Terrorist murder, cycles of violence, and attacks index for the City of Philadelphia during the last two centuries.

Gómez-sorzano, Gustavo
LeasingMetrix Group, Inc

29. January 2007

Terrorist Murder, Cycles of Violence, and Attacks Index for the City of Philadelphia During the last Two Centuries.

By Gustavo Alejandro Gómez-Sorzano*

Paper for the Stockholm Criminology Symposium
Stockholm University 2008 *Section on National Crime Prevention Strategies*

Abstract: I apply the Beveridge-Nelson business cycle decomposition method to the reconstructed time series of murder of the City of Philadelphia (1826-2004). Separating out "permanent" from "cyclical" murder, I hypothesize that the cyclical part coincides with documented waves of organized crime, internal tensions, breakdowns in social order, crime legislation, social, and political unrest, and recently with the periodic terrorist attacks in to the United States. The estimated cyclical terrorist murder component warns that terrorist attacks to the U.S, have affected Philadelphia City creating turning point dates marked by those attacks. This paper belongs to the series of papers helping the U.S, and Homeland Security identify the closeness of terrorist attacks, and constructs the attacks index for Philadelphia. Other indices constructed include the Index for the U.S. http://mpra.ub.uni-uenchen.de/1145/01/MPRA_paper_1145.pdf, New York State http://mpra.ub.uni-muenchen.de/3776/01/MPRA_paper_3776.pdf, New York City http://mpra.ub.uni-muenchen.de/4200/01/MPRA_paper_4200.pdf, Arizona State http://mpra.ub.uni-muenchen.de/4360/01/MPRA_paper_4360.pdf, Massachusetts State http://mpra.ub.uni-muenchen.de/4342/01/MPRA_paper_4342.pdf., California http://mpra.ub.uni-muenchen.de/4547/01/MPRA_paper_4547.pdf., Washington http://mpra.ub.uni-muenchen.de/4604/01/MPRA_paper_4604.pdf., Ohio http://mpra.ub.uni-muenchen.de/4605/01/MPRA_paper_4605.pdf, and Arkansas. http://mpra.ub.uni-muenchen.de/4606/01/MPRA_paper_4606.pdf. These indices must be used as dependent variables in structural models for terrorist attacks and in models assessing the effects of terrorism over the U.S. economy.

Keywords: A model of cyclical terrorist murder in Colombia, 1950-2004. Forecasts 2005-2019; the econometrics of violence, terrorism, and scenarios for peace in Colombia from 1950 to 2019; scenarios for sustainable peace in Colombia by year 2019; decomposing violence: terrorist murder in the twentieth in the United States; using the Beveridge and Nelson decomposition of economic time series for pointing out the occurrence of terrorist attacks, terrorist murder, cycles of violence, and terrorist attacks in New York City during the last two centuries.

JEL classification codes: C22, D74, H56, N46, K14, K42, N42, O51.
alexgosorzano@yahoo.com , gustavo.gomez-sorzano@reuters.com
Econometrician. Analyst, Reuters, Lipper, U.S.
Paper dedicated to the city with personality. I want to express my appreciation towards REUTERS. The opinions expressed do not compromise the company for which I currently work.
First Draft, January 29th, 2007.

Terrorist Murder, Cycles of Violence, and Attacks Index for the City of Philadelphia During the last Two Centuries.

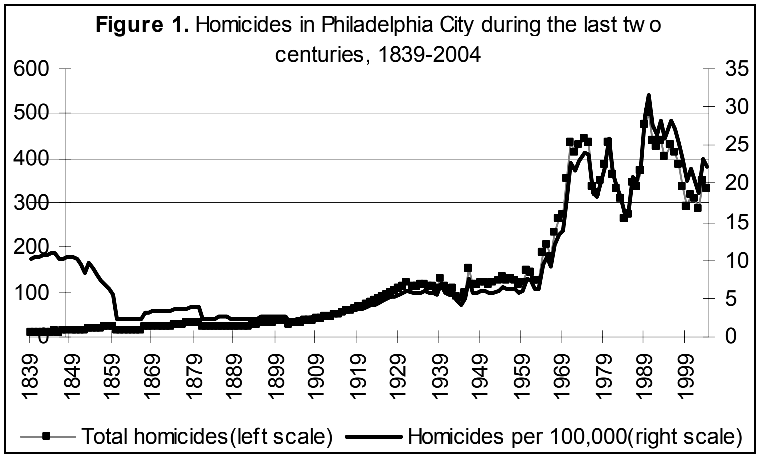
1. Introduction.

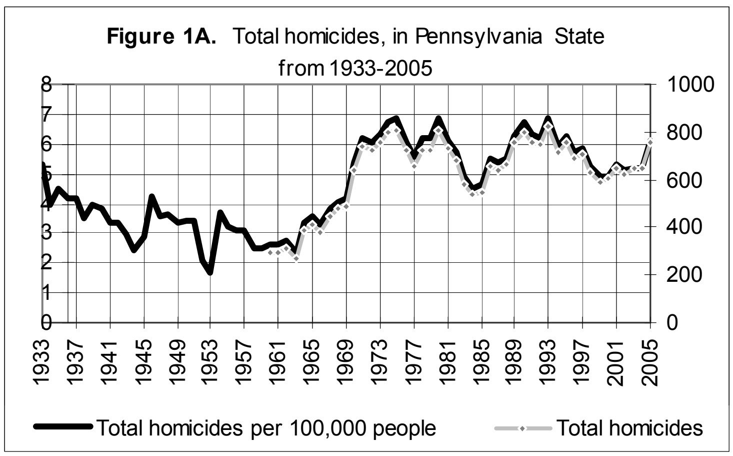
After decomposing violence, and creating the cyclical terrorist murder and attacks index for New York State: *decomposing violence: terrorist murder and attacks in New York State* (Gómez-Sorzano 2006E), this paper continues that methodology research applied to the City of Philadelphia. The current exercise for Philadelphia is the second one at the city level constructing the murder, and attacks index preventing the closeness of attacks, or tragic events in the main cities, and States of the U.S.

This research shows that the estimated cyclical component of murder carefully has pointed out through estimated turning point dates the tragic events occurred in Philadelphia City from 1868 to 2004. The indicator for the city additionally carefully signaled the terrorist attacks to the nation, particularly, the World Trade Center bombing, and 9/11 2001.

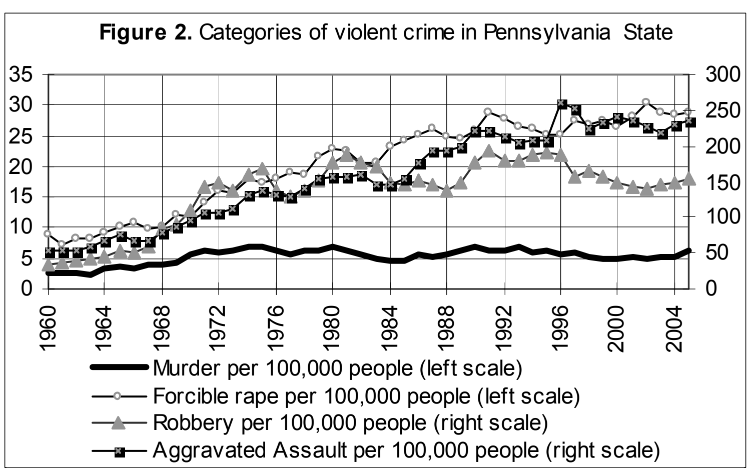
According to my estimates and, observed data from the Federal Bureau of Investigation, Uniform Crime Reporting System, total homicides in Philadelphia City increased from an average of 14 homicides per year for the period (1839 to 1865), a sub-period embedded inside the American Civil War period (1861-1865); then to 31 murders per year, period (1866-1918) coinciding with the ending up of the First World War lasting from 1914-1918; then jumping to 99 for the period (1919-1945) a period marked by the end of the Second World War; to 205 for (1946-1975), and to 364 for (1976-2004) a period marked by the end of the Vietnam Conflict.

When adjusted for population growth, i.e., homicides in 100,000 people in the population, and again marking the periods in identical way as done by Monkkonen (2001), by the cessation of every U.S war, a dramatic picture emerges for the five periods as follows: 7.80, 2.83, 5.16, 10.46, and 22.76 for the last period that includes the war against global terrorism (Fig.1).



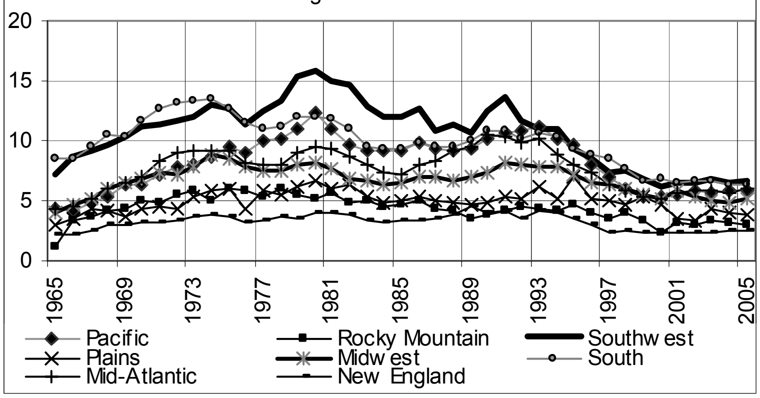


Out of the state's four categories of crimes, measuring violent crime (murder, forcible rape, robbery, and aggravated assault) murder is the one that varies the less, but all of them are going up steadily during the last years (Fig. 2). The attacks index for 2004 appears as the highest of the nation with a value of 11.36 per capita (Fig. 5).



Although the U.S., murder rates appear stabilizing during the last years, the highest per capita rates are found in the southwest, and south regions with 6.67, and 6.39 per capita, the Mid-Atlantic region where Philadelphia City belongs appears as the third highest of the country with a rate of 5.93 for 2005 (Fig. 3).

Figure 3. Murder per capita rates per 100,000 across regions of the U.S.



2. Construction of the per capita murder series for Philadelphia City.

Since the data series of murder per capita for Philadelphia City does not exist, a reconstruction for such data series is performed using table 8 e.g., *number and average annual rate per 100,000 population of incidents resulting in homicide indictments, by period* taken from Lane (1999 pp. 60), and the statistics for population for Philadelphia City taken from Historical Statistics of the United States, Volume 1[1]. This volume presents the information for population for Philadelphia City from 1790 up to 1990. The information shown is the inter-census population having holes of 10 years; so accordingly a reconstruction for population was accomplished using the standard exponential calculation of population growth[2]. Table 1 and Figure 4 present respectively the inter-census population growth rates, and my estimated population, while Figure 4A presents population taken from Lane (1999, pp.11., Table 1) that presents population from 1839 to 1875, which I chained with my estimated population from 1876 to 2004. Accordingly population 1 to refer to my reconstructed series from 1839 to 2004, and population 2 to refer to Lanes' 1839-75 chained with mine 1876-2004.

---

[1] Table Aa832-1013 Population of cities with at least 100,000 population in 1990 (1790-1990). Source U.S., Bureau of the Census, 1990 Census of Population and Housing "population and housing unit counts", number CPH-2-1, table 46, series (Aa 841).

[2] $P_F = P_0 \exp^{rt}$, where PF stands for final population, P0 initial population, r is the inter-census rate, and t as time comprised between two consecutive census.

The data series for total homicides of Figure 4 is reconstructed and chained using Lane's Table 8 (1999, pp. 60), the Historical Statistics of United States, Volume 5[3] (2001), and the FBI Crime Reporting System which is source for homicides from 1997 to 2004.

Table 1. Inter-Census population growth rates in Philadelphia, and NYC from 1790 to 1990

Period	Philadelphia	NYC
1790-1800	3.34	4.29
1800-1810	2.40	3.75
1810-1820	1.56	2.17
1820-1830	2.10	4.23
1830-1840	1.38	4.35
1840-1850	2.35	5.24
1850-1860	13.90	4.75
1860-1870	1.59	2.08
1870-1880	2.07	2.33
1880-1890	1.92	2.46
1890-1900	1.92	2.86
1900-1910	1.63	2.97
1910-1920	1.48	1.49
1920-1930	0.61	1.90
1930-1940	-0.09	0.66
1940-1950	0.63	0.51
1950-1960	-0.30	-0.12
1960-1970	-0.24	0.13
1970-1980	-1.13	-1.00
1980-1990	-0.57	0.31

Table 2. Number of incidents resulting in homicide indictments by period

Years	Homicides	7-yr.rate
1839-1845	73	3.70
1846-1852	85	3.10
1853-1859	138	4.00
1860-1866	100	2.40
1867-1873	156	3.30
1874-1880	205	3.70
1881-1887	159	2.40
1888-1894	167	2.20
1895-1901	231	2.70

Source: Violent Death in the City, Lane Roger, 1999, pp.60

[3] Table Ec237-241. Series Ec241 refers to murders, and non-negligent manslaughters in the City of Philadelphia from 1797 t0 1996. The series displayed reports continuously just from 1935 to 1996.

The reconstruction of homicides was realized using a backward recursive substitution process, starting with the earliest reliable data found, from Historical Statistics of the U.S. that data corresponds to year 1991 with 119 homicides. I accordingly set up an Xcel spreadsheet with a column summing the total for the periods shown on table 2. The first period reconstructed backwards was 1931-1902, for which I used the total homicide growth rate for NYC of 5.14 for that period. In order to chained the estimated value of 28 homicides for 1902, with the distribution of homicides from 1895-1901 with a total of 231 homicides (Table 2), I created an initial seed for 1895, and multiplied it by the estimated average growth rate for that period (Table 2), recreating the homicides for the sub-period, the initial seed functioned as initial values which had to be adjusted for having the sub-period homicide values coinciding with Lane (Table 2). I proceeded this way backwards for each one of the sub-periods creating the estimated values of homicides for them. The process reconstructs holes according to intra-period homicides, and average homicide rates suggested by Lane; and appears as optimum, as later the estimated peaking dates coincide amazingly well with major terrorist attacks to the country.

Figure 4. Estimated population and total homicides in Philadelphia City from 1839 to 2004

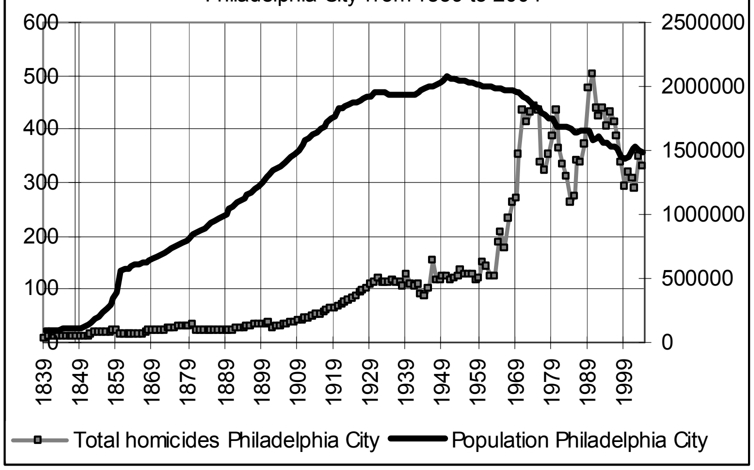


Figure 4A. Estimated population and total homicides in Philadelphia City from 1839 to 2004 (population 2)

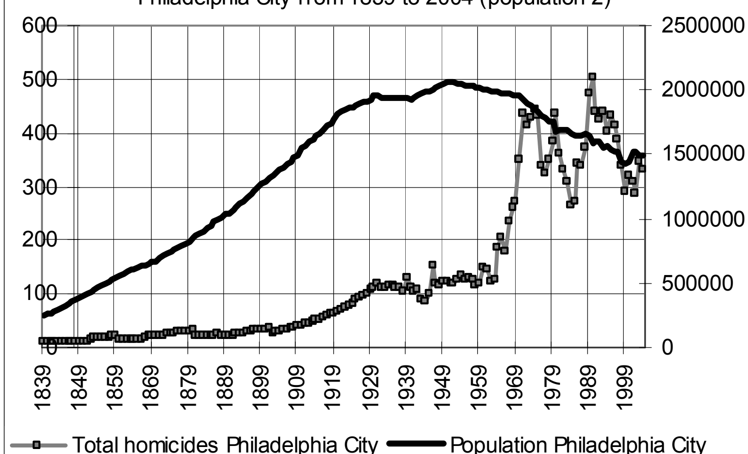


Figure 4B. Estimated per capita murder series for Philadelphia City from 1839 to 2004 (populations 1 and 2)

The reconstructed per capita murder series according to population 1 is calculated as the quotient between murder, and population multiplied per 100,000, and is shown on figure 1, and used for estimating model 1 (Table 4), while murder per capita 2, is used for estimating model 1 (Table 4A).

2. Data and methods

For this analysis I use the reconstructed murder rates per 100,000 people shown on figure 1. As is known, time series can be broken into two constituent components, the permanent and transitory component. I apply the Beveridge-Nelson (BN for short 1981) decomposition technique to the Philadelphia City series of murders. The estimated cyclical component contains the turning points dates, the information for terrorist attacks for the city are hidden in these cycles, particularly coinciding with the turning point dates.

Beveridge and Nelson decomposition

I use the augmented Dickey Fuller (1981), test to verify the existence of a unit root on the logarithm of murder 1797-2005. It presents the structural form shown in equation (1).

$$\Delta L\,\text{hom}_t = \alpha + \theta.\, t + \phi\, L\,\text{hom}_{t-i} + \sum_{i=1}^{k} \gamma_i\, \Delta L\,\text{hom}_{t-i} + \varepsilon_t \qquad (1)$$

The existence of a unit root, is given by (phi) ϕ=0. I use the methodology by Campbell and Perron (1991) in which an auto-regression process of order k is previously selected in order to capture possible seasonality of the series, and lags are eliminated sequentially if: a) after estimating a regression the last lag does not turn out to be significant, or b) if the residuals pass a white noise test at the 0.05 significance level. The results are reported on table 3.

Table 3 Dickey & Fuller test for Unit Roots

Series	K	Alpha	Theta	Phi	Stationary
D(Lhphilly) – murder series	65	-1.22	0.0226	-0.7248	No
City of Philadelphia , 1839-2004		-1.10	1.11	-1.01	

Notes: 1. K is the chosen lag length. T-tests in second row refer

To the null hypothesis that a coefficient is equal to zero.

Under the null of non-stationarity, it is necessary to use the Dickey-Fuller critical value that at the 0.05 level, for the t-statistic is -3.50 , -3.45 (sample size of 50 and 100)

After rejecting the null for a unit root (accepting the series is non stationary), I perform the BN decomposition which begins by fitting the logarithm of the per capita murder series to an ARIMA model of the form (2):

$$\Delta Lt\,\hom_t = \mu + \sum_{i=1}^{k} \gamma_i \Delta Lt\,\hom_{t-i} + \sum_{i=1}^{h} \psi_i \varepsilon_{t-i} + \varepsilon_t \qquad (2)$$

Where k, and h are respectively the autoregressive and moving average components. The selection of the ARIMA model is computationally intense. My search for the right model for the two century period 1839-2004 stopped with an ARIMA (28,1,18) ran with RATS 4, shown in table 4, and including autoregressive components of order 7,14,16, and 28, and moving average terms of order 2,7,14 and, 18. The model is unique at providing a cyclical component oscillating around a zero average, and coinciding amazingly well with mayor cycles of violence, and most importantly terrorist attacks occurred recently in Philadelphia City.

Table 4. Estimated ARIMA model for murder for Philadelphia City

Annual data from 1868 to 2004

Variables	**Coeff**	**T-stats**	**Std Error**	**Signif**
Constant	-0.0043	-2.600	0.0010	0.0000
AR(7)	-0.4243	-6.840	0.0620	0.0000
AR(14)	-0.4137	-17.390	0.0230	0.0000
AR(16)	0.1153	4.280	0.0260	0.0000
AR(28)	-0.1185	-4.650	0.0250	0.0000
MA(2)	-0.9181	-12.860	0.0710	0.0000
MA(7)	0.8252	12.240	0.0670	0.0000
MA(14)	1.1558	10.560	0.1000	0.0000
MA(18)	0.6944	7.950	0.0870	0.0000

Centered R^2 = 0.99

DW= 1.92

Significance level of Q = 0.0065

Usable observations = 137

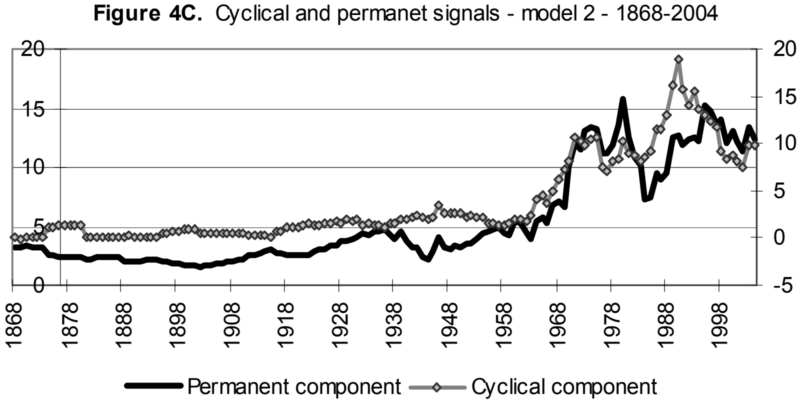
Table 4B. Estimated ARIMA model for murder for Philadelphia City
Annual data from 1868 to 2004

Variables	Coeff	T-stats	Std Error	Signif
Constant	0.0083	2.110	0.0039	0.0360
AR(7)	-0.5649	-9.120	0.0619	0.0000
AR(14)	-0.7159	-44.260	0.0162	0.0000
AR(16)	-0.0632	-3.810	0.0166	0.0000
AR(28)	-0.1330	-2.140	0.0621	0.0341
MA(7)	0.7122	16.990	0.0419	0.0000
MA(10)	0.1091	2.620	0.0416	0.0098
MA(14)	0.9902	16.440	0.0602	0.0000
MA(18)	0.2611	4.420	0.0590	0.0000

Centered R^2 = 0.98
DW= 1.99
Significance level of Q = 0.0000
Usable observations = 137

The transitory and permanent signals from model 4B are shown on figure 4C, but, since this model (model 2) does not reproduce to perfection major attacks to the U.S, and major violence cycles of Philadelphia, it is rejected, it particularly shows a reduction from 2000 to 2001, from 8.86 to 8.16 (-7.9%).

Figure 4C. Cyclical and permanet signals - model 2 - 1868-2004



The nine model parameters from table 4 are replaced in the equation for the permanent component of murder shown in (3)[4]:

$$L\,\hom_t^{PC} = L\,\hom_0 + \frac{\mu . t}{1-\gamma_1 - . . . \gamma_k} + \frac{1+\Psi_1 + \ldots . \Psi_h}{1-\gamma_1 - . . . \gamma_k} \sum_{i=1}^{t} \varepsilon_i \quad (3)$$

[4] The extraction of permanent and cyclical components from the original series is theoretically shown in BN (1981), Cuddington and Winters (1987), Miller (1998), Newbold (1990), and Cárdenas (1991). I show the mathematical details for New York City in appendix A.
Eq.3 above, turns out to be Eq.17 in appendix A.

The transitory or cyclical terrorist murder estimate is found by means of the difference between the original series, and the exponential of the permanent per capita component ($L\text{hom}_t^{PC}$)[5], and is shown in Figure 5, that shows additionally the estimated permanent component. The estimated cyclical index matches qualitative description of known waves of organized crime, internal tensions, crime legislation, social, and political unrest overseas, and disentangles the timing for terrorist attacks, and terrorist murder in the City of Philadelphia. To compare this historical narrative of events with my estimates for cyclical terrorist murder, and attacks I use chronologies, and description of facts taken from Clark (1970), Dosal (2001), Durham (1996), Blumstein and Wallman (2000), Bernard (2002), Henrreta et al. (2006), Hewitt (2005), Lane (1999), Monkkonen (2001), the Spanish Division Library of Congress for the Chronology of the Spanish-American War[6], and Wikepedia.

Figure 5A for informational purposes shows, the terrorist murder and attacks indices for Colombia, New York City, and Philadelphia.

Figure 5. Cyclical terrorist murder and attacks index for Philadelphia City 1839-2004

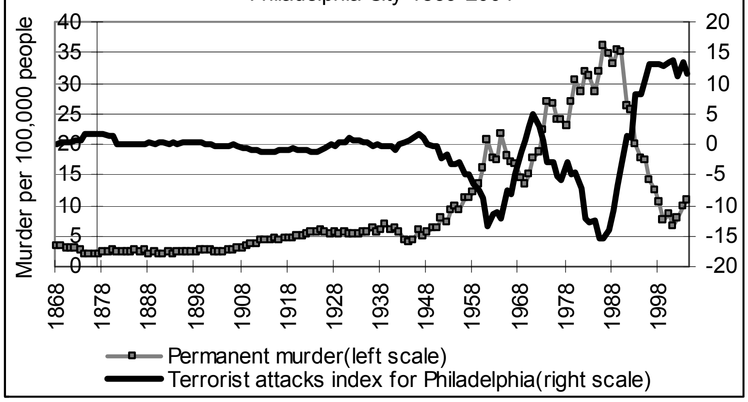
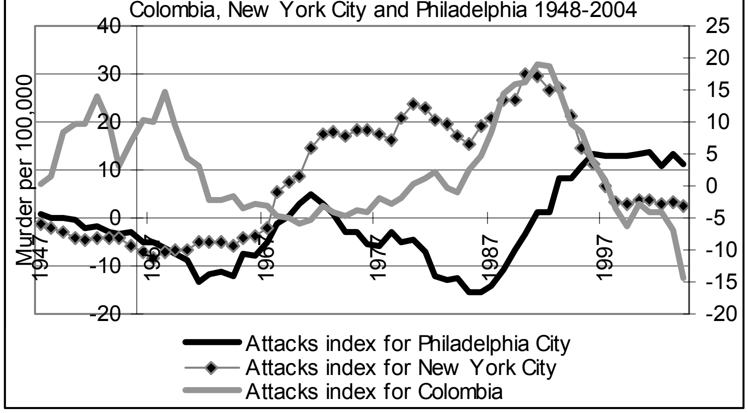


Figure 5A. Terrorist murder and attacks indices for Colombia, New York City and Philadelphia 1948-2004



[5] Turning the estimated permanent per capita component into the level of the permanent component.
[6] http://www.loc.gov/rr/hispanic/1898/chronology.html.

3. Interpretation of the terrorist attacks index for Philadelphia City.

The reconstructed per capita murder series for Philadelphia appears as optimal, as the Beveridge and Nelson splitting time series procedure, confirms the cyclical component matching a full historic inventory of cycles of violence in the city and attacks to the U.S. The terrorist murder and attacks indicator for Philadelphia City presents as a whole 5 main cycles. Four descending and three ascending ones as follows:

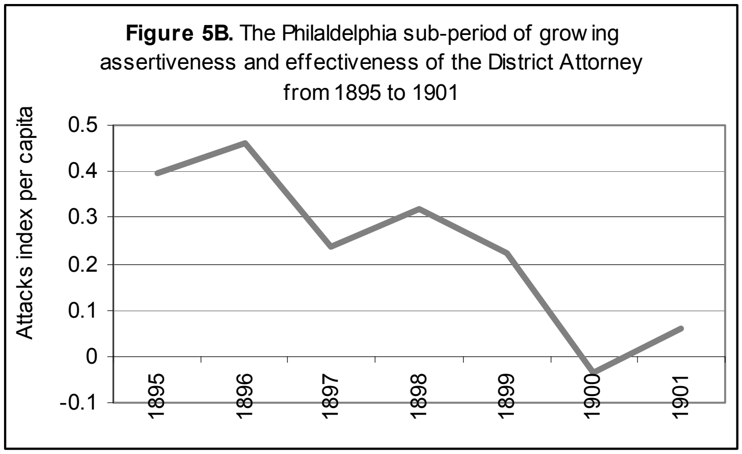
First descending cycle 1868-1897 (a 30 year period), that coincides in descending in identical way as the index for New York City. Period characterized by the Post American civil war.

The period is marked by the elections of November 8, 1870. From 1868 to 1869 the index jumped from -0.011 in 1868 to 0.17 per capita in 1869 to 0.23 in 1870 (35.2 %); according to Lane (1999, pp. 56),the total of homicide arrests effectively jumped from a total of 6 arrests for 1869 to 18 for the month of April 1870 (200%)[7], 1870 was a exceptional year, according to Lane a total of twenty-three incidents resulted in murder indictments against thirty-five individuals. Only one man was held for an accident: Adolph Fisher, a German immigrant who had drunkenly driven his wagon into a ninety-year-old woman and then compounded his offense by riding away[8].

According to Lane (1999, pp 81), in 1953 the office of coroner was abolished as an unnecessary anachronism, and the city turned instead to an appointed medical examiner to run the wholly professional that has existed ever since (for some reason my index passes from -1.48 in 1952 to -3.11 in 1953); he additionally describes the sub-period 1895-1901 (fig 5B), as the sub-period of growing assertiveness and effectiveness of the district attorney, a period when the threshold of tolerance of violence reached its lowest point (my index decreases moving from 0.39 in 1895) to 0.45 (1896), 0.23 (1897), 0.32 (1898) 0.22 (1899), -0.035 (1900), and 0.060 (1901), but his rate of success never approached that of his modern counterparts as already explained.

[7] According to Lane the model homicide in nineteenth-century Philadelphia resulted from a brawl or quarrel originating in a saloon but reaching a climax in the street, Lane (1999, pp.59).

[8] The grand jury ignored the murder charge; Fisher was tried for voluntary manslaughter, convicted of involuntary manslaughter, recommended to the mercy of the court, and fined.



Second descending cycle 1898-1931 (a 34 year period, peaking in 1931). Period marked by the Spanish American War (1898-1902), and frequent U.S overseas invasions[9].

According to Lane (1999, pp 85) as late as 1898 there were only fifteen detectives for the entire city, they were sometimes called upon to work in homicide cases, but they were technically unprepared.

In a more global context, and according to Henretta et al., pp.623, this period perfectly coincides with the Roosevelt corollary to the Monroe Doctrine that states U.S. intention to intervene unilaterally in Latin America, as well as forbid European intervention. It included the takeover of part of Colombia for the Panama Canal, numerous invasions 1898-1931, and coups to overthrow "unfriendly" governments also known as unilateralism.

According to Dosal (2002), the American Caribbean's Wars began in Cuba in 1898 when the United States replaced Spain and England as the masters of the Caribbean, according to him during the opening Caribbean War (1898-1932), the US intervened frequently and directly with American troops.

The first Caribbean war was the Spanish American War declared between the US and Spain on 25 April 1898[10] lasting up to 1902 and comprising sub-wars for Cuba, Phillippines and Guam, and Puerto Rico.

The U.S. force appeared off Santiago de Cuba with more than 16,200 soldiers and a total of 153 ships, peace was signed on January 1, 1899, my index descends from 0.32 to 0.22 from 1898 to 1899. With the Phillippines the intention was to terminate Spaniard occupation, and to provide security to its inhabitants. Peace protocol was signed in Washington D.C. on August 12, terminating hostilities between United States and Spain in the war fronts of Puerto Rico, Cuba and the Phillippines

---

[9] This period is called by Lester D. Langley as The Banana Wars: United States Intervention in the Caribbean (1898-1934).

[10] Chronology taken from: The World of 1898: The Spanish-American War, Hispanic Division Library of Congress. http://www.loc.gov/rr/hispanic/1898/chronology.html.

The war between the Phillippine Republic and the US, started on 4 February 1899 ending up in July 1902, according with the Hispanic Division, Library of Congress, it had more than 4,200 US soldiers and 20,000 and 200,000 Filipo soldiers and civilians deaths; respectively, my index descends from 1901 to 1902, from 0.06 to -0.30. Although the U.S. Department of Defense does not clearly set up limits for its duration, it reports that had 306,760 military serving, and a total of 2,446 deaths composed by 385 battle deaths, and 2,061 other deaths; wounds not mortal accounted for 1,662.

During this period, Bernard (2002, pp. 150) additionally reports that around 100,000 garment workers in New York City went on strike on 1913, at the same time that some 150,000 workers walked out in the women's garment industries. Garment workers' grievances stemmed from long hours, low wages and unsanitary conditions of work; this year my index descends from -1.25 in 1912 to -1.42 in 1913, a fact indicating that this fact did not affect Philadelphia.

On May 15 1916 additionally marines occupied Monte Cristi and Puerto Plata in the Dominican Republic, the occupation ended in 1924 after having a democratically elected president in office. The index reports positive and negative oscillations during the period comprised from 1917 to 1926 as follows, from 1917 to 1918 moves from -1.06 to -0.88 (20.4%) to -0.81 in 1919 (8.6%), to -1.09 in 1920, -0.97 in 1921, -1.06 in 1922, -1.18 in 1923, -1.17 in 1924, -1.08 in 1925, and -0.73 for 1926.

In 1918 in Haiti, and according to Dosal (2002), Charlemagne Peralte a Haitian nationalist, was leading an army of 5,000 Cacos in 131 encounters with the American marines. My Philadelphia index effectively jumps from -1.06 in 1917 to -0.88 in 1918 (20.4%). Two marines infiltrated the Cacos, as well as the encampment, and shot Peralta dead, which started and insurrection that continued after Peralte's death with at least 2,000 Haitians deaths.

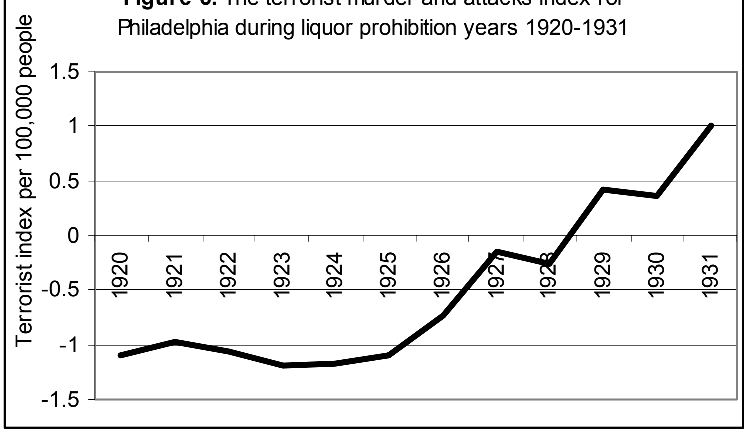
During this period additionally, President Woodrow Wilson entered First World War in 1917. According to Bernard (2002, pp.325), there was Draft registration in New York City as mentioned earlier. After the US broke up diplomatic relations with Germany in early February, popular anti-German feelings intensified, especially after intercepting the telegram sent from Arthur Zimmerman, the German Foreign Minister, to Jonathan Bernstorff, the German Ambassador in the US, it revealed their government's decision to resume unrestricted submarine warfare. It was also suggested that Mexico would receive German assistance in the re-conquest of Texas, New Mexico and Arizona, if an alliance between the two countries could be secure. On 6 April 1917 the US finally declared war on the German government (rather than its subjects). From 1917 to 1918 effectively my index for attacks and terrorist murder jumped from -1.06 to -0.88 (20.4%). According to the U.S. Department of Defense[11] during World War I (1917-1918) the US had a total of 116,516 deaths, composed by 53,402 battle deaths, and 63,114 other deaths; wounds not mortal accounted for 204,002.

---

[11] In its report: PRINCIPAL WARS IN WHICH THE UNITED STATES PARTICIPATED U.S. MILITARY PERSONNEL SERVING AND CASUALTIES.

The period additionally coincides with prohibition years. Henrretta et al describes it, as a government ban on hard liquor set up in 1917, a war measure enlarged by the 18th Amendment coming into full force as a ban on interstate commerce in beer or alcohol in 1920, and repealed in 1933. My index effectively takes into account prohibition years in Philadelphia, and the U.S as a whole as years of increasing violence and its reduction for the whole U.S. came to happen years later after Amendment 18th was repealed e.g., Gómez-Sorzano (2006, pp.7).

Figure 6. The terrorist murder and attacks index for Philadelphia during liquor prohibition years 1920-1931



For Philadelphia City, from 1917 to 1918 the index jumps from -1.06 t0 -0.88, then in 1919 passes to -0.81, to -1.09 in 1920; from 1921 to 1922 moves from -0.97 to -1.06; 1923 to 1924 passes from -1.18 to -1.17; 1927 to 1928 from -0.14 to -0.24; to 0.42 in 1929, and 0.37 in 1930 peaking in 1931 with 1.00 (170%)[12]

Descending cycle 1932-1967. (a 36 year period), characterized by the ending up of Nicaragua's intervention 1927-1932; the U.S. Good Neighbor Policy period or Second phase of America's Caribbean War (1933-1945); the Korean War (1950-1953), World War II (1941-1946), the terrorist assassination of John F. Kennedy, and the beginning of Vietnam Conflict (1964). Two particular sub-periods 1948-1952, and 1972-1974 gave born during this period to the concept of "justifiable homicide"

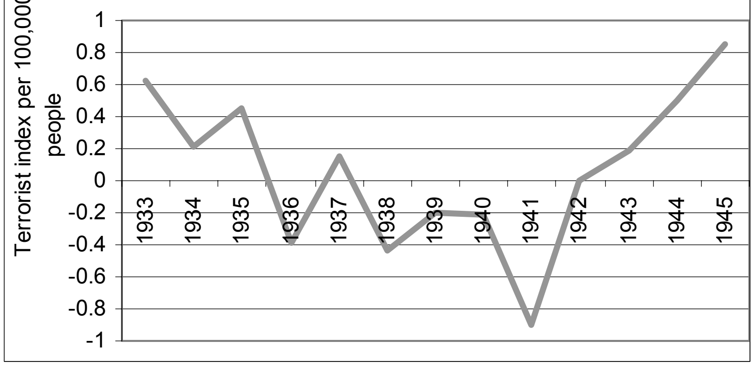
This period overlaps with Nicaragua's intervention started in 1927, and escalated in 1929 after the U.S deployment of 5,000 marines. According to Dosal (2002), it was the largest American military deployment in the Caribbean prior to 1965. The war was unpopular and President Herbert Hoover withdrew the marines after supervising presidential elections of 1932. The Philadelphia index effectively diminishes from 1.0 in 1931 to 0.51 in 1932 (-50%).

This period additionally coincides according to Dosal (2002) with strongmen maintaining order on behalf of American troops. General Somoza in Nicaragua and Trujillo in the Dominican Republic, the period was known as the U.S Good Neighbor

[12] As curious fact , during the post Economic Depressions years from 1932 to 1937 my index drops continually, e.g., from 1931 to 1932 passes from 4.92 to 4.84 to 4.05 1933, to 2.76 in 1934 to 2.32 in 1935 to 1.04 in 1936 to 0.59 in 1937, which in percent changes gives -1.5 %, -16.2%, -31.8%, -15.8%, -55.2%, -42.7 %; from 1938 onward until 1967 the index becomes negative.

Policy lasting from 1933 to 1945. My index amazingly capture this descending and peaceful period. Figure 6A shows and index that starts at 0.62 per capita in 1933, gets a minimum of -0.90 in 1941, and then jumps to 0.84 in 1945 at the end of the period.

Figure 6A. The terrorist murder and attacks index for Philadelphia during the U.S. Good Neighbor Policy period from 1933-1945



According to Dosal (2002), this good neighbor policy said nothing about indirect interventions, so occupation and intervention by proxy became the norm. During this second phase of America's Caribbean War, the Caribbean enjoyed relative peace at the high price of democracy, it was the time for dictators. Dictators Fulgencio Batista 1934-1944, 1952-1958), Trujillo (1930-1961), Jorge Ubico (1931-1944), Tiburcio Carias Andino (1932-1948), and Somoza (1934-1956) maintained domestic order so well in Cuba, the Dominican Republic, Guatemala, Honduras, and Nicaragua that the United States did not have to use its forces to protect American interests.

This period additionally coincides with World War II (1941-1946), and the tragic terrorist attack on Pearl Harbor on 7 December 1941. For Pearl Harbor model 1 decreased from -0.20 in 1940 to -0.90 in 1941, and then abruptly became positive jumping after the attack in 1942 to 0.002[13]. During the war, the attacks index for Philadelphia slowly increased, and jumped the year of the surrendering of Japan to 0.84 (on 2 September 1945) creating a turning point date one year later in 1946 with 1.52, but decreased in 1947 to 0.87; the attacks on Hiroshima and Nagasaki on August 6, and 9 respectively created and ascending cycle, the situation resembles 9/11 2001 terrorist attacks where the index for Philadelphia peaked, and came down again for subsequent years e.g., see last cycle ahead in the text. After the nuclear attacks in Japan the Philadelphia index for attacks increased from 0.84 in 1945 to 1.52 in 1946 (80.9% change), after 1946 the index decreased additionally further getting its minimum value or most peaceful time during this sub-period in 1961 with -13.33 per capita.

According to Lane (1999, pp 81), there was a total of 558 homicides reported during 1948-1952 (the index moved from 0.14 in 1948 to -0.20 (1949), -028(1950), -2.19 (1951), and -1.48 for 1952. This period for Philadelphia, additionally coincides with the reduction of the terrorist index for the nation as a whole e.g., the U.S index decreased from 1953 to 1959 from 0.81 per capita to 0.34 (Gómez-Sorzano 2006). The sub-period

[13] Model 2 however jumped from 1940 to 1941 from 2.03 to 2.10.

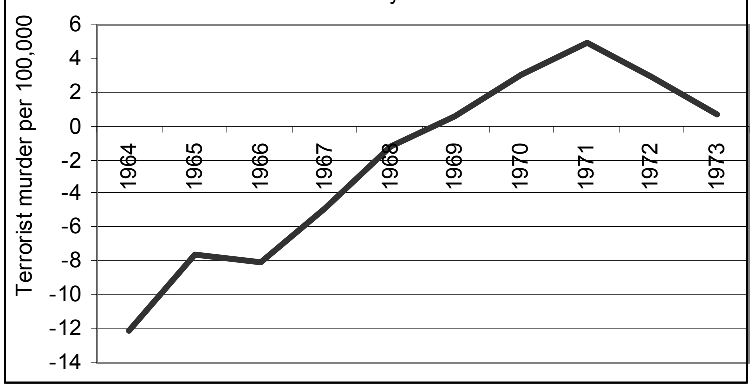
1948-1952 is also referred by Lane (1999, pp.88) as the first justifiable homicide sub-period with fourteen shooting cases.

Additional U.S facts affecting the NYC index were the assassination of President Kennedy, which increased the index from -11.5 in 1962 to -11.09 in 1963 (3.6%); the shut down in power in NYC on August 1965 additionally moved the index from -12.07 in 1964 to -7.66 in 1965 (58%)

The Korean War of 1950-1953. Apparently did not affect much the index for Philadelphia which moved from -0.28 in 1950 to -1.48 in 1952 to -3.11 in 1953, and to 1954 (-3.16, the year this war was ended up), but ascended in 1955 to -3.01 .

The last part of this period coincides with the beginning of the Vietnam Conflict in 1964 ending up in 1973.

Figure 6B. The terrorist attacks index for Philadelphia during the Vietnam Conflict years 1964-1973



During this period war or military conflict proves one more time, affects the terrorist index causing a quickly instantaneous ascension of it. Once the Vietnam conflict (Fig 6B) initiated the index continuously rose, from 1964 to 1965 it moved from -12.07 to -7.66 (57.7%), in 1966 to -8.07, in 1967 -4.89 (64.4%); it had a huge ascension in 1968 to -1.22, in 1969 to 0.52, and decreased the year it ended up to 0.66 from 2.92 in 1972. This phenomenon coincides with what the U.S is experiencing after initiating the global war on terrorism; the terrorist index for the nation increases permanently, Gómez-Sorzano (2006).

Descending cycle 1968-1991 (a 24 year sub-period, peaking in 1991), characterized by the continuation of the Vietnam Conflict and its ending up in 1973; the assassination of Dr. Martin Luther King, the Invasion of Panama, and the war on drugs in Colombia 1985-1991. The second justifiable homicide sub-period 1972-1974.

This period is marked by the assassination of Martin Luther King, Jr. on 4 April 1968, the index jumped from 1967 to 1968 from -4.89 to -1.22 (300.8%). During the Vietnam conflict years the index continuously grew up, and just stopped its climbing tendency once the conflict was over e.g., from 1968 to 1969 passed from -1.22 to 0.52; in 1970 moved to 2.98, in 1971 to 4.91, 1972 to 2.93, 1973 to 0.66, and decreased in 1974 to -2.84; one more time, history confirms how periods of U.S. involvement in conflicts and wars are responsible for boosting the terrorist attacks indexes. According with the U.S Department of Defense, the Vietnam Conflict produced 58,209 total deaths composed by 47,424 battle deaths, and 10,785 other deaths; wounds not mortal accounted for 153,303.

According to Lane (1999, pp 80), there was a total of 1,058 homicides reported in Philadelphia during 1969-1971, for these years the index moved from 0.52 (1969), to 2.98 (1970), and 4.91 (1971). He also reports the second sub-period of justifiable homicide as comprised from 1972 to 1974, my index effectively captures it, descending from 2.93 in 1972 to 0.66 (1973), and to -2.85 in 1974, same as in the first sub-period it involved killings by police officers.

During this period a slight reduction for the Philadelphia index appears coinciding in identical way with the reduction of the U.S attacks index (Gómez-Sorzano, 2006), I refer to the sub-period 1982-1986, the Philadelphia index moves from -12.27 in 1982 to -15.36 in 1986 (-20%, Blumstein and Wallman, 2002), refer to it as attributed to the aging of the population, as the huge baby-boom cohorts moved into adulthood, they brought down the total rate of homicide and other crimes.

Additional facts include U.S military invasion of Panama arresting Manuel Noriega in 1989, the Philly index accordingly moves passing from -10.8 to -6.78 in 1990 (59.2%), during this ascending cycle the war on drugs in Colombia worsens from 1985 to 1991, the index moves from -15.25 in 1985 to -14.15 in 1987, to -10.87 in 1988, to -6.78 in 1989, to 1.37 in 1991. A similar ascending movement is observed for the U.S as a whole (Gómez-Sorzano 2006).

Ascending cycle 1992-2004 (a 13 year period) characterized by the World Trade Center Bombing, the Long Island train massacre, the enacting of the Crime Act, 9/11 2001 terrorist attacks in NYC, Operation Iraqui Freedom, and the beginning of the global war on terrorism.

In 1992 the U.S. and Colombian authorities kill Pablo Escobar, the Philly index moves from 1.37 in 1991 to 1.06 in 1992 (-29.2%), this year additionally the FBI successfully prosecutes New York's Gambino family crime boss John Gotti on 13 charges or murder, gambling, racketeering, and tax fraud. Gotti had escaped three previous indictments since 1986, and had earned the nickname "Teflon Don".

In 1993 New York City experienced a second terrorist attack "the World Trade Center Bombing", the index with precision jumped, creating an estimated turning point date. Additionally the NYC experienced the tragic events of the Long Island train massacre. The Philadelphia index passed in 1992 from 1.06 to 8.13 in 1993 (666.9%).

Finally, one more time, the index with amazing precision, same as happened in 1993, warned the occurrence of 9/11 2001 for the city; it created an estimated turning point date on 2001; the index moved from 2000 to 2001, from 13.39 to 13.92 (3.9%), and then decreased in 2002 to 10.99 (-21%).

4. Conclusions.

I have re-constructed the per capita murder series for Philadelphia from 1839 to 2004, and used it for estimating the cyclical terrorist murder and attacks index for the city. The estimated index foretold with amazing precision the most important tragic events occurred in Philadelphia during the last two centuries: the Philadelphia description of cycles according to Lane matches the terrorist index, as well as national tragic events as President Kennedy's assassination in 1963, the shut down in power of 1965, the murder of Dr. Martin Luther King, the World Trade Center Bombing, Oklahoma Federal building bombing and 9/11 terrorist attacks. Immediate research should be done particularly the construction of a model for attacks, and permanent murder for the city.

Data Source: FBI, Uniform Crime reports, Historical Statistics of the United States, Volume I, United States Department of Commerce, Economics and Statistics Administration, U.S. Census Bureau.

Acknowledgements

I thank the organizers of the Stockholm Criminology Symposium 2007, Lina Nilsson, and the Jerry Lee Center of Criminology Dr. Lawrence W. Sherman for extending invitation to present this research. I additionally thank **R*EUTERS*** United Kingdom and Reuters Lipper U.S, the Federal Bureau of Investigation (FBI), the Bureau of Economic Analysis (BEA), and the U.S. Census Bureau. Finally comments by anonymous lecturers and researcher around the world have enriched this 16 year continuous research project.

Appendix A. The Beveridge & Nelson decomposition of economic time series applied to decomposing Philadelphia City per capita homicides from 1839 to 2004.

I denote the observations of a stationary series of the logarithm of per capita homicides for Philadelphia City. by *Lthom* and its first differences by W_t. Following Beveridge & Nelson, BN for short, (1981, p.154), many economic times series require transformation to natural logs before the first differences exhibit stationarity, so the W_t's, then are continuous rates of change.

$$W_t = Lt\,\mathrm{hom}_t - Lt\,\mathrm{hom}_{t-1} \qquad (1)$$

If the w's are stationary in the sense of fluctuating around a zero mean with stable autocovariance structure, then the decomposition theorem due to Wold (1938) implies that W_t maybe expressed as

$$W_t = \mu + \lambda_0 \varepsilon_t + \lambda_1 \varepsilon_{t-1} + \ldots,\ \ where\ \lambda_0 \equiv 1 \qquad (2)$$

Where, μ the $\lambda's$ are constants, and the $\varepsilon's$ are uncorrelated disturbances. According to BN, the expectation of $Lt\hom_{t+k}$ conditional on data for $Lt\hom$ through time t is denoted by $Lt\hat{\hom}(k)$, and is given by

$$\begin{aligned} Lt\hat{\hom}(k) &= E(Lt\hom_{t+k} \mid \ldots\ldots, Lt\hom_{t-1}, Lt\hom_t) \qquad (3) \\ &= Lt\hom_t + E(W_{t+1} + \ldots W_{t+k} \mid \ldots, W_{t+1}, W_t) \\ &= Lt\hom + \hat{W}_t(1) + \ldots + \hat{W}_t(k) \end{aligned}$$

Since the $Z_t's$ can be expressed as accumulations of the $W_t's$. Now from (2) it is easy to see that the forecasts of W_{t+i} at time t are

$$\begin{aligned} \hat{W}_t(i) &= \mu + \lambda_i \varepsilon_t + \lambda_{i+1} \varepsilon_{t-1} + \ \ldots\ldots \qquad (4) \\ &\mu + \sum_{j=1}^{\infty} \lambda_j\ \varepsilon_{t+1-j}\ , \end{aligned}$$

Now substituting (4) in (3), and gathering terms in each ε_t, I get

$$\begin{aligned} L\hat{\hom}_t(k) &= L\hom_t + \hat{W}_t(i) \qquad (5) \\ &= L\hom_t + \left[\mu + \sum_{j=1}^{\infty} \lambda_j \varepsilon_{t+1-j}\right] \\ &= k\mu + L\hom_t + \left(\sum_1^k \lambda_i\right)\varepsilon_t + \left(\sum_2^{k+1} \lambda_i\right)\varepsilon_{t-1} + \ldots \end{aligned}$$

And considering long forecasts, I approximately have

$$L\hat{\hom}_t(k) \cong k\mu + L\hom_t + \left(\sum_1^{\infty} \lambda_i\right)\varepsilon_t + \left(\sum_2^{\infty} \lambda_i\right)\varepsilon_{t-1} + \ldots \qquad (6)$$

According to (6), it is clearly seen that the forecasts of homicide in period (k) is asymptotic to a linear function with slope equal to μ (constant), and a level $L\hom_t$ (intercept or first value of the series).

Denoting this level by $\overline{L\hom_t}$ I have

$$\overline{L\hom_t} = L\hom_t + \left(\sum_{1}^{\infty}\lambda_i\right)\varepsilon_t + \left(\sum_{2}^{\infty}\lambda_i\right)\varepsilon_{t-1} + \;.\;.\;.\;.\;.\;.\;. \qquad .(7)$$

The unknown μ and $\lambda's$ in Eq. (6) must be estimated. Beveridge and Nelson suggest and ARIMA procedure of order (p,1,q) with drift μ.

$$W_t = \mu + \frac{\left(1-\theta_1 L^1 - .\;.\;. - \theta_q L^q\right)}{\left(1-\varphi_1 L^1 - .\;.\;. - \phi_p L^p\right)}\varepsilon_t = \mu + \frac{\theta(L)}{\varphi(L)}\varepsilon_t \qquad (8)$$

Cuddington and Winters (1987, p.22, Eq. 7) realized that in the steady state, i.e., L=1, Eq. (9) converts to

$$\overline{L\hom_t} - \overline{L\hom_{t-1}} = \mu + \frac{(1-\theta_1 - \;.\;.\;.\; \theta_q)}{(1-\phi_1 - .\;.\;. \varphi_p)}\varepsilon_t = \mu + \frac{\theta\,(1)}{\varphi\,(1)}\varepsilon_t \quad (9)$$

The next step requires replacing the parameters of the ARIMA model (Table 3) and iterating Eq.(9) recursively, i.e., replace t by (t-1), and (t-1) by (t-2), etc, I get

$$W_t = \overline{L\hom_t} - \overline{L\hom_{t-1}} = \mu + \frac{\theta(1)}{\phi(1)}\varepsilon_t \qquad (10)$$

$$W_{t-1} = \overline{L\hom_{t-1}} - \overline{L\hom_{t-2}} = \mu + \frac{\theta(1)}{\phi(1)}\varepsilon_{t-1}$$

:

$$W_1 = \overline{L\hom_1} = \overline{L\hom_0} + \mu + \frac{\theta(1)}{\phi(1)}\varepsilon_1 \quad (\textit{this is the value for year } 1868)$$

:

$$W_{137} = \overline{L\hom_{180}} = \overline{L\hom_0} + \mu + \frac{\theta(1)}{\phi(1)}\varepsilon_{137} \quad (\textit{this is the value for year } 2004)$$

Adding these equations I obtain W_1 (the value for year 1868), and W137 (the value for year 2004), on the right hand side μ is added “t” times, and the fraction following μ is a constant multiplied by the sum of error terms. I obtain

$$\overline{L\hom_t} = \overline{L\hom_0} + \mu.t + \frac{\theta(1)}{\phi(1)}\sum_{i=1}^{t}\varepsilon_i \qquad (11)$$

This is, Newbold's (1990, 457, Eq.(6), which is a differential equations that solves after replacing the initial value for $\overline{L\hom_0}$, which is the logarithm of per capita murder in year 1868.

Cárdenas (1991), suggests that Eq.(11), should be changed when the ARIMA model includes autoregressive components. Since the ARIMA developed for Philadelphia City (Table 4), includes autoregressive, and moving average components, I formally show this now.

$$L\hom_t - L\hom_{t-1} = \mu + \sum_{i=1}^{p}\phi_i W_{t-i} + \sum_{j=1}^{q}\theta_j \varepsilon_{t-j} + \varepsilon_t \qquad (12)$$

$$\Delta L\hom_t = W_t = Lt\hom_t - Lt\hom_{t-1}$$

$$L\hom_t - L\hom_{t-1} = \mu + \sum_{i=1}^{p}\phi_i \Delta L\hom_{t-i} + \sum_{j=1}^{q}\theta_j \varepsilon_{t-j} + \varepsilon_t$$

Bringing the moving average components to the LHS, I get

$$L\hom_t - L\hom_{t-1} - \left(\sum_{i=1}^{p}\phi_i \Delta L\hom_{t-1}\right) = \mu + \sum_{i=1}^{q}\theta_j \varepsilon_{t-j} + \varepsilon_t \qquad (13)$$

Expanding summation terms

$$(1-\phi_1 L^1 - \phi_2 L^2 - . \ . - \phi_p L^p)(L\hom_t - L\hom_{t-1}) = \mu + (1+\theta_1 L^1 + . \ . + \theta_q L^q)\varepsilon_t \quad (14)$$

Rearranging Eq. (14) and including the ARIMA parameters from Table 4, I get.

$$L\hom_t - L\hom_{t-1} = \frac{-0.0042}{1+0.42+0.41-0.11+0.11} + \left(\frac{1-0.91+082+1.15+0.69}{1+0.42+0.41-0.11+0.11}\right)\varepsilon_t \quad (15)$$

Now, after recursively replacing, t with (t-1), and (t-1) with (t-2), etc, and after adding together "t" times, I have

$$L\hom_t - L\hom_0 = \frac{-0.0042.\,t}{1+0.42+0.41-0.11+0.11} + \left(\frac{1-0.91+0.82+1.15+0.69}{1+0.42+0.41-0.11+0.11}\right)\sum_{i=1}^{t}\varepsilon_i \quad (16)$$

And rearranging,

$$L\hom_t = L\hom_0 + \frac{-0.0042.\,t}{1+0.42+0.41-0.11+0.11} + \left(\frac{1-0.91+0.82+1.15+0.69}{1+0.42+0.41-0.11+0.11}\right)\sum_{i=1}^{t}\varepsilon_i \quad (17)$$

In the steady state, when L=1, Eq. (17) yields the permanent component of the per capita murder for Philadelphia, the last step requires taking the exponential to the LHS of Eq. 17, getting the level for the permanent component. The cyclical component is finally obtained by the difference of the level of the observed per capita murder minus the level of the permanent component. Both permanent and cyclical estimated components are shown on Fig.5 (inversely co-variating[14]), and presented in Appendix B, which additionally presents for informational purposes the estimated cyclical component of model 2.

Appendix B : data table

				BEVERIDGE - NELSON		
	Per capita murder Gomez-Sorzano	**Per capita murder** Lane	Murder	**Model 1** **Terrorist murder and attacks index** Cyclical - component	**Model 1** Permanent component	Model 2 attacks index
year						
1839	10.25	3.73	9			
1840	10.33	3.75	10			
1841	10.47	3.72	10			
1842	10.60	3.66	10			
1843	10.74	3.63	11			
1844	10.88	3.60	11			
1845	11.03	3.57	12			
1846	10.24	3.23	11			
1847	10.31	3.19	11			
1848	10.39	3.13	12			
1849	10.47	3.08	12			
1850	10.27	3.05	12			
1851	9.29	3.04	13			
1852	8.40	3.04	13			
1853	9.72	3.88	17			
1854	8.87	3.92	18			
1855	8.09	3.95	19			
1856	7.38	3.97	20			
1857	6.74	4.00	20			
1858	6.15	4.04	21			
1859	5.61	4.07	22			
1860	2.35	2.35	13			
1861	2.37	2.36	14			
1862	2.39	2.38	14			
1863	2.41	2.39	14			
1864	2.43	2.41	15			
1865	2.45	2.42	15			
1866	2.47	2.43	15			
1867	3.19	3.15	20			
1868	3.25	3.20	21	-0.012	3.26	-0.01
1869	3.30	3.25	22	0.171	3.13	-0.05
1870	3.30	3.30	22	0.237	3.06	-0.01

[14] According to Beveridge and Nelson the splitting procedure is technically optimal when both estimated new series are finding inversely co-variating.

1871	3.34	3.33	23	0.400	2.94	0.02
1872	3.38	3.35	24	0.510	2.87	0.06
1873	3.42	3.38	25	0.668	2.75	0.09
1874	3.58	3.53	26	1.568	2.01	1.07
1875	3.64	3.57	27	1.572	2.07	1.11
1876	3.69	3.62	28	1.738	1.96	1.28
1877	3.75	3.68	29	1.635	2.12	1.31
1878	3.81	3.73	30	1.640	2.17	1.34
1879	3.87	3.79	31	1.425	2.45	1.38
1880	3.85	3.85	33	1.271	2.58	1.41
1881	2.44	2.43	21	0.083	2.36	0.19
1882	2.45	2.44	22	-0.001	2.46	0.18
1883	2.47	2.44	22	0.048	2.42	0.10
1884	2.48	2.44	23	0.059	2.42	0.02
1885	2.49	2.44	23	0.010	2.48	0.02
1886	2.50	2.45	24	0.161	2.34	0.01
1887	2.51	2.45	24	0.041	2.47	0.04
1888	2.28	2.21	23	0.175	2.11	0.18
1889	2.29	2.21	23	0.101	2.19	0.19
1890	2.24	2.25	24	0.210	2.03	0.14
1891	2.25	2.25	24	0.232	2.02	0.18
1892	2.26	2.25	25	-0.027	2.28	0.04
1893	2.26	2.25	25	0.186	2.08	0.08
1894	2.27	2.25	26	0.077	2.19	0.07
1895	2.64	2.61	30	0.396	2.24	0.56
1896	2.66	2.63	31	0.459	2.20	0.59
1897	2.68	2.64	32	0.237	2.44	0.80
1898	2.70	2.66	33	0.321	2.38	0.82
1899	2.72	2.67	34	0.222	2.50	0.89
1900	2.68	2.68	35	-0.036	2.72	0.92
1901	2.71	2.70	36	0.061	2.65	0.95
1902	2.08	2.08	28	-0.306	2.38	0.53
1903	2.15	2.15	29	-0.227	2.38	0.52
1904	2.22	2.22	31	-0.172	2.39	0.49
1905	2.30	2.30	32	-0.229	2.53	0.44
1906	2.38	2.38	34	-0.163	2.54	0.46
1907	2.46	2.46	36	-0.391	2.85	0.40
1908	2.55	2.55	38	-0.531	3.08	0.44
1909	2.63	2.63	39	-0.671	3.31	0.40
1910	2.68	2.68	41	-0.853	3.53	0.47
1911	2.77	2.77	44	-0.988	3.76	0.26
1912	2.87	2.87	46	-1.252	4.13	0.30
1913	2.98	2.98	48	-1.430	4.41	0.20
1914	3.09	3.09	51	-1.220	4.31	0.28
1915	3.20	3.20	53	-1.288	4.48	0.19
1916	3.31	3.31	56	-0.999	4.31	0.65
1917	3.43	3.43	59	-1.063	4.49	0.68
1918	3.56	3.56	62	-0.886	4.44	1.04
1919	3.68	3.68	65	-0.816	4.50	1.18
1920	3.76	3.76	69	-1.097	4.85	1.23
1921	3.93	3.93	72	-0.978	4.90	1.41
1922	4.10	4.10	76	-1.063	5.17	1.57
1923	4.29	4.29	80	-1.183	5.47	1.42
1924	4.48	4.48	84	-1.175	5.66	1.44

1925	4.68	4.68	88	-1.089	5.77	1.60
1926	4.89	4.89	93	-0.734	5.63	1.55
1927	5.11	5.11	97	-0.140	5.26	1.81
1928	5.35	5.35	102	-0.250	5.59	1.66
1929	5.59	5.59	108	0.422	5.16	1.90
1930	5.80	5.80	113	0.373	5.43	1.82
1931	6.11	6.11	119	1.009	5.10	2.02
1932	5.79	5.79	113	0.513	5.27	1.42
1933	5.83	5.83	113	0.630	5.20	1.55
1934	5.88	5.88	114	0.216	5.66	1.27
1935	5.92	5.92	115	0.444	5.48	1.36
1936	5.77	5.77	112	-0.386	6.16	1.04
1937	5.78	5.78	112	0.149	5.63	1.56
1938	5.47	5.47	106	-0.432	5.90	1.63
1939	6.67	6.67	129	-0.203	6.87	2.04
1940	5.70	5.70	110	-0.211	5.91	2.04
1941	5.40	5.40	105	-0.906	6.31	2.11
1942	5.57	5.57	109	**0.003**	5.57	2.42
1943	4.57	4.57	90	0.186	4.39	2.14
1944	4.29	4.29	85	0.505	3.79	2.03
1945	5.02	5.02	100	0.846	4.17	2.15
1946	7.58	7.58	152	**1.526**	6.05	3.44
1947	5.84	5.84	118	0.872	4.97	2.56
1948	5.76	5.76	117	0.141	5.62	2.71
1949	5.97	5.97	122	-0.203	6.17	2.66
1950	5.89	5.89	122	-0.287	6.18	2.68
1951	5.71	5.71	118	-2.200	7.91	2.19
1952	5.84	5.84	120	-1.489	7.33	2.36
1953	6.09	6.09	125	-3.119	9.21	2.26
1954	6.55	6.55	134	-3.168	9.72	2.10
1955	6.18	6.18	126	-3.018	9.19	1.56
1956	6.34	6.34	129	-4.939	11.28	1.55
1957	6.26	6.26	127	-4.930	11.19	1.27
1958	5.79	5.79	117	-6.439	12.23	1.30
1959	5.91	5.91	119	-7.447	13.35	1.65
1960	7.49	7.49	150	-8.722	16.21	2.04
1961	7.21	7.21	144	-13.336	20.54	2.03
1962	6.22	6.22	124	-11.529	17.75	1.77
1963	6.29	6.29	125	-11.098	17.39	2.46
1964	9.48	9.48	188	-12.074	21.55	4.01
1965	10.36	10.36	205	-7.667	18.03	4.58
1966	9.02	9.02	178	-8.047	17.07	3.78
1967	11.88	11.88	234	-4.891	16.78	5.05
1968	13.34	13.34	262	**-1.223**	14.56	6.17
1969	13.83	13.83	271	0.525	13.31	7.21
1970	18.05	18.05	352	2.985	15.07	8.13
1971	22.60	22.60	435	4.911	17.69	10.62
1972	21.75	21.75	413	2.935	18.81	10.19
1973	22.94	22.94	430	0.665	22.28	9.84
1974	24.00	24.00	444	-2.845	26.85	10.57
1975	23.77	23.77	434	-2.937	26.71	10.63
1976	18.76	18.76	338	-5.223	23.98	7.50
1977	18.17	18.17	323	-5.855	24.02	7.02
1978	20.00	20.00	351	-2.973	22.98	8.21

1979	21.91	21.91	385	-4.995	26.90	8.36
1980	25.93	25.93	436	-4.506	30.44	10.24
1981	21.46	21.46	362	-7.171	28.63	8.90
1982	19.67	19.67	332	-12.272	31.95	8.82
1983	18.38	18.38	311	-12.875	31.25	8.17
1984	15.83	15.83	264	-12.597	28.43	8.59
1985	16.65	16.65	273	-15.258	31.90	9.25
1986	20.85	20.85	343	-15.364	36.21	11.42
1987	20.49	20.49	338	-14.154	34.65	11.59
1988	22.39	22.39	371	-10.876	33.26	12.93
1989	28.75	28.75	475	-6.787	35.54	16.19
1990	31.72	31.72	503	-3.509	35.23	18.93
1991	27.56	27.56	440	1.378	26.18	15.71
1992	26.50	26.50	425	1.070	25.43	14.10
1993	28.15	28.15	439	8.134	20.02	15.60
1994	25.89	25.89	404	8.238	17.65	13.63
1995	28.24	28.24	432	10.745	17.49	13.01
1996	27.09	27.09	414	13.136	13.95	12.39
1997	25.46	25.46	386	13.001	12.46	11.82
1998	23.32	23.32	338	12.961	10.36	9.26
1999	20.34	20.34	292	12.759	7.58	8.37
2000	21.98	21.98	319	13.397	8.58	8.86
2001	20.35	20.35	309	13.924	6.43	8.17
2002	18.89	18.89	288	10.990	7.90	7.56
2003	23.26	23.26	348	13.495	9.77	9.83
2004	22.23	22.23	330	11.360	10.87	9.90

References

Bernard, Bruce. 2002. CENTURY, one hundred years of human progress, regression, suffering and hope. Phaidom Press Inc, New York, NY.

Beveridge, S., Nelson, C.R., 1981. A new approach to decomposition of economic time series into permanent and transitory components with particular attention to measurement of the "business cycle". Journal of Monetary Economics 7, 151-174.

Blumstein, A., Wallman, J., 2000. The Crime drop in America. Cambridge University Press.

Clark, Ramsey., 1970. Crime in America. Simon and Schuster publishers, New York.
Campbell, J.Y., P, Perron., 1991. "Pitfalls and opportunities: What Macroeconomists Should Know about Unit Roots," in O.J. Blanchard and S. Fisher (eds.), *NBER Macroeconomics Annual*, The MIT Press, 141-201.

Cárdenas, M., 1991. Coffee Exports, Endogenous State Policy and the Business Cycle. PhD dissertation. Economics. University of California, Berkeley, CA.

Cuddington, J., Winters, L.A., 1987. The Beveridge-Nelson decomposition of economic time series. Journal of Monetary Economics 19, 125-127.

Dickey, D.A., Fuller, W.A., 1981. Likelihood ratio statistics for autoregressive time series with a unit root. Econometrica 49, 1057-1972.

Dosal, Paul., 2002. THE CARIBBEAN WAR: The United States in the Caribbean, 1898-1998. Cercles 5: pp. 39-55, online at http://www.cercles.com/n5/dosal.pdf.

Durham, Jennifer L., 1996. Crime in America: A Reference Handbook. ABC – CLIO, Inc, Santa Barbara California.

Eck, John and Maguire Edward., 2000. Have changes in policing reduced violent crime? assessment of the evidence. In *The Crime Drop in America* by Alfred Blumstein and Joel Wallman Editors. Cambridge University Press.

Enders, Walter and Sandler, Todd., 2006. The Political Economy of Terrorism. Cambridge University Press. New York.

Gómez-Sorzano, Gustavo A., 2005. "A model of cyclical terrorist murder in Colombia, 1950-2004. Forecasts 2005-2019". Unpublished paper, presented at the 14th World Congress of Criminology, paper nominated to the Stockholm Prize in Criminology, online at http://mpra.ub.uni-muenchen.de/134/01/MPRA_paper_134.pdf

Gómez-Sorzano, Gustavo A., 2006. Decomposing Violence: Crime Cycles in the Twentieth Century in the United States. Journal of Applied Econometrics and International Development Vol.7-1, pp.

________________________, 2006A. " Scenarios for sustainable peace in Colombia by year 2019." Unpublished paper, University of Pennsylvania, submitted to the Colombian Presidency, High Commissioner for Peace, Bogotá, Colombia, April. Online at http://mpra.ub.uni-muenchen.de/135/01/MPRA_paper_135.pdf

________________________, 2006B. "The econometrics of violence, terrorism and scenarios for peace in Colombia from 1950 to 2019. Unpublished book, University of Pennsylvania, Philadelphia, October. Online at http://mpra.ub.uni-muenchen.de/539/01/MPRA_paper_539.pdf

________________________, 2006C. "Decomposing violence: terrorist murder in the twentieth century in the United States". Unpublished paper, Stockholm Criminology Symposium 2006, Stockholm, Online at http://mpra.ub.uni-muenchen.de/1145/01/MPRA_paper_1145.pdf

________________________, 2006D. "Using the Beveridge and Nelson decomposition of economic time series for pointing out the occurrence of terrorist attacks". Unpublished paper, Stockholm Criminology Symposium 2007, Stockholm, Online at http://mpra.ub.uni-muenchen.de/3388/01/MPRA_paper_3388.pdf

________________________,2006E. "Decomposing violence: terrorist murder and attacks in New York State from 1933 to 2005". Unpublished paper, Stockholm Criminology Symposium 2007, Stockholm University, online at http://mpra.ub.uni-muenchen.de/3776/01/MPRA_paper_3776.pdf

__,2007A. "Terrorist murder, cycles of violence and terrorist attacks in New York City during the last two centuries". Unpublished paper, Stockholm Criminology Symposium 2008, Stockholm University, online at http://mpra.ub.uni-muenchen.de/4200/01/MPRA_paper_4200.pdf

________________________,2007B. "Cycles of violence and terrorist attacks index for the State of Massachusetts." Unpublished paper, Stockholm Criminology Symposium 2008, Stockholm University, online at http://mpra.ub.uni-muenchen.de/4342/01/MPRA_paper_4342.pdf

________________________,2007C. "Cycles of violence and terrorist attacks index for the State of Arizona." Unpublished paper, Stockholm Criminology Symposium 2008, Stockholm University, online at http://mpra.ub.uni-muenchen.de/4360/01/MPRA_paper_4360.pdf.

________________________,2007D. "Cycles of violence and terrorist attacks index for the State of California." Unpublished paper, Stockholm Criminology Symposium 2008, Stockholm University, online at http://mpra.ub.uni-muenchen.de/4547/01/MPRA_paper_4547.pdf.

________________________,2007E. "Cycles of violence and terrorist attacks index for the State of California." Unpublished paper, Stockholm Criminology Symposium 2008, Stockholm University, online at http://mpra.ub.uni-muenchen.de/4547/01/MPRA_paper_4547.pdf

________________________,2007F. "Cycles of violence and terrorist attacks index for the State of Washington." Unpublished paper, Stockholm Criminology Symposium 2008, Stockholm University, online at http://mpra.ub.uni-muenchen.de/4604/01/MPRA_paper_4604.pdf

________________________,2007G. "Cycles of violence and terrorist attacks index for the State of Ohio." Unpublished paper, Stockholm Criminology Symposium 2008, Stockholm University, online at http://mpra.ub.uni-muenchen.de/4605/01/MPRA_paper_4605.pdf

________________________,2007H. "Cycles of violence and terrorist attacks index for the State of Arkansas." Unpublished paper, Stockholm Criminology Symposium 2008, Stockholm University, online at http://mpra.ub.uni-muenchen.de/4606/01/MPRA_paper_4606.pdf

Henretta, et al., James, 2006. America: A concise history, 3rd ed., vol.1 (Bedford-St. Martin's, 2006)

Hewitt, Christopher, 2005. Political Violence and Terrorism in Modern America, a Chronology. Praeger Security International, Connecticut.

Kegley W. Charles Jr., Raymond, Gregory A., 2007. After Iraq: the imperiled American Imperium. Oxford University Press. New York

Lane, Roger, 1999. Violent death in the city, suicide, accident and murder in nineteeth-century Philadelphia. Ohio State University Press.

Levitt, Steven. D., 1996. "The Effect of Prison Population Size on Crime Rates: Evidence from Prison Overcrowding Litigation." *Quarterly Journal of Economics* 111:319-51.

Menjívar, Cecilia and Néstor Rodríguez., 2005. When States Kill, Latin America, the U.S., and Technologies of Terror. University of Texas Press, Austin.

Miller, S.M., 1988. The Beveridge-Nelson decomposition of economic time series: another economic computational method. Journal of Monetary Economics 21, 141-142.

Monkkonen, Eric H., 2001. Murder in New York City. University of California Press. Berkeley and Los Angeles, California.

Newbold, P.,1990. Precise and efficient computation of the Beveridge-Nelson decomposition of economic time series. Journal of Monetary Economics 26, 453-457.

Marvell, Thomas B., and Carlisle E. Moody, Jr., 1994. "Prison Population Growth and Crime Reduction." *Journal of Quantitative Criminology* 10:109-40

Spealman, William., 1994. *Criminal incapacitation*. New York: Plenum.

_______________., 2000. The limited importance of prison expansion. In *The Crime Drop in America* by Alfred Blumstein and Joel Wallman Editors. Cambridge University Press.

White, Jonathan R., 2003. Terrorism: 2002 update, 4th edition. (Belmont, CA: Wadsworth/Thomson Learning).