Counting the Cost of the Intifada: Consumption, Saving and Political Instability in Israel

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Abstract

In this paper we investigate some of the ways in which short-term variations in the magnitude of political instability can impact on macroeconomic performance, taking the example of Israel since 1987. Several indicators of political instability are found to have a significant impact on aggregate consumption and savings, and explain a large part of poor Israeli savings performance over reccent years.

Key Words: Israel, Saving, Consumption, Political Instability

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1. Introduction

In the 1970s and 1980s, a major part of research in development economics was devoted to explaining the determinants of savings in low and middle-income countries. Unless a country can expand its foreign debt indefinitely its steady state investment rate, and therefore its output growth rate, will be constrained by its savings rate. A great deal of attention was given to the impact of monetary and financial liberalization (McKinnon, 1973; Shaw, 1973; Fry, 1993) and of macroeconomic stabilization (Villanueva and Mirakhor, 1990). One middle income country that underwent a successful stabilization program in the 1980s, followed by substantial liberalization in the early 1990s, is Israel (Cuckierman, 1988; Liviatan, 1988; Razin and Sadka, 1993; Bank of Israel, 1999). However, as Table 1 shows, Israel's savings rates have been remarkably low by international standards.

Table 1: Gross Domestic Saving as a Fraction of GDP for Selected Areas
(World Bank Standard Tables)

	1990	1997
High Income Countries	0.226	0.222
Middle Income Countries	0.248	0.227
Low Income Countries (Excluding China and India)	0.208	0.205
Israel	0.143	0.092

One possible explanation for Israel's poor savings performance is the fact that over a long period it has suffered from high levels of political violence and threat of political instability. If this is the case, then economic reform in low and middle-income countries like Israel is a necessary but not sufficient condition for improvements in growth performance.[1] In this paper we will show that political factors have been important in determining Israeli savings rates. If Israel is in any way representative of low and middle-income countries then no amount of economic policy reform will by itself fix poor growth performance.

Economists have already gotten interested in the link between politics and economic performance, as manifested by recent papers presenting the results of cross-country growth or investment regressions (Alesina and Perotti, 1993, 1994; Easterly and Levine, 1997; Fedderke and

[1] During the hyperinflationary period in Israel (1980-4) average annual real GDP growth was 3.28%, and in the stabilization and post-stabilization period (1985-9) it was 3.00%. The improved growth performance in the early 1990s (6.26% on average for 1990-4) might suggest that stabilization led to higher growth, but the figure for 1995-9 is only 3.10%: Israeli growth rates now are at roughly the same level as during the hyperinflation.

Klitgaard, 1998). These papers show that part of the cross-country variation in economic performance can be explained by political factors such as the extent of civil rights[2] or the extent of local politically motivated violence. While these papers demonstrate some correlation between political and economic performance, the cross-section approach is not well suited to investigation of the mechanisms by which political instability affects the economy. The coefficients estimated on the political variables in cross-country regressions are to be interpreted as average effects (no-one seriously suggests that the impact of political conditions on the economy is uniform across the world); detailed investigation into the socio-economic mechanisms at play is best suited to investigation at the level of the individual country. In many countries there is a lack of reliable time series data on variables relating to political instability that makes this approach infeasible. One exception to this rule, however, is Israel, for which some appropriate time series do exist. In this paper we will use these time series to investigate one aspect of the mechanism by which political instability might inhibit growth: that is, by depressing private sector saving.

Section 2 of the paper reviews the economic and political science literature relevant to our time series model, which is presented in Section 3. Section 4 concludes.

2. Consumption, Saving and Political Instability in Israel

As a consequence of the 1967 Arab-Israeli war, Israel currently governs territories outside its 1948 borders, including the West Bank, i.e., territory west of the River Jordan but east of the 1948 border, and the area around the city of Gaza. The majority of the population in these areas is made up of Palestinian Arabs, many of whom contest the legitimacy of Israeli rule and Jewish settlement of the territories. In December 1987 there was a sudden uprising (*Intifada*) amongst Palestinians in these areas (Peretz, 1990). The uprising consisted of strikes and public demonstrations, which often escalated to the point where protestors were shot dead by Israeli security forces; later there was an increase in the number politically motivated assassinations and attacks on Israeli targets by Palestinian paramilitary groups, particularly *Hamas*. The uprising continued up to September 1993, when the Israeli Government signed an agreement with the Palestine Liberation Organization (the Oslo Peace Accord). This agreement included PLO recognition of the State of Israel and Israeli recognition of the need for Palestinian self-government in at least part of the West Bank and Gaza areas (henceforth WBG). The political structures envisaged by the Oslo Peace Accord have not yet been fully implemented, and the political violence and instability have not ceased.

Over the 12 years since the start of the *Intifada* the magnitude of political tensions and violence has varied considerably. In this paper we will construct a macro-econometric model that uses this variation to estimate the ways in which the political instability has impacted on Israeli

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[2] Political scientists have produced several data sets quantifying such rights. See for example Gurr (1997).

saving. The model is based on existing work on aggregate consumption in more politically stable industrialized countries, but is modified to allow for the influence of political factors. The measurement of the political time series is discussed below, but first we review the economic model.

Muellbauer (1994) surveys the evolution of the econometric analysis of aggregate private sector consumer behavior in industrialized countries. (For a given level of income, a model of aggregate consumption is also implicitly a model of aggregate saving.) The core of such functions is typically of the form:

$$\beta_0(L)\ln(c)_t = \beta_1(L)\ln(y)_t + \beta_2(L)p_t + \beta_3(L)r_t + u_t \qquad (1)$$

where c_t is private sector consumption, y_t private sector income, p_t the rate of consumer price inflation, r_t a real interest rate and u_t a residual.[3] This equation reflects a deterministic long run relationship between the private sector's consumption and its income, but with the possibility that the average propensity to consume depends on both the level of income and on prevailing rates of interest and inflation.[4] It is also possible that short run elasticities will deviate from long run elasticities, for example because of adjustment costs or adaptive expectations. In many cases restrictions on equation (1) can improve the performance of the model according to some empirical criterion, for example a Bayesian information criterion or a measure of the size of forecast errors, as can various other modifications to the equation (such as the addition of variables representing demographic changes or the extent of credit restrictions). If consumption and income are difference-stationary, then equation (1) must be estimated by some co-integration technique. Typical examples of this type of analysis are Muellbauer and Murphy (1993) for the USA, Carruth and Henley (1990) for the UK and Lattimore (1993) for Australia.

This type of analysis has often been applied to OECD economies, but applications to low or middle-income countries are few and far between. One possible reason for this is that countries outside the OECD suffer from large social and political shocks which affect consumption but which

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[3] $\beta_i(L)$ is a lag operator: $\beta_i(L) = \Sigma_p b_{i,p} \cdot L^p$, $p = m,\ldots,n$. If the assumptions of the Rational Expectations - Permanent Income Hypothesis model hold then all the parameters on the RHS of equation (1), except those on r_t, will equal zero (see for example Hall, 1978). The positive income coefficients observed in empirical models reflect some deviation from this paradigm, for example credit constraints on some consumers or rule-of-thumb behavior in place of Rational Expectations (Muellbauer and Lattimore, 1994).

[4] Changes in the real interest rate alter the slope of the intertemporal budget constraint. Changes in inflation alter the opportunity cost of holding money, which can alter consumption levels under certain specifications of cash-in-advance models, and in models with uninsured risk (see e.g. Jovanovic and Ueda, 1997).

are difficult to quantify. In the case of Israel, however, we do have data on a number of social and political factors that are likely to influence private sector consumption, and estimates of the determinants of aggregate consumption can be conditioned on these data.

The motivation for including political instability variables in a consumption model is that such instability might increase the perceived risks associated with saving. Levels of political violence in the 1980s and 1990s have not been so high that they disrupt more than a small fraction of consumers in Israel proper. But an increase in current political instability, or in violence affecting a few individuals, might increase the perceived probability of more widespread disruption in which legal claims on assets are compromised, or in which people are prevented from spending the money their savings have earned; and this might discourage saving. Their propensity to save will fall (and their propensity to consume will rise.)[5] The risk might take a number of forms:

1. The possibility of injury to person or property in paramilitary attacks;
2. The possibility of the uprising spreading to Arab Israelis,[6] who became much more politicized in the 1980s (Mayer, 1988; Rouhana, 1989, 1991);
3. For Arab consumers, the possibility of the loss of property rights as a result of Israeli security measures.

The political time series we will introduce are designed to capture the perceived likelihood of these outcomes. The choice of political time series is motivated by the results of recent empirical evidence gathered by political sociologists in Israel.

Rouhana and Fiske (1995) use factor analysis of individual survey data to explore the characteristics of Israeli society and politics that evoke a sense of threat in survey respondents. The authors are not directly concerned with economic risk, but it is not unreasonable to suppose that perceived economic risk is correlated with "threat" as they define it. There are 22 characteristics in their questionnaire; the ones evoking the greatest sense of threat in Jewish respondents are:

1. "Attacks and acts of sabotage";
2. "Arabs in Israel join the uprising";

The ones evoking the greatest sense of threat in Arab respondents are:

3. "Expropriation of Arab land";
4. "Discussions about expulsion of Arabs";

If the intensity of these characteristics increases (for example, if the number of attacks increases or more Arab land is expropriated) then perceptions of insecurity amongst Jews and Arabs are

[5] Political risk might increase precautionary saving, so the sign of the political instability effect is *a priori* ambiguous. Both a positive and a negative correlation between risk and saving are consistent with a utility-maximising representative agent. See Levhari and Srinivasan (1969), Rothschild and Stiglitz (1971) and Miller (1976).

[6] The term "Arab Israelis" refers to those Arabs with Israeli nationality and right of abode in Israel proper.

likely to become more intense. One consequence of this might be a reduction in investment or other economic activity by the Jewish or Arab communities.

There are two readily available time series measures that are closely related to characteristics 1-2. First, there are monthly figures for the number of deaths in Israel proper resulting from politically motivated attacks that are now in the public domain. Second, there are monthly figures for the number of deaths in WBG. These figures include both killings of Israelis by Palestinians and killings of Palestinians by Israelis and Israeli security forces. (Most Israeli deaths are in Israel proper; most Palestinian deaths are in WBG.) B'Tselem (1999) reports all these figures. The degree of perceived insecurity may depend on either the number of deaths in Israel, or the total number of deaths, or both figures. Deaths in Israel proper may invoke more fear of the *Intifada* spreading across the country. Deaths in WBG are correlated with the intensity of protests against Israeli rule there.

With respect to characteristics 3-4, the Israeli Central Bureau of Statistics publishes data detailing the number of private residential buildings for which construction was completed each quarter in Jewish settlements in WBG.[7] Not all building in WBG is on expropriated land, but it might well be the case that Arabs perceive the expansion of the West Bank and Gaza settlements to be at the expense of Arab property rights. In this case an increase in the rate of expansion will be linked to an intensification of the perceptions of economic insecurity associated with characteristics 3-4.

Figure 1 illustrates the three political instability-related time series from the beginning of the Intifada in 1987q4. We will denote fatalities in WBG as $\ln(1+tk)$ where tk is the number of deaths per quarter. This fatality series exhibits a negative secular trend over the period 1988-1999, although there is a peak in 1994q1 at 104 deaths. Similarly, fatalities in Israel proper are denoted as $\ln(1+ik)$. (Logarithms are used to create series that are approximately normally distributed. The series $\ln(ik)$ cannot be used because there are a few quarters in which no fatalities occurred.) This fatality series has a maximum in 1996q1 at 45 deaths; there is no obvious trend over time. The figure also plots total Jewish residential construction statistics for WBG settlements. These are measured as the logarithm of the reported number of buildings completed, $\ln(z)$; no data on the size of dwellings is available. Construction peaks in 1992q3 at 7,370 buildings.

We will also make use of a fourth time series, the rate of growth of the total number of immigrants coming into Israel in each quarter, ?$\ln(m)$. This series could be related to macroeconomic performance for two reasons. First, an increase in the number of immigrants could be associated with an increase in the insecurity felt by Arabs in Israel, as manifested in characteristics 3-4 above. Certainly, the peak in the rate of construction in WBG settlements coincides with the fastest rate of

[7] Figures before 1990 are reported only annually; the quarterly figures for 1988-9 are interpolations using the method of Lisman and Sandee (1964).

growth of immigration in recent years, in the early 1990s. Second, as discussed in Razin and Sadka (1993), a sudden increase in immigration might increase consumption relative to income, because labor and housing markets are not flexible enough to absorb the extra labor supply in the short term. As Razin and Sadka point out, most immigrants are skilled workers who are not unemployed for long, and a higher level of immigration is unlikely to entail lower productivity in the steady state. Nevertheless, the transition to a steady state with a higher immigration level might involve a temporarily lower level of per capita income.

In the next section we will estimate a consumption function for Israel that combines these political time series with the macroeconomic data. But the first part of the data analysis will be an exploration of the time series properties of the individual series.

3. Empirical Results

3.1 Data Description

Table 2 below reports descriptive statistics for both the economic variables in equation (1) and the four political time series discussed above. The economic data, the immigration statistics and WBG construction figures are taken from the Central Bureau of Statistics Monthly Bulletin; the two fatality series are taken from B'Tselem (1999). All data are quarterly; private consumption and income figures are measured in thousands of New Sheqels and deflated using the private consumption deflator (1998 = 1), which is also used in constructing the inflation and real interest rate series. The nominal interest rate used is the three-month t-bill rate. Table 3 reports Augmented Dickey-Fuller Test statistics for the null that each individual series is I(1) against the alternative that it is I(0), possibly with a deterministic trend. The sample period used for each series (and reported in the table) is the longest available without a major change in the definition of the variable. The exceptions to this rule are r_t and p_t, which behave quite differently in the post-hyperinflation period. The sample for these series is truncated in 1986. The test statistic for each variable x_t takes the form of a p-value for the coefficient on the parameter b_2 in the regression:

$$?x_t = b_0 + b_1 \cdot t - b_2 \cdot x_{t-1} + S_i\, a_i \cdot ?x_{t-i} + u_t \qquad (2)$$

where the lag order for $?x_t$ is high enough to ensure that the residual u_t is white noise. The power of the ADF Test is very sensitive to the form of the data generating process assumed under the null, so rather than using the critical values in Dickey and Fuller (1979), we have constructed the p-values on 10,00 simulations for each variable under the null that $b_1 = b_2 = 0$ and that the data generating process is:

$$?x_t = b_0 + S_i\, a_i \cdot ?x_{t-i} + u_t \qquad (3)$$

where b_0 and the a_i are fitted on the sample data. In all cases except for ln(z), the null that a series is I(1) can be rejected at the 5% level.[8] In the case of the construction series ln(z) the null cannot be rejected, but the null that ?ln(z) is I(1) can. We conclude that all the series except ln(z) are I(0), and we do not have to resort to co-integration analysis to test hypotheses about the relationship between them. The construction variable used in the consumption function will be ?ln(z).

Table 2: Descriptive Statistics (1988-1999)

	mean	std. dev.	correlation with ln(c)
ln(c)	17.58400	0.21473	1.00000
ln(y)	17.84100	0.21660	0.98871
p	0.02569	0.01946	-0.51594
r	0.00663	0.01952	0.43151
?ln(m)	0.04182	0.33343	-0.13379
?ln(z)	0.01715	0.43026	-0.20728
ln(1+ik)	1.49600	1.02260	-0.11293
ln(1+tk)	3.02950	1.10310	-0.77788

Table 3: ADF Statistics

		p-value	lag order	trend
ln(c)	(80-99)	0.025	11	yes
ln(y)	(80-99)	0.019	08	yes
p	(86-99)	0.001	08	yes
r	(86-99)	0.006	11	yes
?ln(m)	(88-99)	0.000	12	yes
?ln(z)	(88-99)	0.000	00	yes
ln(1+ik)	(88-99)	0.000	00	no
ln(1+tk)	(88-99)	0.000	00	yes

3.2 The Estimated Consumption Function

In order to capture the effects of political instability on consumption, we will modify equation (1), and estimate an equation of the form:

$$ß_0(L)\ln(c)_t = ß_1(L)\ln(y)_t + ß_2(L)p_t + ß_3(L)r_t + ß_4(L)\ln(1+ik)_t + ß_5(L)\ln(1+tk)_t \qquad (4)$$

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8 In the case of ln(1+ik) this is true only when the deterministic trend has been removed from the regression. In this case the trend is insignificant, so its inclusion is likely to bias the test towards acceptance of the null (Peron, 1988).

$$+ \beta_6(L)\Delta\ln(z)_t + \beta_7(L)\Delta\ln(m)_t + \Sigma_j\, ?_j . S(j) + u_t$$

where the S(j) are deterministic seasonal effects.[9] The steady state corresponding to the estimate of this equation is reported in Table 4; the sample period is 1989q1-1999q4. We do not report the estimates of the individual β_{ip} coefficients, most of which are insignificant at the 5% level. Since equation (2) very probably contains nuisance parameters, we also estimate a restricted form of the equation that squeezes the maximum and minimum lag length of each explanatory variable so as to minimize the Schwarz Bayesian Information Criterion. The steady state corresponding to this regression is also reported in Table 4, and Table 5 reports individual coefficient estimates and standard errors for the restricted model.

Given that Israel experienced a certain amount of financial liberalization in the 1990s, it is possible *a priori* that aggregate consumption will depend on some financial sector variables, such as total credit to the private sector or private sector financial wealth. No such variable has any explanatory power when added to the Israeli consumption function; nor does unemployment.

With the exception of the coefficient on $\Delta\ln(m)$ there is little difference between the steady state elasticities in the restricted equation and those in the unrestricted equation, though the standard errors on the latter are, unsurprisingly, somewhat higher. The $\Delta\ln(m)$ coefficient is substantially larger in the restricted regression; with this caveat, it is possible to say that the restrictions on the regression dynamics do not alter inferences about long run effects. Diagnostic statistics for the restricted regression (Table 5) show no evidence of mis-specification. There is no residual autocorrelation or ARCH; nor, using the method of Hansen (1992), is there any evidence of parameter instability. When we estimate the model recursively over the last three years of the sample there are no significant one-step forecast errors nor any significant Chow Test statistics (Table 6).

The tables show that aggregate private sector consumption depends significantly on income, the real interest rate and inflation. The long run income elasticity is very close to (and insignificantly different from) unity, although the short run elasticity (for the response of consumption within the first quarter of a change in income) is only around 0.5. The short run interest elasticity is around -1, increasing in magnitude to around -1.5 in the long run. For inflation

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[9] Lags of all explanatory variables are included from p = 1 to p = 4, and for income also p = 0. A fifth lag of ln(c) is necessary to prevent residual autocorrelation. The consumption function is estimated by OLS. One potential worry with the estimator is that $\ln(y)_t$ might not be independent, and an alternative form of the regression in which $\ln(y)_t$ is instrumented is available on request. The IV estimates are very close to the results reported in Table 4, so there is little if any bias due to the endogeneity of income. Apart from $\ln(y)_t$ no contemporaneous explanatory variable is significant when included in the regression.

the short run elasticity is around -0.67, which increases in magnitude to something over -2.0 in the long run. (With its history of hyperinflation, consumers in Israel are very sensitive to nominal price changes.)

These results do not differ greatly from those in similar studies of industrialized countries. More interesting, however, are the estimated coefficients on the four political variables, all of which have a significant impact on private sector consumption. The coefficients by themselves are difficult to interpret, since the variables are measured in different ways and the relative sizes of the elasticities do not necessarily reflect the relative importance of each variable. In order to get an impression of the relative importance of each of the political variables, we calculate for each variable the product of the estimated long-run elasticity implied by the Table 5 regression with (i) the sample standard deviation

Table 4: Determinants of Consumption in the Steady State

	restricted model		unrestricted model	
variable	coeff.	std. err.	coeff.	std. err.
ln(y)	1.05300	0.02748	1.00700	0.11650
p	-2.07200	0.72640	-2.69500	3.54800
r	-1.41700	0.61550	-1.60600	2.80000
?ln(m)	0.03562	0.00963	0.00775	0.03721
?ln(z)	0.02879	0.00865	0.02222	0.04931
ln(1+ik)	0.04954	0.00658	0.05299	0.02508
ln(1+tk)	0.01847	0.00501	0.01778	0.01961
intercept	-1.26600	0.50340	-0.40720	2.19300
S(1)	0.03050	0.01725	0.02785	0.03627
S(2)	0.01745	0.01468	0.00358	0.04030
S(2)	0.06435	0.02101	0.08269	0.05247

Table 5: Restricted Regression Equation

variable	coeff.	std. err.[¶]	t-ratio	corrected std. err.[¶]	ins.[§]
ln(c)$_{t-1}$	0.02074	0.10577	0.196	0.13147	0.03
ln(c)$_{t-2}$	-0.26942	0.09575	-2.814	0.09182	0.03
ln(c)$_{t-3}$	0.12442	0.07586	1.640	0.06442	0.03
ln(c)$_{t-4}$	0.24881	0.06924	3.594	0.06555	0.03
ln(c)$_{t-5}$	0.20253	0.07589	2.669	0.09786	0.03
ln(y)$_{t}$	0.48867	0.06796	7.191	0.06540	0.03
ln(y)$_{t-1}$	-0.04902	0.10525	-0.466	0.12310	0.03
ln(y)$_{t-2}$	0.26908	0.10534	2.554	0.09445	0.03
p$_{t-1}$	-0.67695	0.35160	-1.925	0.38264	0.06
p$_{t-2}$	-0.27758	0.11177	-2.483	0.09823	0.03
p$_{t-3}$	0.03770	0.11665	0.323	0.14022	0.08
p$_{t-4}$	-0.47758	0.11293	-4.229	0.09982	0.07
r$_{t-1}$	-0.95341	0.33918	-2.811	0.37249	0.08
?ln(m)$_{t-3}$	0.02397	0.00568	4.224	0.00434	0.17
?ln(z)$_{t-2}$	0.01938	0.00409	4.743	0.00336	0.08
ln(1+ik)$_{t-1}$	0.00781	0.00212	3.692	0.00189	0.05
ln(1+ik)$_{t-2}$	0.01009	0.00228	4.430	0.00223	0.04
ln(1+ik)$_{t-3}$	0.00544	0.00203	2.680	0.00166	0.03
ln(1+ik)$_{t-4}$	0.01000	0.00177	5.664	0.00138	0.05

$\ln(1+tk)_{t-4}$	0.01243	0.00290	4.288	0.00248	0.03
intercept	-0.85167	0.33111	-2.572	0.32344	0.03
S(1)	0.02052	0.01094	1.876	0.01085	0.17
S(2)	0.01174	0.00932	1.259	0.00973	0.16
S(3)	0.04330	0.01069	4.051	0.00949	0.21

s = 0.00892; adjusted R^2 = 0.93982 Schwarz Criterion = -8.16225
Hansen (1992) coefficient mean instability test: 4.27857
Hansen (1992) variance instability test: 0.13841
LM autocorrelation test (order 1): F(1,19) = 1.1308; (order 4): F(4,16) = 1.8151
LM A.R.C.H. test (order 1): F(1,18) = 0.04665; (order 4): F(4,12) = 0.11997
Ramsey RESET test: F(1,19) = 0.04917 [0.8269]

¶ The second column of the table reports standard errors without any correction for heteroskedasticity. The fourth column reports standard errors corrected for heterskedasticity using the method of White (1980).
§ Hansen's (1992) test statistic for parameter instability.

Table 6: Chow Test Statistics (Restricted Model)

t	forecasts for period t	forecasts for t-99q4	forecasts for 97q1-t
97q1	F(1,8) = 0.025 [0.88]	F(12,8) = 0.398 [0.93]	F(1,8) = 0.025 [0.88]
97q2	F(1,9) = 1.945 [0.20]	F(11,9) = 0.485 [0.87]	F(2,8) = 0.880 [0.45]
97q3	F(1,10) = 0.006 [0.94]	F(10,10) = 0.310 [0.96]	F(3,8) = 0.588 [0.64]
97q4	F(1,11) = 0.341 [0.57]	F(9,11) = 0.378 [0.92]	F(4,8) = 0.517 [0.73]
98q1	F(1,12) = 0.272 [0.61]	F(8,12) = 0.404 [0.90]	F(5,8) = 0.459 [0.80]
98q2	F(1,13) = 0.298 [0.59]	F(7,13) = 0.448 [0.85]	F(6,8) = 0.422 [0.85]
98q3	F(1,14) = 0.030 [0.87]	F(6,14) = 0.498 [0.80]	F(7,8) = 0.365 [0.90]
98q4	F(1,15) = 1.795 [0.20]	F(5,15) = 0.633 [0.68]	F(8,8) = 0.477 [0.84]
99q1	F(1,16) = 0.029 [0.87]	F(4,16) = 0.326 [0.86]	F(9,8) = 0.427 [0.89]
99q2	F(1,17) = 0.861 [0.37]	F(3,17) = 0.451 [0.72]	F(10,8) = 0.444 [0.89]
99q3	F(1,18) = 0.495 [0.49]	F(2,18) = 0.247 [0.78]	F(11,8) = 0.435 [0.90]
99q4	F(1,19) = 0.000 [0.99]	F(1,19) = 0.000 [0.99]	F(12,8) = 0.398 [0.93]

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of the variable and (ii) its sample mean. These products are reported in Table 7. The first column in the table gives an indication of the long run impact on consumption of a typical deviation of each variable from its mean. The second column gives an indication of the effect of a reduction of each variable from its mean sample value to zero, in other words, a stabilization of the levels of immigration and construction in WBG settlements and a cessation of politically motivated killings, both in Israel proper and in WBG.

The table indicates that each of the four variables has a substantial impact on consumption. Increases in the political instability measures lead to an increase in consumption (i.e., a reduction in saving, *ceteris paribus*). A standard deviation increase in the rate of growth of construction in WBG or in the rate of growth of immigration both increase consumption by about 1.2% in the long run. A standard deviation increase in the fatality figure for Israel increases consumption by over 5%, and a similar increase in the fatality figure for WBG increases consumption by over 2%. So although the impact on consumption of WBG fatalities is substantial, it is less than the impact of fatalities in Israel proper, perhaps reflecting the belief that an increase in fatalities in Israel proper corresponds to an increase in the probability that the *Intifada* will spread outside WBG.

For the fatality series, mean sample values are somewhat larger than one standard deviation, so the impact on consumption of a complete cessation of violence, relative to its average level, is even greater than the figures in the previous paragraph suggest. A fall of over 7% for fatalities in Israel proper and over 5% for WBG fatalities. For the two other series, whose mean sample values are very close to zero, the corresponding figures are very small.

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Table 7: Magnitude of the Effect of the Political Instability Variables

variable	coeff. · sample s.d.	coeff. · sample mean	effect @ 1999q4 income levels§
?ln(z)	1.19%	0.15%	0.091
?ln(m)	1.24%	0.05%	0.030
ln(1+ik)	5.07%	7.41%	4.334
ln(1+tk)	2.04%	5.60%	3.305

§ The increase in saving resulting from a reduction in the variable from its mean value to zero, assuming consumption *ex ante* is at its 1999q4 level, in billions of New Sheqels.

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The increases in consumption resulting from increases in political instability as measured by our four variables correspond to reductions in saving. The absolute value of the fall in savings resulting from a given increase in political instability depends on the current level of private sector income and consumption. The third column in Table 7 provides an illustration of the typical magnitude of savings responses by listing the absolute value of the increase in savings that would occur if each instability measure fell from its mean sample value to zero, and if private sector income were at its 1999q4 level. Values are measured in New Sheqels at 1999q4 prices. The figures corresponding to reductions in WBG construction and immigration growth are very small, as in column 2; but the figures corresponding to the two fatality series are much larger: NIS 4.3 bn for fatalities in Israel proper and NIS 3.3 bn for fatalities in WBG. Total Israeli GDP in this period is just under NIS 106 bn at current prices: the absolute value of the change represents about 7% of GDP. So, in the light of the figures in Table 1, the prediction is that the savings ratio in Israel would almost double as a result of a complete cessation of violence.

4. Summary and Conclusion

In this paper we have estimated an aggregate private sector consumption function for Israel over the period since the start of the *Intifada* (1988-99). The estimated response of consumption to aggregate economic conditions, as reflected by prevailing interest and inflation rates and the level of private sector income, is similar to previous estimates for various OECD countries, and in line with standard economic theory. (Though one difference is that the null that income and consumption are I(1) *can* be rejected on the Israeli data.) But consumption is also sensitive to the prevailing political environment, especially to the level of political violence in the country. Greater political instability and violence lead to lower savings and higher current consumption. The Israeli savings ratio is very low by international standards; if the level of political violence were to fall to zero, the increase in savings (relative their value at the average level of violence) would bring the Israeli savings ratio close to the international average.

Both fatalities in Israel proper (largely due to Palestinian attacks on Jewish civilians and Israeli security forces) and fatalities in the West Bank and Gaza (largely Palestinian deaths during protests) have a substantial negative impact on savings. A more Draconian Israeli security policy might reduce the first of these; but, if anything, it would increase the second. Substantial improvements in Israeli savings performance are likely to occur only as a result of a successful outcome to the peace process.

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