2001). For hotel managers who search for solutions to control the negative impact of incidents, hotel performance provides a framework for analyzing impacts on specific indicators of the industry. Research on hotel performance has been carried out for many years. According to one of the studies done by Harris and Mongiello (2001) about finding key performance indicators, sales revenue ranked ninth among top ten key indicators. It is chosen for the reason of letting managers know when and how to improve revenue management. Jang, Hu and Bai (2006) also claimed that sales revenue as a direct indicator can show the rise and fall of hotel industry on the market.

As for finding key determinants of hotel performance, latest research (George Assaf et al., 2017) discussed this problem by considering cross-region marketing characteristics and time trends, which broadens the number of determinants available to be analyzed. This study also breaks some selection constraints caused by different destination features. Final results of the study identified twenty-one determinants under six driver categories that cover the major areas of social economics. And among these different forms of determines, some are just highly related with revenue performance of hospitality industry.

### **2.3.1 Gross Domestic Products (GDP) growth**

The first factor is Gross Domestic Products (GDP) growth. Considering about the obvious periodicity of the hospitality industry, its performance can be very sensitive to changes in economic conditions (Chen, 2010). Gross Domestic Products (GDP) growth, as one of the main general economic conditions, can greatly influence hotel performance (George Assaf et al., 2017). Researchers like Kosova and Enz (2012) claimed that general changes in GDP could make a difference in the demand for hotels and therefore the financial performance of hotels. It is reasonable to think that a turbulent economic climate could lead to the decline of economic well-being and the increased cost of living. And these factors could add tourists' hesitation to travel because of the worry of rising social instability in destinations and more travel budgets required. Chen (2007) also confirmed the impact of GDP growth on the financial performance of tourism-related industries. In his later study in 2010, Chen deduced a positive relationship between hotel performance and economic environment, which means that the growth of economy could enhance hotel earnings & profits and thus indicates a better overall performance of tourist hotel industry.

### 2.3.2 Disposable incomes

The second key economic indicator that often used to estimate the state of the economy is disposable income, sometimes also known as disposable personal income (DPI). It is in general defined as "the amount of money that households have available for spending and saving after income taxes have been accounted for" (Staff, 2017). According to Bonham and Gangnes (1996), when analyzing long-term determinant of hotel revenues, disposable income was recognized as one of the prior factors that have the closest relationship with hotel revenues. Lim (1997a; 1997b) summed up papers that analyzing tourist demand since the 1960s and found that this indicator was one of the most-used independent variables. Other researchers like Walsh, Enz and Canina (2004) claimed that the decline of real disposable income could result in less tourist accommodation demand because domestic travelers could cut back expenditures on leisure tourism. And for overseas tourists, an unfavorable level of disposable income could suggest a lower standard of living, which reduces the tourism competitiveness of destination itself. Or rather, a lower standard of living could lead to lower prices for tourists, which increases the attractiveness to foreign visitors instead.

### 2.3.3 Gasoline price

The third economic factor is gasoline price, which is usually considered as a main representative of fuel price. It is generally acknowledged that energy consumption always accounts for a considerable proportion of people's daily consuming behavior. In most western countries, self-driving travel is a common travel pattern especially when routes are within continental Europe. Hence, it is reasonable to deduce that the change of gasoline price could alter consumer choices, thus influence the demand for many goods and services such as tourist accommodation. According to results of Canina, Walsh and Enz's study (2003) on the linkage between gas price and rooms demand, the rise of gasoline prices will lead to a reduced demand for lodging-related products such as hotel rooms. While an earlier paper about energy price done by Arbel and Ravid (1983) showed an opposite result: higher fuel prices could contribute a mild increase in the demand of hotel business. It was explained as people change their long-way journey to short-distance trips for less time on the road, hence there could be a longer time staying in hotels at certain place.

It is therefore not hard to see that the overall economic circumstance and price level can affect the financial performance of hotel industry in an area to some extent. Even when analyzing hospitality at the city level, national circumstances can be just important as regional ones considering the reference value of economic well-being and commercial climate for tourists. And such impact could be even more obvious for cities in small countries than cities in big countries.

## 3 Data and Methodology

### 3.1 Introduction

The empirical analysis propose of this thesis is to explore the effect of unrest events like riots on hotel revenues. We used a panel of 10 cities in 8 European countries for the period 1996-2005. The sample was observed by quarter. The main variables are hotel revenues and riots. The control variables include GDP per capita and a dummy variable for seasonality. Practical information about these cities was shown in the following chart.

City	Country	Is this city a capital	2015 Top 100 Cities Destination Ranking
Amsterdam	Netherlands	YES	29
Athens	Greece	YES	47
Barcelona	Spain	No	25
Belfast	the United Kingdom	NO	100+
Berlin	Germany	YES	35
Brussels	Belgium	YES	60
Florence	Italy	NO	36
Paris	France	YES	5
Rome	Italy	YES	13
The Hague	Netherlands	NO	100+

Figure 1

These 10 cities come from 8 popular nations for tourists who visit Europe. And 6 of the 10 cities are capitals of corresponding countries. In tourism, some of the cities are recognized as typical tourist places while some are not. Taking the report of 2015 top 100 city destinations ranking as a reference (Geerts, 2016), cities such as Paris, Rome and Barcelona were typical tourism destinations with very strong tourist competitiveness. And these cities usually own well-known and successful tourism destination images. Belfast and The Hague were not on the list, but this would not mean that they did not develop the tourism industry. Compared with top ones, they are more often recognized as an industrial city and a political center instead.

### 3.2 Data

Variables containing in this thesis are from one dataset and two databases: STR Trend Reports, Eurostat National Accounts Database and Civil Unrest Event Database.

### 3.2.1 STR Trend Reports

Carried out by STR, STR Trend Reports display monthly hotel performance data in terms of occupancy, daily average rates (ADR), revenue per available room (RevPAR), supply, demand and revenue. STR collected hotel performance data every month from information sources such as chain hotel headquarters, private hotel owners and independent operators. Type of hotels in this database covered from standard global&local chain hotels to independently owned and operated lodges. Establishments that combine accommodation with business&leisure projects (e.g. conference, spa, casino) were also included in the ranges of calculation. Hence, Trend Reports do not reflect individual hotel data but data on aggregated groups of hotels (e.g. hotels in the European market).

In the Trend Reports, hotel revenues were calculated as total revenues generated from the sale or rental of guest rooms. And there are some other room-related items that should also be included in room revenues. First was already-made payments from guests who failed to either check in or cancel their reservation within regulated time frame. The second was mainly surcharges and service charges generated from compulsory or optional services such as guest room cleaning and customers' use of an amenity provided. The third was incomes received from renting out functional rooms such as hospitality suites, dressing rooms and undertaking activities like movie auditions and employment interviews. The fourth was fees charged from extra bed/crib service and guest early/late departure. And the last one was usually extra money required for specific room types such as room allowing smoking/pets and room with beach view. Meanwhile, earnings from selling food and beverage or from non-room sources were not included in room revenues. Also, all rebates, refunds, allowances, overcharges and taxes have been deducted from room revenues reported to STR.

Room Revenues provided by SHARE Center successfully covered guest rooms in a comprehensive range of hotel categories. Considering accommodation service is the main business for the majority of hotels, it is acceptable to take room revenues as hotel revenues. The only problem is that there is no clear distinction between rooms for travel& leisure and rooms for business. Since this thesis mainly focuses on the tourism industry of a destination, hotel rooms of which primary customers are business people would not be the main research objects. Hence, revenues calculated by guest rooms in this way will not reflect hotel financial performance in tourist market as accurately as expected. People stay overnight on business could not be that sensitive to tourism attractive factors (e.g. tourism destination image) and this might weaken the impact on hotel revenues caused by changes in these factors.

### 3.2.2 Eurostat National Accounts Database

Eurostat National Accounts Database provides data on GDP per capita of European countries. It is calculated as the total output of a country divided by the number of people

residing in the territory concerned. In another word, it evaluates the amount of money each individual can get in a country. Compared with GDP, GDP per capita shows the relative performance of the countries and can be used as a measure of standard of living. High GDP alone sometimes would not indicate a high standard of living because for countries with large population base, wealth distributed to each resident could turn out to be quite low (Differencebetween.net, 2017). Hence, for this thesis, GDP per capita is a more efficient indicator to estimate either economic circumstances or living standards of destinations. What's more, to compare GDP per capita in one period with that of another period, we choose real GDP per capita instead of nominal GDP per capita because the former was corrected for inflation.

There were both annual and quarterly data on GDP per capita available from Eurostat and in this thesis we took GDP per capita on the frequency of quarter. Advantages of using quarterly data can be listed as follows. First, a higher frequency of data could obviously increase the sample and the accuracy of estimates. Second, a higher granularity could lead to data aggregation bias. If we use annual data other than quarterly data, there will be no evident quarterly changes on GDP per capita reflected. Considering hotel revenues were analyzed on a quarterly basis, only knowing annual GDP per capita could push the result to either overestimate or underestimate the size of their relationship.

It is worth mentioning that the higher frequency of data series, the more likely it displays seasonal pattern. In this thesis, we would still take GDP per capita data that were neither seasonally adjusted nor calendar adjusted and remove the seasonal factor by using seasonal dummy variables.

### **3.2.3 Civil Unrest Event Database**

Civil Unrest Event Database was a fruit of Social, Political and Economic Event Database (SPEED) Project. The core issue of this project was Societal, Stability Protocol (SSP), which aimed to provide a good empirical understanding through event data about civil unrests (Hayes and Nardulli, 2011). This database recorded civil unrests happened from 1946 to 2005 in 165 countries with a total 62,141 observations. According to the report on quality and reliability of data collected by this protocol, reliability test results showed a high accuracy level of coder-generated data, which means that 72% to 85% of all events were involved.

The strengths of this database are that it did not focus on a single type of negative events such as terrorist attacks or minority conflicts, but successfully built a more comprehensive framework of civil unrest data. This higher level of data availability made it possible to reach event data which would normally be inaccessible from most official sources. In more detail, Social, Political and Economic Event Database (SPEED) covered news sources for events in the overall period after WWII and enlarged sample population to more than one hundred countries, which greatly helped researchers to explore unrest through cross-national and

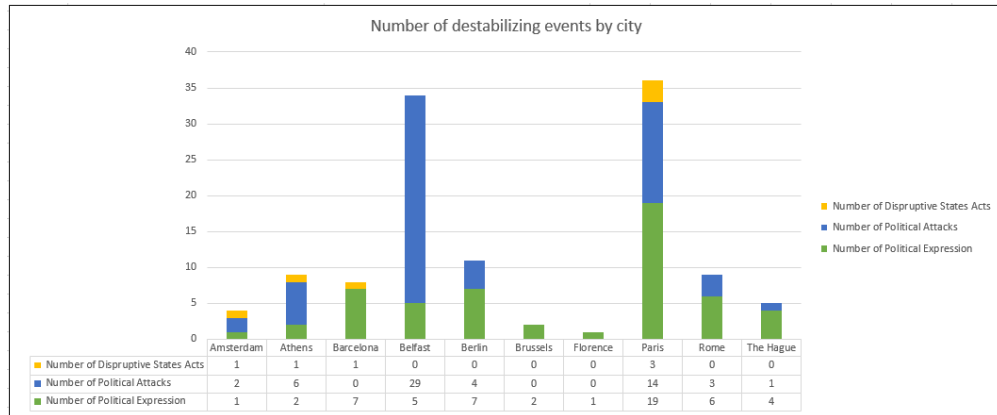
longitudinal analysis. On the data processing side, the SPEED used automated procedures as well as the help of human coders, which makes it realize the maximum extraction of event-based data from available information sources with high efficiency. What's more, this hybrid approach also increased the reliability of information such as event locations at city-level, event origins and event intensity. Such type of information may not be very useful for practical applications but can be decisive factors for academic research (Hayes and Nardulli, 2011).

However, limitations of this database are also obvious. One is the freshness of data. It can be observed that although the data started from the end of the Second World War, the latest year of data available stopped in 2005. The blank from 2005 to now can be attributed to the huge time and manpower required when collecting information in a relatively long given period. While it can not be denied that data which is not updated on time may weaken the reference value of analysis results. In this case, it means the impact of riots on hotels competing in fast changing tourism markets. The other one is the screening standard of data on riots. As one of many examples of civil unrests, riot in this database, however, was not classified directly as one of the main categories of destabilizing events. Instead, it was coded as a pattern of violence under three main event types coded as "Political Expression", "Political motivated attacks" and "Disruptive state acts" respectively. Because there was no further explanation about how this database defined or classified riots mentioned in this database, there is a possibility that except for subcategory that was clearly coded as "riot", other coded subcategories such as "revolt", "border incident" and "brawl" under these three types of events could also be correlated with riot (e.g. riot as a trigger but not the form adopted). Hence, the size of data selected would be decided by how to define a riot for this thesis. A narrow definition of 'riot' based on the code name could ensure the accuracy literally but might lost a number of events that can be equal to riots. While a broad definition based on violence and people's negative feelings could definitely increase data available but also sample error. As a consequence, it can be predicted that data extracted in this way would not be as "pure" as expected.

In order to have a comprehensive understanding of riots, the broad definition of a riot was taken as filter criterion in this thesis. Then we firstly dropped events that were not coded for a destabilizing event and thus ensured all the data left were events that could bring fear and anxiety to people. Next, by examining whether subcategories/tactics/types of each main destabilizing event category could be involved in violence, categories coded as "Political Expression", "Political motivated attacks" and "Disruptive state acts" were kept while "Political Reconfigurations" was dropped. Meanwhile, event categories coded by "Missing", "Null" and "Other" were also dropped because their results were meaningless in this case. Therefore, there were 119 riots counted in the 10 European cities from 1996 to 2005 in total, which were composed of 59 political attacks, 54 political expression and 6 disruptive states acts. Every city had the record of political expression while only 4 cities experienced Disruptive states acts. For typical tourist cities, Florence had the least number of destabilizing events while Paris had the most, which could nearly match the record of non-typical tourist city Belfast. Cities in which political expression occupied the biggest proportion of events were Barcelona, Berlin, Brussels, Florence, Paris, Rome and The Hague.



And political attacks were dominant in Amsterdam, Athens and Belfast (see figure 2).



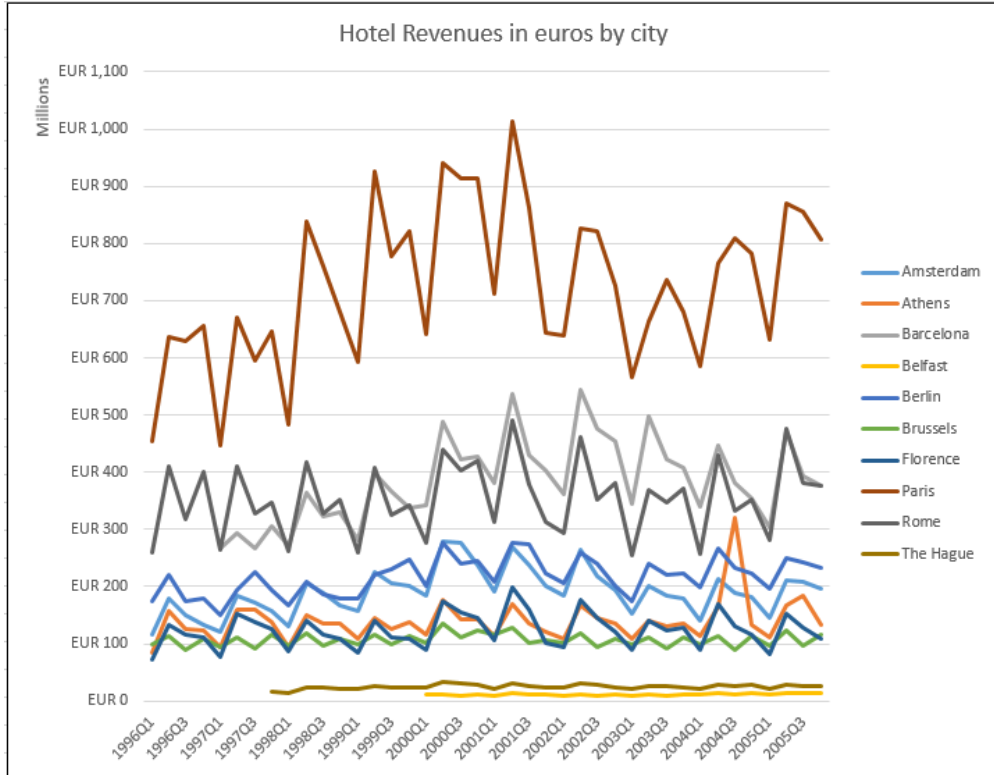
**Figure 2:** Number of destabilizing events by city, 1996Q1-2005Q4

### 3.3 Variable description

#### 3.3.1 Dependent variable

##### 3.3.1.1 Hotel revenue-hotelrevenue

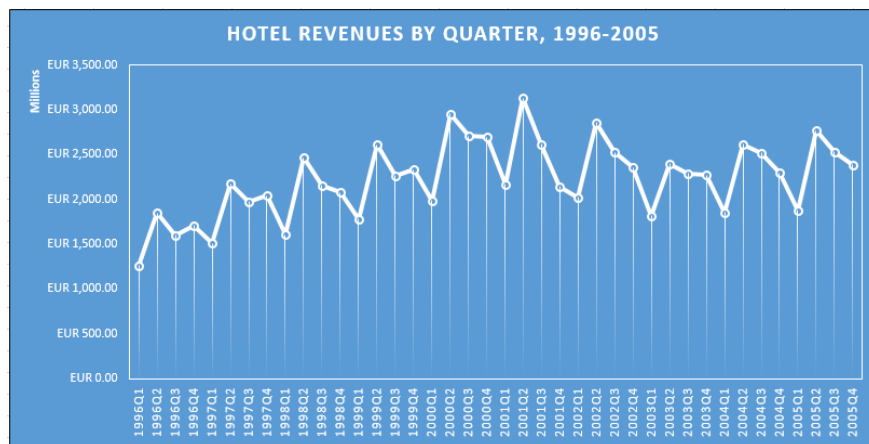
Hotel revenues of these ten cities showed various change trends by quarter from 1996 to 2005. Typical tourist city such as Paris and Barcelona kept much higher levels of hotel revenues compared with hotel revenues of other non-typical cities like Belfast and The Hague over the ten years. But these difference could also be partially explained by city size. What else can be observed was that with a higher revenue level, there was always a higher revenue volatility. The relatively stable trend of revenues only appeared in cities like Belfast and The Hague, which means that although hotel revenues in these cities were much lower, the change tendency was more predictable (see figure 3).



**Figure 3:** Hotel revenues in euros, 1996Q1-2005Q4

For city Athens, there was an abnormal revenue peak in the third quarter of 2004 when most of the other cities experienced decreases from the prior quarter. The most likely reason for this surge is the 2004 Athens Olympics. Such mega-event substantially brought positive effect on either occupancy or the Average Daily Rate, which as a whole increased hotel revenues.

Hotel revenues across the years show a quite strong seasonal change pattern. Revenues usually surge from 1st quarter to 2nd quarter and then drop a little in the 3rd quarter. There can be either an increase or decrease from the third quarter to the fourth quarter but the degree of change will be very small (see figure 4). Hence, it can be inferred that the first quarter will always be the off-peak season and hotel revenues tend to peak in every second quarter of a year.



**Figure 4:** Hotel revenues by quarter, 1996-2005

### 3.3.2 Main independent variables

The main independent variables are about riots and we are interested not only in whether riots occurred but also types of events that touch off riots, the locations of riots and their time of length. Hence, there will be four models exploring these questions and correspondingly four kinds of main independent variables about riots in each model. What is worth mentioning is that there could be more than one riot happened in a given quarter of a year, and these riots could fall into different event types, locations and length of time. Therefore when categorizing riots according to these factors, we need to consider indicator variables that indicate whether the riot belongs to a certain group or not instead of normal categorical variables that divide riots data into more than two groups. Consider riot types as an example (model 2), there would be three event types mentioned and if we label them 1, 2 and 3, it could be confusing when more than one type of riot happened in a quarter. But if we create three binary variables (indicator variables) that indicate whether this type of riot happened or not per quarter, we will not miss any type of riots. Moreover, binary variables will only reflect whether riots happened but not the number of riots occurred. In fact, it should be realized that riots can not be simply added up even if these riots belong to the same type-/location/duration because there could still be many other factors that can differentiate riots.

#### 3.3.2.1 A riot occurred yes/no—Riotdum

The first main independent variable is the binary variable "Riotdum" indicating whether riot occurred in the destination city. We took the value of Riotdum as 1 if there was one or more riots happened in a quarter, and the value of 0 if there was no riot. From figure 4 we can see that observations with no riot recorded in any quarter from 1996 to 2005 were in the majority (331 of 400). The highest number of riot can be recorded in a given

quarter was 5 but with only one observation. In contrast, frequencies of observations that had 1 or 2 riots happened in a given quarter were much ampler. Hence, if we generate more dummies that recoding whether there were 2/3/4/5 riots or not respectively, there will be many dummy variables with little observations, which could be too rare to be statistically significant. Another reason to take binary variable for the happen of riots is that each riot is unique in terms of its type, location and duration and hence can not be simply added up. Two riots might not be necessarily worse than one riot depending on how severe they were. Therefore further generating dummies for the number of riots could make their coefficients very confusing.

```
. tabulate Riot_n
```

Number of riots	Freq.	Percent	Cum.
0	331	82.75	82.75
1	38	9.50	92.25
2	20	5.00	97.25
3	4	1.00	98.25
4	6	1.50	99.75
5	1	0.25	100.00
Total	400	100.00	

**Figure 5:** Frequencies of total number of riots

In figure 6 we could see that there were 69 observations with a record of experiencing at least one riot. The number of riots recorded became “less” because we should notice that either a quarter with one riot or two riots was identified as the same in riotdum, which equals to 1.

```
. tab Riotdum
```

Riotdum	Freq.	Percent	Cum.
0	331	82.75	82.75
1	69	17.25	100.00
Total	400	100.00	

**Figure 6**

### 3.3.2.2 Type of riots–PE, PA, DSA

Next, we are interested in how riots resulting from different event types affect hotel revenues. Hence in the second model, we would take Riotdum out and replace it with dummies for riot types. As what we have illustrated in the data section, the riot was not classified directly as the main categories of destabilizing events, hence types of riots in this thesis actually indicated types of destabilizing events that could trigger riots. There were three types of riots involved: Political expression, Political Attacks and Disruptive States Acts (Destabilizing States Acts). And we counted the number of riots falling in each type per quarter, which were expressed as PE\_riot\_n, PA\_riot\_n and DSA\_riot\_n respectively (see figure 7).

```
. tabulate PE_riot_n
```

Number of Political Expression	Freq.	Percent	Cum.
0	359	89.75	89.75
1	30	7.50	97.25
2	9	2.25	99.50
3	2	0.50	100.00
Total	400	100.00	

```
. tabulate PA_riot_n
```

Number of Political Attacks	Freq.	Percent	Cum.
0	360	90.00	90.00
1	25	6.25	96.25
2	12	3.00	99.25
3	2	0.50	99.75
4	1	0.25	100.00
Total	400	100.00	

```
. tabulate DSA_riot_n
```

Number of Disruptive States Acts	Freq.	Percent	Cum.
0	394	98.50	98.50
1	6	1.50	100.00
Total	400	100.00	

Figure 7

Thus we created three binary variables named "PE", "PA" and "DSA" for types of Political expression, Political Attacks and Disruptive States Acts (Destabilizing States Acts) respectively. For each of the dummy, we took the value of 1 if there were one or more

corresponding types of riots and 0 if there was no riot. Then we had 41 and 40 positive cases for dummies "PE" and "PA" respectively but observations for Disruptive States Acts (Destabilizing States Acts) were only 6.

### 3.3.2.3 Duration of riots—Oneday, morethan1D

When we looked at the duration of riots, there were four types of time length involved in this dataset. In total, 112 in 119 riots lasted for only one day, which definitely constituted the majority part. What's left was 3 riots recorded with a duration of two to seven days, 3 riots continued for one week to a month and 1 riots lasted greater than a month. It is obvious that there were too few observations for three other riot lengths. Hence we would combine them and make types of riot length recorded in this thesis become two. One is the duration of one day and the other is the length more than one day.

To explore how riots with different length of time can affect hotel revenues, we created two binary variables. The first dummy "One day" took the value of 1 if riots that lasted for one day occurred and 0 if no riot happened. The second dummy "morethan1D" took the value of 1 if riots that continued for more than one day happened and 0 if no riot happened (see figure 8).

```
. tab Oneday
```

Oneday	Freq.	Percent	Cum.
0	334	83.50	83.50
1	66	16.50	100.00
Total	400	100.00	

```
. tab morethan1D
```

morethan1D	Freq.	Percent	Cum.
0	393	98.25	98.25
1	7	1.75	100.00
Total	400	100.00	

Figure 8

### 3.3.2.4 Locations of riots– DenselyPopulatedArea\_riot, SpecificLocation\_riot and UnspecifiedLocation\_riot

If we analyze riots by differentiating their locations, there would be 15 specific locations involved in total (see table 1). The term location here would mean not only areas geographically but also facilities/institutions with certain city function. To avoid having too many location dummies with few number of observations in a model, we simplified these 15 locations types into 3 main categories. The first category "Densely populated area" was a general location type that indicates urban locations with large population density. The second category was called "Specific locations". Compared with the first category, this one contains 13 locations/facilities with specific functions from different sectors of society. Transportation-related locations included road, railway, ground transportation site, airport and air space. There were also public authorities in terms of the government facility, embassy/consulate, religious site and medical facility. Another location set was more related to tourism and business activities and thus included the public monument, recreational site and residential property. The third category was Other/unspecified locations. Results of this category might not be the interest of this thesis, but adding them to other categories might lower the accuracy of classification rules.

Riots location type	The number of riots happened in the location
Densely populated area	62
Road	6
Railway	2
Ground transportation site	2
Airport	3
Air Space	1
Government facility	12
Embassy/Consulate	4
Religious site	4
Medical facility	1
Public monument	2
Recreational site	3
Residential property	6
Other location	1
Unspecified location	10

**Table 1**

Hence there were three binary variables indicating whether riots happened in the category of location or not. For each dummy variable, we took the value 1 to indicate the presence of riots and 0 to indicate the absence of riots (see figure 9).

```

. tab DenselyPopulatedArea_riot

DenselyPopu
latedArea_r
iot          Freq.    Percent    Cum.
-----
0            359      89.75     89.75
1             41      10.25    100.00
-----
Total        400      100.00

. tab SpecificLocation_riot

SpecificLoc
ation_riot   Freq.    Percent    Cum.
-----
0            368      92.00     92.00
1             32       8.00    100.00
-----
Total        400      100.00

. tab UnspecifiedLocation_riot

Unspecified
Location_ri
ot           Freq.    Percent    Cum.
-----
0            391      97.75     97.75
1              9       2.25    100.00
-----
Total        400      100.00

```

Figure 9

### 3.3.3 Control variables

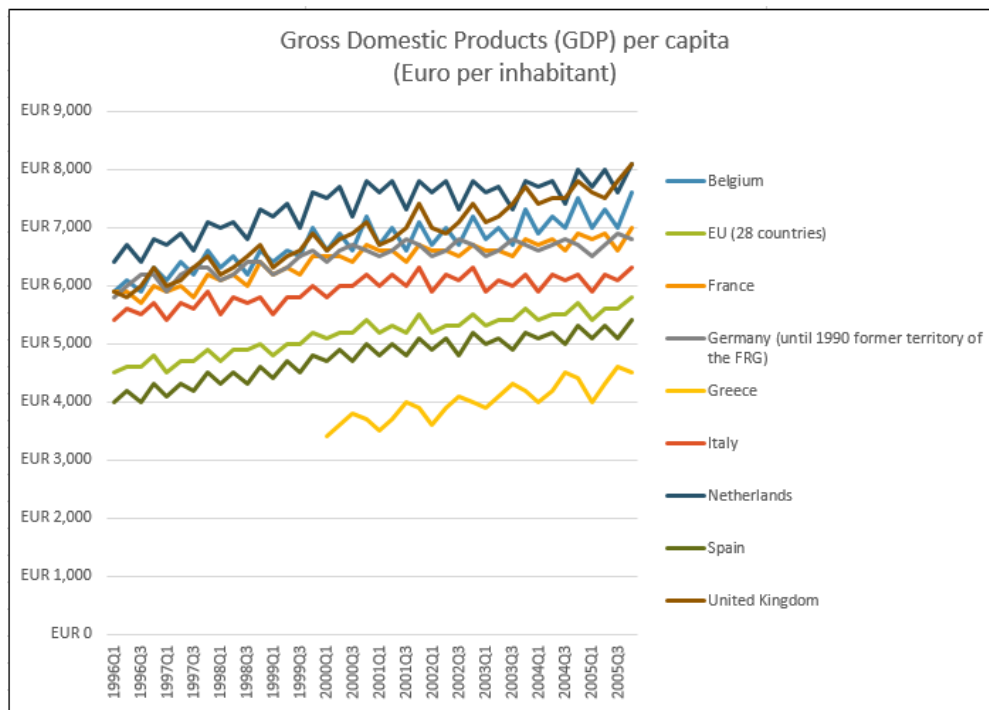
#### 3.3.3.1 GDP per capita-gdpper capita

Taking national economic indicator as an independent variable controlling for the economic circumstance of a city might be too general. The alternative indicator can be regional GDP per capita or Gross Regional Products (GRP) per capita, but we have to admit that data available on the period in the 1990s are very hard to get. In this thesis, GDP per capita is acceptable because economic well-being and business environment it measures can have influences on hospitality industry as well. Therefore national circumstances can be just



as important as regional circumstances for a city and this would be more true for a city in smaller countries such as Belgium and the Netherlands than relatively larger ones like France and Germany in this case.

GDP per capita for these 8 countries where 10 cities belong did not vary dramatically but kept at a high changing frequency. In general, economic circumstance kept a steady or upward momentum in each country over the period. Taking the value of the European Union (28 countries) as a reference, GDP per capita of Spain and Greece are always below the level of EU while the other 6 countries are on the contrary (see figure 10). The average GDP per capita for the observed period is 6026.75 euro. The minimum average value of GDP per capita belongs to Greece (4008.3 euro) and this could partially due to its missing data from 1996Q1 to 1999Q4. The maximum values go to the Netherlands with 7372.5 euro each quarter. The United Kingdom (City Belfast) and Belgium (city Brussels) followed closely.



**Figure 10:** GDP per capita in euros, 1996Q1-2005Q4

### 3.3.3.2 Quarterly seasonal dummy variables-quarter1, quarter2, quarter3 and quarter4

Data on GDP per capita were seasonally unadjusted. Thus a "seasonal Dummies" predictor was added to the model to serve as regressors for seasonal effects. We set up four indicator (dummy) variables: quarterdum1, quarterdum2, quarterdum3 and quarterdum4, one for each quarter. To avoid dummy variable trap, we will drop the first quarter variable, so the coefficients associated with the other quarters are measures of the difference between

those quarters and the first quarter.

```
. tabulate quarter, generate(quarterdum)
```

quarter	Freq.	Percent	Cum.
1	100	25.00	25.00
2	100	25.00	50.00
3	100	25.00	75.00
4	100	25.00	100.00
Total	400	100.00	

Figure 11

### 3.4 Research methodology

#### 3.4.1 Research hypothesis

The research consists mainly of four parts:

Hypothesis 1: The happening of riots has a significantly negative impact on city hotel revenues.

Hypothesis 2: Different types of riot have different degrees of negative influence on city hotel revenues. The impacts of riot types "Political expression" and "Political attacks" are expected to be similar but differ from the impact of riot type "Disruptive states acts".

Hypothesis 3: Different durations of riot have different degrees of negative influence on city hotel revenues. Riots lasted more than one day are expected to decrease hotel revenues more than riots lasted one day do.

Hypothesis 4: Riots taking place in different locations have different degrees of negative impact on urban hotel revenues. Riots from specific locations are expected to cause less loss in hotel revenues than riots from densely-populated areas recognized in a broader sense.

#### 3.4.2 Model

First of all, we should take a look at missing values in the dataset. In the total of 400 observations, there were 43 observations with one missing values. In more detail, 27

of 43 missing values were in the dependent variable "Hotel revenue" and 16 were from the independent variable "GDP per capita" (see figure 12). For these numeric data, coding missing value as zero could lead to heavily biased estimates. In fact, this 10.75% of missing values accounted in the dataset is acceptable and therefore we will let Stata deal with it automatically.

```
. misstable sum
```

Variable	Obs<.			Obs<.		
	Obs=.	Obs>.	Obs<.	Unique values	Min	Max
gdppercapita	16		384	47	3400	8100
hotelrevenue	27		373	373	9562237	1.01e+09

Figure 12

Next, we need to test the normality of variables. According to the graph of the distribution of hotel revenue, we can see that it is somewhat right-skewed (see figure 13). Therefore we consider running a log transformation for raw data on hotel revenues to reduce the skewness. By computing a nature log of hotel revenues, we can see that the distribution looks much more normal (see figure 14). Moreover, on economic grounds, taking log transformed data on hotel revenues is also reasonable because the sample consists of cities of different sizes and conditions. Small cities could find that the change of GDP per capita has a small impact on hotel revenues while large cities might experience proportionately more growth in hotel revenues for the same increase in GDP per capita. The distribution of GDP per capital itself, instead, was more close to a normal distribution and thus had no need to be logged.

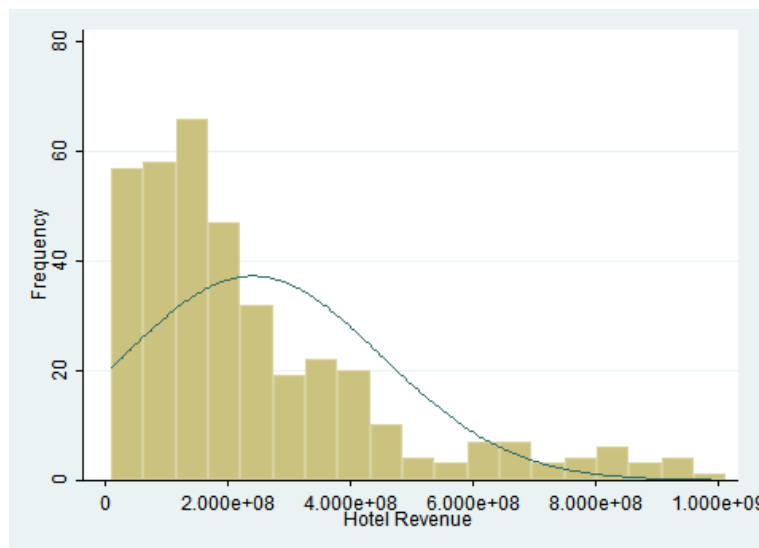
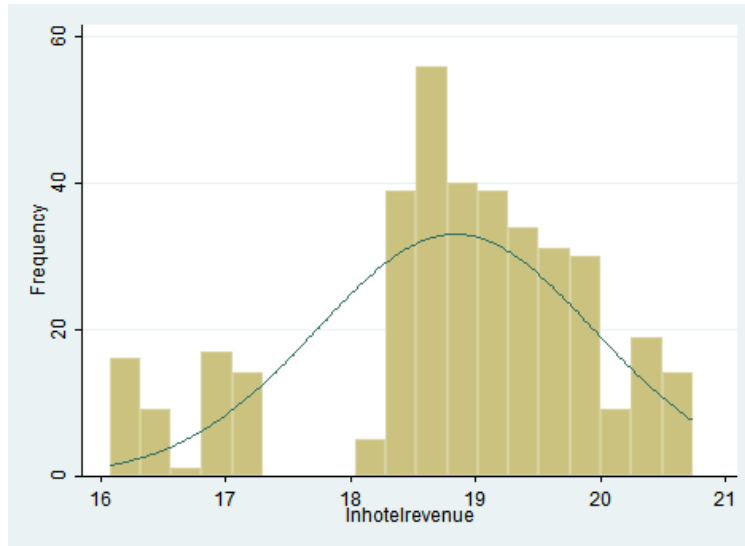


Figure 13



**Figure 14**

Since the database contains no qualitative information about cities, the heterogeneity of samples is certain to be unobserved and it has to be either controlled for the regression or simply removed. Statistical methods that are frequently used in econometrics to deal with unobserved effects can be fixed effect model and random effect model. Fixed effect model controls for all time-invariant factors specific to each city: for instance, location, land and property values, tax rates and wages. Even though some of these variables are not time invariant, they are unlikely to change very much between cities during the period of the data selected in this thesis. Random effect model will estimate the effects of time-invariant factors instead of removing them but with the assumption that the unobserved variables are assumed to be uncorrelated with all the observed variables. Theoretically, the use of the fixed effect model instead of a random effect model in this thesis is more acceptable because we would fail to reject the correlation between the city specific effects and the independent variable. We also considered Hausman test to help choose between FE and RE model. And the option "sigmamore" was used to guaranteed the non-negative Hausman statistic.

```
. hausman fixed random, sigmamore
```

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fixed	(B) random		
gdppercapita	.0002715	.0002677	3.80e-06	1.80e-06
Riotdum	.0057353	.0056785	.0000568	.0002676

b = consistent under Ho and Ha; obtained from xtreg  
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(2) = (b-B)'[(V\_b-V\_B)^(-1)](b-B)  
= 4.53  
Prob>chi2 = 0.1038

Figure 15: Hausman test result - Model one

```
. hausman fixed random, sigmamore
```

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fixed	(B) random		
gdppercapita	.0002786	.0002675	.0000111	3.14e-06
PE	.0039136	.0050445	-.0011309	.0003201
PA	.0106537	.0081696	.0024842	.0007954
DSA	-.1857923	-.1805593	-.005233	.0011738

b = consistent under Ho and Ha; obtained from xtreg  
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(4) = (b-B)'[(V\_b-V\_B)^(-1)](b-B)  
= 26.62  
Prob>chi2 = 0.0000

Figure 16: Hausman test result - Model two

```
. hausman fixed random,sigmamore
```

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fixed	(B) random		
gdppercapita	.0002718	.0002673	4.49e-06	1.97e-06
Oneday	.0092281	.0090371	.0001909	.0002582
morethan1D	-.0308911	-.0308267	-.0000643	.0004737

b = consistent under Ho and Ha; obtained from xtreg  
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

```
chi2(3) = (b-B)'[(V_b-V_B)^(-1)](b-B)
        = 7.56
Prob>chi2 = 0.0561
```

Figure 17: Hausman test result - Model three

```
. hausman fixed random,sigmamore
```

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fixed	(B) random		
gdppercapita	.0002703	.0002652	5.17e-06	2.12e-06
DenselyPop~t	.0259402	.0263332	-.000393	.0002748
Unspecifie~t	-.0573245	-.0572757	-.0000487	.0003291
SpecificLo~t	-.0332715	-.0337551	.0004837	.000299

b = consistent under Ho and Ha; obtained from xtreg  
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

```
chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
        = 10.45
Prob>chi2 = 0.0335
```

Figure 18: Hausman test result - Model four

Hausman test results in four models are significant at 10% level. Results of model 2 and 4 are even significant at 5% level. Hence, we reject the null hypothesis and stick to our opinion of using fixed effect model over random effect model. The fixed effect model of the four hypotheses can be presented by the following equations:

$$y_{it} = \alpha_i + \beta x_{it} + \varepsilon_{it}$$

where  $y_{it}$  is the dependent variable observed for city  $i$  at time  $t$ ,  $x_{it}$  represents the  $K$ -dimensional vector independent variables,  $\alpha_i$  is the unobserved individual-specific intercept and  $\varepsilon_{it}$  is the error term. Then we have four models with different main independent variables as follows:

Mode One:

$$\ln(\text{hotelrevenue})_{it} = \alpha_i + \beta_1 \text{Riotdum}_{it} + \beta_2 \text{gdppercapita}_{it} + \beta_3 \text{quarter2} + \beta_4 \text{quarter3} + \beta_5 \text{quarter4} + \varepsilon_{it}$$

Model Two:

$$\ln(\text{hotelrevenue})_{it} = \alpha_i + \beta_1 \text{PE}_{it} + \beta_2 \text{PA}_{it} + \beta_3 \text{DSA}_{it} + \beta_4 \text{gdppercapita}_{it} + \beta_5 \text{quarter2} + \beta_6 \text{quarter3} + \beta_7 \text{quarter4} + \varepsilon_{it}$$

Model Three:

$$\ln(\text{hotelrevenue})_{it} = \alpha_i + \beta_1 \text{Oneday}_{it} + \beta_2 \text{morethan1D}_{it} + \beta_3 \text{gdppercapita}_{it} + \beta_4 \text{quarter2} + \beta_5 \text{quarter3} + \beta_6 \text{quarter4} + \varepsilon_{it}$$

Model Four:

$$\ln(\text{hotelrevenue})_{it} = \alpha_i + \beta_1 \text{Oneday}_{it} + \beta_2 \text{morethan1D}_{it} + \beta_3 \text{gdppercapita}_{it} + \beta_4 \text{quarter2} + \beta_5 \text{quarter3} + \beta_6 \text{quarter4} + \varepsilon_{it}$$

### 3.4.3 Autocorrelation and heteroskedasticity in fixed effect model

Our panel data consists of time series of 40 quarters and therefore a test for autocorrelations is necessary to perform. Serial correlation in linear panel-data could bias the standard error and lead to less-efficient results (Drukker, 2003). In this thesis, the serial correlation test performed is Wooldridge test, which is easy to implement with relatively few assumptions. In each of the four models, the null hypothesis of no serial correlation is rejected. Therefore, autocorrelation presented in our models. As for identifying the presence of heteroskedasticity, we consider a modified Wald test for groupwise heteroskedasticity in residuals of fixed effect model, which uses the command "xttest3" in Stata. The resulting test statistic is distributed Chi-squared under the null hypothesis of homoscedasticity (or constant variance). And results (p < 0.05) for each of the four model indicate that we must reject the null hypothesis and confirmed the presence of heteroskedasticity.

Now we face two problems with our models: serial correlation and heteroskedasticity. To deal with both of the problems we use Rogers or clustered standard errors. In Stata, the estimation command with option "cluster" allow us to compute so-called clustered standard error. And we also notice that for fixed effect regressions, the robust and cluster option in Stata are identical but the latter is more appropriate.

## 4 Results

The results of regressions can be found in table 2. The positive impact of GDP per capita on hotel revenues is significant at 1% in four models. The results of model 1, including country and seasonal control variables, show that the impact of the eruption of riots is not significant. Therefore at the aggregate level, the hypothesis that the happening of riots has a significantly negative effect on city hotel revenues is rejected.

When making a further classification of riots, it can be found that riots resulting from disruptive states acts have a negative impact on hotel revenues at 10% level of significance. This means that if there is one or more riots occurred due to disruptive states acts in a city, hotel revenues decrease by 10.07 %. However, impacts of riots due to the other two political-related events, political expression and political attacks, are not significant (model 2).

In model 3 analyzing riots through the length of time, neither riots lasted one day nor riots continued for more than one day have a significant impact on hotel revenues. Therefore we can not tell the difference between impacts of these two durations. But as what we have described above, observations under duration dummy variable for more than one day were only 7, which is quite small relative to the overall number of observations. According to Wielenga (2007), category variables with too few observations could have a trivial power of impact on the overall prediction. If one of the levels include almost all the observations (dummy takes the value of 0 in this thesis), it could be hard to observe any variability and thus differentiate between the results of the model.

Results in model 4 show that riots happened in unspecified locations have no significant impact on hotel revenues. The impact of riots occurred in specific locations is negative at 10% significant level. While if riots happen in densely populated areas, hotel revenues will increase by 3.09% (at 5% significant level). A result like this is contrary to our hypothesis.

Quarterly dummies are individually statistically significant at 1 % level, which shows that hotel revenues are significantly different in four quarters (quarter 1 is default to avoid the dummy variable trap). On average, hotel revenues could increase by over 30% from the first quarter to the second quarter in each of the four models. The third quarter has over 20% of hotel revenues more than the first quarter and the increase in hotel revenues in the fourth quarter compared with the first quarter is around 10 % in the four models. Therefore hotel revenues do display seasonal patterns.



**Table 2:** Fixed effect regression results (1996Q1-2005Q4)

Explanatory variables	Model (1)	Model (2)	Model (3)	Model (4)
gdppercapita	0.000236*** (0.000)	0.0002407*** (0.000)	0.0002369*** (0.000)	0.0002345*** (0.000)
Riotdum	0.0081909 (0.0135)			
PE		0.0216709 (0.0164)		
PA		-0.0086289 (0.0177)		
DSA		-0.1007287* (0.0523)		
Oneday			0.0146504 (0.0170)	
morethan1D			-0.0377869 (0.0418)	
DenselyPopulatedArea_riot				0.0309174** (0.0109)
SpecificLocation_riot				-0.0381276* (0.0211)
UnspecifiedLocation_riot				-0.0472845 (0.0347)
quarter2	0.3082298*** (0.0369)	0.3057584*** (0.0371)	0.3081539*** (0.0369)	0.3082436*** (0.0360)
quarter3	0.2152837*** (0.0459)	0.2129234*** (0.0457)	0.2155385*** (0.0459)	0.216289*** (0.0451)
quarter4	0.1176096*** (0.0226)	0.1137393*** (0.0211)	0.1168403*** (0.0220)	0.11783*** (0.0221)
_cons	17.19629*** (0.2243)	17.16976*** (0.2311)	17.19048*** (0.2272)	17.20745*** (0.2223)
Number of obs.	357	357	357	357
R-sq within	0.6142	0.6181	0.6154	0.6195
R-sq between	0.2140	0.2134	0.2151	0.2091
R-sq overall	0.0934	0.0953	0.0943	0.0904

Note: Dependent variable:  $\ln(\text{hotel revenue})$ . Robust standard errors in parenthesis: \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

## 5 Discussion

The goal of the thesis is to examine the impact of riots on city hotel revenues. We collected hotel revenues data from 10 European countries in the period between 1996 and 2005 by quarter. To analyze the effect of riots, we ran several regressions to capture riots from different dimensions and thus explore the differences of their influences on hotel revenue. GDP per capita was included in regressions as the proxy of a country/region's economic conditions as well as a reflection of the living standards. We also controlled the seasonal effect by introducing quarterly dummy variables. What we found at first was that the happening of riots hardly had any influence on hotel revenues, which is contrary to our initial assumption. But riot as a binary variable in the model could reflect only whether there is a record of riot happened in a given quarter but not the specific number of riots or further information such as event types and locations. Therefore we looked into the types of riots and created corresponding binary variables that indicated whether this type of riot occurred or not. The results showed that riots triggered by disruptive states acts have a negative impact on hotel revenues while we could not conclude any negative influence of riots from political expression or political attacks. We also found that neither riots lasted only one day nor more than one day had any influence on hotel revenues, which makes our hypothesis rejected again. This conclusion was a little bit tricky because the term of "more than one day" could be accepted as durations like two days, one week and over a month. We aggregated them just because there were too few observations in each length of time to bring variability, but there are reasons to believe that riots with long enough durations could bring significant influence on hotel revenues. The last dimension of riots we analyzed was locations. We found that if riots were identified to happen in specific locations, hotel revenues would suffer some losses correspondingly. Riots outbreak in densely populated areas, on the contrary, had a positive impact on hotel revenues. Therefore, based on the results we have, the impact of riots on hotel revenues is quite selective and not as negative as we expected.

Taking into consideration tourism destination image, results of hotel revenues might be able to be explained to some extent. The reason that we failed to observe any effect of riots on hotel revenues as a whole could be that the outbreak of riots does not affect the existing urban tourism image at first; that is to say, the loss of life and property induced by riots is existent objectively, but whether tourists would regard such damage as a hit on destination's tourism image is worth discussing. Another possibility is that the negative impact of riots on tourism destination image is confirmed (e.g. lower sense of safety), but the power of other tourist-related factors such as high-quality services, favorable climate and low prices successfully offset the disadvantage of riots. As a result, such destination is still attractive for tourists whose willingness to travel highly depends on these aspects.

The majority of riots recorded in our dataset lasted only one day and we highly doubt riots with such a short duration could make any difference in tourism image. Tourists who have formed a positive image on a destination would not change their attitudes so easily

just because of an unrest occurred in such a short time. This is even more understandable for local and neighboring visitors considering their various accesses to get up-to-date information about the incident. International tourists might be manipulated more by the news media instead of the riot itself. It is highly possible that one-day riot is not newsworthy enough to catch people's eyes and hence filtered out by international news media. Therefore the tourism demand for a destination is retained.

As for the locations of riots, we should notice that the specific locations we aggregated included places/facilities which are also crucial component factors of tourism destination image. For instance, urban road network as the main components of the city function has a crucial influence on trip quality for commuters and visitors. When riots happened in public transportation system in terms of road, airport and ground transportation sites, the objective conditions contributing to a good destination image are indeed impaired. Visitors might change their travel plans actively or passively in order to avoid the inconvenience brought by such chaos. Meanwhile, we also recorded riots occurred in public monument and recreational site. For most famous tourist cities such as Rome, Paris and Amsterdam, their tourism images are highly built on the long history and rich cultural atmosphere which arouse people's affections and interests. Once facilities/locations as carriers of culture and history are damaged in riots, cities could lose the core competitiveness of their tourism images. As a result, tourists who originally hold a positive image on the destination could still give up the trip because of the predictable inconsistency between the view in mind and the view of reality.

The reason behind the positive relationship between hotel revenues and riots in densely populated areas is hard to be explained through city tourism image. The main problem is that densely populated areas are not recognized by the feature of a place but the density of population, hence we can have some candidates like populated tourist attractions, residential areas and even slums, but not every location is correlated with tourism resources. Tourists might not be threatened so much by riots as long as they know that those densely populated areas are not in the list of their visiting spots. In some cases, tourists might choose to stay in hotels for a longer time during riots to stay away from trouble. And hotel revenues get increased somehow in a safety drive from tourists.

## 6 Limitations and Recommendations

There are some limitations that should be taken into account in this thesis. First, since we took riots as dummy variables in our models, the number of observations on riots in the models became much less than the raw data. This means our study focused on whether riots happened instead of how many riots occurred. Considering the data frequency was by quarter instead of by month or day, we observed many quarters with more than one riot.

Although one more riot would by no means equal to one more aggregated impact, we still have reason to believe that the tourism market would react differently on a quarter with one riot and a quarter with four riots. Second, our study only allowed riots to have an impact on city hotel revenues in the same quarter, but whether riots can have a delayed impact was failed to be explored. In real life, if a riot happens today, there could be less tourism in a couple of months or even half a year from now on because people always tend to pick their travel destinations months in advance. People who have booked the accommodation might not be affected easily, but for people who are still considering the vacation sites, their future travel plans would be deterred or postponed by the riots. Therefore the current situation of a destination can be an important reference factor for future travelers' decisions and thus a lagged effect of riots on tourism demand may be able to detect. Third, in order to avoid too few observation in a category, we did a reclassification about riots in terms of durations and locations. However, some categories that were merged together could be worthy of analysis separately. For instance, duration of a week and more than a month, and location on the public monument and residential property. Thus we might be able to have more information about the impact of riots happened in different locations on hotel revenues. In addition, the data on riots, available from Civil Unrest Event Database, is not as fresh as expected. Therefore we had to make the observation period start from the year of 1996, a time when the data on hotel revenues and quarterly GDP per capita were not available for all cities/-countries. This makes valid research on hotel revenues be limited by data availability. In fact, disposable personal income could be a better economic indicator than GDP per capita because it can reflect price level, but still, we could not find too much data available at that time point.

Hence, for further research, a larger dataset is needed in order to make subsample analysis on riots more thoroughly. Thus the number of observations falling into subsample would not reduce dramatically compared with the raw dataset. It is also important to introduce economic indicators at a regional level in the model for a more precise evaluation of the regional business environment. As for variables on riots, lagged variables should be considered to check the existence of a delayed impact at first. And of course, result from binary variable is obviously limited. There are more factors about riots can be included in the later study and the additional factors might contribute to finding the decisive factors of riots that can influence hotel revenues most.

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