Cycles of violence, and attacks index for the State of Florida

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Abstract: I apply the Beveridge-Nelson business cycle decomposition method to the time series of per capita murder of Florida State (1933-2005). Separating out "permanent" from "cyclical" murder, I hypothesize that the cyclical part coincide with documented waves of organized crime, internal tensions, crime legislation, social, and political unrest, and with the periodic terrorist attacks to the U.S. The estimated cyclical component of murder shows that terrorist attacks against the U.S. have affected Florida, creating estimated turning point dates marked by the most tragic terrorist attacks to the nation: the World Trade Center bombing in 1993, and 9/11 2001 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 Florida. 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., Philadelphia City, http://mpra.ub.uni-muenchen.de/4783/01/MPRA_paper_4783.pdf, 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, N42, K14, K42, N42, O51.
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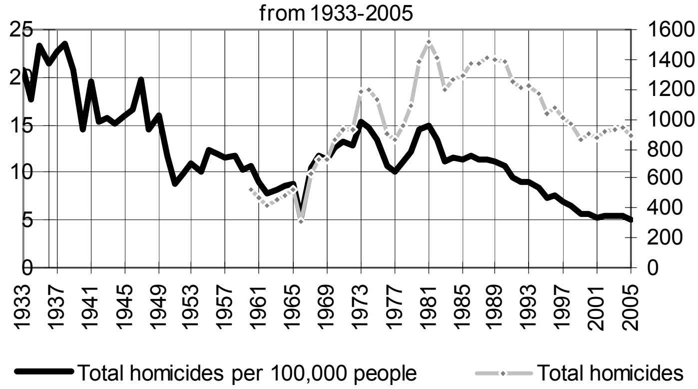
1. Introduction.

After decomposing violence, and creating the cyclical terrorist murder and attacks index for the United States (Gómez-Sorzano 2006), *terrorist murder, cycles of violence, and terrorist attacks in New York City during the last two centuries* (Gómez-Sorzano 2007A), and *terrorist murder, cycles of violence, and attacks index for the City of Philadelphia during the last two centuries* (Gómez-Sorzano 2007H) this paper continues that methodology research applied at the State level. The current exercise for Florida State is the ninth one at decomposing violence at the state level on the purpose of constructing murder and attacks indices preventing the closeness of attacks or tragic events.

According to the Federal Bureau of Investigation, Uniform Crime Reporting System, total homicides in Florida State increased from an average of 529 per year in the 1960s to 1.001 in the 1970s, 1364 in the 1980s, and 1,118 in the 1990s (Fig. 1), for year 2005 the State reported 883 homicides.

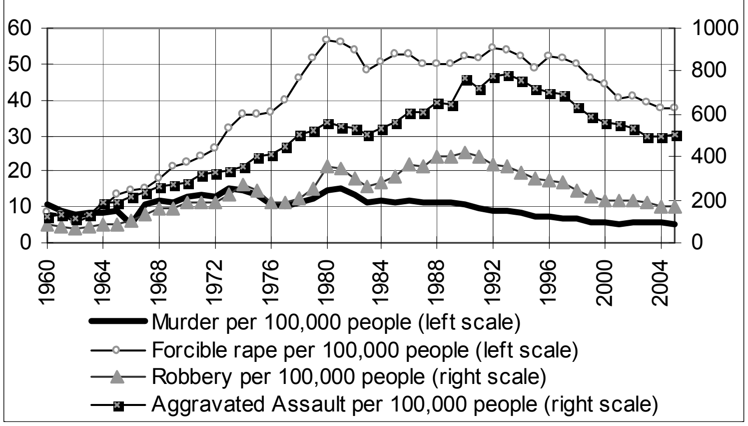
When adjusted for population growth, i.e., homicides per 100,000 people in the population, peaks are found in 1938, 1947, 1960, 1973, and 1981 with values of 23.6 murders per capita, and 19.8, 10.6, and 14.9 respectively for those years, and 5 for 2005.

Figure 1. Total homicides, in Florida State from 1933-2005



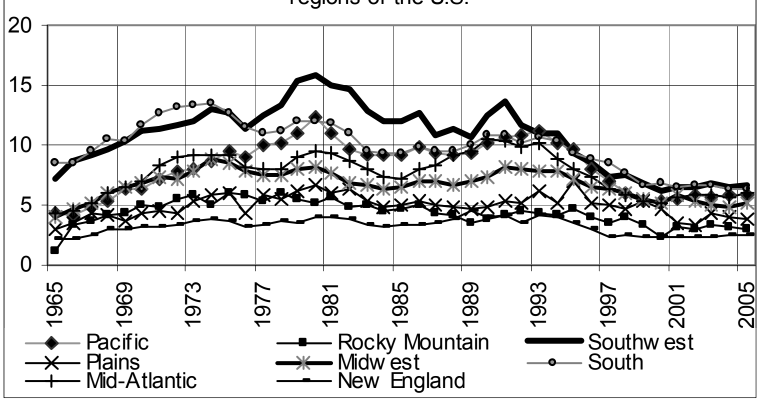
Out of the state's four categories of crimes, measuring violent crime (murder, forcible rape, robbery, and aggravated assault) murder is the one that varies the least, but shows a diminishing tendency from 2004 to 2005 (Fig. 2).

Figure 2. Categories of violent crime in Florida State



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 South region where Florida belongs appears as the second highest rate across the nation (Fig. 3).

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



2. Data and methods

The Bureau of Justice Statistics has a record of crime statistics that reaches back to 1933, (for this analysis I use the murder rates per 100,000 people[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 Florida State series of per capita murder.

[1] Taken from FBI, Uniform Crime Reports.

Beveridge and Nelson decomposition

I use the augmented Dickey Fuller (1981), tests to verify the existence of a unit root on the logarithm of murder 1933-2005. These tests present the structural form shown in equation (1).

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

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 2.

Table 2 Dickey & Fuller test for Unit Roots

	K	Alpha	Theta	Phi	Stationary
D(Lflori) – per capita murder series	26	4.13	-0.015	-1.4000	No
Florida State , 1933-2005		2.596	-2.646	-2.5440	

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)

An additional test for unit roots uses equation (2) with the series ran in levels its results are reported on table 2A.

$$L\,\mathrm{hom}_t = \alpha + \theta.\,t + \phi\,L\,\mathrm{hom}_{t-i} + \sum_{i=1}^{k} \gamma_i\,L\,\mathrm{hom}_{t-i} + \varepsilon_t \qquad (2)$$

Table 2A Dickey & Fuller test for Unit Roots

	K	Alpha	Theta	Phi	Stationary
(Lhflori) – per capita murder series	27	4.13	-0.015	0.5240	No
Florida State , 1933-2005		2.596	-2.646	2.4690	

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 technically can perform the BN decomposition.

The selection of the right ARIMA model for Florida was computationally intense. The procedure begins by fitting the logarithm of the per capita murder series to an ARIMA model as shown on equation (2):

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

Where k, and h are respectively the autoregressive and moving average components. For Florida, and using RATS 4, I estimated an initial ARIMA model (6,1,17) – model 1, whose results are reported on table 3, and its transitory and permanent signals displayed on figure 4.

Table 3. Estimated ARIMA model for murder for Florida State

Annual data from 1933 to 2005

Variables	Coeff	T-stats	Std Error	Signif
Constant	-0.0450	-4.82	0.0095	0.0000
AR(1)	-0.2330	-2.31	0.1008	0.0243
AR(6)	0.6200	5.35	0.1158	0.0000
MA(2)	-0.3395	-3.89	0.0870	0.0000
MA(6)	-0.7126	-5.63	0.1265	0.0000
MA(13)	-0.2347	-2.4	0.0977	0.0195
MA(17)	-0.3990	-4.41	0.0903	0.0000

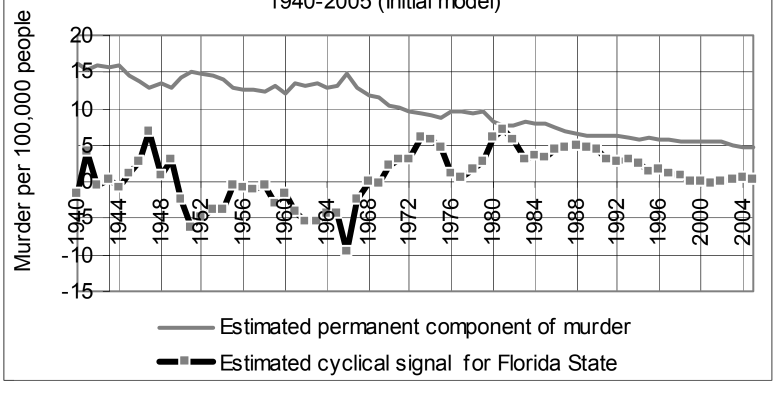
Centered R^2 = 0.8216

DW= 1.92

Significance level of Q = 0.4433

Usable observations = 66

Figure 4. Permanent and Transitory signals for Florida State 1940-2005 (Initial model)



Model 1 does not reproduce to perfection major attacks to the country as the World Trade Center bombing and 9/11 2001, for that reason a second model is estimated, and finally selected. Model 2 is shown on table 3A, and displayed on figure 5.

Table 3A. Estimated ARIMA model for murder for Florida State

Annual data from 1933 to 2005

Variables	**Coeff**	**T-stats**	**Std Error**	**Signif**
Constant	-0.0367	-5.64	0.0065	0.0000
AR(3)	0.7846	9.42	0.0830	0.0000
AR(13)	-0.7282	-11.78	0.0610	0.0000
MA(2)	0.2215	2.57	0.0860	0.0129
MA(3)	-1.9300	-9.45	0.2044	0.0000
MA(10)	0.7536	3.48	0.2164	0.0000
MA(20)	-0.7060	-2.74	0.2574	0.0083

Centered R^2 = 0.8420

DW= 2.08

Significance level of Q = 0.0004

Usable observations = 59

The 7 model parameters from table 3A or model 2 are replaced in the equation for the permanent component of murder shown in (3)[2]:

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

The transitory, terrorist murder estimate, or attacks index is found by means of the difference between the original series, and the exponential of the permanent per capita component ($L\,\hom_t^{PC}$)[3], and is shown on figure 5 along with the permanent component of murder for the State. The attacks index matches the qualitative description of known waves of organized crime, internal tensions, crime legislation, social, and political unrest overseas, and presents the cycles of violence in the State as affected by major attacks across the union. 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), Durham (1996), Blumstein and Wallman (2000), Bernard (2002), Dosal (2002), Hewitt (2005), Monkkonen (2001), Wikepedia, the Military Museum, and Henrreta et al. (2006).

[2] 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 the U.S.' case in appendix A. Eq.3 above, turns out to be Eq.17 in appendix A.

[3] Turning the estimated permanent per capita component into the level of the permanent component.

Figure 5. Attacks index for Florida State from 1947 to 2005

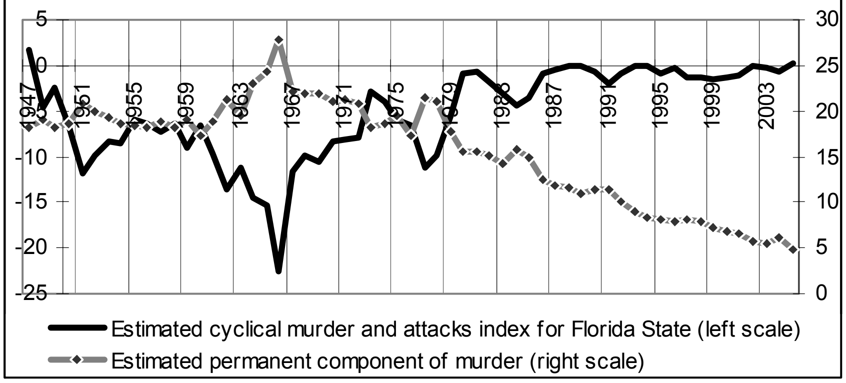
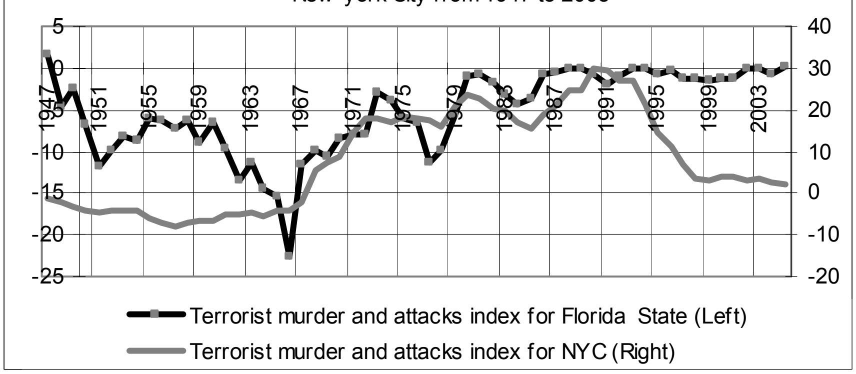


Figure 6 for informational purposes presents the attacks indices for Florida, and New York City.

Figure 6. Terrorist murder and attacks index for Florida State and New york City from 1947 to 2005



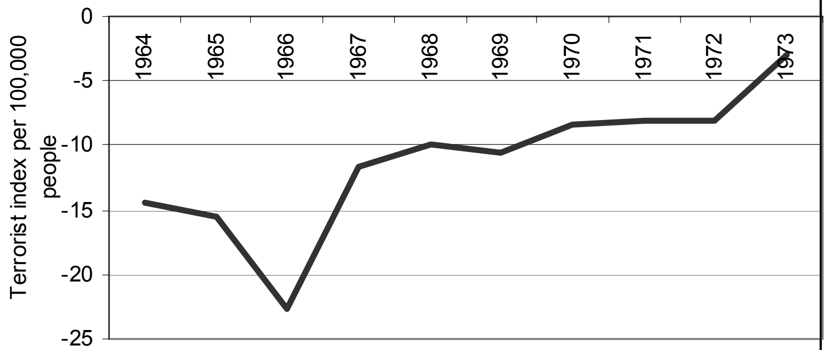
3. Interpretation of results.

I have been able to surpass the technical difficulties, and have split the per capita series for Florida State finding both, its terrorist attacks index and its permanent component of murder. The attacks indicator presents as a whole 5 main cycles.

Descending cycle 1947–1966, marked as post World War II, period, and characterized by the Korean War (1950-1953), the terrorist assassination of John F. Kennedy in 1963, the beginning of the Vietnam conflict in 1964.

The assassination of President John F. Kennedy, jumped this index from 1962 to 1963 from -13.53 to -11.30 (19.7%); the entrance to the Vietnam Conflict fueled additionally the index moving from -14.4 in 1964 getting the lowest point for Florida in 1966 with -22.66 and jumping to -2.91 by the end of this conflict in 1973. (Figure 7).

Figure 7. The attacks index for Florida State during the Vietnam Conflict years from 1964 to 1973



Stable peaceful period 1967-1977. This period is characterized by the assassination of Dr. Martin Luther King Jr., which jumped the index from -11.65 in 1967 to -9.92 in 1968 (17.43%), and the ending up of Vietnam Conflict in 1973 which caused a turning point date that year by moving from -8.02 in 1972 to -2.91 in 1973 to -3.86 in 1974, -5.94 in 1975, -6.62 in 1976, and -11.22 in 1977.

Ascending cycle 1978-1989. The period begins with an index of -9.87 in 1978, ending up with 0.051 in 1989, this last year Florida relaxes its law governing concealed weapons, setting off a string of similar laws in other States that permit citizens to carry concealed handguns, murder jumped instantly from -0.10 in 1988 to 0.051 in 1989, a series of accidental shootings prompts Florida to enact a new law that requires adults to keep loaded guns away from children. Offenders face a $5,000 fine and five years in prison. This year also the U.S. military invades Panamá, arresting Manuel Noriega.

Second stable peaceful period 1990-2004. The period begins with an attacks indicator of -0.67, ending up with -0.66. A period characterized by the end of the war on drugs in Colombia 1985-1991, the World Trade Center bombing, the Long Island Train massacre, the enacting of the Crime Act in 1994, and 9/11 2001.

In 1992 the U.S. with cooperation of Colombian authorities Kill Pablo Escobar, this year additionally the U.S. experience military operations in Los Angeles, and as well the FBI successfully prosecutes New York's Gambino family crime boss John Gotti on 13 charges of murder, gambling, racketeering, and tax fraud. The attacks index for Florida ascends from 1991 to 1992 from -1.90 to -1.02 (86.2%). The State index suffered in 1993 marking with precision the World Trade Center attack, and the Long Island Train massacre both in New York City; accordingly this index moved from -1.02 in 1992 to -0.086 in 1993 (1,086%).

The index moved up again for 9/11 2001, from -1.24 in year 2000 to -1.21 in 2001 (2.47%). The index for the State of Florida appears thus optimally matching major attacks to the nation and suffering from legislation permitting carrying weapons in the State.

Ascending cycle 2005. The attacks indicator moves upward for Florida jumping from -0.66 in 2004, becoming positive in 2005 with 0.11.

4. Conclusions.

Provided with a data series of per capita murder from 1933 to 2005, I have constructed both the attacks and the permanent murder indices for Florida State. The index appears moving detecting major disasters and terrorist attack dates occurred across the nation, immediate research should be done, particularly headed towards constructing a model for attacks, and for permanent murder for this State.

Data Source: FBI, Uniform Crime reports, and Department of Commerce, Economics and Statistics Administration, U.S. Census Bureau.

Acknowledgements

I thank the organizers of the Stockholm Criminology Symposium 2007, particularly Dr. Lina Nilsson, and Dr. Lawrence W. Sherman from the Jerry Lee Center of Criminology for extending invitation to present this research. I additionally thank the Federal Bureau of Investigation (FBI), the Bureau of Economic Analysis (BEA) the U.S. Census Bureau, anonymous lecturers around the world, ***REUTERS,*** United Kingdom and Reuters - Lipper U.S, as well as University of Pennsylvania Department of Economics.

Appendix A. The Beveridge & Nelson decomposition of economic time series applied to decomposing the Florida State per capita homicides from 1933 to 2005.

I denote the observations of a stationary series of the logarithm of per capita homicides for Florida State. 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.

$$W_t = Lt\hom_t - Lt\hom_{t-1} \qquad (1)$$

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

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

Where, μ the λ's are constants, and the ε'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

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

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

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

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

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

And considering long forecasts, I approximately have

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

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 $L\overline{\hom_t}$, I have

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

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.

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

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

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

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

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

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

$$\vdots$$

$$W_1 = \overline{L\hom_1} = \overline{L\hom_0} + \mu + \frac{\theta(1)}{\phi(1)}\varepsilon_1 \quad (\textit{this is the value for year } 1947)$$

$$\vdots$$

$$W_{59} = \overline{L\hom_{59}} = \overline{L\hom_0} + \mu + \frac{\theta(1)}{\phi(1)}\varepsilon_{59} \quad (\textit{this is the value for year } 2005)$$

Adding these equations I obtain W_1 (the value for year 1947), and W59 (the value for year 2005), 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

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

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 1941.

Cárdenas (1991), suggests that Eq.(11), should be changed when the ARIMA model includes autoregressive components. Since the ARIMA developed for Florida (Table 3A), includes autoregressive, and moving average components, I formally show this now.

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

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

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

Bringing the moving average components to the LHS, I get

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

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 3A, I get.

$$L\hom_t - L\hom_{t-1} = \frac{-0.036}{1-0.78+0.72} + \left(\frac{1+0.22-1.93+0.75-0.70}{1-0.78+0.72} \right) \varepsilon_t \quad (15)$$

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

$$L\hom_t - L\hom_0 = \frac{-0.036\,t}{1-0.78+0.72} + \left(\frac{1+0.22-1.93+0.75-0.70}{1-0.78+0.72} \right) \sum_{i=1}^{t} \varepsilon_i \quad (16)$$

And rearranging,

$$L\hom_t = L\hom_0 + \frac{-0.036\ t}{1-0.78+0.72} + \left(\frac{1+0.22-1.93+0.75-0.70}{1-0.78+0.72} \right) \sum_{i=1}^{t} \varepsilon_i \quad (17)$$

In the steady state, when L=1, Eq. (17) yields the permanent component of the per capita murder for Florida, 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 figure 5.

Appendix B : data table

	Original Data		**BEVERIDGE - NELSON** **Terrorist murder and attacks index**	
year	Murder	Murder per capita	Cyclical - component	Permanent component
1933		20.80		
1934		17.70		
1935		23.40		
1936		21.40		
1937		22.60		
1938		23.60		
1939		20.90		
1940		14.60		
1941		19.50		
1942		15.43		
1943		15.83		
1944		15.03		
1945		15.91		
1946		16.69		
1947		19.83	1.7340	18.0960
1948		14.45	-4.5288	18.9788
1949		15.89	-2.3875	18.2775
1950		11.86	-6.6644	18.5244
1951		8.85	-11.8854	20.7354
1952		9.97	-9.9205	19.8905
1953		10.90	-8.2850	19.1850
1954		10.10	-8.6007	18.7007
1955		12.30	-5.9931	18.2931
1956		11.90	-6.3657	18.2657
1957		11.60	-7.2259	18.8259
1958		11.80	-6.3483	18.1483
1959		10.20	-8.9253	19.1253
1960	527	10.64	-6.6304	17.2735
1961	477	9.13	-9.6787	18.8131
1962	420	7.69	-13.5368	21.2305
1963	463	8.19	-11.3001	19.4919
1964	489	8.57	-14.4208	22.9922
1965	518	8.92	-15.4711	24.3945
1966	312	5.25	-22.6662	27.9179
1967	630	10.51	-11.6537	22.1625
1968	731	11.87	-9.9248	21.7917
1969	720	11.33	-10.5530	21.8844
1970	860	12.67	-8.4139	21.0806
1971	933	13.25	-8.0361	21.2871

1972	924	12.73	-8.0290	20.7580
1973	1180	15.37	-2.9157	18.2843
1974	1191	14.72	-3.8695	18.5914
1975	1130	13.52	-5.9492	19.4708
1976	903	10.72	-6.6252	17.3484
1977	859	10.16	-11.2289	21.3922
1978	949	11.04	-9.8709	20.9134
1979	1084	12.23	-5.5374	17.7722
1980	1387	14.50	-1.0116	15.5092
1981	1522	14.97	-0.6568	15.6283
1982	1409	13.53	-1.6830	15.2102
1983	1199	11.23	-3.0899	14.3165
1984	1264	11.52	-4.3547	15.8707
1985	1296	11.40	-3.5596	14.9620
1986	1371	11.74	-0.8031	12.5462
1987	1371	11.40	-0.5246	11.9278
1988	1416	11.44	-0.1051	11.5457
1989	1405	11.09	**0.0517**	11.0367
1990	1379	10.66	-0.6717	11.3303
1991	1248	9.40	-1.9001	11.2998
1992	1208	8.96	-1.0202	9.9763
1993	1224	8.95	-0.0864	9.0344
1994	1165	8.35	0.0028	8.3467
1995	1037	7.32	-0.8404	8.1608
1996	1077	7.48	-0.3493	7.8284
1997	1012	6.91	-1.2770	8.1830
1998	967	6.48	-1.3217	7.8047
1999	859	5.68	-1.5166	7.2011
2000	903	5.65	-1.2475	6.8975
2001	874	5.30	-1.2197	6.5197
2002	911	5.50	-0.0986	5.5986
2003	924	5.40	-0.1566	5.5566
2004	946	5.40	-0.6668	6.0668
2005	883	5.00	0.1147	4.8853

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