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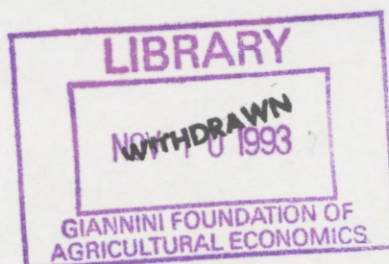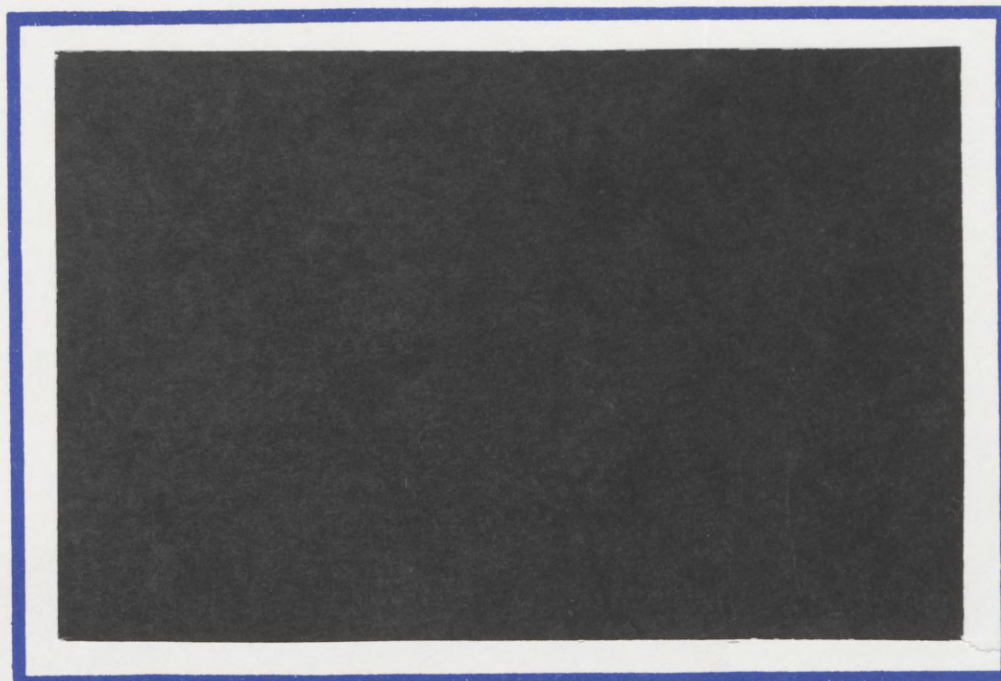
מכון למחקר כלכלי ע״ש ד״ר ישעיהו פורדר ז״ל

ע״י אוניברסיטת תל־אביב

POLITICAL EVENTS AND ECONOMIC TRENDS: THE EFFECTS OF THE INTIFADA ON THE ISRAELI ECONOMY

by

Gideon Fishelson[*]

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*   The Eitan Berglas School of Economics, Tel–Aviv University, Tel–Aviv, Israel

ABSTRACT

The natural flows of economic activities are often disturbed by political-military exogenous events that cause the various economic activities to change course. Such an event was the uprising – intifada – that started in December 1987 in the West Bank and Gaza, WBG, and affected the economy of these areas as well as that of Israel. In this study we perform an econometric analysis that was aimed at detecting the change of levels and trends of the various real economic activities in Israel. The same time dependent behavioral model was applied to all activities. The findings indicate that the intifada did have significant effects, from the statistical point of view, on most economic activities. The exceptions are various export activities.

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The natural flows of economic activities are often disturbed by political-military exogenous events that cause the various economic activities to change course. Such an event was the uprising - intifada - that started in December 1987 in the West Bank and Gaza, WBG, and affected the economy of these areas as well as that of Israel. In this study we perform an econometric analysis that was aimed at detecting the change of levels and trends of the various real economic activities in Israel. The same time dependent behavioral model was applied to all activities. The findings indicate that the intifada did have significant effects, from the statistical point of view, on most economic activities. The exceptions are various export activities.

In this study we present empirical findings that answer the question whether the intifada - uprising in the territories, the West Bank and Gaza, beginning in December 1987 - had a significant impact upon the Israeli economy. The initial reaction to the uprising when referring to its economic implications was that since the Israeli economy is ten times larger than that of the WBG, the economic impacts are negligible. The common view was that they might be witnessed on the micro level, i.e., in plants trading heavily with the WBG or in sectors relying heavily on inputs from the WBG, e.g., construction and agriculture. However, the arguments were that, since in 1988 the weight of these two sectors in the economy was very small, the macro effects are also very small and there are hardly any spillovers to other sectors.

In this study we first discuss the general possibilities of a political-military effect on an economy. We then observe some macro economic relations between Israel and the WBG. We continue with a time series analysis aimed at identifying the impacts of the uprising in terms of levels of activities and on the effects of time of the levels of activities. The conclusion is that statistically the uprising did have a significant effect on the Israeli economy. However, the impact might be a short run and would diminish as the proper adjustments are complete.
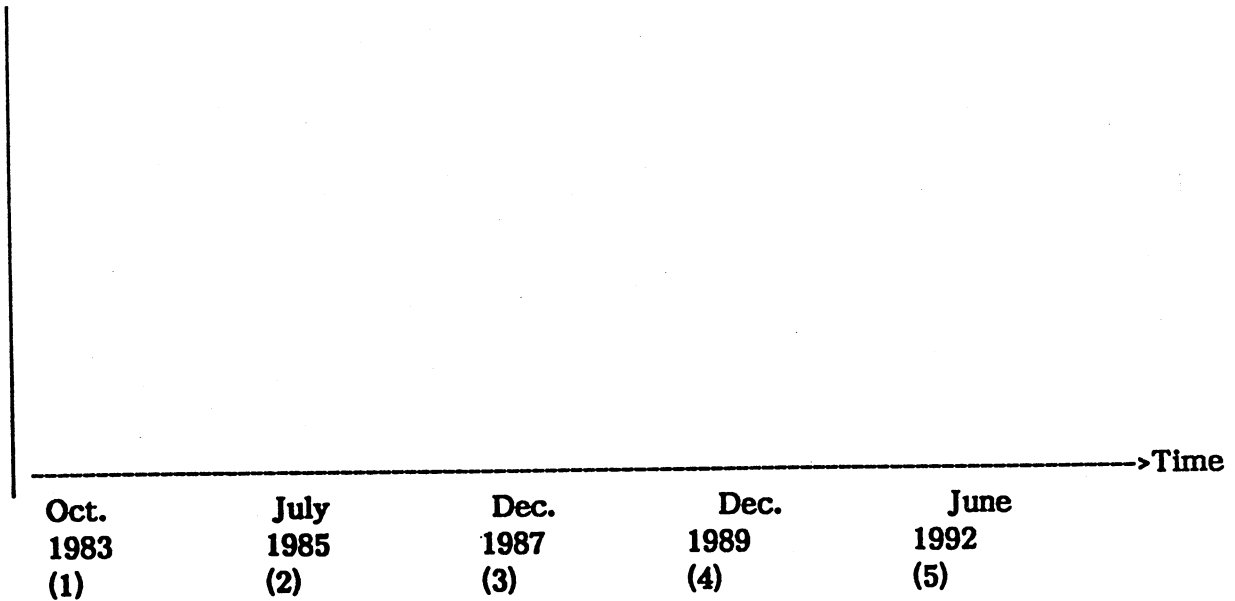
We tested for the existence of the effects of the intifada over a period of two years, up to the end of 1989. The impacts in general were significant for this period. The period was not extended in this study since in December 1989 a new "shock" to the Israeli

economy took place - mass immigration from the CIS (former USSR states). Later on, in August 1990, the potential impacts of the Iraqi invasion of Kuwait became evident, reaching their peak in the first quarter of 1991. Hence, since the end of 1989, several additional forces were taking place in the region, each intensifying or weakening the impacts of the other. Thus, the analysis of the post December 1989 period is left to a subsequent study.

Political Event and Economic Behavior

Most economic activities, if uninterrupted and if not confronted with an effective constraint, would develop over time, at some constant rate, at least in the short run. This relative smooth behavior may be slowed down, stopped or even change direction as a result of a political event or the application of a new policy. In this study we are interested in external events. Figure 1 describes the behavior-magnitude during the last ten years, 1982-1992, of a typical activity in the Israeli economy. The activity is not named on purpose. The figure is aimed at exhibiting the possible changes due to the various political, policy, events, changes in level and trend of activity. The dotted lines are extensions of the pre-event trend. In the following we enter the square box.

Level of
Activity

                                                                                    —————>Time

Oct.	July	Dec.	Dec.	June
1983	1985	1987	1989	1992
(1)	(2)	(3)	(4)	(5)

(1) The Banks crash   (4) Beginning of the mass immigration
(2) The new Economic policy (5) Elections, Labor Party back in power
(3) Beginning of the uprising

The Intifada

The uprising in the WBG against the Israeli occupation began on December 9, 1987. We take this event as given, not questioning its reasons and its timing. The military resistance was soon followed by economic resistance. The general idea was of an economic boycott of Israel which was unfeasible given the strong economic dependence of the WBG on Israel, mainly in terms of employment and as a source of essential production and consumption goods and services, electricity, fuels, communications, fertilizers, seeds, pesticides and industrial raw materials.

We first describe the major macro implications of the uprising on the WBG itself and then cross over to the Israeli side. Table 1 contains macro data for the WBG for 1986-87, the years prior to the intifada and where available for 1988-89. The data are presented

Table 1: GDP Trade and Employment Data 1986-1989 for the WBG

	GDP 1986 prices 10^6 NIS	Exports to Israel (10^6 US$)	Imports from Israel (10^6 US$)	Employed in Israel (000)	Weekly Worked Hours (000)
West Bank					
1986	1846	155.9	451.0	51.1	2272
1987	1703	160.5	580.7	62.9	2757
1988	1744-1797	na	na	64.0	2186
1989	1681-1741	na	na	65.4	2437
Gaza					
1986	544	118.7	346.8	43.4	1886
1987	611	143.2	380.5	46.0	1898
1988	533-541	na	na	45.4	1341
1989	605-615	21.8	165.7	39.5	1179

separately for the West Bank and Gaza. The data, yearly totals, indicate a reversal of trends for all the variables in the table as will be seen, the decline is more pronounced in Gaza. The data, mainly those related to the national accounts, are unavailable for the years after 1987. For Gaza, most data for 1988 are unavailable but show up again for 1989 or 1990. The corresponding data for Israel are presented in Table 2.

Table 2: <u>National Income Accounts, Relative Changes, %</u>
(compared to previous year)

	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>
<u>Sources</u>				
GDP	3.6	5.2	2.7	1.6
Total Imports	8.9	19.3	-2.1	-6.6
Civilian Imports	15.4	11.7	0.5	-1.4
Total Sources	5.6	10.1	1.6	-1.4
<u>Uses</u>				
Private Consumption	14.2	8.4	4.2	0.3
Civilian Public Consumption	-0.2	3.7	3.6	2.1
Gross Domestic Investment	10.4	3.3	-0.3	-5.3
Exports	8.7	6.1	-1.6	3.9
GDP of the Business sector	5.7	7.0	2.5	2.0

While for the WBG only annual data are available for Israel, quite a large number of data on various economic activities are available on a monthly basis. These can be categorized as follows:

1. Labor market data
2. International trade data
3. Industrial production date
4. Tourism data
5. Construction data
6. Private consumption-retail trade data

These monthly data can be used to detect changes in trends. Some of the variables within these categories have by their nature seasonal fluctuations. Thus, wherever seasonally adjusted data were available they were used for the analysis.

The hypotheses of the study are, that given the nature of the political event, the expected impacts on all activities are negative. The level of negativity is, however, not expected to be the same. It is expected to be larger in activities that were either dependent upon the workers from the WBG as an input, or on the WBG as a market for the product. Other activities such as the labor market variables and private consumption variables might absorb those negative effects and behave accordingly.

The Model

Given that the data to be analyzed are monthly data and for relatively short periods, up to five years, we *a priori* assumed that if external events would not occur, the economy would evolve along an uninterrupted path which can be approximated by a linear relation over time, i.e.

$$1) \quad Y_t = a + bT_t + E_t$$

where Y_t is the level of activity Y at time t.

T_t measures the time variable taking values from 1 to T_t. E_t is the random disturbance.

An extension of this model is

$$2)\ Y_t = a + bT_t + cY_{t-1} + E_t$$

i.e. the lagged variable of the dependent variable is another explanatory variable which expresses the effect of continuation. The problem with formulation (2) is that if the trend is "too" smooth, multicolinearity prevails. Then one can safely omit the lagged variable. Model (2) can be expanded to account for events that either shift the level or change the role of time in the development of the activity. The model is

$$3)\ Y_t = a + bT_t + dD_t + eT1_t + gY_{t-1} + E_t$$

where

$$D_t = \begin{cases} 0 & \text{the time period 7/85-12/87} \\ 1 & \text{the time period 1/88-12/89} \end{cases}$$

$$T1_t = \begin{cases} 0 & \text{the time period 7/88 - 12/89} \\ 1...24 & \text{the time period 1/88-12/89} \end{cases}$$

Hence, d is the parameter denoting the change in level between the two regimes while e is the parameter denoting the change of the effect of time (the slope of the time variable). The signs of the parameters depend upon the nature of the variable that is analyzed.

Table 3 contains the variables that were the dependent variables in the econometric analysis. Table 4 contains the estimated parameters.

Table 3: <u>The dependent variables and corresponding units of measurement</u>

1.	TWS*	- Total work seekers
2.	JVT	- Total job vacancies
3.	W51	- Work seekers, duration of unemployment 2-6 days
4.	W52	- Work seekers, duration of unemployment 7+ days
5.	DAU	- Daily average of unemployed
6.	CBU	- Claims of unemployment benefits
7.	WSNR	- Work seekers not referred to work
8.	JVU	- Unfilled job vacancies
9.	TA**	- Total tourist arrivals
10.	TAUS	- Tourist arrivals from the USA
11.	BNH	- Bed nights in tourist hotels
12.	BS***	- Private sector building in 24 large towns, starts
13.	BE	- Private sector building in 24 large towns, completions
14.	EX****	- Foreign trade, exports total
15.	IM	- Foreign trade imports total
16.	EXI	- Industrial exports excluding diamonds
17.	EXF	- Exports of food, beverages and tobacco
18.	EXX	- Exports of textiles, clothing and leather
19.	EXL	- Exports of other light industry
20.	EXM	- Exports of mining and non metallic minerals
21.	EXC	- Exports of chemicals
22.	EXE	- Exports of metal and electronic products
23.	IP*****	- Industrial production, index
24.	IWE	- No. of employees
25.	IWD	- Man-days worked
26.	OWD	- Output per man day
27.	IFB	- Industrial production, food and beverages
28.	ITX	- Industrial production, textiles and clothing
29.	IL	- Industrial production, light industries
30.	IMT	- Industrial production, mining and non metallic minerals
31.	IC	- Industrial production, chemical industries
32.	IE	- Industrial production, metals and electronics

Table 3 continued:

33.	DCM	- Private consumption, organized retail trade total
34.	PCND	- Private consumption, not including durable goods
35.	PFB	- Private consumption, food
36.	PCX	- Private consumption, textiles and clothing
37.	PCD	- Private consumption, durable goods
38.	PCH	- Private consumption, household and kitchen items
39.	FCFU	- Private consumption, fuels and fuel products

*	Unit of measurement of the following 8 variables is number of workers
**	Variables 9-11 in thousands
***	Variable 12-13, number of dwellings, original date
****	Variables 14-22, in millions of US$
*****	Variables 23-39 in index numbers, 1984 = 100

Table 4: <u>Time Series Analysis of Model 3[a]</u>

Dependent Variable	$\hat{a}$	$\hat{b}$	$\hat{d}$	$\hat{e}$	$\hat{g}$	R^2	D.W.
1. TWS	12802.9* (5025.1)	-82.06 (55.8)	1477.8 (445.3)	573.4* (249.3)	0.691* (0.12)	0.97	2.1
2. JVT	18148.8* (2431.4)	249.2* (44.0)	-1126.3** (694.5)	-489.6* (77.9)	-0.116 (0.15)	0.70	1.9
3. W51	5941.5* (1201.4)	-31.24** (16.0)	644.5** (384.1)	90.58* (33.2)	0.247 (0.15)	0.59	2.1
4. W52	6018.6* (2221.6)	-81.58* (39.3)	693.7 (814.9)	518.5* (191.4)	0.724* (0.10)	0.99	1.7
5. DAU	5170.8* (1784.2)	-63.5* (29.6)	393.6 (670.1)	461.0* (157.6)	0.714* (0.10)	0.99	1.8
6. CUB	7082.6* (2104.1)	-43.2 (31.7)	-384.1 (975.4)	579.6* (174.4)	0.690* (0.09)	0.98	1.7
7. WSNR	3925.1** (2110.5)	-25.0 (28.2)	886.1 (620.9)	313.1** (163.9)	0.823* (0.09)	0.99	1.8
8. JVU	1547.6* (4073.0)	61.6* (18.7)	-217.4 (301.6)	-116.5* (32.2)	0.466* (0.13)	0.76	2.0
9. TA	40.59* (11.9)	0.419** (0.23)	-12.93* (5.93)	-0.150 (0.38)	0.592* (0.11)	0.50	2.3
10. TAUSA	4.430* (1.99)	0.036 (0.043)	-1.010 (1.15)	-0.014 (0.08)	0.747* (0.09)	0.61	1.8
11. BNH	144.2* (54.4)	2.746* (1.36)	-70.10* (33.8)	-2.429 (2.39)	0.696* (0.09)	0.65	2.0
12. BS[b]	302.9* 72.7)	12.70* 2.98)	-51.15 (66.0)	-16.94* (5.26)	0.191 (0.14)	0.51	2.1
13. BE[b]	736.2* (114.9)	12.52* (5.16)	-332.4* (133.8)	3.812 (8.72)	-0.392* (0.13)	0.26	2.2

Table 4 continued:

14. EX	373.3*	5.120*	13.70	-0.986	0.019	0.82	2.0
	(55.9)	(1.10)	(21.6)	(1.42)	(0.14)		
15. IM	611.4*	12.45*	-43.28**	-9.883*	-0.177	0.87	2.0
	(72.2)	(1.61)	(22.02)	(1.88)	(0.14)		
16. EXI	357.1	4.983*	20.68	0.641	-0.047	0.84	2.0
	(50.2)	(1.01)	(20.2)	(1.31)	(0.14)		
17. EXF	53.22*	0.739*	-1.622	-1.087*	0.461*	0.87	2.1
	(14.0)	(0.24)	(2.61)	(0.31)	(0.15)		
18. EXX	29.78*	0.795*	-0.317	-0.804*	-0.002	0.87	2.0
	(4.39)	(0.13)	(1.72)	(0.17)	(0.14)		
19. EXL	50.0*	0.817*	6.555*	-0.104	-0.113	0.91	2.0
	(6.3)	(0.14)	(2.57)	(0.16)	(0.14)		
20. EXM	25.3*	-0.003	-0.760	0.342*	-0.192	0.34	2.0
	(3.0)	(0.05)	(1.68)	(0.11)	(0.24)		
21. EXC	71.8*	0.969*	0.009	0.079	-0.145	0.63	1.8
	(9.4)	(0.26)	(6.06)	(0.40)	(0.14)		
22. EXE	172.9*	1.137*	13.73	0.075	-0.109	0.62	2.0
	(24.6)	(0.67)	(16.2)	(1.06)	(0.14)		
23. IP	109.8*	0.514*	-6.475*	-0.598*	-0.044	0.66	2.0
	(15.0)	(0.08)	(1.54)	(0.12)	(0.14)		
24. WE	38.0*	0.075*	-1.114*	-0.252*	0.616*	0.97	1.9
	(11.2)	(0.02)	(0.35)	(0.08)	(0.11)		
25. IWD	98.1*	0.108*	-2.910*	-0.540*	0.034*	0.82	2.0
	(14.6)	(0.04)	(1.14)	(0.11)	(0.14)		
26. OWD	94.0*	0.326*	-2.793*	0.094	0.093	0.93	2.0
	(14.8)	(0.06)	(0.94)	(0.06)	(0.14)		
27. IFB	53.22*	0.739*	-1.622	-1.087*	0.461*	0.87	2.1
	(14.0)	(0.24)	(2.60)	(0.31)	(0.15)		

Table 4 continued:

28. ITX	72.44* (13.5)	0.467* (0.12)	-11.26* (2.61)	-0.732* (0.22)	0.260** (0.14)	0.79	2.2
29. IL	63.34* (13.72)	0.537* (0.14)	-8.098* (2.40)	-0.382* (0.17)	0.417* (0.13)	0.79	2.1
30. IMT	82.62* (14.9)	0.227 (0.15)	-4.403 (3.00)	-0.031 (0.24)	0.230 (0.14)	0.17	2.0
31. IC	64.86* (13.9)	0.496* (0.13)	-3.281 (2.18)	-0.166 (0.14)	0.373* (0.14)	0.86	2.0
32. IE	96.55* (15.3)	0.134** (0.07)	-3.249** (1.74)	-0.352* (0.12)	0.088 (0.14)	0.46	2.0
33. PCM	76.8* (13.7)	1.115* (0.24)	-4.706** (2.70)	-1.224* (0.29)	0.238 (0.14)	0.87	2.19
34. PCND	89.5* (14.0)	1.158* (0.21)	-2.834 (2.3)	-1.218* (0.25)	0.111 (0.14)	0.89	2.0
35. PCFB	189.3* (14.0)	1.609* (0.24)	-0.203 (2.9)	-1.515* (0.27)	-0.123 (0.14)	0.89	1.8
36. PCX	89.38* (16.3)	0.672* (0.21)	-17.96* (5.8)	-0.320 (0.39)	0.167 (0.15)	0.29	1.9
37. PCD	74.1* (15.7)	1.581* (0.54)	-21.05** (11.2)	-2.022* (0.88)	0.321* (0.14)	0.46	2.0
38. PCH	102.6* (14.9)	1.919* (0.44)	-17.12** (9.2)	-3.187* (0.76)	-0.028 (0.14)	0.43	2.0
39. PCFU	85.2* (13.4)	0.876* (0.16)	0.861 (2.14)	-0.735* (0.18)	0.112 (0.19)	0.89	2.0

<u>Table 4 continued:</u>

a Values in parentheses are standard errors of estimates.

*   – significant at 5%
** – significant at 10%
No star implies significance at below 10%

b The data on construction are the original ones, i.e. not seasonally adjusted. Observing the data, one sees seasonality in the data. There is a concentration of large numbers in months that are the last ones in the quarter which are not accounted for by us. This might be the reason for the relatively low R^2's.

Table 4 is divided into six parts, the short horizontal lines. Each category refers to a different segment of the economy. Thus the expected signs of the parameters might differ among the categories and also within each category. The general idea is that before the intifada, the economy was moving towards better times. This was the feeling in the July 1985-December 1987 period. Hence b is expected to be positive in equations of variables that stand for economic activities and for standards of living, and negative for variables that reflect weaknesses in the economy, like some variables in the labor market. Correspondingly, for the same reason, d and e are expected to be negative in the first category of variables, and positive in the second category. In Table 4 in the first group, labor market variables, in two equations out of the 8, (2) and (8), b is expected to be positive as proven. In (2), d and e are significant at 10 and 5 percent respectively while in (8) only e is significant. In the other six equations b is negative significant in three, d is positive significant in one and e is positive significant in all the six. Hence one can conclude that the positive trends prevailing in the labor market were considerably worsened by the intifada.

In the other five groups of equations, 31 variables, all the trends are expected to be positive. In the estimation only one, b, turned out to be negative which is insignificant. Among the d's, only six are positive with only one being significant and among the e's, five are positive, one of which is significant. Hence, the estimators with a wrong and significant sign are less than 5 percent in these five categories. By statistical reasoning this can be regarded as a pure random event.

Since model 3 was estimated using the absolute values of the dependent variables, the estimated parameters are not helpful for purposes of determining the absolute and relative impacts of the intifada on the corresponding activity. We thus suggest the construction of two ratios comprising the two jobs. The first ratio is $H = d/a$, H being the relative shift of the intercept. The intercept - a - can be considered as a base value. It also appears in the same units of the dependent variable. The second ratio is $K = e/b$. K is the relative change of the trend over time. The two ratios are pure numbers and can also be expressed in percentage terms.

Given that the ratios are of random variables to keep their integrity, we construct only those for which the numerator, the effect of the intifada, is in the "right" direction , and is statistically significantly different from zero. The value of zero ratio is assigned to the other cases and the two indices are presented in Table 5. One would like to test the null hypotheses $H_j = 0$ and $K_j = 0$. Yet, given the quality of the estimates and the problematics involved in calculating the variances of H_j and K_j just their values are presented. First, note that when K is above unity, the previous trend is not only

Table 5: <u>Relative Changes in the Economic Activities</u>

<u>Activity</u>	<u>H</u>	<u>K</u>
1. TWS	0	4.21
2. JVT	0.06	1.97
3. W51	0.11	2.90
4. W52	0	6.34
5. DAU	0	7.20
6. CUB	0	13.5
7. WSNR	0	12.5
8. JVU	0	1.89
9. TA	0.31	0
10. TAUSA	0	0
11. BNH	0.49	0
12. BS	0	1.33
13. BE	0.45	0
14. EX	0	0
15. IM	0.07	0.82
16. EXI	0	0
17. EXF	0	1.48
18. EXX	0	1.00
19. EXL	0	0
20. EXM	0	0
21. EXC	0	0
22. EXE	0	0
23. IP	0.64	1.08
24. IWE	0.02	3.36
25. IWD	0.30	4.90
26. OWD	0.29	0
27. IFB	0	1.47
28. ITX	0.16	1.55
29. IL	0.13	0.70
30. IMT	0	0
31. IC	0	0
32. IE	0	0
33. PCM	0.04	0.26
34. PCND	0	1.05
35. PCFB	0	0.95
36. PCX	0.20	0
37. PCD	0.28	1.26
38. PCH	0.17	1.68
39. PCFD	0	0.84

weakened but reversed. As can be seen, the major negative changes took place in the labor market which worsened as time passed. The next group of affected activities is that of industrial production. These two observations are obviously strongly correlated and related.

The relative changes of the levels were much smaller than those of the trends. Also more trends were changed significantly compared to levels (24 vs. 16). The group of activities less affected was that of the export activities. In none of them did the level change and the trend changed only in the food and textile industries. With regard to the latter two it is difficult to say whether the reason for this is the inputs effect or the market effect. The two industries are labor intensive but have also been heavily dependent on exports to the WBG.

Conclusions

We employed a relatively simple statistical procedure to detect whether the intifada had a negative impact on the economy of Israel. Based upon this procedure the answer is definitely that it had. In the study we refer to the relative magnitudes of the negative effects. We do this in spite of the fact that we did not "optimize" the determination of the effects in the sense that we did not estimate them from the actual time they started. We imposed, via the estimation procedure, the starting date to be January 1988. Some of the measured effects might have begun later but could have been more intensive or might have ended before December 1989. Hence, the parameters that were estimated should be regarded as averages for the corresponding period. d is the average shift of the variable,

regardless of the time effect, during the 1.88-12.89 period. e is the change in the average monthly change of the variable during the 1.88-12.89 period. b is the average monthly change over the entire period 7.85-12.89. The difference, b+e, (e is negative) can thus be viewed as the estimator for the net change per month in the 1.88-12.89 period. As can be seen for variables 9)-39) there are twelve cases in which this difference is negative, but only in four is this difference significant. Hence, there were activities that were actually declining over the later period (e.g., dwellings started, exports of food, number of employees in industry, man days worked).

The results in general confirm the expectations, with one exception. Most export activities were not affected and some even prospered more than before, i.e. some export activities are independent upon the political events connected with the WBG. The various findings are obviously not independent. e.g., the trends in the industrial sector are also reflected in the labor market variables. Thus, one cannot just sum up the effects. The variables that best summarize the effects which were estimated plus various others are those of the national accounts mainly the GDP (see Table 2). If the lost growth of the GDP is nonrecoverable, i.e. even after the intifada ceases the path on which the GDP would move would be permanently lower than before - if the intifada had not come into being - then the permanent loss of GDP is 2.2 percent of the average level of 1987 and 1988. Which comes to approximately US$ 0.9 billion. In per capita terms, considering the population during these years, it is approximately $200/capita. These magnitudes of losses might not seem to be high or important, yet their staying permanent, unless a revere process takes place, gives them different order of magnitude.

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