



ELSEVIER

Available online at www.sciencedirect.com

SCIENCE @ DIRECT®

Journal of Monetary Economics 51 (2004) 1003–1006

Journal of
MONETARY
ECONOMICS

www.elsevier.com/locate/econbase

Discussion

Comment on: “Macroeconomic consequences of terror: theory and the case of Israel”[☆]

Alex Cukierman^{*,1}

*Eitan Berglas School of Economics, Tel-Aviv University, P.O. Box 39040, Ramat Aviv,
Tel Aviv 69978, Israel*

Received 21 November 2003; received in revised form 17 May 2004; accepted 17 May 2004

Abstract

This paper is a pioneering attempt to take a systematic look at the effects of terror in Israel. It presents a theoretical analysis of the macroeconomic consequences of terror followed by empirical evidence for Israel. The theory part utilizes a steady state version of Blanchard (1985) finite lives model in which each individual faces a constant probability of death at every moment. The empirical part is, for the most part, based on level and first difference VAR's between GNP, non durable consumption, investment and exports (all in per capita terms) augmented by a proxy for the intensity of terror and a measure of the real rate of interest. The theory is used as a broad guiding device to qualitatively guide the empirical work rather than for providing a precise structure to be estimated.

The main implications of the theory are that, by raising the probability of death, an increase in terror reduces investment, production and consumption. Essentially, by increasing the probability of death d , an increase in terror activity reduces the incentive to save and with it the steady state level of capital, production and consumption. In parallel the increase in d raises the interest rate and reduces total wealth. The paper augments Blanchard's model with a welfare maximizing government that responds to the increase in terror activity by raising government expenditures designed to partially offset its impact on the probability of death.

The main results of the empirical part are that, in Israel, the terror variable exerts a negative and significant impact on the macroeconomic variables mentioned above. A counterfactual experiment implies that if terror continues at the level it had been at (between the last quarter of 2002 and the third quarter of 2003) up to the third quarter of 2005 then, in comparison to a

[☆] Comment on “Macroeconomic Consequences of Terror: Theory and the Case of Israel” by Zvi Eckstein and Daniel Tsiddon for the November 2003 Carnegie-Rochester Conference.

*Tel.: +972-3-6409-909; fax: +972-3-6409-908.

E-mail address: alexcuk@post.tau.ac.il (A. Cukierman).

¹ I benefitted from useful discussions with Yona Rubinstein.

no terror benchmark, annual GDP per capita is lower by roughly 2 percent per year, non durable consumption per capita is lower by 1 percent per year and the level of investment per capita is lower by 10 percent annually. The paper also contains an empirical analysis of the differential impact of terror on domestic versus foreign tourists.

My discussion focusses on possible broader interpretations of the main empirical results of the paper in light of its theoretical model and of the Israeli political and economic scene since the inception of the Oslo peace process in the mid nineties.

© 2004 Elsevier B.V. All rights reserved.

1. A puzzle

Broadly interpreted in terms of Blanchard's (1985) finite horizon model the terror variable is a proxy for the probability of death d . Viewed in this way, are the estimated responses above small or large? A first step towards answering this question requires an estimate of the extent to which the increase in terror fatalities since the beginning of the El-Akza Intifada increased the probability of death. The following table presents the evolution of the total number of deaths and the number of deaths from car accidents in Israel:

Years	1979–1984	1985–1989	1990–1994	1995–1997	1998–1999
Total deaths per 100 thousands	797 ²	662	630	623	614
Deaths in car accidents per 100 thousands	13	10	8	10	9

Source: Table 3.26, Statistical Abstract of Israel, 2003.

Recent releases put the cumulative death toll from terror activity since fall 2000 till May 2004 at a bit over one thousand which is roughly 300 terror fatalities per year, on average. In terms of average total population in 2001 (6.439 millions) this represents a, terror induced, death rate of 4.66 per 100 thousands living individuals.³ The figure for total deaths per 100 thousand individuals in 1998–1999 implies that, prior to the start of the El-Akza Intifada the probability of death was 0.00614. The terror induced increase in deaths raised this probability from 0.00614 to 0.00619—roughly 0.8 of a percent increase in d . Thus, interpreted in terms of the theoretical model, the empirical results in the paper suggest that this change in d was associated with a one percent yearly decrease in non durable consumption per capita, a two percent yearly decrease in output per capita and a ten percent yearly decrease in investment per capita—implying elasticities of 1.25, 2.5 and 12.5, respectively.

² Excludes fatalities in the 1982 Lebanon war.

³ Interestingly this rate is about one half of the death rate in car accidents as can be seen by comparing to the last row of the table.

Those appear to be quite substantial elasticities that raise the following puzzle. The table shows that between 1985 and 1999 the probability of death decreased by a bit over seven percent (from 0.00662 to 0.00614). In conjunction with the above elasticities that would imply yearly percentage increases in non durable consumption per capita, in output per capita, and in investment per capita that are unrealistically high and much above what has been observed in practice over that period. This suggests that, although useful as a starting point, the Blanchard–Yaari framework misses important elements of the economic response to increases in terror. The following two sections suggest two missing elements.

2. Terror as a signal

The Blanchard–Yaari framework assumes that individual responses to a change in the probability of death does not depend on the source of the change in this probability. In particular, the response is taken to be the same whether the change is due to a change in medical technology, a change in road conditions (for deaths due to car accidents) or an escalation of violence against the background of a persistent conflict between two national entities. An escalation of violence appears to be qualitatively different from other sources of change in the probability of death. In particular, even if it raises the actual probability of death by a modest amount, an increase in terror normally signals an increase in the likelihood of further escalation and, relatedly, a protracted period of political instability. This may reduce investment and, with it, economic activity through two channels. One that amplifies the mechanism highlighted in the Blanchard–Yaari framework through expectations about the future probability of death and another that operates via a different route. Elaborations follow.

First, the pickup in terror may be taken as a signal of further escalation, leading individuals to believe that in the future the probability of death will be substantially higher than the currently measured increase in the frequency of death. Obviously this makes the measured response of investment and output to the *actual* increase in the frequency of death stronger. Second, by signalling political instability and an associated weakening in the enforcement of property rights, terror reduces the propensity to invest. Svensson (1998) produces international evidence from a sample of about 100 countries which supports the view that an increase in political instability, by weakening property rights, deters investment activity. This factor is likely to be particularly potent in a small open economy with free capital flows like Israel.⁴ Even if they are not personally affected by the increase in death probability due to terror, investors have a strong incentive to shift their investment to more politically stable regions of the world.

These considerations support the view that a terror induced increase in death probability has a stronger adverse effect on economic activity than an equally sized

⁴ A recent empirical investigation of the effect of political instability on investment in Israel during the last two decades appears in Fielding (2003).

increase in death probability due to other reasons like more car accidents. The punch line is that individual responses to an increase in the probability of death depend both on that probability, as well as on *its source*.

3. Terror as a deterrent to consumption

Becker and Rubinstein (2004) have recently conjectured that the utility from consumption decreases when the threat of terror increases. For essential components of consumption this may not have a noticeable effect on the volume of consumption. However for relatively discretionary components of consumption, like eating outside, or for easily substitutable forms of tourism, this may seriously reduce expenditures and depress production by reducing demand. The substantial reduction in foreign tourism documented in the paper is consistent with this hypothesis.

4. Is it only terror?

A quick look at the time path of the terror index in Fig. 5 suggests that the index reached non negligible levels already between 1994 and 1997. Unlike the period following the last quarter of 2000, this pickup in terror activity was not accompanied by low growth. As a matter of fact, as can be seen from Table A1 in the paper, during the 1994–1997 period real GDP per capita increased at a non negligible pace. This raises the possibility that the post 2000 decrease in growth attributed by the VAR to the pickup in terrorist activity is partly proxying for something else. In particular, an important difference between the 1994 and 1997 period and the 2001–2003 period is that in the first period there was a credible hope of a peace agreement and of open borders on the horizon. By contrast in the second period, following the breakdown of the Taba talks between Barak and Arafat in 2000, this hope was largely gone. This conjecture could actually be tested in future work by adding a dummy for the period prior to the Taba's talks or by utilizing poll data that would indicate how the public's beliefs about the likelihood of a peaceful settlement of the Israeli-Palestinian conflict have changed before and after the breakdown of the Taba talks.

References

- Becker, G.S., Rubinstein, Y., 2004. Fear and the response to terrorism: an economic analysis, Manuscript, May.
- Blanchard, O.J., 1985. Debts, deficits and finite horizons. *Journal of Political Economy* 93 (2), 223–247.
- Fielding, D., 2003. Modelling political instability and economic performance: Israeli investment during the Intifada. *Economica* 70, 159–186.
- Svensson, J., 1998. Investment, property rights and political instability: theory and evidence, 1998. *European Economic Review* 42 (7), 1317–1341.