

**THE INTIFADA'S IMPACT ON TOURISM IN ISRAEL: An Interrupted
Time-Series Approach**

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Abstract:

Tourism is a delicate industry that's vulnerable to existing economic and political conditions. This study is concerned with statistically quantifying the impact of the most recent violence in the West Bank and Gaza Strip on tourism in Israel. The effect of the intifada is measured using a time-series intervention model to test for two hypotheses: (1) an immediate impact; (2) gradual impact. The presented empirical evidence supports the former. As a result of the intifada, Israel has lost approximately one third of its tourists after the onset of the current wave of hostilities in the region (second intifada).

Keywords: intervention model, intifada, Israel, tourism

1. Overview

Violent political conflicts have extravagant costs that are felt in every sphere of social and economic life. Political violence usually results in an erosion of civil and legal rights, spreads despair and hopelessness among the people, and boosts insecurity and lawlessness. Moreover, conflicts beget substantial economic losses that arise from death, destruction and interruption of normal life, reduced productivity, lost investment, and diverting resources to military activities away from civilian purposes.

Given the substantial costs of political conflicts, economists were always seeking to measure the impact of the various violent episodes in history such the American Civil War (Goldin & Lewis, 1975), World War I (Rossiter, 1916), World War II and the Korean War (Ohanian, 1997), the conflict in the Basque Country (Abadie & Gardeazabal, 2003), the Sri Lankan Civil War (Grobar & Gnanaselvam 1993; Arunatilake et al. 2001), The war in Nicaragua (DiAddario, 1997), and the Palestinian intifada (Fielding, 2001; 2003). This paper will analyze and quantify the impact of the most recent fighting between the Palestinians and Israelis on tourism in the Holy Land.

Tourism is a delicate industry that's vulnerable to existing economic and political conditions. The travel industry can be helpful in bringing about peace and understanding among nations. But even though peace and understanding are most needed during periods of conflict, tourism will usually disappear when discords materialize among or within nations. In general, the tourism industry is highly susceptible to the perceived or actual risk associated in traveling to a certain touristic destination. No country has perhaps felt this more profoundly than the state of Israel. At the domestic level, hostilities and acts of violence between the Palestinians and Israelis have, intermittently, discouraged tourists for the past 40 years. Besides, because Israel is located in the heart of the Middle East, tourists tend to avoid visiting it during every major crisis in the region. Periods of violence such as the Palestinian first and second *intifada*, the Gulf War of 1991, or even the September 11 attacks in 2001 have adversely affected tourism in Israel. Therefore, more than any other tourist destination, the Israeli tourism industry will prosper if dramatic improvements are recorded at the domestic and global security levels.

Since its establishment in 1948, Israel has been the subject of consistent political instability and violent unrest at least once every decade. In 1956 Israel, France and Britain launched a war against Egypt when that country nationalized the Suez Canal and blockaded the Gulf of Aqaba. Shortly afterwards in 1967, Israel-alone this time-

launched a series of preemptive air strikes against its Arab neighbors in Egypt, Jordan, Syria, and Iraq (Goldschmidt, 1995). Six years later in 1973, Israel went to war with Egypt and Syria in what became known as the October or Yom-Kippor War. In an attempt to halt attacks by Palestinian rebel groups, Israel invaded and occupied southern Lebanon in 1982. In 1987 the Palestinians living in the occupied territories launched the first *intifada* against the Israeli occupation of the West Bank and Gaza Strip (WBGS). This period of unrest lasted until 1994 and terminated with the establishment of the Palestinian National Authority (PNA). The most recent conflict between the Palestinians living in the WBGS and Israel Defense Forces (IDF) had begun at the end of September 2000 and is still ongoing.

Since tourists are in general seeking tranquility and peace of mind which they can't find by visiting nations with ongoing conflict, episodes of political instability have inflicted damage on the Israeli tourism industry and increased the variability of the number of visitors to Israel. Therefore long-term planning and investment in the tourism industry became very difficult and risky. Typically, during wars politicians tend to ignore the expensive costs of conflicts and neglect to understand that extended instability has economy wide repercussions. In this paper, I hope to reveal some of the costs of conflicts. To that end, this study will be concerned in statistically quantifying the impact of the most recent violence in the WBGS on the tourism sector in Israel

The structure of this paper is as follows: In the next section I will survey the performance of the Israeli economy in the first two years of the new millennium which corresponds to the first two years of the current conflict. Section 3 will present a discussion of the tourism sector in Israel after the onset of the *intifada*. Section 4 will include a survey of previous studies on the subject of political violence and tourism. Section 5 discusses the dataset and provides the econometric methodology along with the results. Section 6 concludes. All data, graphs, and tables are appended.

2. The Israeli Economy in 2000 and 2001

Overall, 2001 and 2002 were not good years for the state of Israel. The security and economic situations deteriorated sharply in those two years. After President Clinton's Camp David sponsored summit had failed, fighting erupted between the IDF and the Palestinians. The parties failed to contain their hostilities, and by the end of September 2000, it became a full blown-out war with the IDF reoccupying all the cities that were

seceded to the Palestinian National Authority (PNA) as part of the Oslo Peace Accord. Economically, Israelis experienced the most dismal performance they had seen in a decade. After growing at an annual average rate of approximately 5 percent from 1990 to 2001, the trend was reversed and the Israeli economy growth rate of real GDP became negative reflecting the global and domestic shocks that impacted the Israeli economy.

The economic fundamentals have been bleak since the start of the uprising in September 2000. At the consumer level, Israelis experienced severe changes in prices (the Consumer Price Index showed a 6.5 percent climb in 2002), a decline in real wages, and the unemployment rate increased to 10.2 percent in 2002, up from 9.4 percent in 2001. The New Israel Shekel (NIS) lost ground, and consumers and businesses alike faced a high real interest rate (6 percent on average). Moreover, private consumption receded to levels not witnessed for years.

The business sector in Israel was hit hard as the national saving rate declined, and the gross capital formation decreased by 2.6 and 10.2 percent in 2001 and 2002 respectively. The decline in investment was experienced both at the domestic and foreign investment levels. The elite Israeli high-tech industry of struggled to cope with the global recession in the information technology market. The demand for Israeli exports, especially high-tech industries, took a hit falling 6.9 percent and 7.8 percent in 2001 and 2002 respectively. This decline arrived after a strong growth of exports between 1992 and 2000.

In 2002, the IDF military engagements in the WBGS increased defense spending beyond the original estimates in the budget. As a result, the budget deficit as a percent of GDP expanded to 4.5 percent in 2002 compared to 3.9 percent in 2001. To offset the increase in public spending and defense spending in particular, the government of Israel increased the direct and indirect business tax rates —as a last resort measure. However, such a step had failed to achieve its objectives as the share of taxes in GDP fell slightly in 2002 compared to 2001 (Israel Ministry of Finance, 2003)

The economic prosperity of 1990s came to an abrupt end as the first two years of the new millennium were inglorious at the economic, social, political, and security levels for the state of Israel. Still, the current economic trend is expected to worsen unless the security situation improves.

3. Tourism in Israel after the Intifada

Throughout the year tourists flock to Israel for religious, nationalistic, business, or recreational purposes. Tourism in Israel is highly seasonal with the tourism cycle dependent upon the weather and religious holidays. At the beginning of every year, tourism is usually low, but it increases until it peaks during the spring months of March and April. It then dwindles and then rebounds in June and is highest in the summer months of July and August. Soon after, tourism retreats again to peak once more during the fall months of October and November. Israeli tourism is lowest during the three months of the winter (December, January, and February).

Besides the weather, violence and crime can have notorious consequences for tourist destinations and the effect on tourism is even graver when tourists or tourists' facilities are the prime target and are deliberately attacked. Whilst tourists are sometimes at the bull's eye of violent actions by paramilitary and rebels groups, it is not the case in Israel where Palestinian militants are targeting Israeli citizens.

In Israel, deaths and injuries to tourists are merely incidental. However, separatist groups in some other countries eyed tourists as a legitimate target. *ETA-Militar* (a Basque separatist group) has always targeted hotels in Spain and the group has systematically tried to disrupt tourism and multi-national companies. In 1997 for example, 35 British and Irish tourists were injured in an attack by TEA, and in July 2003, two bombs went off minutes apart in Spanish resorts (BBC news online edition). *the National Front for the liberation of Corsica (FNLC)* did attack tourist complexes in Corsica as it did in July of 2003 when four holiday homes belonging to non-Corsican went up in flames that night (BBC news). In Peru, the country's tourism has suffered after the *Sendero Luminoso*¹ (The Shining Path) killed British and French tourists (Ryan 1993). More recently, the suspected attacks by al-Qaeda have been specific against tourists as was the case in the Bali bombing in Indonesia, and the most recent attacks on the synagogue in Tunisia and hotels and night clubs in Morocco and Kenya where tourists were the prime target.

In the seventies until the mid eighties, the various Palestinian Paramilitary groups have attacked tourists or tourist facilities abroad. These attacks varied from plane or cruise-ship hijackings to attacking western and Israeli airline ticket agents at airports. But since the onset of the first intifada, this modus operandi has changed. The new Palestinian paramilitary groups (Hamas, Palestinian Islamic Jihad, and the Black Panthers of the

Fateh group) that emerged from inside the Palestinian Territories have only attacked Israeli civilians and military installations and avoided attacking tourists. Since thousands of Palestinians depend on tourism for their livelihoods, attacking tourist installation remained nonexistent throughout the first and second intifada.

Tactically, attacks on tourists serve two purposes: First, tourists are at times considered a threat to national customs, identity and undermining national traditions (Ryan 1993). Such was the justification put forth by the *Sendero Luminoso* and the *Meibion Glyndw² (Sons of Glendower)*. Secondly, attacking foreign visitors usually makes headline news and commands immediate international attention. By attacking tourists, the paramilitary groups aim at achieving a change in the domestic or international policy of the tourists' national governments. Such was the motivation behind Palestinian attacks in the past, and more recent attacks by al-Qaeda.

The puzzling scenario is that tourists have been avoiding Israel even though they are not in any immediate danger while they are there and normal life in Israel is not interrupted. The risk of injury or death in a suicide attack is minute. Based on the statistics published by the *Israeli Information Center for Human Rights in the Occupied Territories (B'Tselem)*, Palestinian suicide attacks have killed seven westerners in Israel since the start of the second *intifada*³. Similarly, IDF operations in the Palestinian Territories have killed five westerners only. Also, comparing the foreign casualties figure with the total fatalities since the start of the current fighting (almost 4,000 Palestinians and Israelis killed as of August 2003) convinces us that tourists are not being targeted and all deaths are tragic accidents. It is also apparent that the Palestinian attacks don't seem to intensify during religious holidays or the tourism season. Therefore, the demise of the Israeli tourism industry has been compounded by other forces, perhaps, in addition to the current internecine fighting. So, how did the intifada affect tourism in Israel if tourists and tourists' facilities have never been targeted since the outbreak of the intifada?

Two potential culprits could have been responsible in causing the intifada to impact tourism. First, the *media effect* or the 'TV factor' created from the excessive media coverage particularly in the U.S., where a quarter of the tourists arrive from, has created a negative image of Israel as a tourist destination. While media coverage can achieve certain political gains, it can also narrow the risk-gap between the real level of risk associated with a trip and the counterfactual risk induced by media exposure. As a result, potential tourists perceive the region as unsafe and unattractive for emotional but not so rational reason. Beirman (2002) suggested that political turmoil in a country would

have a long-term effect on the image of a tourist destination. He states that “continued and sustained media exposure to riots, killings and political stand-offs can carry on for a much longer period of time” (p.167). Also Mansfeld (1999) had indicated that creating a long lasting negative image of a country is a major problem resulting from any security turmoil.

Secondly, exactly one year after the onset of the Palestinian intifada, the attacks of September the 11th took place and had a significant effect in increasing the risk of air travel thereby lowering the demand for international tourism. The Buys-Ballot (table 7) reveals that the number of tourists arriving to Israel fell below the 100,000 visitors per month only after the 9-11 attacks. After the onset of the intifada the visitor numbers remained regularly above the 100,000 per month. But in September 2001, number of tourists fell for the first time to 78,000 tourists per month and continue to be around this new level to this day. Two factors may have caused this severe drop in visitor numbers after September 2001: (1) besides reducing air travel world wide, local governments in many states in the U.S. have launched intensive campaigns to promote domestic tourism after 9-11 drawing on people’s elevated awareness of patriotism, which might have contributed to diverting tourism to within the U.S. rather than abroad to Israel (More research is important to reveal the impact of promoting domestic tourism in the U.S., where around 25 percent of the tourists arrive from, on the demand for tourism to Israel); (2) There has been a rise in the number of Palestinian attacks in 2001 and 2002 relative to 2000 in which only 53 attacks were recorded (author collected data). For instance, there have been 123 attacks in 2001 of which 31 were suicide bombings. Moreover, over half of those suicide bombings took place between September and December 2001 (right after the 9-11 attacks). Similarly in 2002, there have been even more attack. In that year 153 attacks were reported of which 45 were suicide bombings (author collected data). This translates into doubling and tripling of the number of attacks in 2001 and 2002- respectively- relative to 2000.

Since 9-11 attacks has brought home to many Americans the tragedy and fear of suicide attacks, we can hypothesize that the 9-11 attacks combined with the extensive coverage of monthly suicide attacks in Israel have sharply reduced the desire to seeking tourism in Israel and increased the perception of the risk being killed in Israel as a result of the intifada. Therefore, the above mentioned factors may have magnified the actual risk associated with a trip to Israel, thereby crowded out tourism in Israel. Therefore, although the intifada has not targeted tourists at all, still the impact of the Palestinian-

Israeli fighting on the tourism industry has been channeled through the media and the travel phobia after the attacks of 9-11. In effect, Israeli measures focused on improving the image of Israel as a tourist destination is futile as long as the global political climate remains tense and media coverage is strong. Regardless of the intifada's effect transmission mechanism, one fact is clear— tourism in Israel and the Palestinian Territories has been fractured by existing hostilities in the region.

The tourism industry made great strides during the 1990's thanks to the peace process, approaching new millennium, inexpensive and safe air travel, and cheap oil prices. But in the twenty-first century, the tourism industry world-wide had to cope with new challenges—terror attacks, irregular gas prices, higher airfares, long lines at airports, and additional security clearances (Tarlow, 2002). The security situation in Israel was no exception, and the hostilities between the Palestinians and Israelis had stymied tourism growth. Tourism in Israel started a disastrous decline as number of visitors began to plummet at the end of 2000. Tourism is supposed to bring about an escape from the stresses and realities of daily life; however, violence and stress are what tourists are likely to face in Israel.

Since the start of the al Aqsa intifada, the United States issued a travel advisory cautioning Americans from traveling to the region and advising them to leave if they are in Israel. The following travel warning is published by the Consular Affairs at the U.S. Department of State: "The Department of State warns U.S. citizens to defer travel to Israel, the West Bank and Gaza. Ongoing violence has caused numerous civilian deaths and injuries, including to some American tourists, students, and residents". Similarly, the British Foreign and Commonwealth Office advised Brits to avoid travel to Israel and the West Bank and Gaza Strip (see <http://www.fco.gov.uk> for details on the travel advisory).

Given that one third of the vacationers in Israel come from the U.S. and U.K., those noted travel advisories were unwelcome news for the Israeli tourism, an industry that is not well diversified in terms of tourists national origin. In fact, more than half of the visitors arriving on a tourist visa to Israel are coming from four countries only (U.S., U.K., France and Germany). Historically, 23 percent of the tourists arrive from the U.S., 11 percent from U.K, 10 percent from France, and another 10 percent from Germany.

To comprehend the repercussions from the dwindling number of tourists, we need to understand the contribution of tourism to the Israeli economy. In Israel, tourism has a great impact on the economy particularly in terms of hiring and revenue. The Israeli *Central Bureau of Statistics (CBS)* reported that the Accommodation Services and

Restaurant Industry (ASRI) employed about 30,000 people before the onset of the current intifada. Tourism in Israel- like any where else- is a labor intensive sector and this is apparent by the fact that the employment by the ASRI amounted to approximately 5 percent of the total employment by all industries, and exceeded the absorption of labor by the agricultural and banking industries combined. These figures include the direct employment in the tourism industry alone, but –as we know-tourism does spin-off employment in other supporting industries through the employment multiplier.

Tourism is a major area of the Israeli economy accounting for 1.5-2 percent of the GDP. Total tourism revenue, including foreign and domestic markets, amounted to \$1.5 billion in 2000 of which 45 percent was from international sources. Although the Israeli economic life is well diversified, still the economic impact of 2.5 million visitors a year arriving to a nation of 6 million people can't be underestimated.

There are various other avenues through which tourism can affect the economy in Israel. Income generated by tourist expenditure increases national income directly by increasing income and output and indirectly through the tourism multiplier. One direct implication of the dimming number of tourist arrivals that reached their lowest level in 20 years is the impact on related and supporting industries. A prime example is the impact felt by airline companies globally and especially airline carriers in the U.S. where most of the tourists have been arriving from. In 2000 and 2001, the number of tourists arriving by air was about 1 million and 2.1 millions respectively. But in 2002 approximately 779,000 arrived by air—a loss of around 1.3 million air passengers between 2001 and 2002. The slowed demand for travel to Israel continued in 2003 as international passenger traffic through Lod airport dropped 27 percent for the first quarter of 2003 (<http://www.index.co.il/tourism>). In the U.S., major airline carriers like Delta and American had cut their capacity and flights to Israel dramatically.

In addition to the aforementioned costs of the intifada on tourism in Israel, there are additional adverse effects such as losses to the public sector from taxes collected directly from tourists, as with airport departure tax, and indirectly from VAT taxes. Also the drop in the flow of tourists to Israel meant a loss of hard currency, which can affect the balance of payment. Since the outbreak of the intifada in October 2000, the cumulative loss of tourism revenue is estimated at \$2.5 billion as compared to reaching a record of \$3.4 billion in 2000. More yet, the lost tourism revenue from the intifada can crowd out capital investment in the tourism industry and in the infrastructure that supports the tourism sector (Fletcher & Snee, 1989).

In an interview with *BusinessWeek* online edition, Israel's Finance Minister Silvan Shalom summarized the effects the intifada had on the Israeli economy in general by saying:

[since September,2000] the intifada has cost the Israeli economy an estimated \$5 billion in lost tourism and other business...will cost us [even more] in the long term. Foreign investors and tourists aren't coming here. Tourists won't come to a place where there is violence. The high-tech industry has been hit because foreign investors who put billions into the Israeli economy aren't coming here like they used to (*BusinessWeek*, April 19, 2002)

4. Tourism and Political Instability in the literature

Researchers have been constantly concerned with the consequences of criminal activity (Dimanche & Lepetic, 1999; Ryan, 1993), violence and political unrest (Gartner & Shen, 1992), and oil prices (Mings, 1988) on the attractiveness of a tourist destination. Political unrest affects tourism by increasing the risk of death, injury, or personal inconvenience and discomfort (closed ports, disorder and chaos) in the destination country. Therefore, any risk of violence in the destination country, however remote, creates a barrier to travel and inhibits demand for tourism. Tisdell (1998) notes that personal safety and the prevalence of law-and-order are of chief concern to tourists, and variability in any of these factors will imply a change in the demand for international or domestic tourism.

In a special report about the effect of the Gulf War on tourism, the World Tourism Organization (WTO) reported that all regions were affected by Iraq's invasion to Kuwait in August 1990. In the five months after the Iraqi invasion, several Middle Eastern countries had experienced a sharp drop in tourist arrivals. For example, Israel and Jordan suffered a 30 percent drop of incoming visitors, while Egypt experienced a 17 percent decline in tourism (Special Report, WTO 1996). Goodrich (1991) discussed the impact of the Gulf war on tourism to and from the United States. He explained that the Gulf War had reduced travel from Europe to the U.S. by 50 percent, and declined American demand for transatlantic flights by 40 to 50 percent. In addition, the author conducted a survey at Miami International airport to identify the main factors behind people's fears of traveling abroad during the 1990 Gulf crisis. Based on the survey

results, the predominant factors cited by respondents for canceling or changing overseas travel plans were the threat of terrorism and the economic recession in America. Also the Gulf War had imposed excessive costs on local tourism agencies, travel agents, and airlines.

With the war also came additional costs on the U.S. government to increase security spending, while travel agents struggled to search for alternative travel plans for those who cancelled their overseas travel reservations, and airline carriers reduced their fares causing them to lose millions of dollars and dismiss thousands of workers.

Ironically the Gulf War had positive impact on other industries. Substitutes for travel abroad have actually flourished. As the airline manufacturers (Boeing, McDonnell Douglas) lost contracts and airlines carriers scrambled to modify their entertainment and advertising campaigns, the demand for video conferencing sky rocketed, and demand for touristic memorabilia and patriotic souvenirs about the war had flourished.

Tourism in Cyprus, Pakistan, the Philippines, Jamaica, the Bahamas, Sri Lanka, and Northern Ireland, like Israel, had suffered as a result of the violent political pandemonium Ioannides and Apostolopoulos (1999) discussed how political instability in the divided island of Cyprus affected tourism in the northern and southern parts of the island. The authors note that tourism in the politically separated island has evolved differently. While the southern part (Republic of Cyprus) allowed foreign investment in the tourism industry and made it a priority to develop the sector, tourism in the northern part lagged behind as tourist facilities remained underdeveloped and inadequate. The political instability and international isolation of the northern part of the island is behind this mediocre performance of the tourism sector. Yet recently, tourism in the southern part has been also stagnating as competition from other European touristic destinations is diverting tourists away from Cyprus. The authors conclude that if tourism in the south continues to grow, then removing the political division between the south and the north and marketing the island as one unified destination can help both sides.

In the Philippines tourism was targeted as a way to attack the regime of Marcos who along with his associates controlled 100 percent of the tourism hotels. The *Light-a-Fire* movement began burning down luxury hotels, and in the south the Japanese tourists were kidnapped (Richter, 1999). In the case of the Sri Lankan Civil war, Arunatilake et al. (2001) estimated the lost income from reduced tourist arrivals for the period from 1984 to 1996. The civil war has cost that country most of its tourists which meant a loss

of \$1.6 billion to \$2.8 billion, or from 13 percent to 23 percent of the 1996 Sri Lankan Gross Domestic Product (GDP).

After the 9-11 attacks, tourism in the Bahamas and Jamaica came to a complete halt; however, a swift response by the tourism officials in both nations in the form of revised marketing campaigns to expand the customer base had helped rejuvenate the tourism industry (Pratt , 2003).

Buckley and Kelmm (1993) pointed out that visitor numbers from America to Northern Ireland did not decline sharply during the 1970s and 1980s. Americans did not perceive themselves as threatened or targeted by the conflict. But, British visitor numbers (major market for Irish tourism) have declined seriously; falling 35 percent from late 1960s to 1983.

Enders et al. (1992) used a time series approach to estimate the impact of politically motivated attacks on tourism in various destinations in Europe. They estimated a transfer function model for Greece, Italy, Austria, and continental Europe. According to their estimates, Austria, Italy, and Greece lost 2.5 billion, 615 and 427 million of SDRs (in real 1988:IV SDRs), respectively, since 1974⁴.

Mansfeld (1999) identified six cycles of political unrest that affected the Israeli tourism industry since June 1967 war. These cycles took place once every decade and each was unique in its nature, duration, severity, and geographic location. Although tourism usually recovers briefly after each cycle (within two years), Mansfeld's main argument is that the Israeli government had never developed a contingency plan to lessen the effects of each cycle on the vulnerable tourism industry.

Fleischer and Buccola (2002) estimated a demand model for tourism in Israel that included a terror index. Their findings indicate that a rise in their terror index by four units will cause a 7.5 percent drop in bed-nights per month from the sample mean. Also they found that two months have to elapse after a terror event before its impact is felt on foreign tourism. Moreover, terror attacks appear to have little effect on local demand for hotel stays. Beirman (2002) focused on the related costs of managing a political crisis in the tourism sector in Israel. In addition to the explicit costs of lost revenue and labor absorption, managing the crisis can impose added expenditure and increases the opportunity costs for the tourism industry. Advertising campaigns, free solidarity tours, increasing direct subsidies to the accommodation services and tour operators will increase government expenditure during a time of political crises. For example, the Israeli

government had to hire Ruder Finn, an international public relations firm, to help improve the image of Israel as a tourist destination.

The intifad's impact is not limited only to tourism in Israel. For example, Fielding (2000) pointed out that political violence and instability in Israel affected macroeconomic performance through two channels. First, there is the direct effect of disrupting production, and secondly the indirect effect by increasing the perceived risk of investment in Israel. He then constructed a macro-econometric model (VAR model) that used the variations of political violence and tension to estimate the ways in which the political instability impacted the Israeli economic performance. His results showed substantial losses to the Israeli real GDP from political instability. In another study Fielding (2003) used variations in political tension and violence in Israel to estimate the impact of such variations on Israeli savings rate. If there is an end to the current violence, the estimated model predicts a doubling of the savings rate in Israel.

6. Dataset for study and Methodology

(i) Data

The monthly data on the number of tourists visiting Israel each month was extracted from various issues of the *Tourism and Hotel Services Statistics Quarterly* (THSQ) published by the Israeli Central Bureau of Statistics (CBS) from 1990-2003. Data for the period from 1996-2003 is also available at the CBS website (<http://www.cbs.gov.il>). Table 1 (Buys-Ballot table) summarizes all the data used in this study and Figure 1 show a time plot of the series. The sample included 161 observations and extends from 1990:1-2003:05.

Citizens of foreign countries entering or leaving Israel through border checkpoints are required to fill out appropriate forms according to their visa (immigrant, tourist, temporary resident, etc). Most of the tourists arrive via the Ben-Gurion international airport. For this study, only tourists arriving in Israel by air or cruise ship are included in this study.

A tourist is defined by the CBS as “a foreign national who enters Israel on a tourist visa, and is neither an immigrant, a temporary resident, nor a cruise passenger; also included are diplomats” (p.38). A cruise passenger is a “visitor on a cruise, or on foreign navy vessels, generally for a day or two, usually spending their nights on board”. I defined *total tourist arrivals* as the combined number of tourists and cruise passengers entering Israel in a given month. Before the second *intifada* (1990:1 to 2000:9), an

average of 176,000 tourists arrived in Israel every month. After September 2000, the number dropped to 91,000. Total tourist arrivals in a given year reached their highest level in a decade (2.6 million tourists) in the year 2000.

Approximately two-thirds of the tourists arriving in Israel arrive from nine countries: US, UK, France, Germany, Italy, Netherlands, Canada, Belgium, and Spain with the U.S. leading in the number of tourist arrivals.

(ii) Methodology:

An *intervention* or *impact* model is a special case of the general *transfer function* models in which the exogenous input variable is a series of indicator variables identifying the occurrence of a unique event thought to affect the time series under examination (Montgomery & Weatherby 1980). I will study the impact of the second Palestinian *intifada* on tourism to Israel by using this *impact* or *event intervention* analysis. In general, when employing intervention analysis we are interested in the effect of a singular event (war, embargo, strike, gun control law...etc) called the *input* on some response series (tourist arrivals, GDP, productivity, number of armed robberies,..., etc) known as the output series. Therefore, impact analysis is useful for modeling and identifying the effect of an event or outlier observation thereby describing and controlling for their effects on a process under examination (Yaffee, 2000).

Intervention analysis has several underlying assumptions about the event and the response series under investigation. First, “the system in which the input event and impact response take place is assumed to be closed” (Yaffee, 267, 2000). The series is allowed to be affected by the exogenous event and no other. Second, the starting, duration, and termination of the event are identifiable. Third, the ARIMA model for the pre intervention series has to be stable.

(iii) Data Transformation:

The first step in the impact analysis is to identify the noise series, i.e— the series free of the intervention (the *intifada*). Therefore, I select the series from 1990:1-2000:9 to be the noise series. The reason for including September 2000 is that the *intifada* started on the 27th of September 2000, thereby its impact will be felt in October arrivals. Next we

need to identify an appropriate ARIMA structure for the noise series. Thus we needed to examine the stationarity of the noise series.

The tourist data depicted in figure 1 is nonstationary for two reasons. First, the data is nonstationary in the variance and level. Second, the number of tourist arrivals has a strong seasonal component. Therefore, a number of transformations have to be undertaken to render the series stationary in the larger sense (second-order stationarity). The log-transformed series is pictured in figure 2 where the year to year fluctuations are now roughly the same before and after the onset of the second *intifadat*. However, the log-transformation has not rendered the series stationary, ACF fails to “die out” which indicate a nonstationary series that needs to be differenced before identifying a tentative model. Since the data exhibit a seasonal cycle of period $s=12$, then I chose to take the seasonal difference of the log-transformed series. If we let $y(t)$ stands for the log transformed series. Then an appropriate stationary rendering transformation of the series is

$$y^*(t) = (1 - L^{12})y(t)$$

Where $y^*(t)$ is the differenced series. An augmented Dickey-Fuller (ADF) test rejects the null of a unit root at the 1 percent level of significance with 12 augmented lags. The ADF test was estimated with out deterministic component based on the SBC criterion. Since the ADF test has a low power we can conclude that the seasonally differenced series is indeed stationary. The seasonally differences series is depicted in figure3.

(iv) ARIMA model for the noise series.

The correlogram of $y^*(t)$ series spikes at lags 1 and then decays exponentially and become insignificant by lag 5, then spikes again at lag 12 followed by a quick decay. The PACF displays three significant correlations at lags 1, 12, and 13. Therefore, we estimate several plausible ARIMA $(p,d,q)(P,D,Q)_s$ models for the noise series that are compatible with the sample ACF and PACF’s. Eleven tentative models were estimated (see table 4). Table 5 reports the estimates of the three best performing models based on their SBC information criterion. These are models 2, 8, and 9. The residual autocorrelation check reveals –for all models- that they are not different from a white noise process All estimated coefficient lie within the bounds of stationarity and invertability, but the

estimated autoregressive coefficient in model 9 lies dangerously close to the bound of stationarity.

The next step is to re-estimate the models selected over the entire sample period with the intervention component included.

(v) The intervention model

We seek to represent the number of tourist arrivals to Israel by an ARIMA (p, d, q) process which allows for the *intifada*'s impact/intervention. The general intervention ARIMA model for tourist arrivals in Israel can be written as:

$$y(t) = \frac{\omega_s(L)}{\delta_r(L)} I(t-b) + \frac{B(L)}{A(L)} \varepsilon(t)$$

Where $y(t)$ the logarithm in period t of the number of total tourist arrivals to Israel at time t (1990:1 to 2003:03). The log transformation meant to stabilize the variance of the series; $I(t)$ is the intervention variable or indicator of the start of effect of the *intifada*. b is the delay parameter, if any, defined as the delay involved for the impact to take effect.

$\omega_s(L)$ are the intervention parameters of order s , and $\delta_r(L)$ are the decay parameters of order r . In general there are two scenarios for coding the indicator or input variable $I(t)$. A *step function* approach or *pulse function* approach. For this study, we will employ the step function representation of the intervention indicator. A pulse indicator is more appropriate if the event occurs in a single time period (SAS user guide). In addition since a pulse function can be produced by differencing the step function, the choice between one or the other is usually based on convenience of interpretation (Wei, 1990). Therefore, we define our intervention indicator in the following manner:

$$I(t) = \begin{cases} 0 & \text{when } t < 2000 : 10 & \text{(noise series, or pre-intervention response series)} \\ 1 & \text{when } t \geq 2001 : 10 & \text{(post-intervention response series)} \end{cases}$$

This formulation of $I(t)$ assumes that the first influence of the *intifada* was not felt until the following month, October 2000⁵. Therefore, the period October 2000 to March 2003 is regarded as containing the intervention effect. $A(L)$ yields the autoregressive (AR) components of the series, and the coefficients of $B(L)$ yield the moving average (MA) component of the ARIMA model. The ω and δ parameter allow for dynamic modeling of the intervention variable. $\varepsilon(t)$ is a normal i.i.d. disturbance. Next, I re-estimate the models in table 5 with the intervention indicator. I entertain two different types of intervention models: One is a model with a permanent and abrupt effect of the *intifada*, and the second entertains a gradual permanent impact of the *intifada*.

Model 1: The Zero-Order Intervention Component:

The zero-order intervention model is the simplest possible intervention formulation where the highest power of L is zero. Therefore, the intifada's impact assessment model is:

$$y^*(t) = \omega_0 I(t) + \text{ARIMA model for the noise series.}$$

This model implies an abrupt, permanent shift in the tourist arrivals series from the pre-to postintervention level at the onset of the intifada. Since the series $y^*(t)$ is deemed stationary, then the parameter ω_0 is an estimate of the difference between the pre- and postintervention series level (McClearly & Hay, 1980). Models 2, 8, and 9 were estimated over the entire sample incorporating the intervention variable. Model 9 had an insignificant parameter. Relative to model 2, model 8 had the lowest SBC information criterion. The Correlation between the coefficients of model 8 were low and the residual is not different from white noise. The final estimated zero-order intervention component becomes:

$$y(t) = -0.40866I(t) + \frac{\varepsilon(t) - 0.702\varepsilon(t-12)}{(1 - 0.843L - L^{12})}$$

All parameters are significant at the 1 percent level (see Table 3.6 for detailed results). Translated into a percent change estimate of impact indicates a drop in tourist arrivals by 33 percent ($1 - e^{-0.408}$) from the pre-intifada level. As the pre-intifada mean for the tourism series is approximately 175,000 tourists per month, the percentage change represents a reduction of approximately 59,000 tourists per month.

Model 2: The First-Order Intervention Function:

The first-order intervention function implies a gradual and permanent change in the level of the time series. Since the data is aggregated on a monthly basis, then a first order, not zero order intervention function might be adequate. Therefore, we estimate the model:

$$y^*(t) = \frac{\omega_0}{1 - \delta_1 L} I(t) + \text{ARIMA model for the noise series.}$$

Estimation results were not significant for the decay parameter (δ_1). In addition the estimates for the other parameter remained the same. Therefore, I find no significant evidence to support this model.

6. Conclusion:

Tourists have been avoiding Israel though they are not the target of any attack and normalcy of life in Israel is uninterrupted. Although fighting between the Israelis and Palestinians is not blamed directly, the extensive coverage of suicide bombings and the events of September 11th have exacerbated peoples' fears and created a negative image of Israel as a touristic destination. Therefore, perceived risk seems to be more important than the actual risk associated with travel to a certain destination. After the intifada, Israel has lost approximately one third of its tourists. That translates into a loss of billions of dollars (depending on the average spending by tourists) to the tourism industry in Israel. Empirical evidence suggests that the intifada had an immediate impact rather than a gradual impact on tourism in Israel. This is somewhat puzzling. Typically, canceled travel arrangements entail heavy fines; therefore, the decline of tourist numbers should have been gradual. Unfortunately there is no available data to test for the effect of the intifada on tour operators, and to examine the magnitude of canceled tickets and tours to Israel. Based on the presented empirical evidence, The Palestinian and Israeli economies are not the only victims of the intifada, but there is circumstantial evidence of substantial losses to tour operators inside and outside Israel. More research is needed to study the impact of media coverage on altering risk perception in the minds of tourists. As for the impact of September 11 attacks, empirical evidence is hampered by the lack of sufficient data points after the date of the attacks. Israeli tour operators and the Israeli Ministry of Tourism have the challenge of whitewashing the image of Israel as calm and tranquil tourist destination despite extensive media coverage which they can't directly control.

Table 1: descriptive statistics of total tourist arrivals from 1990:1-2003:5

Descriptive Statistics	
N	161
Mean	157.7 (thousands)
Standard deviation	61.21 (thousands)
Maximum (1999:10)	292.4 (thousands)
Minimum (1991:2) Gulf War	15.1 (thousands)
Total visitors	25394.85 (thousands)
Standard deviation	61.5246 (thousands)
[0,100) visitor per month	33 months
[100,200) visitors per month	86 months
[200,300) visitors per month	42 months

Table 2: employment by economic activity as a percent of total employment⁶

YEAR	education	public	Business	bank	accommodation	construction	Manufacturing	Agriculture	other
1994	12	5.8	8.5	3.5	4	6.6	21.3	3.5	34.8
1995	12.1	5.5	9	3.5	4.2	7.2	20.7	2.9	34.9
1996	12.1	5.4	9.7	3.4	3.8	7.5	20.2	2.6	35.3
1997	12.1	5.6	10.1	3.6	3.7	7.2	19.7	2.4	35.6
1998	12.7	5.5	10.5	3.6	3.9	6.3	18.9	2.3	36.3
1999	12.6	5.5	10.6	3.5	4.3	5.7	18.4	2.3	37.1
2000	12.4	5.4	11.8	3.3	4.6	5.3	18	2.2	37
2001	12.6	5.6	12.3	3.3	4.3	5.2	17.5	1.9	37.3

Source: Statistical Abstract of Israel various issues

Table 3: revenue from tourism and other statistics

Year	Revenue from tourists(\$M)	total	person employed monthly average	tourist occupancy	number of hotels	number of rooms
1987	-	\$599.1	23235	62.3percent	310	32028

1988	-	\$629.9	22355	55.2percent	307	32522
1989	-	\$659.4	21958	56percent	295	31432
1990	-	\$663.8	20549	50.8percent	272	29831
1991	-	\$640.3	18326	44.1percent	241	26957
1992	-	\$639.5	20306	60percent	240	27258
1993	-	\$851.5	22741	60.2percent	250	28879
1994	\$456.9	\$893.2	23645	59.2percent	291	33510
1995	\$588.2	\$1156.2	28064	59.3percent	298	34801
1996	\$575.1	\$1204.6	27849	55.1percent	305	36748
1997	\$538	\$1188.2	27928	50.5percent	309	38270
1998	\$523.8	\$1200.3	28,145	46.2percent	313	40268
1999	\$604.8	\$1317.7	29686	48.4percent	330	43111
2000	\$661.4	\$1449.5	29849	49.5percent	340	45707
2001	\$285.2	\$1045.6	23150	25.3percent	339	46658
2002	-	-	20225	-	-	-

Source: Statistical Abstract of Israel various issues

Table 4: tentative ARIMA models for the noise series

(1)ARIMA [0,0,1][1,1,0]₁₂

$$(1 - L^{12})y(t) = \alpha_{12}y(t - 12) + \varepsilon(t) - \beta\varepsilon(t - 1)$$

(2)ARIMA (1,0,0)(1,1,0)₁₂ Multiplicative Seasonal ARIMA

$$(1 - L^{12})y(t) = (1 - \beta L)(1 - \beta_{12}L^{12})y(t)$$

(3)ARIMA (0,0,1)(0,1,1)₁₂ Multiplicative Seasonal ARIMA

$$(1 - L^{12})y(t) = (1 - \beta L)(1 - \beta_{12}L^{12})\varepsilon(t)$$

(4) ARIMA [(1,13),0,0][1,1,1]₁₂

$$(1 - L^{12})y(t) = (\beta L + \beta_{12}L^{12} + \beta_{13}L^{13})y(t) + \varepsilon(t) - \beta_{12}\varepsilon(t-12)$$

(5) ARIMA [(1,13),0,0][1,1,0]₁₂

$$(1 - L^{12})y(t) = (\beta L + \beta_{12}L^{12} + \beta_{13}L^{13})y(t) + \varepsilon(t)$$

(6) ARIMA [0,0,(1,12)][0,1,0]₁₂ Additive Seasonal ARIMA

$$(1 - L^{12})y(t) = (1 - \beta_1 L - \beta_{12}L^{12})\varepsilon(t)$$

(7) ARIMA [1,0,(13)][0,1,1]₁₂

$$(1 - L^{12})y(t) = \alpha_1 y(t-1) + \varepsilon(t) - \beta_{12}\varepsilon(t-12) - \beta_{13}\varepsilon(t-13)$$

(8) ARIMA (1,0,0)(0,1,1)₁₂

$$(1 - L^{12})y(t) = \alpha_1 y(t-1) + \varepsilon(t) - \beta_{12}\varepsilon(t-12)$$

(9) ARIMA (1,0,1)(0,1,1)₁₂

$$(1 - L^{12})y(t) = \alpha_1 y(t-1) + \varepsilon(t) - \beta_1 \varepsilon(t-1) - \beta_{12}\varepsilon(t-12)$$

(10) ARIMA (0,0,1)(0,1,0)₁₂

$$(1 - L^{12})y(t) = \varepsilon(t) - \beta_1 \varepsilon(t-1)$$

(11) ARIMA (1,0,0)(0,0,1)₁₂

$$(1 - L^{12})y(t) = \alpha_1 y(t-1) + \alpha_{12} y(t-12) + \varepsilon(t)$$

Table 5: ARIMA Models estimated for the noise series based on ACF and PACF.

Model Estimates	SBC	Residual Q –stats(p-value)
Model 2:		
AR(1)= 0.867 (<.0001)	-45.652	Q(12)= 9.5 (0.485)
AR(12)= -0.660 (<.0001)		Q(24)= 29.87 (0.121)
Model 8		
AR(1)= 0.655 (<0.0001)	-44.9391	Q(12)= 9.10 (0.523)
MA(12)= 0.876 (<0.0001)		Q(24)= 12.3 (0.949)

Model 9

AR(1)= 0.923	(<0.0001)	-43.9391	Q(12)= 5.27	(0.810)
MA(1)= 0.198	(0.0567)		Q(24)= 8.83	(0.990)
MA(12)=0.659	(<0.0001)			

Notes: Each model was estimated with a constant, but none were significant.

Q(n) reports the Ljung-Box Statistics for the autocorrelations of the n residuals of the estimated model. Significance levels are in parentheses.

Models were estimated using SAS ARIMA Procedure.

Table 6 Results for the zero-order intervention model

AR(1) estimate	0.84322	(<.0001)	
MA(12)	0.70209	(<.0001)	
ω	-0.40866	(<.0001)	
SBC	-34.2182		
	Q(12) = 9.97	(0.4427), Q(24) = 13.89	(0.9054)

Table 7: Buys-Ballot table of total monthly tourist arrivals to Israel from 1990 to 2002

year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Total	Avg.
1990	89.1	110.3	148.8	183.1	134.9	119.7	150.1	129.6	85.4	82.3	45.2	63.2	1341.7	111.8083
1991	23.1	15.1	68.2	72.3	91.3	95.1	134.9	136.3	105.2	142.6	107.2	118.8	1110.1	92.50833
1992	89	109.6	145.8	189.6	160.4	140	177.7	179.3	153.1	182.8	148.2	129.8	1805.3	150.4417
1993	102.4	117.9	167.5	196.6	166.4	157.9	195.3	193.4	156.9	196.6	158.6	136.8	1946.3	162.1917
1994	115.7	144.7	191.9	209.1	184	163	208.3	209.2	169.2	242.4	180.1	150.9	2168.5	180.7083
1995	136.7	166.2	217.1	243.3	214.5	191.4	242.8	247.1	205.9	279.1	205.9	180.6	2530.6	210.8833
1996	175.8	214	233.5	232.7	188.4	166.1	198	214.9	173.9	215.8	170.3	176.8	2360.2	196.6833
1997	145.8	177.9	216	223.7	203.7	177.7	217.723	202.888	174.317	193.436	191.966	170.403	2295.533	191.2944
1998	133.471	135.678	169.709	222.534	183.215	181.589	202.013	217.424	165.47	227.388	193.323	165.4	2197.214	183.1012
1999	137.3	160.6	224.2	227.5	201.2	193.6	229.9	248.1	207.6	292.4	261.5	182	2565.9	213.825
2000	169.8	213.8	285.9	291.8	282.7	247	265.1	258.3	270.4	166.3	110.9	110.1	2672.1	222.675
2001	103	104.3	129.2	144	108.7	100.9	117.2	116.9	78.3	70.3	68.1	81.5	1222.4	101.8667
2002	69	64.2	82	59.9	60.7	61.1	73.5	85.6	72.6	77.6	63.7	92.4	862.3	71.85833
Total	1490.171	1734.278	2279.809	2496.134	2180.115	1995.089	2412.536	2439.012	2018.287	2369.024	1904.989	1758.703	25078.15	2089.846
Avg.	114.6285	133.406	175.3699	192.0103	167.7012	153.4684	185.5797	187.6163	155.2528	182.2326	146.5376	135.2848	1929.088	160.7574

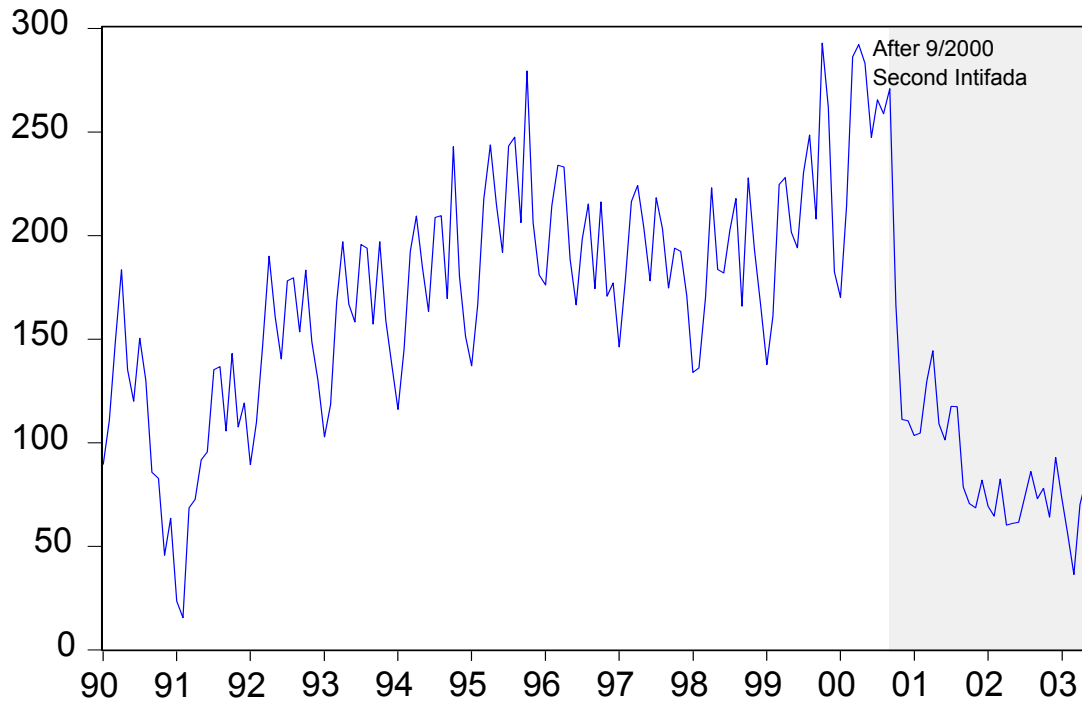


Figure 1: time plot of total tourist arrivals to Israel from 1990:1 -2003:5

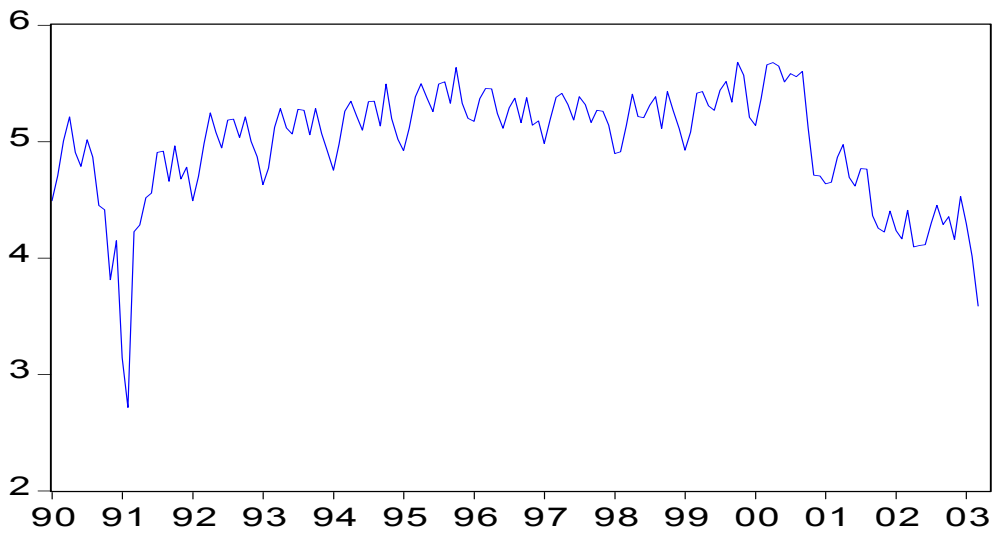


Figure 2 : time plot of total tourist arrivals to Israel, Log-transformation

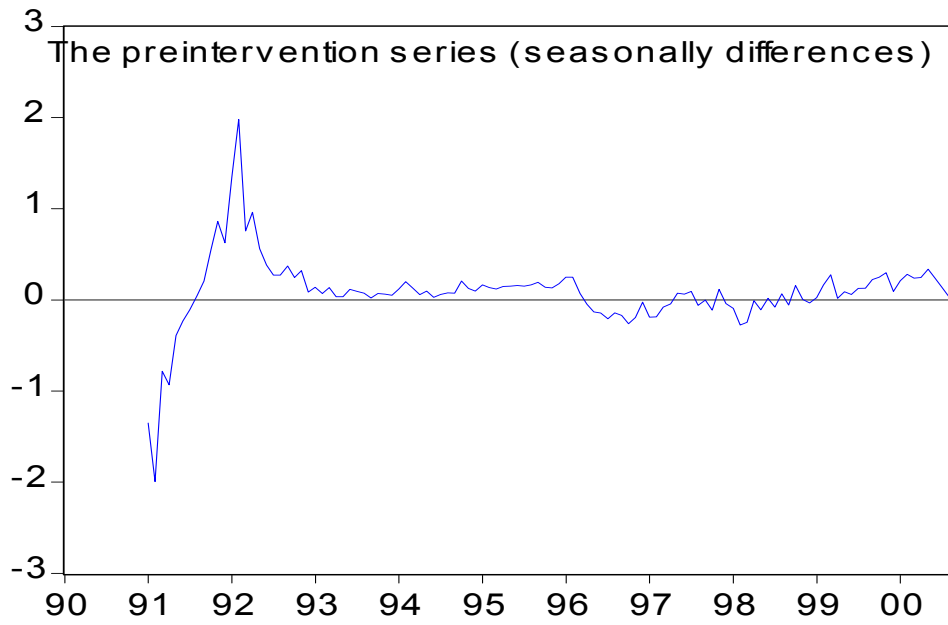


Figure 3 : $y_t^* = (1 - L^{12})y_t$ series (1990:1-2000:9)

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<http://news.bb.co.uk/go/pr/fr/-/2/hi/europe/3086627.stm> (ETA attacks)

http://news.bbc.co.uk/go/pr/fr/-/2/hi/programmes/from_our_own_correspondent/3059239.stm
(Corsica attacks)

¹ Larger of Peru's two insurgencies, Shining Path was formed in the late 1960s by then university professor Abimael Guzman. Stated goal is to destroy existing Peruvian institutions and replace them with peasant revolutionary regime. Also wants to rid Peru of foreign influences. The group has bombed diplomatic missions of several countries in Peru, including the US Embassy. Carries out bombing campaigns and selective assassinations. Has attacked US businesses since its inception. Involved in cocaine trade.(<http://www.ict.org.il/>) international policy institute for Counter terrorism.

² Clandestine Welsh nationalist group.

³ A total of 28 foreign nationals were killed in Palestinian attacks since the start of the current conflict but only of these, seven were citizens of France, Sweden, U.S., and UK. The other 27 were foreign workers of Chinese, Ukrainian, Rumanian, and other nationalities.

⁴ Their dataset for the three countries spanned the period from 1970:I to 1988:IV

⁵ the second intifada started on September 27,2000

⁶ Numbers for the years pre 1994 combine the figure from accommodation services and commerce. It is impossible to guess the percentage employed by the accommodation and restaurant services, therefore we did not report pre1994 figures