Fear and the Response to Terrorism: An Economic Analysis*

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Abstract

In this project we aim at explaining, within the framework of rational choice models, why small probability events such as the likelihood to be harmed by terror affect peoples' behavior so much. The large-scale effects of terror on peoples' behavior were often attributed to their "ignorance" of the objective (true) probabilities and their tendency to overstate low probability events. Contrary to these explanations, we put forward an alternative theory incorporating into the expected utility theory situations in which the extreme consequences associated with consumption of risky goods and the extent these turn into a salient phenomenon, affect persons' mental state, generate fear, and by that affect peoples' utility and well-being. Our argument is based on two corner stones. Terror affects not only the likelihood to be harmed but mainly, by generating fear, persons' utility and well-being. Fear can be managed. People can handle their fears. They do so by accumulating the necessary mental skills. Like other investments in human capital, it is not a "free-lunch" and it does not pay back the same to

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anyone. Those who are more likely to benefit from terror infected activity will invest and overcome their fears, while others will substitute the risky activity by other consumption plans, falsely appearing like they overstate the objective probability to be harmed by terror. Using data from the US and from Israel we identify the role of fear on economic behavior by comparing the effect of terror on people who face similar objectives (and subjective) probability to be harmed, but different incentive to invest and overcome fear. We find that those who are more likely to invest are less likely to be affected by terror. For instance we show that while terror generates large average effects on consumers, especially in low frequency usage like air passengers or bus passengers, it has little effect on the compensation (wages) of those employed in the "infected" industries. Suicide bomber attacks decreases the likelihood of drivers to serve as bus drivers, however it has no effect on the likelihood of bus drivers to quit their jobs. Using micro data on the use of public bus routes and taxis we find that suicide bomber attacks carried out on buses have a substantial negative average effect on bus rides and positive effect on the use of taxis. Disaggregating the population into low and high frequency users reveals that this does not hold for the later. Controlling for income, age, and education we find no effect what so ever of suicide bomber attacks on the number of bus rides taken by high frequency users. Micro data on the consumption in coffee shops make it very clear that while moderate consumers substantially decrease their consumption when terror strikes, consumers who had previously spend more of their income in coffee shops did not change their habits. Finally, using our estimates we address the following question: to what extent should people's fear and risk aversion be in order to fit the data? We calibrate the risk and the fear aversion parameters restricting the utility function to be of the constant relative risk aversion class (CRRA). We find that if suicide bomber attack carried out on buses reduces the marginal utility of a bus ride by 20 percent then the risk aversion parameter which fits the data equals 1! Fear is not limited to terror. Large scale effects generated by low probability events are part of our daily life. Needless to say that our model shed new insight on that too. Evidence from the "Mad Cow" crisis show, in accordance with our theory, that those who consumed high level of beef did not change their consumption at all while those who consumed less reduced their beef consumption substantially. Terror takes advantage of people being human and rational. By generating fear, terror, even in the form of a low probability event, may cause substantial effects. Hence, terror generates large scale effect by damaging the quality of our life rather than the "quantity" of life.

1 Introduction

In the aftermath of the tragic events of September 11 2001, terror is no longer a phenomenon limited to specific areas of conflict. Terrorism, in the form of "premeditated, politically motivated violence perpetrated against noncombatant targets by sub-national groups or clandestine agents, usually intended to influence an" (the US State Department definition; 1983) is not a new phenomenon. However, the current events carried out by suicide terrorists who are motivated by religious and cultural ideas are not similar to what we have known so far. It is thus not surprising that understanding the causes and consequences of terrorism, especially in its current form, is a challenge economists find hard to resist. So far public opinion, as well as the academic community, focused mainly on: (i) understanding why young and educated people commit suicide while killing others in the name of 'God' (see: Krueger and Malečkova 2003), (ii) estimating the causal effect of terror on aggregate outcomes (Abadie, 2003; Eckstein and Tsiddon, 2004).

Outside academic journals it is common knowledge that even in terror-stricken countries the likelihood to be harmed (by terror) is very low. Nonetheless, terrorism does generate, borrowing Webster's Encyclopedic Unabridged Dictionary definition for terror "an intense fear which is somewhat prolonged and refer to imagined or future dangers".

Extreme fear caused by low probability events is not limited to what is known as terror actions. Illustrative examples are the outburst of the "Mad Cow" disease (Creutzfeld-Jakob disease when contaminating humans) in early 1996, and recently the SARS epidemic where, although the likelihood to be infected was practically zero, visits to the "infected" regions came to a halt. Neither the standard expected utility model or its state-dependent version explain why a negligible change in the probabilities of the underlying states of nature has such a substantial effect on peoples' behavior. In these models, expected utility is linear in the probabilities and therefore it is hard to fit the observed reaction to SARS, terror attacks and the like by using the standard state-dependent expected utility model.

Hence, it is thus surprising that most previous studies ignore the issue of why terrorism generates large influence on peoples' behavior. The large-scale effects of low probability events on peoples' behavior were often attributed to their "ignorance" of the objective ("true") probabilities and their tendency to overstate low probability

events using Tversky and Kahneman (1979) prospect theory.[1]

At first glance, this may cast doubt as to whether a rational choice model can be employed to explain such phenomena. Nonetheless, we argue that it is possible to explain large reactions by very small changes in the states of nature objective probabilities using the framework of a rational choice model. In the standard state-dependent utility model the uncertainty agents face is with respect to the states of nature. However, when consumption eventually takes place, the state of nature is already known. We argue that this view misrepresents "agents' problem" in situations where consumption takes place when the state of nature is not fully revealed.

Our argument is based on two corner stones. Like other low probability events, terror affects not only the likelihood to be harmed, but mainly persons' utility and well-being by generating fear. People can handle their fears. They do so by accumulating the necessary mental skills. Like other investments in human capital, it is not a "free-lunch" and it does not pay back the same to anyone. Those who are more likely to benefit from risk-infected activities will invest and overcome their fears, while others will substitute the risky activity by other consumption (activity) plans, falsely appearing like they overstate the objective probability to be harmed.

The earliest work that we know of, in which persons' belief is an argument in their utility function, is Akerlof and Dickens (1982). In their study, people affect their well being by influencing their beliefs. Recently Caplin and Leahy (2001) incorporated into the expected utility theory situations in which agents experience feelings of anticipation prior to the resolution of uncertainty. By introducing fear as an argument into the utility function we allow uncertainty to affect persons' utility and well-being. Unlike Caplin and Leahy we allow people to invest and handle their fears. Those who find investment "profitable" pay its cost accumulate mental capital and overcome their fears. Unlike Akerlof and Dickens, in our model agents overcome fear by accumulating mental skills and not by understating the objective probabilities.

Hence, an exogenous shock to the underlying probabilities affect agents' choices via two different channels: (i) the risk channel: increasing the probability of the bad state keeping (marginal) utility in each state constant; (ii) the fear channel: deprecating the utility from the risky activity in each state of nature.

[1] Eckstein and Tsiddon (2004) study the effect of terror on the change in trends and business-cycles in Israeli economy. In their model terror endangers peoples' life such that the value of the future relative to the present is reduced. As a result of that investment declines and long-run income declines. They find that a very low increase in the probability to die due to terror nonetheless economic slow-down is large. Eckstein and Tsiddon reconcile this puzzle pointing out the differences between objective and individuals subjective probabilities.

A simple, and hopefully illustrative, example is the experience of unsafe sex in the era of AIDS. It is common knowledge that people involved in sexual relationship with occasional partners learn whether they were infected by that only days or perhaps weeks later. Yet, it is hard to believe that the presence of AIDS does not affect the "real time" pleasure from having unsafe sex. Obviously, their health condition that will be revealed to then only in the future, has no effect on their utility. Unsafe sex is less pleasurable under these conditions even if eventually one is not infected. The analogy to the "Mad Cow" disease and the sharp decline in the consumption of beef during the mid-1990s is trivial.

Employed with our model we aim at identifying the role of fear by comparing the effect of terror on the economic behavior of people who face the same objective (and subjective) probability to be harmed however different incentives for overcoming fear. Our analysis rests mainly on two identifying assumptions. First, terror incidents are exogenous to measured outcomes. Second, people can be classified according to their objective probabilities to be harmed and their likelihood to invest and overcome fear.

We aim at estimating both treatment effects as well as structural risk and fear aversion parameters. We intend to estimate the treatment effect of fear using differences-in-differences estimator. That is by comparing the effect of terror incidents on the consumption of persons facing similar objective probability to be harmed, but different incentive for overcoming fear. Using the well-known Constant Relative Risk Aversion (CRRA) utility function we aim at estimating structural risk and fear aversion parameters and evaluate the effect of contaminating diseases or terror on the utility and well being via the risk and the fear channels.

Standard micro and macro data sets were not designed to provide information about the questions discussed in this project. Therefore, rather than analyzing one data set in isolation, we intend to study various data sets, some of them will be constructed especially for the sake of this study. We intend to use both aggregated and micro data, from the US and Israel. We also plan to take advantage of French micro panel data on the consumption of beef before and during the "Mad Cow" crisis (1996). Using data from US and Israel we show that terror events, on both sides of the Atlantic, generate substantial effects, which cannot be solely attributed to either the change in likelihood to be harmed by terror or to other factors correlated with terror events. Moreover, our preliminary results indicate that the effect of terror varies across individuals in accordance with our theory.

For instance, using micro data on the use of public bus routes and taxis in Israel

we find that a suicide bomber attacks carried out on buses decreases the number of bus passengers by approximately 20 percentage points during the month after. At the same time it increases the use of taxis. Disaggregating the population into low and high frequency users reveals that this does not hold for the latter. Controlling for income, age, and education we find no effect what so ever of suicide bomber attacks on the number of bus rides taken by high frequency users. Micro data on the consumption in coffee shops make it very clear that while moderate consumers substantially decrease their consumption when terror strikes, consumers who had previously spend more of their income in coffee shops did not change their habits.

Evidence from the "Mad Cow" crisis in France (1996) support our theory as well. According to Adda's (2001) findings, consumers who had previously eaten large quantitative of beef did not change their consumption while those with intermediate levels of past consumption decreased significantly their consumption.

We use the benchmark utility function employed in the macro and finance literature - the Constant Relative Risk Aversion (hereafter CRRA) - to estimate (calibrate) risk and fear aversion parameters.[2] The fear aversion parameter in our model stands for the rate at which fear depreciates the utility from consumption. The nature of this part in our proposed research is to search for parameters for which peoples' projected outcome match their observed outcomes.[3] We address two main issues. First, the extent that previous studies might have overstated people's risk aversion by ignoring their fears. Second employed with risk and fear aversion parameters we aim at evaluating the effect of terror or rare contaminating diseases on persons' utility and well-bring via these two channels.

Using our estimates we calibrate the risk aversion parameter for different levels of fear. We find that if suicide bomber attack carried out on buses reduces the marginal utility of a bus ride by 20 percent - that is, the value of a 5 NIS ride drops by 1 NIS[4] - then the risk aversion parameter which fits the data equals 1. Note that for a moderate deprecation of only 10 percent the risk aversion parameter needed in order to fit the data equals 1.5. In general, if a suicide bomber attack depreciates the utility from a bus ride by 5 percent or more we need risk aversion values that do not exceed three

[2] A special form of the CRRA power function that has significant operational advantages is when a equals to one. In this case, so-called "everyone's utility function" postulated by Daniel Bernoulli (1738) the utility function is defined to be logarithmic function which is the limit of the above function as a approaches one.

[3] This class of questions is very popular in the Macro/Finance/Risk and Uncertainty literature (examples: Mehra and Prescott 1985, Rabin, 2000).

[4] 1 US$ $\approx$ 4.5 NIS

(3) to mimic the effect of suicide bomber attacks on the usage of public buses.[5]

Hence, terror takes advantage of people being human and rational. By generating fear, terror, even in the form of a low probability event, may generate substantial effects.

Section II builds a simple model which incorporates into the expected utility framework situations in which the extreme consequences associated with consumption of risky goods affect persons' mental state, generate fear, in an economy where people can handle their fears by investing in there mental human capital. We work out a systematic statement of this theory, and derive various implications, some we discuss here. In Section III we present the identifying strategy. Section IV we provide a brief review of the data we intend to use. Section V displays stylized facts. In Section VI we estimate the treatment effect of terror via fear, calibrate risk and fear aversion parameters and provide evidence to the role of fear from France data on consumption of beef before and during the Mad Cow crisis in France. We conclude in Section VII.

[5] Arrow (1971) argues on theoretical grounds that the risk aversion parameter should be approximately one. Kydland and Prescott (1982) found that the risk aversion parameter needs to be between one and two to mimic observed variability in aggregate consumption and investment.

2 The Model

Model set-up

Consider an economy where individuals live for two periods ($T = 2$), a perfect capital market, a full actuarially fair annuity system and a fair insurance market. At each period individuals can borrow or lend without restrictions at a fixed rate r. The economy consists of two consumption goods: a risky good (c_1) and a risk-less good (c_2). In each period individuals face the risk of not lasting till the end of the period. The probability of surviving periods 1 and 2 is determined by agents' consumption plan. As long as they consume from the risk-less good only, their probability to survive equals 1. The more they consume from the risky good, the less likely they are to survive. *Consumption takes place prior to the resolution of uncertainty.* To simplify we assume that agents gain utility only if their survive (and 0 if not).

Utility is a function of agents' consumption plans and their mental state. Individuals experience different mental states such as fear or excitement which affect their well-being. In our model we use the word "fear" to account for agents' mental state in situations at which consumption takes place prior to the resolution of uncertainty. People can handle their fears. They do so either by avoiding consumption of risky good or by investing in mental human capital and overcoming (at least partly) their fears. Agents maximize their expected utility subject to their budget constraint. Expectations taken over survival probabilities.

Technology

The likelihood to survive is determined by agents' consumption plans. The probability to survive as function of c_1 decreases at a constant rate and takes the following functional form:

$$\pi_t(c_{1,t}) = \exp(-\gamma c_{1,t}), \qquad \text{for } t = 1, 2 \tag{1}$$

where the parameter γ is the rate at which consumption from the risky good (c_1) depreciates the probability to survive ($\gamma > 0$).

Fear and mental human capital

Fear, measured by F, is determined endogenously by consumption and investment plans. It is also affected by γ as well as by the extent at which extreme consequences associated with consumption of risky goods turn into a salient phenomenon measured by S. To illustrate that, consider fear in the context of terror. Terror incidents generate fear not only by making consumption risky ($\gamma > 0$), but also by turning terror into a salient phenomenon (S). It is not only their "physical consequences" that makes them

salient, but also the attention they receive at the mass media. [6]

People can handle their fears. They do so by accumulating mental capital. Investment in mental skills, like other investments in human capital, is not a *free-lunch*. M stands for the monetary resources agents invest in mental skills. Fear discounts the utility from consumption of the risky good (c_1). Let F stand for the fear "discount factor".

$$F = F(S, \gamma, M), \tag{2}$$

where $1 \leq F \leq \infty$. We assume that F is increasing concave in S, γ and decreasing and convex in M for any $\gamma > 0$. We further assume that $F_{M,\gamma} < 0$ and $F_{M,S} < 0$ (for any $\gamma > 0$).

Preferences:

We assume additive separability of preferences over goods and time. We allow for heterogeneity in individuals' taste. There are individuals who like consumption of c_1 more than others. The utility function $W_i(\cdot)$ has a good additive representation that exhibits the following form:

$$W_{i,t} = \alpha_i \cdot U(c_{1,t}) \cdot F_t^{-1} + V(c_{2,t}), \tag{3}$$

where α_i is a taste parameter indicating the extent at which person i likes c_1 relative to the "average" person in the economy. We also assume that $U(\cdot)$ and $V(\cdot)$ are concave and increase with c_1 and c_2 respectively.[7]

Budget constraint:

We assume fair insurance market. We normalize the price of investment to equal 1. The discount factor β is assumed to equal $1/(1+r)$. The budget constraint can be written as:

$$\pi_1 \cdot (p_1 c_{1,1} + p_2 c_{2,1} + M) + \pi_1 \pi_2 \beta \cdot (p_1 c_{1,2} + p_2 c_{2,2}) \leq I, \tag{4}$$

where p_1 and p_2 are the relative prices of c_1 and c_2 respectively, and I is agents' endowments.

[6] Eliaz and Spiegler (2002) study the effect of anticipatory feelings on choice behavior. In their model information is individual specific and endogenous to agents decisions. They show that anomalous attitudes to information explained by anticipatory feelings are inconsistent with maximization of expected utility over beliefs.

[7] Akerlof and Dickens (1982) is the earliest work that we know of, in which agent's belief enters as an argument into their utility function. Caplin and Leahy (2001) incorporated into the expected utility theory situations in which agents experience feelings of anticipation prior to the resolution of uncertainty. By introducing fear as an argument in the utility function we allow uncertainty to affect persons' mental state, and by that their utility and well-being. Unlike Caplin and Leahy, we allow people to handle their fears.

Agents problem:

Agents maximize expected utility subject to investment and consumption constraints, where the expectation is taken over survival probabilities, which is the only source of uncertainty in our analysis:

$$\begin{aligned} \max_{c_{1,t},c_{2,t},M} E\left(W_i\right) &= \sum_{t=1}^{2} \pi_t \cdot \beta^{t-1} \pi_{t-1} \cdot \left(\alpha_i \cdot F_t^{-1} \cdot U c_{1,t} + V\left(c_{2,t}\right)\right) \\ s.t. \quad &: \quad \pi_1 \cdot M + \sum_{t=1}^{2} \pi_t \cdot \beta^{t-1} \pi_{t-1} \cdot \left(p_1 c_{1,t} + p_2 c_{2,t}\right) \leq I, \end{aligned} \tag{5}$$

where $\pi_0 = 1$, $\beta^0 = 1$ and $\beta = 1/\left(1+r\right)$.

The risk and the fear channels

From the FOC (see Appendix A.1) we receive that the hazard rate affects consumption plans via two channels: (i) the "risk channel": by making consumption of the risk infected good more expensive, (ii) the "fear channel": by deprecating the utility obtained from the risky good. The marginal rate of substitution between c_1 and c_2 illustrates both channels. The MRS between c_1 and c_2 (in each period) consists of three components:

$$MRS = \alpha_i \frac{U_{c_1}}{V_{c_2}} - \alpha_i \frac{U_{c_1}}{V_{c_2}} \left(F^{-1}\left(S, \gamma, M\right) - 1\right) - \gamma \cdot \frac{\left(W_i^* - \lambda I^*\right)}{V_{c_2}} = \frac{p_1}{p_2}, \tag{6}$$

where W_i^* equals to person's i expected value of life and $W_i^* - \lambda I^*$ equals to consumer's expected surplus. The first term is the marginal rate of substitution in an economy with neither fear nor risk. The second term stands for the "fear channel", that is, the effect of fear on the marginal rate of substitution. The third term is the standard "risk channel". As Equation (6) clarifies, the hazard rate (γ) affects the optimal consumption plan above and beyond its direct effect via the "risk channel" $\left(W_i^* - \lambda I^*\right)$.

Investment in mental skills and optimal consumption

A key feature of our model is that DMs can overcome fear by accumulating mental skills. Our results are summarized in the following propositions, the proof of which is left to Appendix A.2.

Proposition 1 *Investment in mental capital and consumption of the risky good are complementary goods, that is:* $\frac{\partial M}{\partial p_1} < 0$

Proposition 2 *Investment in mental capital is an increasing function of* a*, that is:* $\frac{\partial M}{\partial a} > 0$

These results indicate that the higher the consumption from the risky good, the more worthwhile it is to invest in mental capacities. Yet, for any given set of prices, c_1 "lovers" invest more than others do.

Proposition 3 *For any set of* $\{S, \gamma, M\}$ *such that* $F = 1$ *there is an* $\bar{a}$ *such that for all* $a \geq \bar{a}$ $F = 1$ *and for all* $a < \bar{a}$ *and* $F > 1$.

Proposition 4 *Investment in mental capital is a decreasing function of* γ*, that is:* $\frac{\partial M}{\partial \gamma} < 0$.

Borrowing Adam Smith's phrase, the results indicate that the "extra" effect of risk via the fear channel is *limited by the extent* of economic incentives to overcome it. This is especially true when the likelihood to be harmed by the risky activity is low.

Graphical illustrations

Figure T.1 shows the expected utility for different levels of c_1/c_2 in the benchmark case of an economy with $S = 0$ curve (1) and in the case were $S > 0$, curve (2). Point A is the optimal consumption plan in the benchmark case, where c_1^* stands for the optimal level of c_1. The comparison between these curves illustrate the role of fear in our model. Fear affects only the expected utility from c_1. Therefore, for $c_1 = 0$ utility is identical in both cases as curve (1) and curve (2) make clear. Our assumption that fear depreciates the expected marginal utility from consumption of risky good c_1 is reflected in the lower slope of curve (2) relative to curve (1) . As expected, the optimal level of c_1 when $\gamma = S = 0$ exceeds the level of c_1 in the optimal consumption when $\gamma > 0$ and $S > 0$ (points A and B respectively).

Figure T.2 shows the expected utility of "c_1 lovers" for different levels of c_1/c_2, for the two possible investment plans. Curve (1) shows the expected utility for the benchmark case where $\gamma = S = 0$. Curve (2) shows the expected utility in the case where agents do not invest. Curve (3) shows the expected utility when agents invest. Point A' is the optimal consumption plan for $M = 0$, where c_1^{**} stands for the optimal level of c_1/c_2 in this case. This is the point where utility is maximized without investment.

Point C is the optimal consumption plan for $M = m$ which is the investment level needed to overcome fear. Point B is the break-even point where the expected utility with and without investment is equal, where $\hat{c_1}$ stands for the corresponding level of consumption of c_1/c_2. Note that for any $c_1/c_2 > \hat{c_1}$ expected utility with investment exceeds expected utility with no investment. As in the standard investment problem, expected utility when agents invest is lower for $c_1 = 0$ than expected utility without investment. The slope, the expected marginal utility with respect to c_1, is higher with investment for any given level of c_1 than without investment. As Figure T.2 makes clear, agents will choose to invest in eliminating fear if the optimal level of c_1 is higher than the level of c_1 at the break-even point.

Figure T.3 presents a case for "c_2 lovers" where the break-even point is to the left of the optimal consumption of c_1/c_2 without investment. In this particular example the maximum expected utility obtained under investment is lower than the maximum expected utility gained with no investment.

Testable implications

We are not the first to incorporate "fear" and beliefs as an argument in the utility function. Akerlof and Dickens (1982) were the first we know, in which agent's beliefs enters as an argument into their utility function. Caplin and Leahy (2001) incorporated into the expected utility theory situations in which agents experience feelings of anticipation prior to the resolution of uncertainty.

By introducing fear as an argument in the utility function we allow uncertainty to affect persons' mental state, and by that their utility and well-being. Unlike Caplin and Leahy, we allow people to handle their fears. As we show, fear is limited by the extent of economic incentives to overcome it. Those who find investment "profitable" pay its cost, accumulate mental capital, and overcome their fears. Unlike Akerlof and Dickens, in our model agents overcome fear by accumulating mental skills and not by understating the objective probabilities. Another notable difference between the Akerlof-Dickens' model and our model is with respect to peoples response to risky situations. In their model it worth to invest in changing one's beliefs especially when risk is not negligible. This is not true in our model. In fact investment is limited by the extent of the "true" risk.

Our model generates testable implications that we take to the data in this paper. As the results above indicate, DMs who used to consume more from what turned to be risky goods invest more in mental capital than their counterparts. Moreover,

if overcoming fear is "technically" feasible, we expect them to invest, overcome fear, and practically keep their consumption plans (c_1/c_2) unchanged, especially for cases in which γ is negligible. Others will substitute the risky activity by other consumption plans, falsely appearing as if they overstate the objective probability to be harmed.

3 The econometric approach

Employed with our model, we propose to identify the role of fear by comparing the effect of terror on the economic behavior of people who, according to our model, *will not* invest in eliminating fear with those who *will*. By comparing persons facing a similar objective (and subjective) probability to be harmed, *but* different incentive for overcoming fear, we identify the role of fear, generated by terror, on their economic behavior.

Our analysis rests on three identifying assumptions: (i) terror incidents, in the US as well as in Israel, are exogenous to measured outcomes, and (ii) people can be divided into groups according to the objective probabilities to be harmed and their likelihood to invest and overcome fear.

Identifying treatment effects

In the absence of a controlled experiment we do not observe agents in both states. Let Y_1^1 denote the *actual* outcomes of agent i if treated and let Y_1^0 denote the *actual* outcome of agent i if not treated. For instance, in the case of passengers in public bus transportation and suicide bomber attacks Y_1^1 stands for the use of public bus services by type 1 persons, ("investors"), in periods when terror strikes, where Y_1^0 stands for their use of public bus transportation under no suicide bomber attacks. Similarly, Y_0^1 and Y_1^0 stand for consumption of moderate consumers when terror strikes and under no terror respectively. Ignoring other covariates (or assuming that these have already been conditioned out), potential outcomes are determined by the treatment state $(0,\ 1)$. For the sake of simplicity let us assume that outcomes exhibit the following linear form:

$$\begin{aligned} Y_1 = &\quad (b+d) \quad \cdot T \quad + U_1 \\ Y_0 = &\quad (b+0) \quad \cdot T \quad + U_0 \ , \end{aligned} \tag{7}$$

where b and d stand for the risk and fear effects respectively. Allowing unobserved heterogeneity to affect only the level of outcomes then the Differences-in-Differences estimator provides an unbiased estimate for the effect of terror via the fear channel only:

$$DID = [E(Y_1 \mid T=1) - E(Y_1 \mid T=0)] - [E(Y_0 \mid T=1) - E(Y_0 \mid T=0)] = d. \tag{8}$$

Identifying risk and fear aversion parameters using CRRA utility function

A simple measure of risk aversion is the Constant Relative Risk Aversion (CRRA) function. A special form of the CRRA which is much in used is the utility function $c^{(1-\alpha)}/(1-\alpha)$. Therefore we restrict the utility function to be of the constant relative risk aversion class of the following form:

$$W_i = a_i \frac{c_1^{(1-\alpha)}}{(1-\alpha)} F^{-1} + \frac{c_2^{(1-\alpha)}}{(1-\alpha)}, \tag{9}$$

where the parameter α measures the curvature of the utility function and F stands for the "fear" discount factor. The fear factor is determined by the level of terror and the investment made by decision makers. To simplify without losing generality, we assume that fear can be eliminated. In order to do so individuals must pay a fixed monetary cost of $M = m$. We further assume that terror incident, by generating fear, depreciate the utility from consumption of the risky good (c_1) at a constant rate and takes the following functional form:

$$F_i(S, \gamma, M) = D_i + (1 - D_i) \exp(-\theta \cdot T) \tag{10}$$

where T stands for the level of terror, D_1 is a binary variable which equals 1 if person i invest in mental capital (and 0 otherwise) and θ is the rate at which terror depreciates the marginal utility from the risky good as long as consumers do not invest in eliminating fear.

By substituting (9) and (10) into the FOC in (see Appendix A.1) and taking logs the optimal consumption of c_1 (in logs) can be expressed as a linear function of terror incidents, in addition to the monetary and non monetary cost:

$$\begin{array}{lll} \ln c_1^0 = & \frac{1}{\alpha}\ln\lambda - \frac{\theta}{\alpha}T & -\frac{1}{\alpha}\ln\left(p_1 + \gamma\left(W_i^{0,*} - I_i^{0,*}\right)\right) \quad + \ln a_i^0 \\ \ln c_1^1 = & \frac{1}{\alpha}\ln\lambda & -\frac{1}{\alpha}\ln\left(p_1 + \gamma\left(W_i^{1,*} - I_i^{1,*}\right)\right) \quad + \ln a_i^1 \end{array},$$

where $\ln c_1^0$ and $\ln c_1^1$ stand for the consumption of those who choose to invest and the others respectively. Assuming that $E\left[\left(W_i^{0,*} - I_i^{0,*}\right) \mid I\right] = E\left[\left(W_i^{1,*} - I_i^{1,*}\right) \mid I\right]$ then for $p_{1,t} = p_1$ the Differences-in-Differences estimator provides us with an unbiased

estimate of the fear-risk ratio $\frac{\theta}{\alpha}$:

$$DID = \left[E\left(\ln c_1^0 \mid T=1\right) - E\left(\ln c_1^0 \mid T=0\right)\right] - \left[E\left(\ln c_1^1 \mid T=1\right) - E\left(\ln c_1^1 \mid T=0\right)\right] = -\frac{\theta}{\alpha}. \tag{11}$$

4 The data

In this study we take advantage of various data sets, some of them collected and constructed especially for the sake of this study, in order to explore different aspects of terror and fear on persons' economic activities. We employ both aggregated as well as micro data, from the US and Israel. The study of the US data is qualitative based on comparing between outcomes before and after September 2001. The ongoing violence in Israel is characterized by weekly and sometimes daily incidents. We documented all incidents, by type, date, location, consequences (casualties) and media converge. As for the outcomes: we focus on consumption outcome assuming no rents at the margin. We focus on "infected" activities such as the use of air flights in the US and the use of public bus transportation in Israel. Following our model we focus on the study of micro data that provides us with treatment and control groups.

Consumption data is based on the Israeli Central Bureau of Statistics (CBS) expenditure surveys. These data are collected (also) at the daily level. The detailed data is not available for public use. Following our request the Israeli CBS established a particular data set for our use.

In addition to that we study the effect of terror on the labor market outcomes of risky-terror jobs: US pilots, Israeli bus drivers and security guards. We take advantage of the Current Population Survey files over the past 5 years to estimate the change in pilots' employment and wages over time. We study the labor market outcomes of bus drivers and security guards in Israel using both the Israeli CBS labor force surveys as well CBS income surveys.

5 First glance at the data

We preview our rigorous estimation of the effect of fear with a set of evidence on the overall effect of terror on the consumption of terror infected goods and the labor market outcomes of those who provide them.

The effect of terror on the use of terror-struck transportation means:

In the US as well as in Israel, terrorists took advantage of transportation facilities (air flights in the US and public line buses in Israel) to commit deadly suicide attacks. It would be almost natural to start our empirical study by estimating the effect of deadly terror events on the use of these facilities in both side of the Atlantic. Four main facts emerge: (i) Terror affects the use of air flights in the US and public transportation in Israel; (ii) The decline in the number of air passengers in the US after September 11th 2001 was approximately 10 percentage points above and beyond the effect of the economy on the use of air transportation facilities; (iii) We find similar results for Israel: the usage of public transportation (buses) is about 20 percentage points lower in months when suicide bomber attacks took place on buses; (iv) The number of passengers in public buses is affected ONLY by suicide bomber on buses, and not by other types of terror, not carried out on buses.

The use of air transportation in the US

To estimate the effect of terror on the use of air flights we compare the number of air passengers before and after the tragic events of September 11th 2001. We do so by taking advantage of monthly data on domestic air passenger miles and freight ton-miles, for the years 1979 to 2003 (April) drawn from the U.S. Department of Transportation, Bureau of Transportation Statistics and Air Carrier Traffic Statistics.

The use of air flights was growing constantly since it became available to public use, (see data since 1979). Data from 1979 show that passengers' air miles were growing at an annual rate of 2.5 percent, with little fluctuations around the trend (see Figure 1.USA). This also holds for the air freight ton miles (Figure 2.USA). The use of air transportation is presumably also affected by fluctuations in economic activity (although we find a low correlation between the de-trended air passengers' time series and the aggregate unemployment rates). Hence, comparing the number of air passengers before and after September 11th 2001 may generate a biased estimator for the effect of terror events on the use of air transportation by the public. Therefore, we use the change in air fright ton-miles as an instrument for the effect of other factors besides terror on the usage of air transportation facilities. Note that this is basically a Differences-in-Differences estimator which is widely used by labor economist especially in time-series analysis ("before" and "after")

Findings: The use of air transportation by passengers shrank by about 15% percentage point just after September 11th 2001. In fact, we find that by the end of 2003, air passengers' figures were still lower than before September 11th. Controlling for long run trends as well as for economic fluctuations, an even more contrasted picture emerges. We find that the ratio of air passengers to air-fright shrank by about 10 percentage points just after September 11th 2001. By the end of 2003 we find no evidence for a recovery in the use of air transportation. It is worth noticing that the ratio of air passengers to air-frights was constant since the mid 1990s, suggesting that the decline in 10 percentage points in this ratio reflects the treatment effect of terror on the use of air transportation. As Table 1.USA shows, the decline in the ratio of air passenger to air freight, since September 2001, is significant.

Finally we take an anecdotal look at the flights from/to New-York City (NYC). To control for heterogeneity in the economic activity within the US, we examine the change in the number of passengers in international flight from the US to out of the country. According to the Department of Transportation, Bureau of Transportation Statistics data, the NYC-Paris and the Chicago-London are the top 2 international routes. Comparing the number of passengers using these routes before and after September 2001, we find that the ratio of NYC-Paris to Chicago-London declined by more than 10 percentage points, showing no recovery until mid 2003.

The use of public bus transportation in Israel

Many suicide bombers terror attacks in Israel took place in public buses. These days, pictures of exploded buses are familiar to many around the world. Therefore, we start our analysis of the Israeli data by estimating the effect of terror events, measured by the number of deadly events, suicide bombers attacks, fatalities, and other indicators, on the use of public ground transportation in Israel.

The ongoing violence, characterized by weekly and sometimes daily deadly events, enable us to estimate, not only the long-run elasticities, but also the contemporaneous effect of terror on the use of public ground transportation.

The use of public buses is affected by other factors than terror. We take advantage of data sets constructed by the Israeli Central Bureau of Statistics (hereafter: CBS). The Israeli CBS provides monthly data about revenues and prices of the bus transportation industry in Israel. Data is disaggregated by type of lines into two main categories: (i) regular lines, within and between cities, and (ii) special lines which stand for tourists or other organized travels. It is worth noticing that none of the terror attacks was

carried on a special line bus. Therefore we study the effect of terror by comparing the change in the number of passengers in regular lines – where all terror events on buses took place – with the change in the number of passengers in the special lines. We do so using monthly data collected by the Israeli Central Bureau of Statistics.

Findings: The number of passengers, proxied by price adjusted revenues, shows almost no change till the third quarter of 2001. (see Figure 1.ISR). During the first year of violence, since October 2000, terror was not carried out on buses. (see Figure 2.ISR). To control for other factors than the effect of terror on the usage of public transportation we look at the ratio of passengers in regular lines to passengers in special lines. As this series shows, the period between January 2000 and April 2003 can be divided into two sub periods, before and after October 2001 (! – is it just a coincidence? I am not sure – it is worth checking). As Figure 4.ISR makes clear, the ratio of passengers in regular line to special lines after October 2001 declined by about 1/4 than the ratio before that. Note that the average number of suicide bomber attacks per month was approximately 1 during the months after October 2001, yet we observe none at the period before. Simple back of the envelope calculation suggests that the effect of a ("successful") suicide bomber attack carried out in public buses decreases the number of passengers by about 25 percentage points.

Closer look at the data: The negative correlation between the number of passengers in the regular bus lines and the number of suicide bomber attacks carried out on buses might reflect other factors than the causal effect of terror on the usage of public transportation. We therefore take our analysis one step further. The detailed Israeli data (collected by the authors) allow us to distinguish between suicide bomber terror attacks which were carried out on buses and other terror events, including suicide bomber, in other places. Note that if indeed, the fear associated with terror attacks, is the underlying process generating the observed stylized facts, then we should find that the number of passengers using regular lines is affected by suicide bombers attack carried out on buses rather than by other terror events.

We take this hypothesis to the data. We find that (see Table 1.ISR) the number of passengers in regular lines in months in which suicide bomber attacks occurred was about 20 percent lower than in months in which no suicide bomber attacks is carried out on buses. As Table 1.ISR makes clear, the number of passengers in regular lines is correlated with other indicators of terror incidents (with fatalities). This holds

through a wide range of indicators such as: the total number of suicide bomber attacks (in the present month), the number of terror incidents with fatalities, the number of people killed etc. By introducing all variables together, without restrictions, we find that ONLY suicide bomber attacks carried our on buses affect the number of passengers using the regular lines. Our estimates indicate that a suicide bomber attack decreases the number of passengers in regular lines by approximately 20 percentage points. Conditional on the number of suicide bomber attacks carried out on buses, we find that other terror events had no significant effect on the number of passengers using the regular lines. In fact, as Table 1.ISR makes clear, the point estimators (of some of them) are literally zero (0).

So far we estimated the instantaneous effect of terror attacks on the number of passengers. Since fear is more likely to have "post" rather the "pre" effects we took a closer look at the time structure. We find that (i) Introducing the lagged (last month) number of suicide bomber attacks carried out on buses we find that much of the effect is noticed one month after the attack. Note that in this analysis we use aggregate monthly data. Results suggest that much of the effect takes place in the week(s) after the attack; (ii) Finally we show that our findings are robust to different cut points of the data (see table 3.ISR).

The effect of terror on the labor market outcomes of risky-terror jobs: US pilots, Israeli bus drivers and security guards

The labor market outcomes of US pilots

In this section we study the effect of September 11th on the wages and employment of pilots in the US. We take advantage of the Current Population Survey files over the past 5 years to estimate the change in pilots' employment and wages over time.

Two main findings emerge: First, the relative wages of pilots shrank by about 15 percentage points, which is about 1/2 of their wage premium. In addition to that their employment rate decreased by 5 percentage points. Hence, we find no evidence for an increase in pilots' compensations pointing out the role of the change in the demand for air transportation services in determining pilots' labor market outcomes. In the rest of this sub-section we describe the data set we use and our findings.

Data These data come from a series of 60 consecutive Current Population Surveys Monthly files (hereafter: CPS) from January 1998 to December 2002. The CPS sample

is a probability sample. The sample is designed primarily to produce national and state estimates of labor force characteristics of the civilian noninstitutional population 16 years of age and older.[8]

The vast majority of empirical analyses of the CPS data either use a single cross-section data point, or a series of consecutive CPS surveys, treating them as a series of repeated cross-sections. The CPS data have, in fact, a longitudinal component. In this paper we take advantage of the CPS basic monthly files - a probability sample of housing units in the US - to construct a panel data. Sample is partitioned into eight representative sub-samples called "rotation groups" used in the CPS rotation scheme. The rotation scheme follows a 4-8-4 pattern. Each unit is interviewed for four consecutive months, followed by two quarters of break, and then by another four monthly interviews. Overall, eight interviews are dispersed across 16 months, which means that each household is (potentially) observed at the same months for two consecutive years. Wage data is collected only during the fourth and the eighth interview - among what is known as the "outgoing rotation groups." Data on schooling, employment, occupations and industries, is available for the entire sample.

If there is no change in the composition of occupants, we have a panel of individuals. Yet, since people switch locations, it might be the case that the same id number was being shared by two (or more) individuals over time. Following Madrian and Lefgren (1999) individuals are identified in our panel data not only by their ID number but also by matching a set of time-invariant characteristics. In this way we can be sure that we do not combine different persons into one artificial observation. The likelihood to be observed over 16 months might vary with age and education. We do find differences by age, (see appendix) however we do not find evidence for differences between education categories.

Employment

Using a balanced sub-sample of men aged 25 to 54 who report working before September 2001 we study the effect of September 11th on pilots' employment outcomes.[9] The idea is quite simple, we compare the probability of pilots to be non-employed after September 2001 with the probability of other male workers. We estimate both non-employment and unemployment rates (non-employment for those who choose to participate). We present our findings in Table 2.USA. Panel A and panel B show the probit estimates for the change in the non-employment and the unemployment rates

[8] For further details see CPS official web site www.bls.census.gov/cps/cpsmain.htm

[9] Overall we observe about 900 pilots in our sample less than 5 percent of them women. Thus we restrict our sample to include men only.

respectively.

The first column in each panel shows the average non-employment rate, since September 2001, of those observed working as pilots before September 2001 relative to the average non-employment rates in the sample population. The number 0.042 at the first column of this table means that the non-employment rate of pilots is 4.2 percentage points higher than the non-employemt rate of the average male in this sub-sample. As this table makes clear, pilots post September 2001 employment rates are about 5 percentage points lower than the employment rates of men with similar observed characteristics. Yet, as this table shows, much of it, is common to the air transportation industry rather than a pilot effect. These findings also hold for the sub-sample of participants.

Wages

In this section we estimate the change in pilots relative wages after September 2001. The (relatively) negligible change in employment rates after September 2001 suggest that cross-section comparison would not be meagerly contaminated from composition bias. We therefore estimate the effect of September 11th on pilots' wages by comparing their relative wages before and after. We use a sub-sample of full-time male workers.

We present out findings in Tables 3.USA (a and b). As Table 3.USA makes clear male pilots earned, before September 2001, about 30 percentage points more than their counterparts. This does not hold for the period after September 2001. Pilots' hourly wages after September 2001 were about 15 percentage points lower (relative to others' wages) then they used to be.

The wages and the employment of Israeli bus drives

In this section we study the effect of terror on the labor market outcomes of Israeli bus drivers. We address two questions: First, does terror affect the wage compensation of bus drivers? Second, are bus drivers less likely to keep their jobs when terror, in the form of suicide bomber attacks carried out on buses, takes place?

We take advantage of aggregate data collected by the Israeli CBS on wages in the Israeli transportation industry as well as the Israeli CBS Labor Force and Income Surveys for estimating the effect of terror incidents, and especially suicide bomber attacks carried out on buses on the real wages and employment of Israeli bus drivers.

Using our aggregate data we find that the mean wage per driver was higher during months with higher number of suicide bomber attacks than in months with no suicide bomber attacks carried out on buses. This does not hold for the micro data. We

find no change in the conditional wages of bus drivers between quarters with more or less suicide bomber attacks. Employment data suggests that the change in mean wages may reflect a composition effect rather than treatment effect of terror. We find that Israeli workers are less likely to be employed as bus drivers in quarters with more suicide bomber attacks in comparison with quarters with less suicide bomber attacks. If the change in the fraction of workers employed as bus drivers reflects mainly demand shocks (rather than supply shock) the slight change in the unconditional mean wages may reflect changes in the composition of bus drivers rather than an increase in the compensation bus drivers get.

First glance on the wages of bus drivers using aggregate data Public bus transportation in Israel, excluding tourist or special lines, is operated solely by two co-operatives EGGED and DAN. EGGED, Israel's biggest public transportation company provides services in the entire country but the Tel Aviv (hereafter: TLV) metro area. DAN controls the TLV metro lines. In addition to cooperative members, these companies hire salaried workers both for driving and non-driving jobs. Public transportation in Israel is regulated by the Israeli government. Prices in regular lines are under government control. EGGED and DAN are subsidized by the government based on their outputs. This is presumably one of the main reasons that the CBS collects detailed data on the public transportation industry, including wages by workers classification.

The Israeli CBS provides the wages (indices) of cooperative members , salaried workers and drivers. We take advantage of CBS disaggregation into drivers and all other workers to study the effect of terror attacks on the wages of those exposed to risk and fear.

It is worth noticing that the mean wages in Israel declined by 8 percentage points since 2000. We therefore estimate the effect of fear and risk using the relative wages of drivers, salaried workers and cooperative workers. We identify the overall risk and fear effects by comparing the change in drivers' wages relative to cooperative member wages. We present our findings in Table 4, Table 5 and Table 6.

Table 4.ISR presents the OLS estimates for the contemporaneous effect of suicide bomber attacks carried out on buses on the relative wages of bus drivers.

Two main facts emerge from Table 4.ISR. While suicide bomber attacks carried out on buses does affect the mean wages of bus drivers, we find that other terror events have no effect on bus drivers' wages.

The first column in Table 5 shows the OLS regression coefficient of log wages on

the number of suicide bomber attacks carried out at the same month. The number 0.054 means that on average the wages of drivers are about 5 percentage points higher during months when one suicide bomber attack carried out on a bus occurs than during months when no suicide bomber was carried out on a bus. Columns (ii) and (iii) show that we find no similar effect of the overall number of suicide bomber attacks nor the number of deadly events. The point estimators are approximately 0. Allowing all type of terror incidents to affect drivers' wages (columns (iv) and (v)) we find that only the number of suicide bomber attacks carried out on buses affects drivers wages.

In column (vii) we introduce, in addition to details of terror incidents data, the wages of cooperative and salaried workers. As this column makes clear, terror suicide bomber attacks carried out on buses increases the mean wages of drivers above and beyond the mean wages of their colleagues. In other words, the effect of terror attacks on drivers' wages cannot be attributed to the mean wages in the transportation industry.

So far we estimated the instantaneous effect of terror attacks on drivers' wages. In Table 5 we take a closer look at the timing. Introducing the lagged (last month) number of suicide bomber attacks carried out on buses we find that much of the effect is noticed one month after the attack. Assuming wages do not immediately respond, these findings may point to the role of suicide bomber attacks carried on buses in the real compensation of drivers.

Closer look using micro data Do bus driver earn more in periods with higher levels of terror attacks carried out on buses? In this sub-section we take advantage of the Israeli Labor Force and Income surveys for the years 2000 through 2002 to study this question (and others). [We provide details on the Israeli Labor Force and Income Survey in the section on security guards].

We start by estimating the effect of suicide bomber attacks carried out on buses on the wages of bus drivers. Table 7.ISR shows the OLS estimators for the effect of suicide bomber attack carried out on a bus on the wages of bus drivers. As Table 7.ISR makes clear, we find no effect of terror on the conditional wages of bus drivers.

We next take a first glance on the effect of terror on the likelihood to serve as a bus driver. We estimate the likelihood of workers to be employed as bus drivers as a function of the number of suicide bomber attacks carried out on buses. We present our findings in Table ISR.8. The first row shows the probit estimates of the change in the probability to be employed as a bus driver between quarters with N-1 suicide bomber attacks carried out on buses and quarters with N attacks. In the second row

we estimate the effect of suicide bomber attacks which were NOT carried out on buses.

We estimate these probabilities first using the population sample of workers and then separately using a sub-sample of all types/classes of professional drivers. All specification include the aggregate controllers such as the total number of buses as well as personal characteristics such as education, origin and marital status.

Two main facts emerge: First, as Table ISR.8 makes clear, while suicide bomber attacks carried out on buses do affect the likelihood to be employed as a bus driver this does not hold for suicide bomber attacks which were not carried out on buses. Second: drivers, as expected, are more likely to be affected than others do.

The market for security guards in Israel

Since the State of Israel was established in 1948, a 3 years military service is mandatory to every man and woman (2 years) aged 18 (with some exceptions). Approximately 20 thousand soldiers died over the last 50 years in wars and other waves of violence (equivalent to 1 million Americans). Not surprisingly the mandatory army service is being viewed by many as the entry pass to the Israeli society.

Despite the substantial growth in the population of Israel over the past five decades,voluntary army is still out of the consensus. The popular view is that money may (perhaps) buy love but it cannot buy soldiers who will be willing to put their lives in danger. It is thus surprising to find that private security guards were involved actively in a substantial number of terror incidents. This "puzzle" was not ignored by the Israeli public opinion. (see articles pointing out to the role of the private security guards).

We take advantage of the Israeli Labor Force and Income surveys for the years 2000 through 2002 to study the effect of terror on (i) the demand for private security guards and (ii) the compensation of private guards.

We preview our analysis with a few basic facts. Table ISR.9 shows the fraction of Israelis employed either as policemen or as private security guards. Three major facts emerge. First, more than 1 percent of Israelis aged 22 to 65 report being employed either as policemen or security guards. Since these numbers exclude the cohorts of birth aged 18 to 21, this fraction underrates the share of male and female occupied by the security sector. Second, more than 4 percentage points of prime aged male workers are employed either as policemen or as security guards. Third, 3/4 of them are employed by the private sector. Hence, at least as measured by the number of workers, much of the security services in Israel are being provided via the labor markets.

We next proceed to estimate the effect of terror on the demand for security guards.

Table ISR.10 shows the Probit estimators of the likelihood of an Israeli worker to be employed either as a policeman or as a private security guard. In the first panel we do not distinguish between the public and the private sector. In the second and the third panels we estimate the likelihood to be employed as a policeman or as a private security guard respectively. We measured terror using both the average number of suicide bomber attacks during the quarter as well as the number of Israeli fatalities. In all specifications we control for personal characteristics such as education, age, marital status and origin (Asia-Africa, Europe-America etc.). In addition we distinguish between veteran Israelis and immigrants from the former USSR who immigrated to Israel since 1989. Two main facts emerge from Table ISR.10: First, the fraction of Israelis employed as policeman/guards responds to the level of terror. Second, this is solely via the private sector. For instance, the likelihood of being employed as a private security guard is 0.7% higher in a quarter with one suicide bomber attack per month than in a quarter with no suicide bomber attacks which turn to be about 30 percents higher than the probability of the average Israeli worker to be employed as a private security guard when there are no suicide bomber attacks.

Who are those who switch to work as private security guards when the level of terror goes up? We take advantage of the panel structure of the Israeli Labor Survey to address this question. Like the US Current Population Survey Monthly files, the Israeli Labor Force Survey (hereafter: LFS) is a probability sample. The sample is designed primarily to produce national labor force characteristics of the civilian noninstitutional population 15 years of age and older.

The LFS data have, in fact, a longitudinal component. In this paper we take advantage of the LFS basic quarterly files - a probability sample of housing units in Israel - to construct a panel data. Sample is partitioned into four representative subsamples called "panels" used in the LFS rotation scheme. The rotation scheme follows a 2-2-2 pattern. Each unit is interviewed for two consecutive quarters, followed by two quarters of break, and then by another two quarters interviews. Overall, four interviews are dispersed across 18 months. Wage data is collected only for the fourth panel that is in the last interview. Data on schooling, employment, occupations and industries, is available for the entire sample. For reasons of privacy the Israeli CBS split the information collected into two separate files: (i) the Labor Survey file with detailed information on employment status and personal characteristics, and (ii) Income survey file, with the earnings data and the basic personal characteristics. Personal ID numbers were scrambled in order to avoid trivial matching of these files. Using a vector of

personal and family characteristics which overlap in both files we were able to construct an algorithm which identifies individuals within each file. Hence, we create a new ID which is based on personal characteristics available in both files. Using our ID we are able to match the "observations" in the LF file with the "observations" in the Income Survey. In Table ISR.12 we take advantage of the panel structure of the LFS.

We split workers into those who were employed during the previous interview (last quarter) and those who were not. We estimated separately for these groups the likelihood to be employed as a private security guard. We present the Probit estimators (in fact the dF/dX - the change in the probability for an infinitesimal change in each independent, continuous variable and, by default, the discrete change in the probability for dummy variables). As Table ISR.12 makes clear, the added security guards come from the pool of those who were not employed during the previous quarter. Rows (10) and (11) in Table ISR.12 show the observed and the predicted probability to be employed as a private security guard. Approximately 6 percent of former non-employed report working during the week of interview as private security guards. This is three times higher than the average fraction among their employed counterparts. We find that the likelihood of former non-employed to be working as a security guard to be 1.5 percentages higher in quarters with an average of N suicide bomber attack than in quarters with an average of N-1 attacks. This is an increase of about 25 percent in their conditional probability to serve as a private security guard. We find almost no effect of suicide bomber attacks on the probability of their counterparts to be employed as security guards.

Following the collapse of former USSR, about 1 million immigrants arrived to Israel during the 1990s. As in other countries, the Israeli labor markets do not treat immigrants as their veteran counterparts. (for further details see:). Therefore we may expect an increase in the demand for security guards to have a larger impact on recent immigrants than on veteran. We re-estimate the likelihood to be employed as a private security guard separately for those who migrated to Israel since 1989 and veterans. We report our findings in Table ISR.13. As expected we find that the effect of suicide bomber attacks on the probability of immigrants to be employed as security guards is significantly higher than on veterans.

Finally we estimate the effect of suicide bomber attacks on the wages of security guards. Table ISR.14 shows the OLS estimators of a suicide bomber attack on the wages of policemen and private security guards. As Table ISR.14 makes clear, private guards earn approximately 40 percentage points less than their counterparts. Given

our main identifying assumption that terror attacks are exogenous both to outcomes as well to other explanatory variables, the OLS generates an unbiased estimate for the average effect of suicide bomber attacks on the wages of drivers. We find that suicide bomber attacks have no effect on the wages of bus drivers.

First glance at the role of fear

The fact that consumption is more likely to be affected by terror than labor market outcomes is consistent with our theory, however one could suggests alternative explanations. For instance, pilots who invest and accumulate specific skills may find it too expensive to quit. As Table US.3 shows, pilots still earn 15 percentage points more than their counterparts. This does not hold for Israeli bus drivers. The average wage of an Israeli bus driver is not significantly higher than the mean wage of their counterparts.[10] If the cost of quitting a bus driver job is higher than the cost of waiting for a while before taking it, our theory predicts that current drivers have more incentive to overcome fear than potential drivers do. Note that this does not hold for temporary jobs as unskilled security guards. In these jobs we expect current workers and others to be similarly affected from terror.

In this section we test these predictions using Israeli data on bus driver and unskilled security guards. We take advantage of the LFS panel structure to estimate the effect of terror on the likelihood to be work as a (i) bus driver, (ii) security guard, separately for those who already work as (i) or (ii) and others. Following our previous findings we use the number of suicide bomber attacks to measure the level of terror. We present our findings in Table ISR.15 and Table ISR.16.

Two main facts emerge from these tables: (i) terror does not affect the likelihood of bus drivers to quit their jobs. This does not hold for their counterparts. (ii) we find no effect of terror on the likelihood to serve as private security guard. This holds both for those who already serve as security guards as well as their counterparts. These findings provide evidence in favor of our theory. Table ISR.15 shows the Probit estimators for the effect of suicide bomber attacks on the likelihood to serve as bus driver. Table ISR.15 consists of two panels. In the first column we show the effect using the population sample of current workers. In columns (ii), (iii) and (iv) we restrict our sample to those we observed working two quarters ago. Among those observed working in time t-2 we distinguish between all workers (ii) all drivers (iii) and sub-sample of bus drivers and taxi drivers only (iv). The idea is quite trivial, if taxi-drivers are more

[10] See Table ISR.7.

likely to work as bus driver than the average worker, then this sub-group should be used as a benchmark group. The first row shows the effect of suicide bomber attacks on the likelihood of persons from the benchmark group to be working as bus drivers. The second row presents the effect of suicide bombers attacks carried out on buses on the likelihood of bus drivers at t-2 to serve as bus drivers at time t, above and beyond its effect on the benchmark group. As Table ISR.15 makes clear, the level of terror on buses does affect the likelihood of those non bus drivers to serve as bus drivers. This is especially strong among taxi drivers. The probability that a worker observed working as taxi driver half a year ago to be working as bus driver today is approximately 20 percentage points during quarter with N suicide bomber attacks carried out on buses than in quarters with N-1. This does not hold for that report working as bus drivers half a year ago. For them we find no significant change in their likelihood to serve as bus drivers. The differential effect, in this case, is consistent with our theory.

We next proceed to estimate the differential effect of terror in the case of unskilled jobs – private security guards. We present our findings in Table ISR.16. We find that suicide bomber attacks have no effect on the likelihood to serve as a private security. This holds both for those who already work as guards as well as for their counterparts.

6 Estimating the effect of fear

We take advantage of the Israeli Expenditure survey for the years 1999 through 2002 to estimate the effect of fear caused by terror on consumption plans. We report our findings in Table ISR.17 through Table ISR.21. We estimate the effect of terror and identify the role of fear using data on the usage of public bus and taxi services and expenditures in coffee shops. We take advantage of personal observed characteristics to instrument consumption in times with no terror in order to identify the *ceteris paribus* effect of fear.

Estimating the treatment effect of fear using micro data on the usage of public bus services

We start by estimating the effect of suicide bomber attacks carried out on buses on the use of public bus services as reported by households. The vast majority of suicide bomber attacks took place in Haifa, Jeusalem and the Tel-Aviv area.[11] Therefore, taking advantage of our micro data, we distinguish between the population in these cities and in the rest of the country. We report our findings in Table ISR.17. Four main facts emerge: (i) a suicide bomber attack carried out on a bus decreases the use of public bus transportation by approximately 30 percentage points, (ii) neither fatalities nor other measures of terror affect the use of public buses, (iii) the effect varies over cities; though it affects consumption in the most populated cities (that experienced suicide bomber attacks), it has almost no effect on the use of public bus services in other locations. The effect of terror carried out on buses is well reflected in the use of taxi services. We report our findings in Table ISR.18. As this table shows, suicide bomber attacks increase the use of taxi services only in the largest cities.

So far we have shown that the use of public bus services responds to terror as projected by our theory. To distinguish between our theory and alternative explanations we compare the effect of terror on the use of bus services by high and low frequency users. We do so by comparing the effect of terror on the consumption paid by daily tickets with the effect of terror on the use of bus services of multiple-rides ticket holders or monthly pass holders. We report our findings in Table ISR.19. We find that a suicide bomber attack carried out on a bus affects the use of public bus transportation solely by affecting low frequency daily use. That is, a suicide bomber attack decreases the use

[11] Disaggregating the population into location which had experienced suicide bomber attacks carried out on a bus and other location makes the difference between the groups even stronger.

of public bus services paid on a daily basis by almost 40 percentage points, having no effect on the use of public bus services paid on a monthly/weekly basis. Table ISR.20 shows that it is not due to income effects.

Estimating the treatment effect of fear using micro data on consumption at coffee shops

Coffee shops, restaurants were as "popular" target for terror attacks as public buses. Some of the most "horrible" took place in restaurants and coffee shops. We take advantage of the Israeli expenditure Survey, which collects data on the consumption of food and beverages in restaurants/coffee shops. Employed with these data we estimate the average effect of terror incidents and identify the role of fear. We present our findings in Table ISR.21 and ISR.22.

We start by estimating the effect of terror incidents on consumption in coffee shops. We present our findings in Table ISR.21. The first panel shows the average effect of terror, as measured by either suicide bomber attacks carried out on a bus or the number of fatalities in the corresponding month on consumption. Note that suicide bomber attacks carried out on a bus have no effect on consumption in restaurants in contracts to the number of fatalities, reflecting other modes of terror. In column (ii) and column (iii) we disaggregated the population sample into those living in one of the three largest cities in Israel and others. We find that the number of fatalities affect consumption in the largest cities.

Finally we proceed to identify the role of fear. We do so by disaggregating the population sample into frequently users of coffee shops and others. We instrument that by peoples' martial status. To control for alternative explanations, we restrict the sample to include households reporting having no children. The first and the second panels show the effect of terror incidents on married and single populations respectively. To ensure that the correlations reflect the effect of terror, we use the number of suicide bomber attacks curried out NOT on a bus to measure terror. As column (i) and column (iii) make clear, terror affects the consumption of low frequency users having no effect on high frequency consumers. While a suicide bomber attack decreases the consumption of married people by 28 percentage points, it has no effect on the consumption of single people. To control for income and age effects (non parametrically) we restrict the sample to include people aged 22 to 35. We report our findings in columns (ii) and (iv).

Calibrating the fear and the risk aversion factors

We use the benchmark utility function employed in the macro and finance literature - the Constant Relative Risk Aversion (hereafter CRRA) - to estimate (calibrate) risk and fear aversion parameters.[12] The fear aversion parameter in our model stands for the rate at which fear depreciates the utility from consumption. The nature of this part in our proposed research is to search for parameters for which peoples' projected outcome match their observed outcomes.[13] We address two main issues. First, the extent that previous studies might have overstated people's risk aversion by ignoring their fears. Second employed with risk and fear aversion parameters we aim at evaluating the effect of terror or rare contaminating diseases on persons' utility and well-bring via these two channels.

Based on the results from the common coefficient specification we calibrate the risk aversion parameter for different levels of fear.[14] We report our findings in Figure ISR.5.

We find that if a suicide bomber attack carried out on a bus reduces the marginal utility of a bus ride by 20 percent - that is, the value of a 5 NIS ride drops by 1 NIS - then the risk aversion parameter which fits the data equals 1. Note that for a moderate deprecation of only 10 percent the risk aversion parameter needed in order to fit the data equals 1.5. In general, if a suicide bomber attack depreciates the utility from a bus ride by 5 percent or more we need risk aversion values that do not exceed three (3) to mimic the effect of suicide bomber attacks on the usage of public buses. Hence, our findings based on the respond of Israeli public to terror incidents are in agreement with Kydland and Prescott (1982) who found that the risk aversion parameter needs to be between one and two to mimic observed variability in aggregate consumption and investment.[15]

[12] A special form of the CRRA power function that has significant operational advantages is when a equals to one. In this case, so-called "everyone's utility function" postulated by Daniel Bernoulli (1738) the utility function is defined to be logarithmic function which is the limit of the above function as a approaches one.

[13] This class of questions is very popular in the Macro/Finance/Risk and Uncertainty literature (examples: Mehra and Prescott 1985, Rabin, 2000).

[14] What should be α? Arrow (1971) argues on theoretical grounds that α should be approximately one.

[15] Anderson and Dillon (1992) proposed a rough and ready classification of degree of risk aversion, based on the magnitude of the relative risk aversion coefficient, that some may find plausible: between 0.5 - hardly risk averse at all - to 3.0 very risk averse and 4.0 - extremely risk averse

Evidence from the "Mad Cow" crisis in France

Another prominent example for the role of fear in explaining large effects caused by low probability events is effect of what is known as "Mad Cow" Disease on the consumption of beef. The "Mad Cow" Disease (MCD) is the commonly used name for Bovine Spongiform Encephalopathy (BSE), and Creutzfeldt-Jacob disease (CJD) in people, is a slowly progressive, degenerative, fatal disease affecting the central nervous system of adult cattle. A variant form of CJD (the vCJD) is believed to be caused by eating contaminated beef products from BSE-affected cattle. BSE in cattle was first reported in 1986 in the United Kingdom (UK). Only since 1996, evidence has been increasing for a causal relationship between ongoing outbreaks in Europe of a disease in cattle, BSE, and a disease in humans, vCJD. To put things in perspective From 1995 through June 2002, a total of 124 human cases of vCJD were reported in the United Kingdom, 6 cases in France, and 1 case each in Ireland, Italy, and the United States.[16]

In this section we provide evidence from the "Mad Cow" crisis in France (1996), as reported by Adda (2001), to support our theory.

Employed with a unique data panel set which follows households before and after March 1996, just after the public was first informed of a causal relationship between the disease in cattle, BSE, and the new variant of the disease in humans, vCJD, Adda estimates the effect of the MCD on beef consumption. Adda estimates the effect of the MCD, as measured by the change in consumption of beef, allowing the effect to vary by the level of consumption households used to have prior to March 1996. According to Adda's (2001) findings, consumers who had previously eaten large quantitative of beef did not change their consumption while those with intermediate levels of past consumption decreased significantly their consumption.

We summarize the main relevant findings as reported by Adda in Table FRC.1.

[16] For further details see: http://www.cdc.gov/ncidod/diseases/cjd/bse_cjd.htm

7 Conclusions

In the aftermath of September 11, terror is no longer a phenomenon limited to particular areas of conflict. Outside academic journals it is common knowledge that the likelihood to be harmed by terror is very low. The "intense fear which is somewhat prolonged and refer to imagined or future dangers" (Webster Encyclopedic Unabridged Dictionary) is often attributed to peoples' "ignorance", either of the objective probabilities or the underlying process that generate a shock to the economy. Contrary to these explanations, we put forward an alternative theory based on the framework of a rational choice model.

We point to the role of *fear*. We argue that an exogenous shock to the underlying probabilities to be harmed affects peoples' choices in two different channels: (i) the *risk* channel: by changing the weights of the "good" and the "bad" states, as in the standard expected utility models; (ii) the *fear* channel: unlike the standard models, the probability to be harmed affects persons' utility in each state of nature. *Fear* can be managed. Persons can handle their fears. They do so by accumulating the necessary skills. Like other investments in human capital, it is not a *free-lunch* and it does not pay back the same to anyone. Those who are more likely to benefit from the risky activity will invest and overcome their fears, while others will substitute the risky activity by other consumption or production plans.

Using data from the US (before and after September 11th) and from Israel (during the last wave of violence starting in the year 2000) we identify the role of fear on economic behavior by comparing the effect of terror on people who face similar objective (and subjective) probability to be harmed, *but* different incentive for overcoming fear. We find that those who are more likely to be paying the fixed costs of overcoming the terror fear effects are less likely to be affected by terror. For instance we show that while terror does generate large effects on consumers, especially in low frequency usage like air passengers or bus passengers, it has little effect on the compensation (wages) of those employed in the infected industries. Suicide bomber attacks decreases the likelihood of drivers to serve as bus drivers, however it has no effect on the likelihood of bus drivers to quit their jobs. Using micro data on the use of public bus routes and taxis we find that suicide bomber attacks carried out on buses have a substantial negative effect on bus rides and positive effect on the use of taxis. Decomposing the treatment effect by the likelihood to use bus we find, consistent with our theory, that suicide bomber attacks affect those who are at the margin of using public buses, having no effect on others.

Finally, using our estimates we address the following question: to what extent should people's fear and risk aversion be in order to fit the data? We calibrate the *risk* and the *fear* aversion parameters restricting the utility function to be of the constant relative risk aversion class (CRRA). We find that if suicide bomber attack carried out on buses reduces the marginal utility of a bus ride by 20 percent then the risk aversion parameter which fits the data equals 1!

Fear is not limited to terror. Large scale effects generated by low probability events are part of our daily life. Needless to say that our model shed new insight on that too. Evidence from the "Mad Cow" crisis show, in accordance with our theory, that those who consumed high level of beef did not change their consumption at all while those who consumed less reduced their beef consumption substantially.

Terror takes advantage of people being human and rational. By generating fear, terror, even in the form of a low probability event, may generate substantial effects. Hence, terror generates large scale effect by damaging the quality of our life rather than the "quantity" of life.

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[25] http://www.cfsan.fda.gov/

[26] http://www.cdc.gov/

8 Appendix A.1

Insert file #2

9 Appendix A.2

Insert file #3

Figure T.1:
Consumption and Investment with and without Fear (F(S))

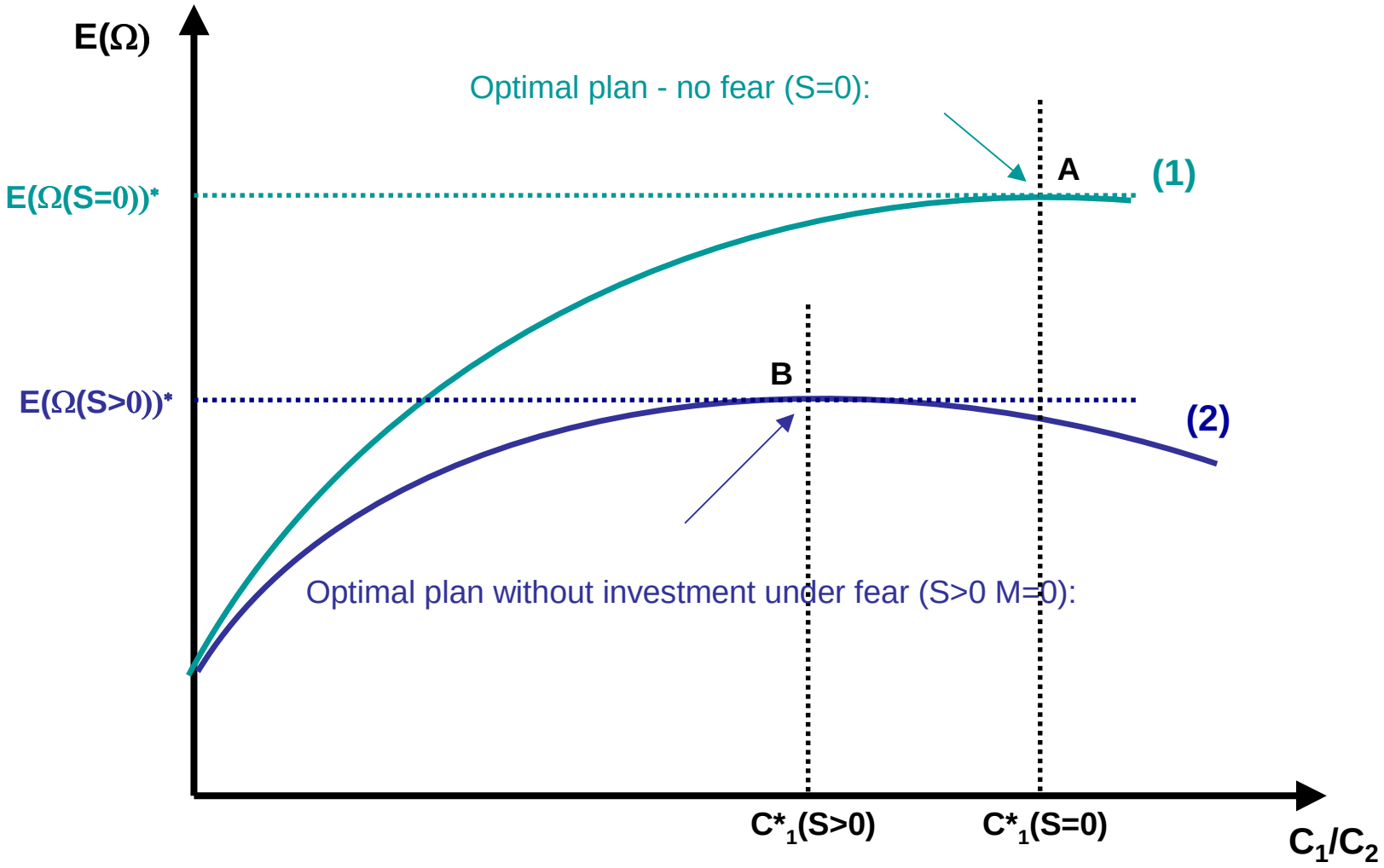


Figure T.2:
Consumption and Investment for C1 "Lovers"

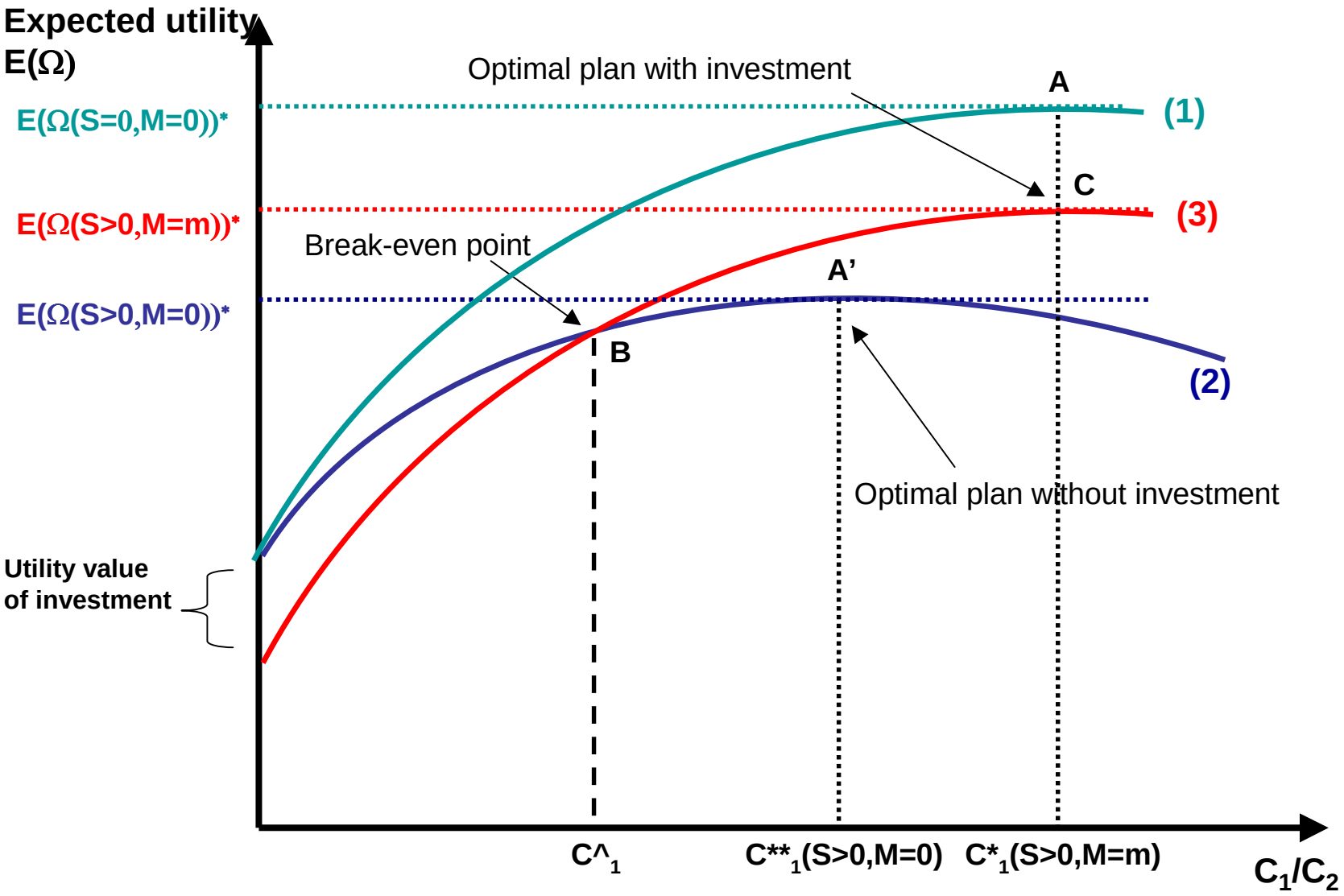


Figure T.3:
Consumption and Investment for C2 "Lovers"

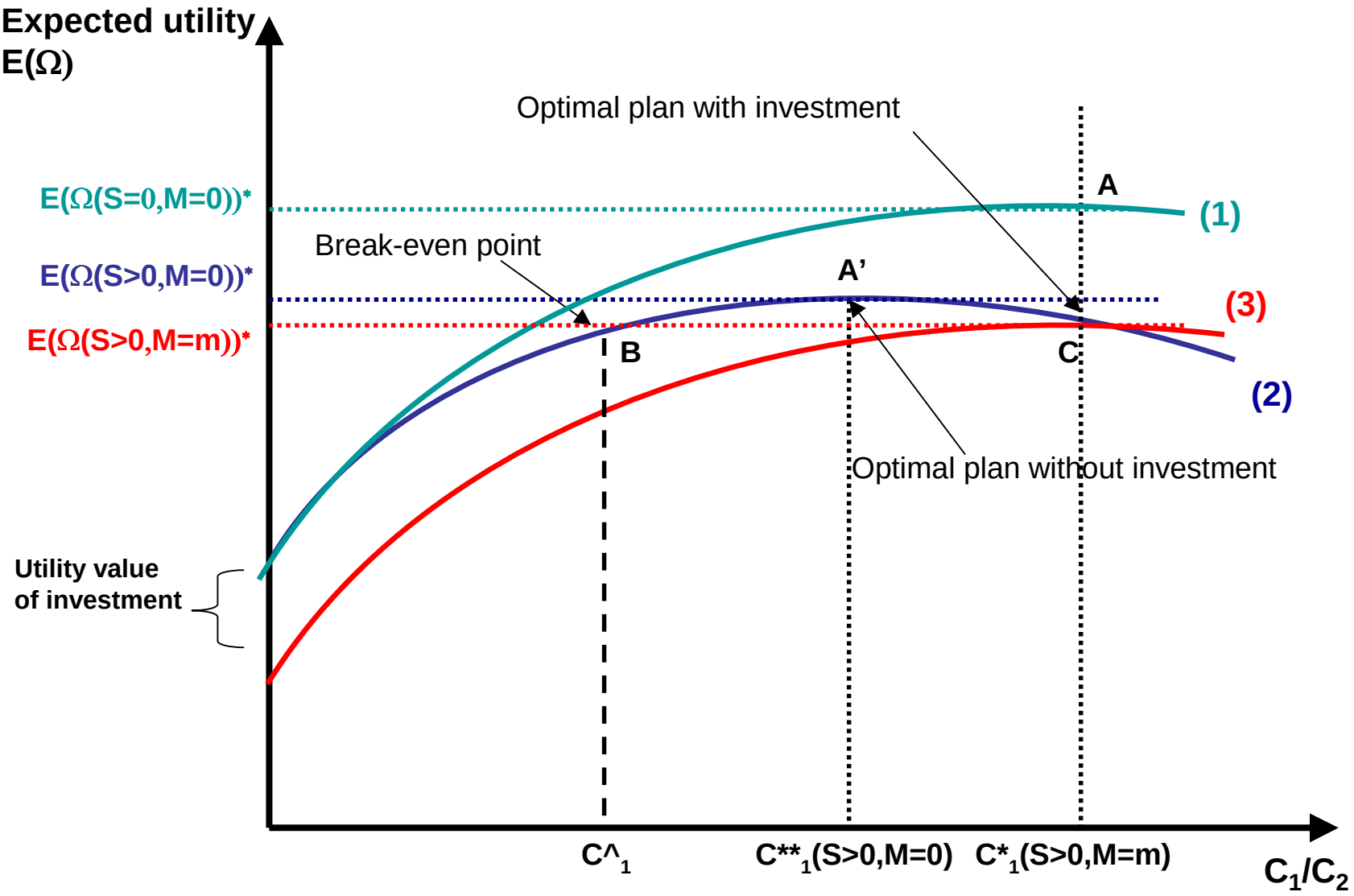


Figure 1.USA: Domestic Flights: Air Passengers

Domestic Air Seat and Passenger Miles (monthly data, not seasonally adjusted)

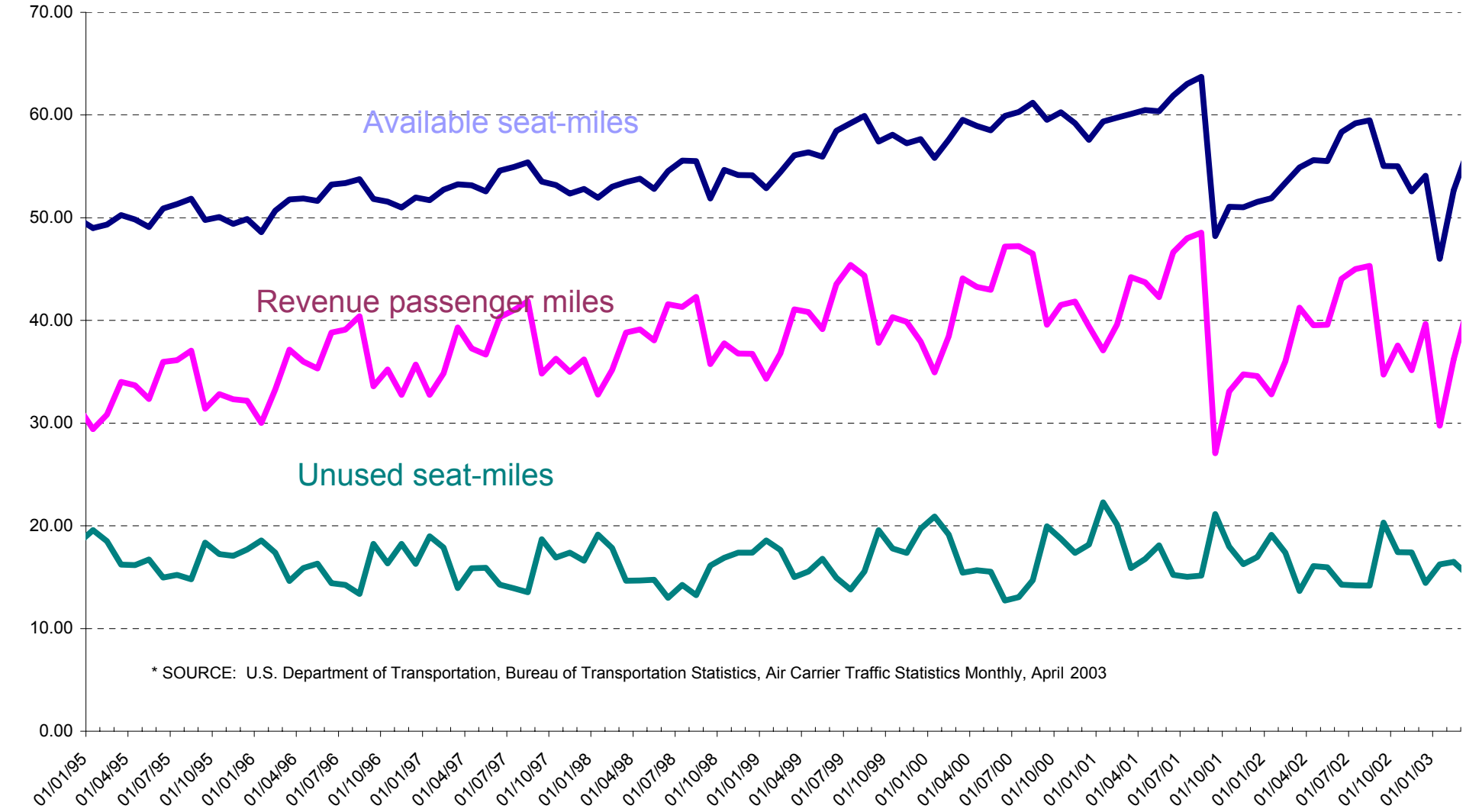


Figure 2.USA: Domestic Flights: Air Freight

Domestic Air Freight Ton-Miles (monthly data, not seasonally adjusted)

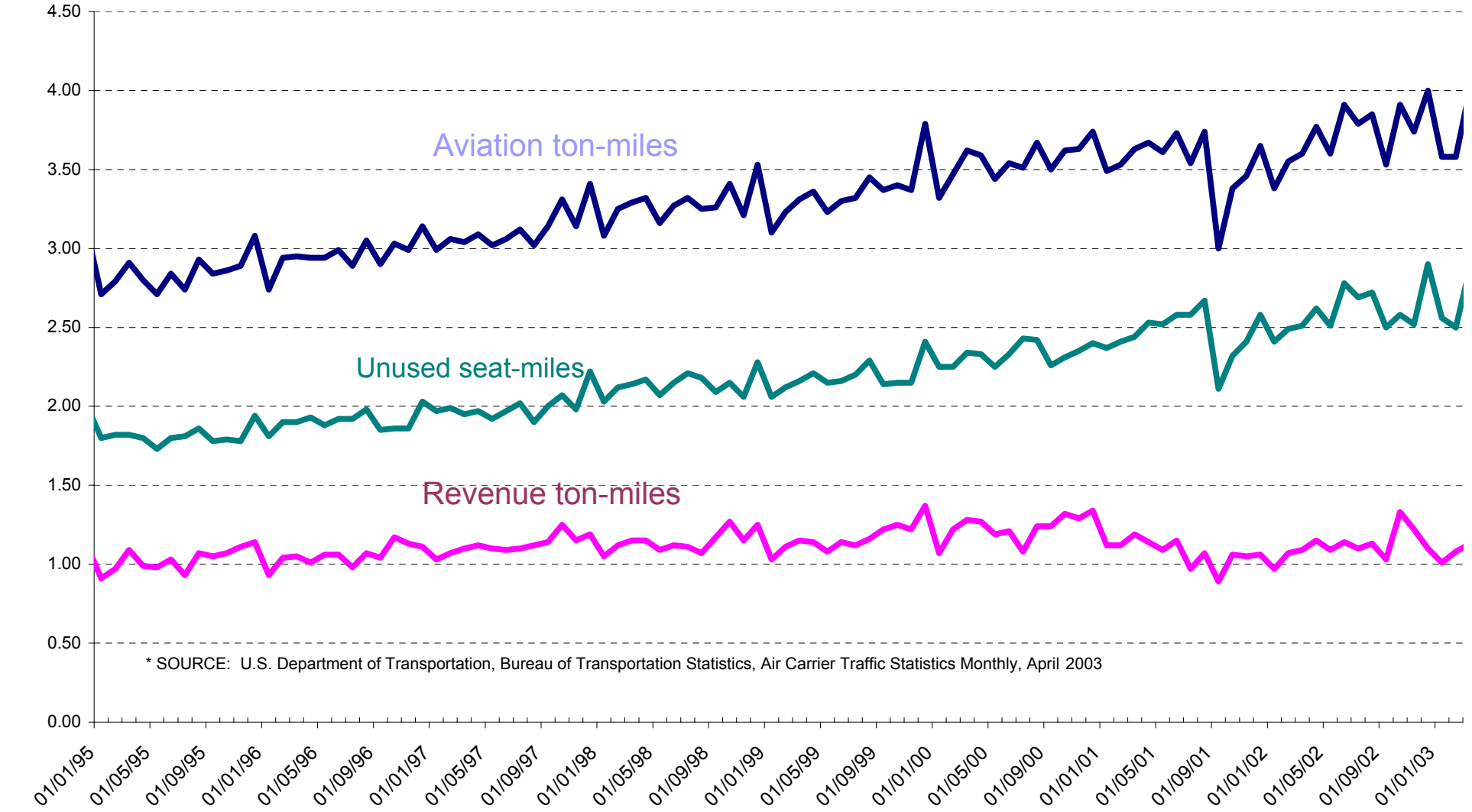


Figure 3.USA: Domestic Flights: Index of Air Passengers Air Freight Ratios
Domestic Air Seat and Passenger Miles and Air Freight Ton-Miles (monthly data, not seasonally adjusted)
January 1997 = 100.0

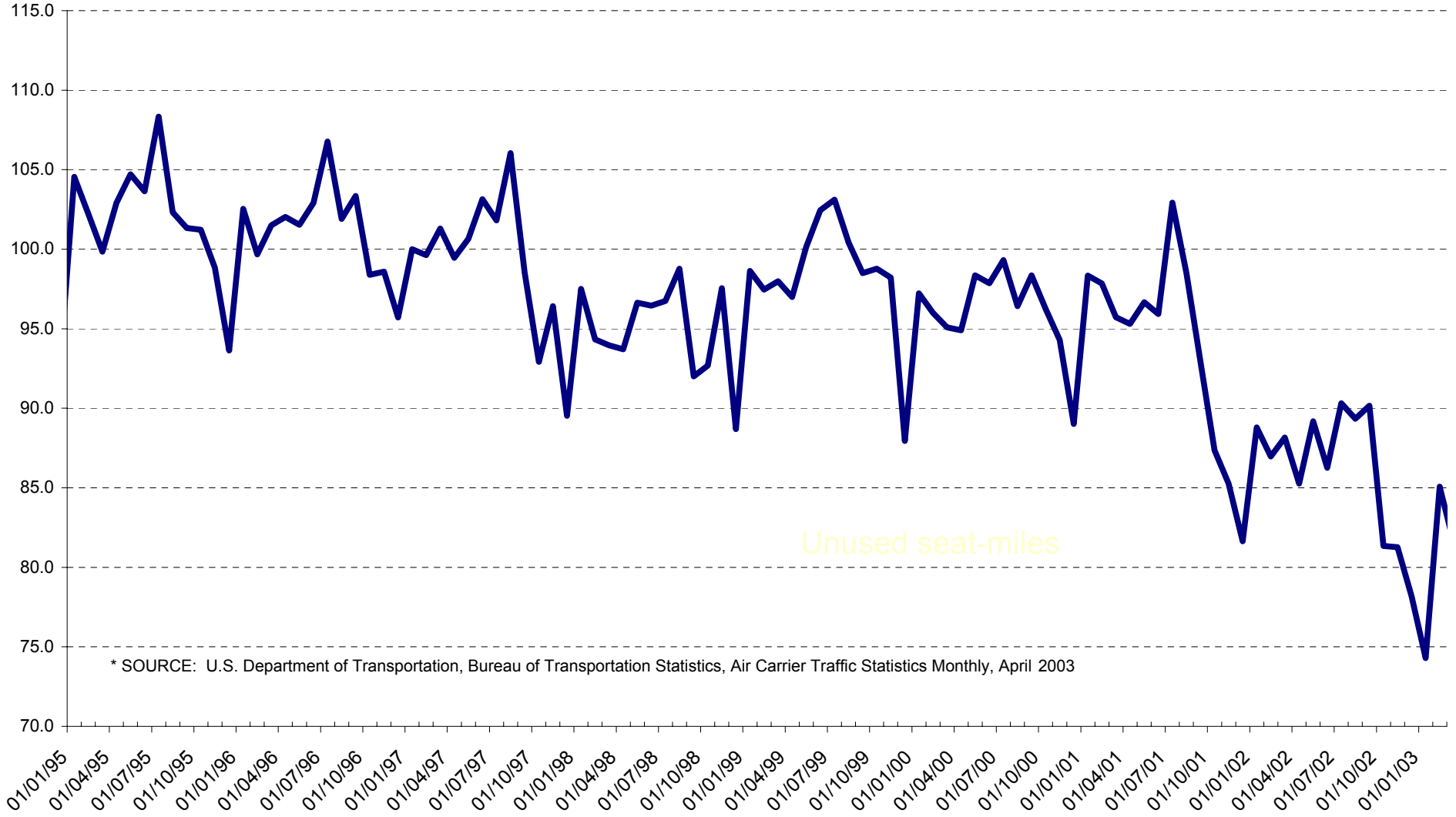


Figure 4.USA: Domestic Flights: Passengers Transported on the Top 2 Intl. Routes
Index of New York-Paris - Chicago-London Ratios
January 2000 = 100.0

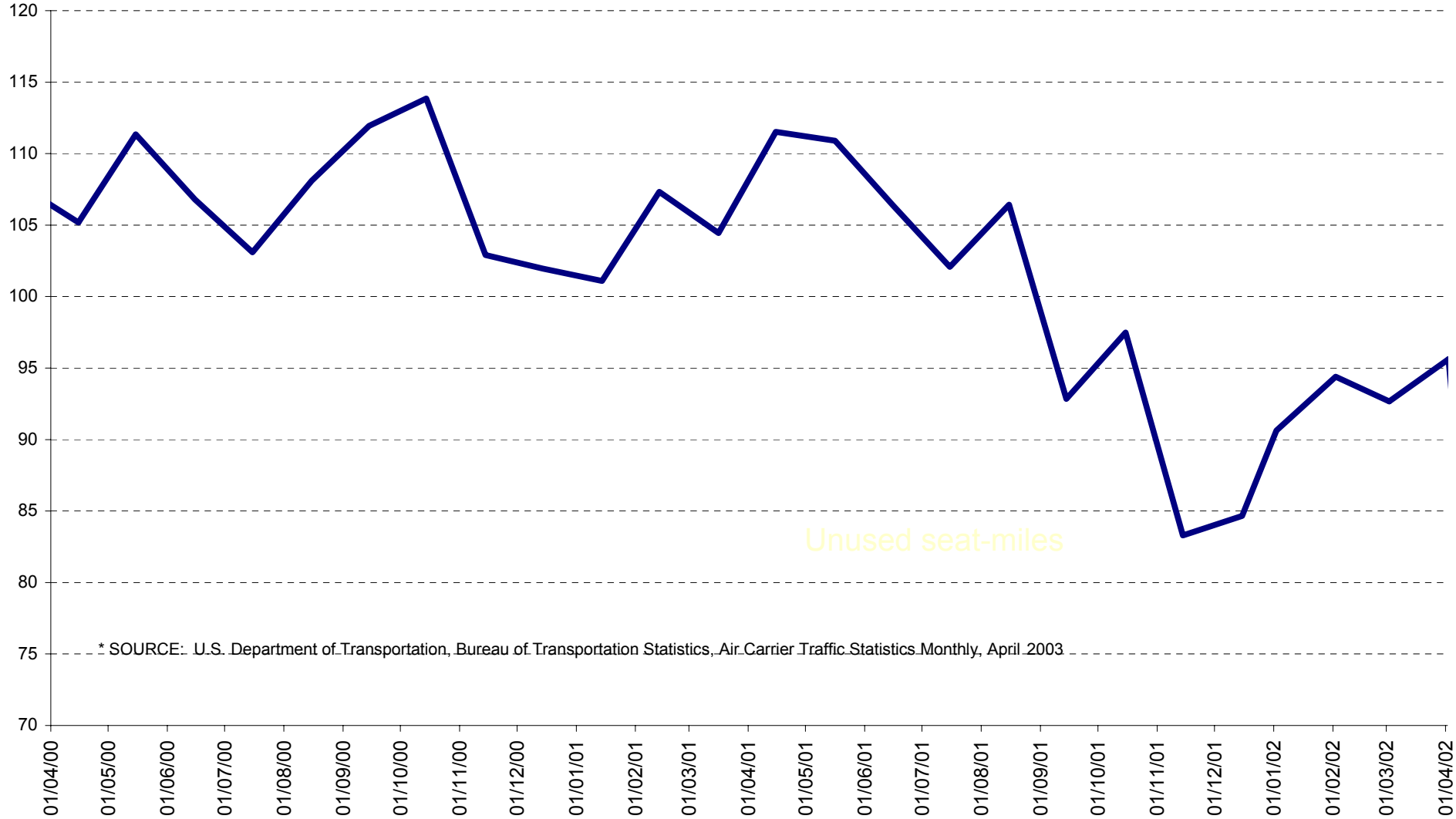


Figure 1.ISR:
Revenues (price adjusted) in Regular Bus Lines - Index
Israel, January 2000 - Decmber 2002
January 2000 = 100.0

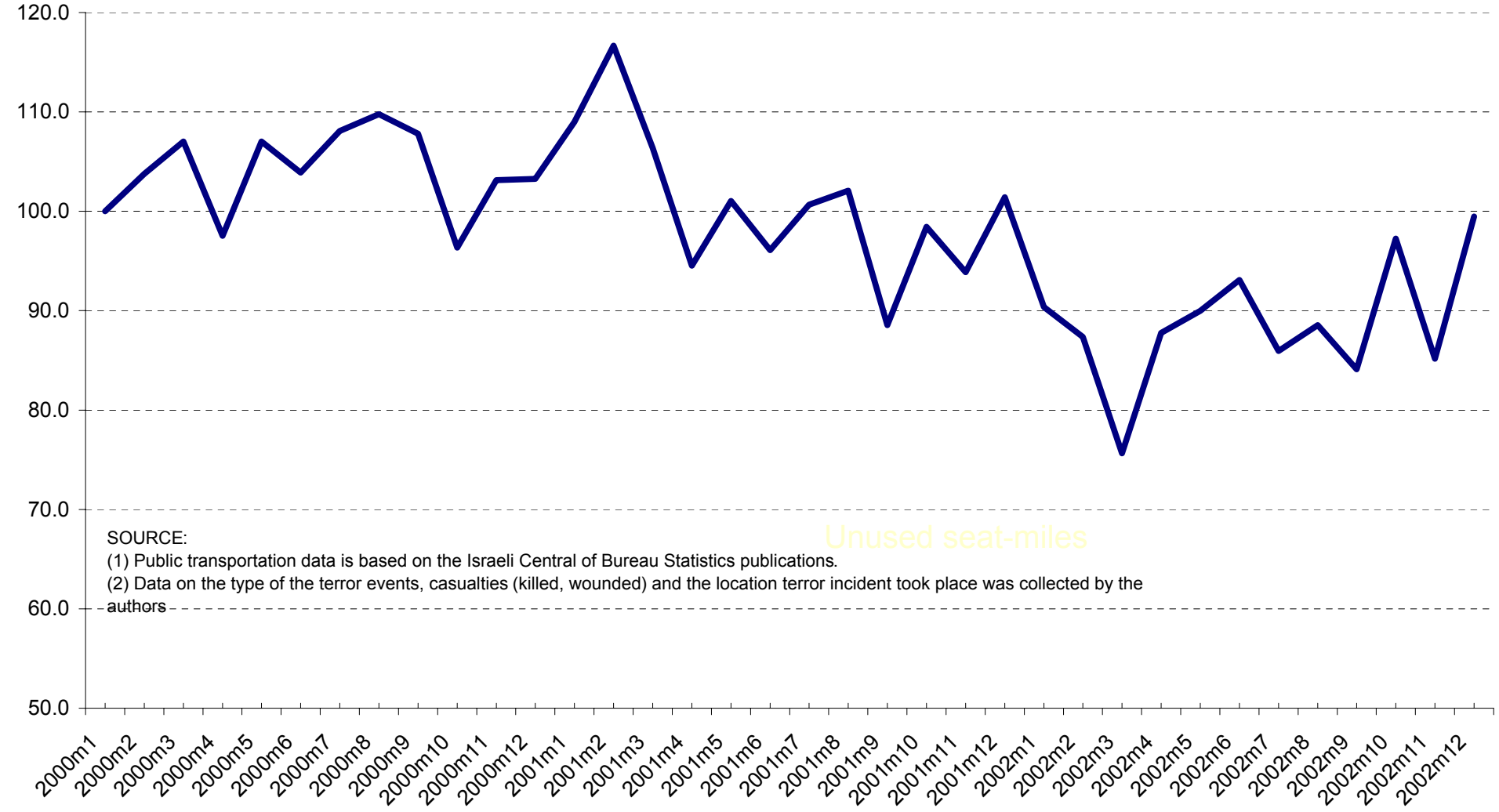


Figure 2.ISR:
The Number Suicide Bomber Attacks and Fatalities by Month: Overall and Carried Out on Buses
Israel, January 2000 through April 2003

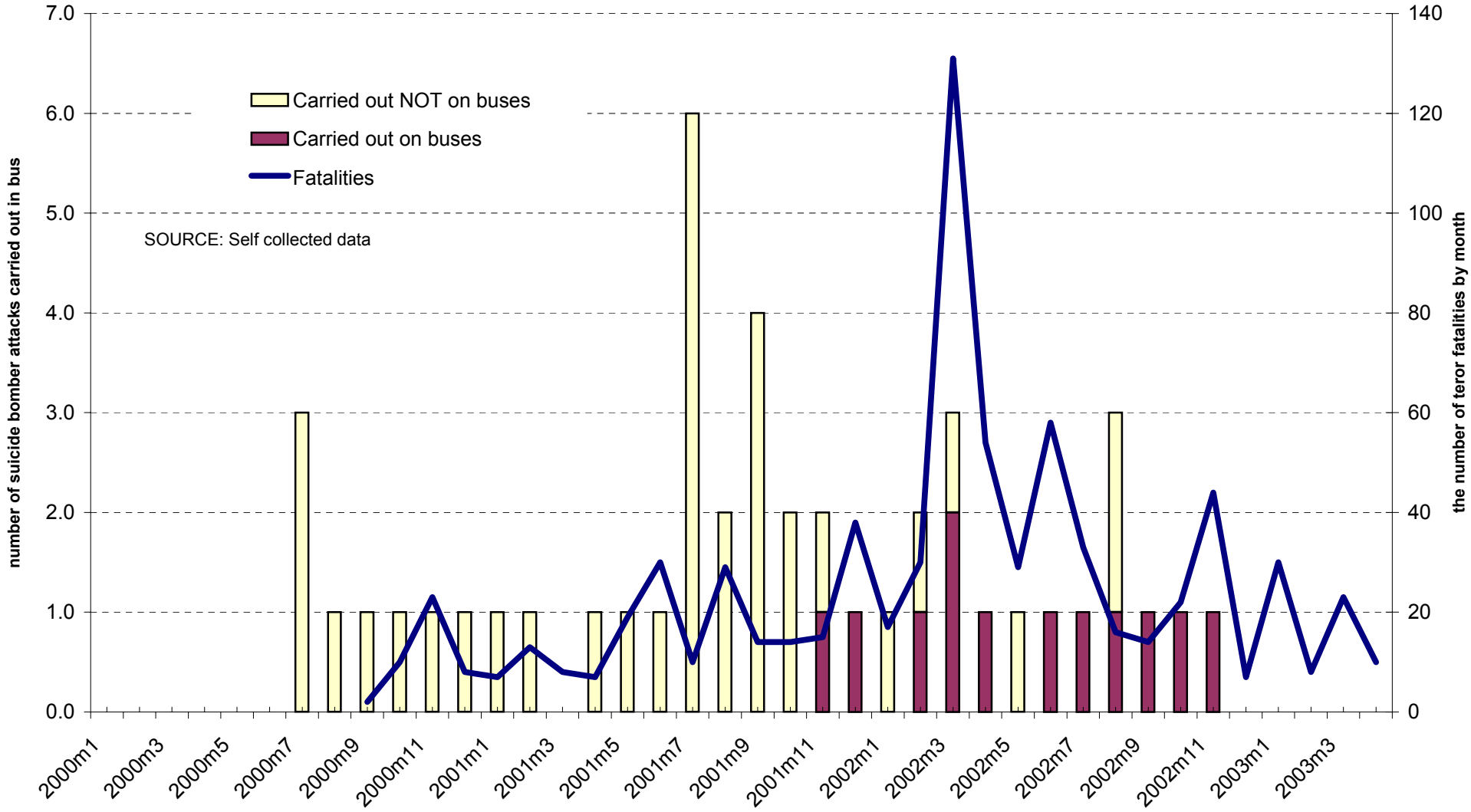
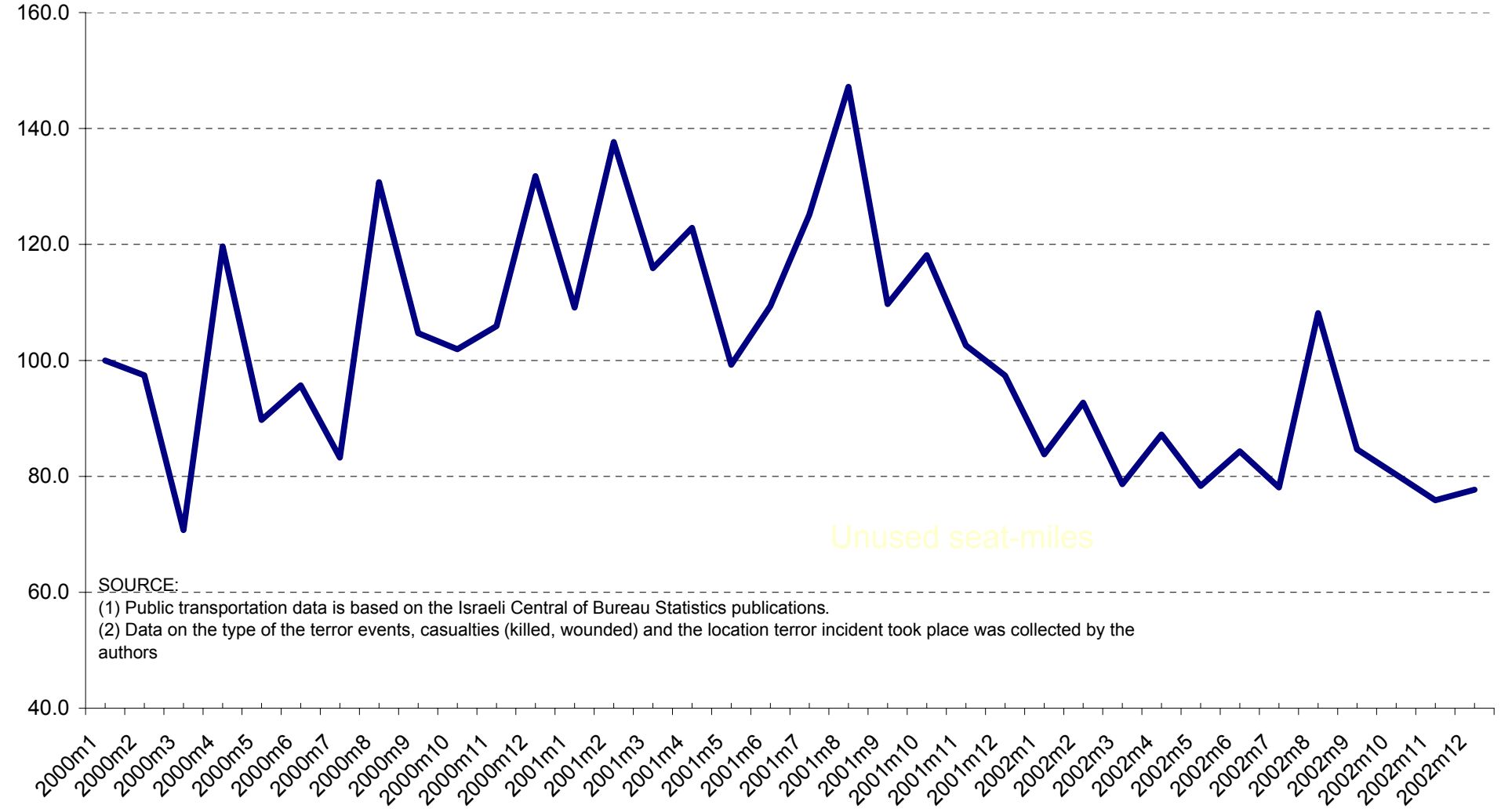


Figure 3.ISR:
Index of the Ratio of Revenue (price adjusted) in Regular Bus Lines to Revenue in Special Lines
Israel, January 2000 - Decmber 2002
January 2000 = 100.0



SOURCE:
(1) Public transportation data is based on the Israeli Central of Bureau Statistics publications.
(2) Data on the type of the terror events, casualties (killed, wounded) and the location terror incident took place was collected by the authors

Figure 4.ISR:
Index of the Raatio of Revenue (price adjusted) in Regular Bus Lines to Revenue in Special Lines and the Average Number of Suicide Bomber Attacks Carried Out on Bus
Israel, Monthly Data, January 2000 - Decmber 2002

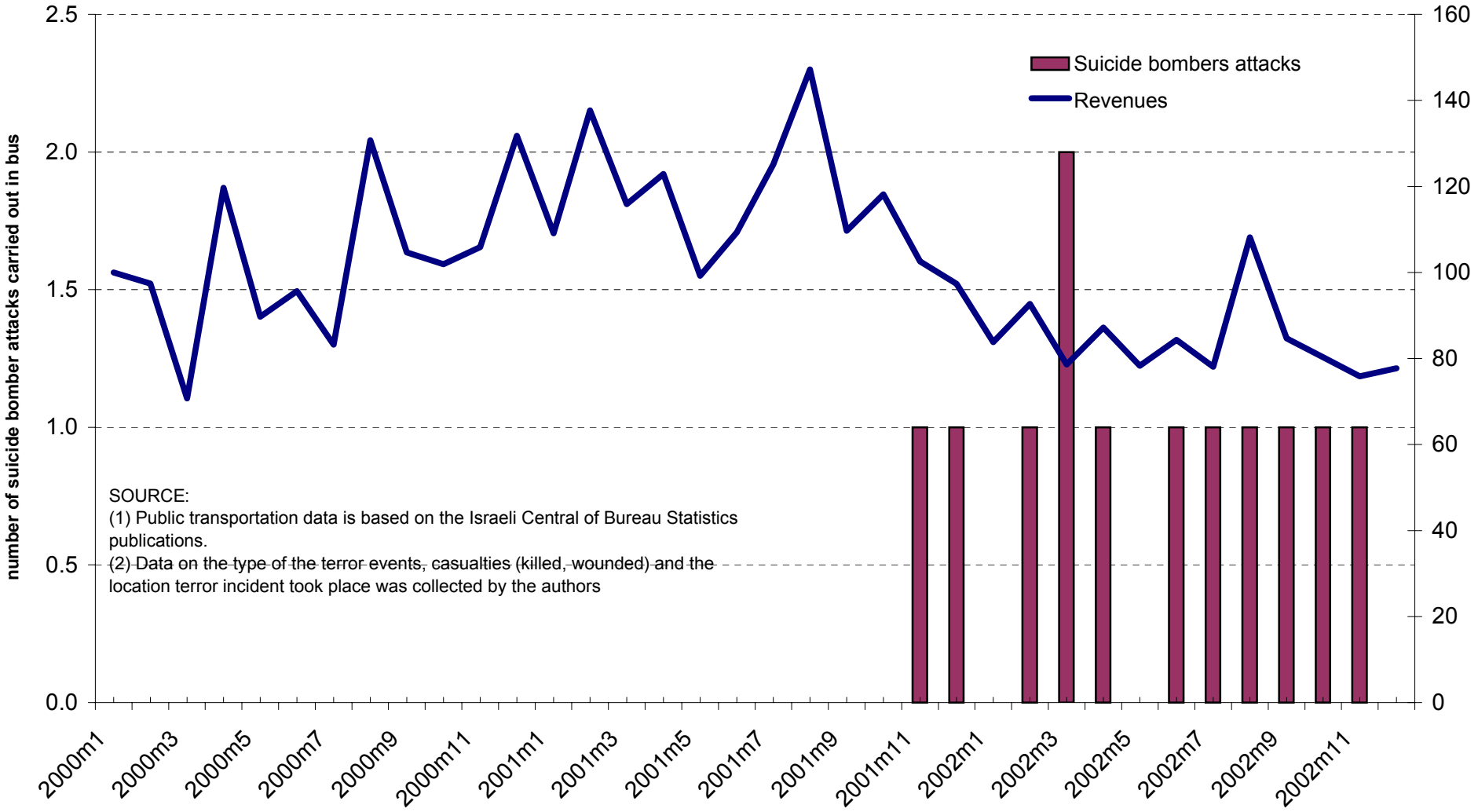


Table 1.USA:
The Effect of September 11th 2001 on the Number of Domestic Air Passengers in the US
Dependent variable: the ratio of air passengers miles to air freight ton-miles (in logs
USA, January 1995 to April 2003

Variables	(i)	(ii)	(iii)	(iv)	(v)
September 2001 April 2003	-0.147	-0.100			-0.105
	(0.011)	(0.014)			(0.014)
Linear time trend		-0.001	-0.002		-0.001
		(0.000)	(0.000)		(0.000)
September 2001			0.030	-0.029	0.085
			(0.051)	(0.075)	(0.041)
Months / observations	100	100	100	100	100
Adj R-Square	0.6318	0.6993	0.5444	0	0.7091

Note:
* SOURCE: U.S. Department of Transportation, Bureau of Transportation Statistics, Air Carrier Traffic Statistics Monthly, April 2003
( ) Standard errors in parenthesis

Table 2.USA:
Not Employed After September 2001: Pilots and Air Transportation Relative to All Other Workers
Sample Includes only those Observed Before and After September 2001.^
Male, Aged 21 to 55 when First Observed
CPS, Monthly Files, 2001-2002
Dependent variable: Not Working (0, 1) after September 2001. 1=not working. Probit estimates

	All				**In the Labor Force after September 2001**			
Variables	**(i)**	**(ii)**	**(iii)**	**(iv)**	**(v)**	**(vi)**	**(vii)**	**(viii)**
Pilot* ^^	**0.043**	**0.013**	**0.051**	**0.019**	**0.041**	**0.014**	**0.050**	**0.021**
	(0.024)	(0.017)	(0.026)	(0.019)	(0.024)	(0.018)	(0.026)	(0.020)
Air transportation* ^^		**0.025**		**0.023**		**0.023**		**0.021**
		(0.012)		(0.012)		(0.012)		(0.011)
Other personal characteristics								
Years of schooling completed			-0.002	-0.002			-0.002	-0.002
			(0.0002)	(0.0002)			(0.0003)	(0.0003)
Black*			0.014	0.014			0.019	0.019
			(0.003)	(0.003)			(0.003)	(0.003)
American Indian*			0.026	0.026			0.034	0.033
			(0.008)	(0.008)			(0.010)	(0.009)
Asian*			0.004	0.004			0.005	0.005
			(0.004)	(0.004)			(0.004)	(0.004)
Hispanic*			0.002	0.002			0.001	0.001
			(0.002)	(0.002)			(0.002)	(0.002)
Constant	0.021	0.021	0.020	0.020	0.024	0.024	0.022	0.022
Observations	53509	53509	53509	53509	48692	48692	48692	48692

Notes:
^ Sample includes only those employed (or out of the LF) before September 2001 and Observed after September 2001
(*) dF/dx is for discrete change of dummy variable from 0 to 1
^^ Pilot =1 for occupation 226: Airplane pilots
^^ Air transportation = 1 for industry 421: Air-transportation
( ) Standard errors in parenthesis

Table 3.a.USA:
The Wages of Risky Jobs Before and After September 2001
CPS Monthly Data, 1998 to 2002
Male, Full-Time workers
Dependent variable: Hourly wage (in logs)

	Age			
	22 - 65	25 - 55	25 - 55	25 - 55
Variables	(i)	(i)	(i)	(i)
Pilot	**0.297**	**0.291**	**0.291**	**0.292**
	(0.032)	(0.034)	(0.034)	(0.034)
Ait-transportation	-0.003	-0.008	-0.007	-0.006
	(0.013)	(0.014)	(0.014)	(0.014)
Firefighting			-0.032	-0.032
			(0.019)	(0.019)
Police			0.096	0.096
			(0.012)	(0.012)
Oct20001-Dec2002	0.014	0.014	0.014	0.021
	(0.004)	(0.004)	(0.004)	(0.002)
Before - After:				
Oct20001-Dec2002 * Pilot	**-0.154**	**-0.145**	**-0.145**	**-0.145**
	(0.064)	(0.069)	(0.069)	(0.069)
Oct20001-Dec2002 * Aifr-transportation	**0.006**	**0.001**	**0.001**	**0.000**
	(0.025)	(0.027)	(0.027)	(0.027)
Oct20001-Dec2002 * Firefighting			0.038	0.038
			(0.035)	(0.035)
Oct20001-Dec2002 * Police			-0.021	-0.020
			(0.023)	(0.023)
Other personal characteristics				
Experience	0.032	0.026	0.026	0.026
	(0.000)	(0.001)	(0.001)	(0.001)
Experience square	-0.001	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
School years completed	0.088	0.089	0.089	0.089
	(0.0004)	(0.0004)	(0.0004)	(0.0004)
Educational category FE	No	No	No	No
Year dummies	Yes	Yes	Yes	No
Adj R-square	0.232	0.217	0.218	0.218
Observations	296901	251983	251983	251983

Note:
CPS monthly files: January 1998 to December 2002
All specification include dummies for region of residence, and weekly worked hours (in logs)
( ) Standard errors in parenthesis

Table 3.b.USA:
The Wages of Risky Jobs Before and After September 2001
CPS Monthly Data, 1998 to 2002
Male, fFull-Time workers
Dependent variable: Hourly wage (in logs)

	Age			
	22 - 65	25 - 55	25 - 55	25 - 55
Variables	(i)	(ii)	(iii)	(iv)
Pilot	**0.252**	**0.245**	**0.245**	**0.246**
	(0.032)	(0.033)	(0.033)	(0.033)
Ait-transportation	0.009	0.004	0.005	0.006
	(0.012)	(0.013)	(0.013)	(0.013)
Firefighting			0.000	0.000
			(0.019)	(0.019)
Police			0.106	0.106
			(0.012)	(0.012)
Oct20001-Dec2002	0.013	0.014	0.014	0.021
	(0.004)	(0.004)	(0.004)	(0.002)
Before - After:				
Oct20001-Dec2002 * Pilot	**-0.150**	**-0.147**	**-0.147**	**-0.148**
	(0.063)	(0.068)	(0.068)	(0.068)
Oct20001-Dec2002 * Aifr-transportation	**0.005**	**-0.001**	**-0.001**	**-0.002**
	(0.025)	(0.027)	(0.027)	(0.027)
Oct20001-Dec2002 * Firefighting			0.034	0.034
			(0.035)	(0.035)
Oct20001-Dec2002 * Police			-0.027	-0.026
			(0.023)	(0.023)
Other personal characteristics				
Experience	0.034	0.031	0.031	0.031
	(0.000)	(0.001)	(0.001)	(0.001)
Experience square	-0.001	-0.001	-0.001	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)
School years completed				
Educational category FE	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	No
Adj R-square	0.248	0.233	0.233	0.233
Observations	296901	251983	251983	251983

Note:
CPS monthly files: January 1998 to December 2002
All specification include dummies for region of residence, and weekly worked hours (in logs)
( ) Standard errors in parenthesis

Table 1.ISR:
The Effect of Suicide Bombers on the Number of Passengers in Regular Bus Lines
Israel, October 2001 to April 2003
Dependent variable: the ratio of passegers in regular lines to passengers in special lines (in logs)

Variables	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)
Num. of suicide bomber events - on buses only - this month	-0.191			-0.168	-0.187	-0.206	-0.219
	(0.054)			(0.059)	(0.064)	(0.067)	(0.089)
Num. of all suicide bomber events this month		-0.053		-0.023	-0.036	-0.053	-0.046
		(0.026)		(0.025)	(0.029)	(0.035)	(0.043)
Fatal incidets			-0.008		0.007	0.003	-0.002
			(0.007)		(0.007)	(0.008)	(0.011)
Fatal incidents with 1967 borders						0.020	0.034
						(0.022)	(0.025)
Num people killed by terror action this month							0.004
							(0.005)
Num. people wounded							-0.001
							(0.001)
Months / observations	28	28	28	28	28	28	28
Adj R-Square	0.2998	0.1076	0.0228	0.2958	0.29	0.2848	0.2627

Note:
Sources:
1. Public transportation data is based on Israeli Central of Bureau Statistics datasets
2. Data on the type of the terror events, casualties (killed, wounded) and location was collected by the authors
( ) Standard errors in parenthesis

Table 2.ISR:
The Effect of Suicide Bombers on the Number of Passengers in Regular Bus Lines
Israel, October 2001 to April 2003
Dependent variable: the ratio of passegers in regular lines to passengers in special lines (in logs)

Variables	(i)
Num. of suicide bomber events - on buses only - this month	-0.082
	(0.061)
Num. of suicide bomber events - on buses only - last month	-0.179
	(0.061)
Num. of ALL suicide bomber events - this month	-0.017
	(0.023)
Num. of ALL suicide bomber events - last month	0.003
	(0.023)
Months / observations	28
Adj R-Square	0.2998

Note:
Sources:
1. Public transportation data is based on Israeli Central of Bureau Statistics datasets
2. Data on the type of the terror events, casualties (killed, wounded) and location was collected by the authors
( ) Standard errors in parenthesis

Table 3.ISR:
The Effect of Suicide Bombers on the Number of Passengers in Regular Bus Lines
Israel, October 2001 to April 2003
Dependent variable: the ratio of passegers in regular lines to passengers in special lines (in logs)

Variables	(ii)	(iii)	(iv)
Num. of suicide bomber events - on buses only - this month	-0.232 (0.049)	-0.208 (0.056)	-0.201 (0.064)
Months / observations	27	21	18
Adj R-Square	0.1076	0.0228	0.2958

Note:
Sources:
1. Public transportation data is based on the Israeli Central of Bureau Statistics publications.
2. Data on the type of the terror events, casualties (killed, wounded) and the location terror incident took place was collected by the authors
( ) Standard errors in parenthesis

Table 4.ISR:
The Effect of Suicide Bombers on the Real Wages of Bus Drivers
Israel, October 2001 to April 2003
Dependent variable: The mean wages of drivers relative to the mean wages per worker (in logs)

Variables	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)
Num. of suicide bomber events - on buses only - this month				0.052	0.057	0.061	0.078
	(0.015)			(0.017)	(0.019)	(0.020)	(0.026)
Num. of all suicide bomber events this month		0.011		0.002	0.005	0.009	0.016
		(0.008)		(0.007)	(0.009)	(0.010)	(0.013)
Fatal incidets			0.002		-0.002	-0.001	0.002
			(0.002)		(0.002)	(0.002)	(0.003)
Fatal incidents with 1967 borders						-0.004	-0.006
						(0.006)	(0.007)
Num people killed by terror action this month							-0.002
							(0.001)
Num. people wounded							0.000
							(0.000)
Cooprative members' compensation							-0.074
							(0.042)
Salaried workers' wages							-0.011
							(0.100)
Months / observations	28	28	28	28	28	28	28
Adj R-Square	0.2926	0.0417	0.0049	0.2665	0.2665	0.2559	0.3674

Note:
Sources:
1. Public transportation data is based on Israeli Central of Bureau Statistics datasets
2. Data on the type of the terror events, casualties (killed, wounded) and location was collected by the authors
( ) Standard errors in parenthesis

Table 5.ISR:
The Effect of Suicide Bombers on the Real Wages of Bus Drivers
Israel, October 2001 to April 2003
Dependent variable: The mean wages of drivers relative to the mean wages per worker (in logs)

Variables	(i)	(ii)
Num. of suicide bomber events - on buses only - this month	0.028	0.028
	(0.018)	(0.018)
Num. of suicide bomber events - on buses only - last month	0.043	0.041
	(0.018)	(0.018)
Num. of ALL suicide bomber events - this month	-0.001	0.001
	(0.007)	(0.007)
Num. of ALL suicide bomber events - last month	0.000	-0.002
	(0.007)	(0.007)
Cooprative members' compensation	0.000	-0.075
	(0.000)	(0.040)
Salaried workers' wages	0.000	-0.001
	(0.000)	(0.087)
Months / observations	28	28
Adj R-Square	0.3639	0.4187

Note:
Sources:
1. Public transportation data is based on Israeli Central of Bureau Statistics datasets
2. Data on the type of the terror events, casualties (killed, wounded) and location was collected by the authors
( ) Standard errors in parenthesis

Table 6.ISR:
The Effect of Suicide Bombers on the Real Wages of Bus Drivers
Israel, October 2001 to April 2003
Dependent variable: The mean wages of drivers relative to the mean wages per worker (in logs)

Variables	(ii)	(iii)	(iv)
Num. of suicide bomber events - on buses only - this month	0.058	0.044	0.039
	(0.014)	(0.016)	(0.018)
Months / observations	27	21	18
Adj R-Square	0.3739	0.2586	0.1773

Note:
Sources:
1. Public transportation data is based on the Israeli Central of Bureau Statistics publications.
2. Data on the type of the terror events, casualties (killed, wounded) and the location terror incident took place was collected by the authors
( ) Standard errors in parenthesis

Table ISR.7:
The Effect of Suicide Bomber Attacks on the Wages of Bus Drivers
Matched Income and Labor Force Surveys, Israel, 2000 to 2002 *, **
Dependent variable: (log) Hourly Wage ***

Variables	(i)	(ii)
(1) Bus driver	0.081	0.108
	(0.096)	(0.090)
(2) Taxi driver	-0.401	-0.469
	(0.177)	(0.121)
The effect of suicide bomber attacks:		
(3) Num. of suicide bomber events carried out on buses this quarter^ (SBB t)	**-0.008**	
	(0.009)	
(4) Num. of suicide bomber events carried out on buses last quarter (SBB t-1)		**0.014**
		(0.009)
Interactions:		
(5) SBB t * Bus driver	**-0.009**	
	(0.065)	
(6) SBB t-1 * Bus driver		**-0.034**
		(0.056)
(7) SBB t * Taxi driver	**-0.063**	
	(0.121)	
(8) SBB t-1 * Taxi driver		**0.016**
		(0.038)
Personal Characteristics:		
(9) Years of schooling completed	0.077	0.077
	(0.002)	(0.002)
(10) Yeshiva (last school)	-0.054	-0.054
	(0.020)	(0.020)
(11) Immigrated to Israel after 1988	-0.424	-0.424
	(0.023)	(0.023)
(12) Quarter fixed effect	Yes	Yes
(13) Observations	5633	5633
(14) Adj. R-square	0.317	0.317

Notes:

Based on the Israeli Income and Labor Force Surveys for the years 2000 through 2002

* For reasons of privacy the Israeli CBS excludes income data from the Labor Force surveys.
Income data is provided in a separate file known as the Income Survey.
Personal (or household) IDs were scrambled to avoid the (easy) possibility of merging back these files.
Using personal characteristics available in both files we were able to match observations from both files.

** The sample excludes (i) Israeli Arabs, (ii) workers who earn less then 1500 NIS (less than 1/2 of minimum wage)
(iii) workers who work less than 10 hours a week

*** All specifications include experience and experience square, origin related dummies and marital status

^ Suicide bomber attacks carried out on buses = the average of suicide bomber attacks carried out on buses in the q

( ) Standard errors in parenthesis

Table ISR.8:
The Effect of Suicide Bomber Attacks on the Likelihood of Male Workers to be Employed as Bus Drivers
Dprobit Estimators (dF/dX): the change in the probability for an infinitesimal change in each variable
CBS, Labor Force Surveys, Israel, 2000 to 2002
Dependent variable: Bus driver (0, 1)

	Population					
	All			Drivers		
Variables						
(1) Num. of suicide bomber events carried out on buses this quarter	**-0.002** (0.001)		**-0.002** (0.001)	**-0.098** (0.033)		**-0.122** (0.048)
(2) Num. of suicide bomber events carried out NOT on buses this quarter		**-0.001** (0.001)			**-0.020** (0.014)	
Time Trend / Aggregates:						
(3) Number of buses in the public transporation ^			0.000 (0.007)			-0.149 (0.242)
Personal characteristics:						
(4) Years of schooling completed	-0.001 (0.000)	-0.001 (0.000)	-0.001 (0.000)	0.022 (0.007)	0.024 (0.008)	0.022 (0.007)
(5) Observations	37482	37482	37482	885	885	885
(6) Observed Probability	0.009	0.009	0.009	0.152	0.152	0.152
(7) Predicted Probability at X bar	0.007	0.007	0.007	0.132	0.135	0.132
(8) Pseudo R-Square	0.059	0.059	0.059	0.076	0.063	0.077
(9) % effect of suicide bomber attacks at X bar (1)/(7)	-0.287	-0.122	-0.282	-0.744	-0.151	-0.929

Notes:
Based on the Israeli Labor Force Surveys for the years 2000 through 2002
* The sample excludes (i) Israeli Arabs and (ii) workers in rural areas
Workers are those who report being employed during the week of interview
^ Suicide bomber attacks carried out on buses = the average number of suicide bomber attacks carried out on buses during the quarter

Table ISR.9:
The Fraction of Protective Workers in the Israeli Labor Force*
Israel, 2000 through 2002
Israeli CBS Labor Surveys

	All		Workers aged 22 to 65	
Fraction of:		**Aged 22 to 65**	**All**	**Male**
Fraction of labor force	1.3	1.7	2.5	4.1
Among them:				
Male	88.4	90.0	90.0	--
Female	11.6	10.0	10.0	--
Protective Workers in the Israel:				
Police and detectives (Public^)	26.0	28.1	27.1	25.7
Firefighters (Public^)	0.8	0.9	0.8	0.9
Prison guards (Public^)	0.4	0.4	0.5	0.5
Other protective workers (Private^^)	41.1	40.3	39.0	38.0
Watchpersons (Private^^)	31.8	30.4	32.6	34.9

Notes:
* Based on Israeli Central Beaureu of Statistics Labor Surveys for the years 2000 to 2002
Labor force does not include slodiers serving in the Israeli army (IDF)
^ Public: most of the employers, including the top largest one, calssified as public sector according to economic branch (3 digits)
^^ Private: most of the employers, including the top largest one, calssified as private sector according to economic branch (3 digits)

Table ISR.10:
The Effect of Suicide Bomber Attacks on the Likelihood of Male Workers to be Employed as Policemen or Security Guards*
Israel, 2000 to 2002
CBS, Labor Force Surveys

Variables	All (i)	Public Sector (ii)	Private Sector (iii)
(1) The average number of suicide bomber attacks	0.0015	-0.0007	0.0023
	(0.0007)	(0.0003)	(0.0006)
Personal characteristics:			
(2) Jew	0.0184	0.0031	0.0137
	(0.0017)	(0.0007)	(0.0014)
(3) School years completed	-0.0004	0.0000	-0.0004
	(0.0002)	(0.0001)	(0.0001)
(4) Age	-0.0042	0.0027	-0.0047
	(0.0004)	(0.0002)	(0.0003)
(5) Age square	0.0000	0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)
(6) Observations	52012	52012	52012
(7) Observed Probability	0.0400	0.0117	0.0283
(8) Predicted Probability at X bar	0.0370	0.0073	0.0252
(9) Pseudo R-Square	0.0243	0.045	0.0331
(10) The % effect of suicide bomber attacks at X bar (1) / (10)	3.9%	-9.0%	9.1%

Notes:
Based on the Israeli Labor Force Surveys for the years 2000 through 2002
* The sample excludes workers in rural areas
Workers are those who report being employed during the week of interview
( ) Robust standard errors in parenthesis

Table ISR.11:
The Effect of Suicide Bomber Attacks on the Likelihood of Male Workers to be Employed as Policemen or Security Guards*
Dprobit Estimators (dF/dX): the change in the probability for an infinitesimal change in each X var
CBS, Labor Force Surveys, Israel, 2000 to 2002
Dependent variable: working as a policeman or a private security guard (0,1)

Variables	All		Public Sector		Private Sector	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)
(1) Suicide bomber attacks^	**0.0020**	**0.0072**	**-0.0001**	**-0.0008**	**0.0018**	**0.0070**
	(0.0009)	(0.0038)	(0.0004)	(0.0015)	(0.0007)	(0.0029)
(2) Killed^^		-0.0004		0.0000		-0.0003
		(0.0003)		(0.0001)		(0.0002)
(3) No of events^^^		0.0001		0.0003		-0.0002
		(0.0006)		(0.0002)		(0.0004)
Personal characteristics:						
(4) Jew	0.0105	0.0105	0.0000	0.0000	0.0090	0.0090
	(0.0027)	(0.0027)	(0.0013)	(0.0013)	(0.0019)	(0.0019)
(5) School years completed	-0.0015	-0.0015	0.0002	0.0002	-0.0017	-0.0017
	(0.0003)	(0.0003)	(0.0001)	(0.0001)	(0.0003)	(0.0003)
(6) Yeshiva^^^^	-0.0231	-0.0231	-0.0061	-0.0060	-0.0104	-0.0103
	(0.0055)	(0.0055)	(0.0008)	(0.0008)	(0.0058)	(0.0058)
(7) Age	-0.0029	-0.0029	0.0013	0.0013	-0.0025	-0.0025
	(0.0005)	(0.0005)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
(8) Age square	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
(9) Married	-0.0204	-0.0204	0.0037	0.0037	-0.0284	-0.0284
	(0.0029)	(0.0029)	(0.0008)	(0.0008)	(0.0027)	(0.0027)
(10) Recent immigrant^^^^^	0.0087	0.0087	-0.0062	-0.0062	0.0132	0.0133
	(0.0041)	(0.0041)	(0.0010)	(0.0010)	(0.0035)	(0.0035)
(11) Observations	37482	37482	37482	37482	37482	37482
(12) Observed Probability	0.0389	0.0389	0.0107	0.0107	0.0283	0.0283
(13) Predicted Probability at X bar	0.0342	0.0342	0.0063	0.0063	0.0214	0.0214
(14) Pseudo R-Square	0.0399	0.0401	0.0641	0.0647	0.0748	0.0752
(15) % effect of suicide bomber attacks at X bar (1) / (10)	5.8%	21.1%	-1.7%	-12.0%	8.6%	32.5%

Notes:
Based on the Israeli Labor Force Surveys for the years 2000 through 2002
* The sample excludes (i) Israeli Arabs and (ii) workers in rural areas
Workers are those who report being employed during the week of interview
^ Suicide bomber attacks = the average number of suicide bomber attacks
^^ Killed = the number of Israeli killed by terror during the current quarter
^^^ Number of terror events is the total number of terror events during the quarter
^^^^ Recent immigrant is a dummy variable which equals 1 if person immigrated to Israel since 1990
( ) Robust standard errors in parenthesis

Table ISR.12:
The Effect of Suicide Bomber Attacks on the Likelihood of Male Workers to be Employed as a Security Guards* by Employment Status at the Previous Quarter
Dprobit Estimators (dF/dX): the change in the probability for an infinitesimal change in each variable
CBS, Labor Force Surveys, Israel, 2000 to 2002
Dependent variable: working as a private security guard (0,1)

Variables	Employment last quarter	
	Yes	No
	(i)	(ii)
(1) Suicide bomber attacks^	**0.0010**	**0.0152**
	(0.0008)	(0.0040)
Personal characteristics:		
(2) Jew	0.0070	0.0233
	(0.0022)	(0.0120)
(3) School years completed	-0.0014	-0.0011
	(0.0003)	(0.0010)
(4) Yeshiva^^^^	-0.0026	--
	(0.0081)	
(5) Age	-0.0025	0.0056
	(0.0004)	(0.0020)
(6) Age square	0.0000	-0.0001
	(0.0000)	(0.0000)
(7) Married	-0.0254	-0.0400
	(0.0034)	(0.0130)
(8) Recent immigrant^^^^^	0.0142	0.0122
	(0.0043)	(0.0210)
(9) Observations	23445	2347
(10) Observed Probability	0.0225	0.0682
(11) Predicted Probability at X bar	0.0166	0.0610
(12) Pseudo R-Square	0.0399	0.0423
(13) % effect of suicide bomber attacks at X bar (1) / (10)	5.8%	24.9%

Notes:
Based on the Israeli Labor Force Surveys for the years 2000 through 2002
* The sample excludes (i) Israeli Arabs and (ii) workers in rural areas
Workers are those who report being employed during the week of interview
^ Suicide bomber attacks = the average number of suicide bomber attacks
^^ Killed = the number of Israeli killed by terror during the current quarter
^^^ Number of terror events is the total number of terror events during the quarter
^^^^ Recent immigrant is a dummy variable which equals 1 if person immigrated to Israel since 1990
( ) Robust standard errors in parenthesis

Table ISR.13:
The Effect of Suicide Bomber Attacks on the Likelihood of Male Workers to be Employed as a Security Guards* by for Recent Immigrants and Veteran Israelies
Dprobit Estimators (dF/dX): the change in the probability for an infinitesimal change in each variable X
CBS, Labor Force Surveys, Israel, 2000 to 2002
Dependent variable: working as a private security guard (0,1)

Variables	Veteran Israelies	Recent Immigrants
	(i)	(ii)
(1) Suicide bomber attacks^	**0.0014**	**-0.0005**
	(0.0008)	(0.0027)
(2) Suicide bomber attacks last quarter^	**0.0003**	**0.0060**
	(0.0007)	(0.0023)
Personal characteristics:		
(3) Jew	0.0122	0.0013
	(0.0018)	(0.0061)
(4) School years completed	-0.0022	-0.0003
	(0.0003)	(0.0008)
(5) Yeshiva^^^^	-0.0071	--
	(0.0056)	
(6) Age	-0.0021	-0.0050
	(0.0003)	(0.0011)
(7) Age square	0.0000	0.0001
	(0.0000)	(0.0000)
(8) Married	-0.0204	-0.0626
	(0.0027)	(0.0088)
(9) Observations	30469	6993
(10) Observed Probability	0.0234	0.0485
(11) Predicted Probability at X bar	0.0178	0.0396
(12) Pseudo R-Square	0.067	0.0722
(13) % effect of suicide bomber attacks at X bar (2) / (10)	1.4%	15.1%

Notes:
Based on the Israeli Labor Force Surveys for the years 2000 through 2002
* The sample excludes (i) Israeli Arabs and (ii) workers in rural areas
Workers are those who report being employed during the week of interview
^ Suicide bomber attacks = the average number of suicide bomber attacks
^^ Killed = the number of Israeli killed by terror during the current quarter
^^^ Number of terror events is the total number of terror events during the quarter
^^^^ Recent immigrant is a dummy variable which equals 1 if person immigrated to Israel since 1989
( ) Robust standard errors in parenthesis

Table ISR.14:
The Effect of Suicide Bomber Attacks on the Wages of Public and Private Secuirity Guards
Matched Income and Labor Force Surveys, Israel, 2000 to 2002 *, **
Dependent variable: (log) Hourly Wage ***

Variables	(i)	(ii)
Police^	-0.020	-0.007
	(0.074)	(0.070)
Private security guard^^	-0.357	-0.390
	(0.059)	(0.054)
The effect of suicide bomber attacks:		
(1) Num. of suicide bomber events carried out on buses this quarter^^^ (SBB t)	-0.008	
	(0.009)	
Num. of suicide bomber events carried out on buses last quarter (SBB t-1)		0.014
		(0.009)
Interactions:		
(2) SBB t * Police	**0.027**	
	(0.047)	
SBB t-1 * Police		**0.015**
		(0.047)
SBB t * Private security guard	**-0.011**	
	(0.034)	
SBB t-1 * Private security guard		**0.017**
		(0.032)
Personal Characteristics:		
Years of schooling completed	0.076	0.076
	(0.002)	(0.002)
Yeshiva (last school)	-0.051	-0.051
	(0.020)	(0.020)
Immigrated to Israel after 1988	-0.425	-0.425
	(0.023)	(0.023)
Quarter fixed effect	Yes	Yes
Observations	5633	5633
Adj. R-square	0.325	0.325

Notes:
Based on the Israeli Income and Labor Force Surveys for the years 2000 through 2002
* For reasons of privacy the Israeli CBS excludes income data from the Labor Force surveys.
Income data is provided in a separate file known as the Income Survey.
Personal (or household) IDs were scrambled to avoid the (easy) possibility of merging back these files.
Using personal characteristics available in both files we were able to match observations from both files.
** The sample excludes (i) Israeli Arabs, (ii) workers who earn less then 1500 NIS (less than 1/2 of minimum wage)
(iii) workers who work less than 10 hours a week
*** All specifications include experience and experience square, origin related dummies and marital status
^ Police =
^^ Private security guard=
^^^ Suicide bomber attacks carried out on buses = the average of suicide bomber attacks carried out on buses in the quarter
( ) Standard errors in parenthesis

Table ISR.15
The Effect of Suicide Bomber Attacks on the Likelihood of Male Workers to be Employed as Bus Drivers
Dprobit Estimators (dF/dX): the change in the probability for an infinitesimal change in each variable
CBS, Labor Force Surveys, Israel, 2000 to 2002
Dependent variable: Bus Driver (0, 1)

	All ^	Worked two quarters ago		
		All	Drivers	Bus and Taxi Drivers
Variables	**(i)**	**(ii)**	**(iii)**	**(iv)**
(1) Num. of suicide bomber events carried out on buses this quarter	**-0.004**	**-0.002**	**-0.117**	**-0.213**
	(0.001)	(0.001)	(0.037)	(0.095)
Interactions:				
(2) Num. of suicide bomber events carried out on buses * Bus driver (t-2)	**0.024**	**0.009**	**0.174**	**0.349**
	(0.001)	(0.001)	(0.037)	(0.095)
Overall effect on bus drivers:				
(1) + (2)	0.021	0.007	0.057	0.136
(3) Prob > chi2	(0.000)	(0.003)	(0.297)	(0.149)
Time Trend / Aggregates:				
(4) Number of buses in the public transporation **	0.002	0.002	-0.070	0.072
	(0.006)	(0.006)	(0.194)	(0.406)
Personal characteristics:				
(5) Bus driver 2 quarters ago	0.501	0.600	0.670	0.731
	(0.077)	(0.069)	(0.061)	(0.058)
(6) Years of schooling completed	0.000	0.000	0.005	0.013
	(0.000)	(0.000)	(0.005)	(0.015)
(7) Observations	25848	13723	885	335
(8) Observed Probability	0.009	0.010	0.152	0.342
(9) Predicted Probability at X bar	0.002	0.001	0.048	0.077
(10) Pseudo R-Square	0.565	0.700	0.639	0.756
(11) % effect of suicide bomber attacks at X bar (3)/(9)	-1.889	-1.810	-2.428	-2.748

Notes:
Based on the Israeli Labor Force Surveys for the years 2000 through 2002

* The sample excludes (i) Israeli Arabs and (ii) workers in rural areas
  Workers are those who report being employed during the week of interview
^ Suicide bomber attacks carried out on buses = the average number of suicide bomber attacks carried out on buses during the quarter
** times 1000

Table ISR.16:
The Effect of Suicide Bomber Attacks on the Likelihood of Male Workers
to be Employed as Private Security Guards
Dprobit Estimators (dF/dX): the change in the probability for an infinitesimal change in each variable$
CBS, Labor Force Surveys, Israel, 2000 to 2002*
Dependent variable: working as a private security guard (0,1)

	All	**Worked 2 quarters ago**
Variables	**(i)**	**(ii)**
(1) Suicide bomber attacks^	**0.002**	**0.001**
	(0.0007)	(0.0006)
Interactions:		
(2) Num. of suicide bomber events * P. Security Guard (t-2)	**0.0021**	**0.0001**
	(0.003)	(0.001)
Personal characteristics:		
(3) Jew	0.0076	0.0006
	(0.0018)	(0.0021)
(4) School years completed	-0.0014	-0.0004
	(0.0002)	(0.0002)
(5) Married	-0.0237	-0.0054
	(0.0025)	(0.0024)
(6) Observations	37482	13528
(7) Observed Probability	0.0283	0.0175
(8) Predicted Probability at X bar	0.0190	0.0053
(9) Pseudo R-Square	0.1517	0.5036
(10) % effect of suicide bomber attacks at X bar (2) / (8)	11.3%	2.6%

Notes:
Based on the Israeli Labor Force Surveys for the years 2000 through 2002
* The sample excludes (i) Israeli Arabs and (ii) workers in rural areas
Workers are those who report being employed during the week of interview
^ Suicide bomber attacks = the average number of suicide bomber attacks
$ All specifications include age, age square, origin dummies, fixed effects for recent immigrants and dummy for "Yeshiva"
( ) Robust standard errors in parenthesis

Table ISR.17:
The Effect of Suicide Bomber Attacks Carried Out on Buses on the Use of Public Bus Transportation
Family Expenditure Surveys, 1999 through 2002
Dependent variable: family expenditures (in logs) on public bus rides

Variables	Location: All (i)	All (ii)	Metro Cities(&) (iii)	Metro Cities(&) (iv)	Others(&&) (v)	Others(&&) (vi)
(1) Suicide bomber attacks curried out on a bus^	**-0.310**		**-0.427**		**-0.065**	
	(0.108)**		**(0.120)****		**(0.231)**	
(2) Suicide bomber attacks curried out not on a bus^		-0.069		-0.069		-0.125
		(0.046)		(0.046)		(0.099)
Personal characteristics:						
(3) School years completed	0.088	0.088	0.052	0.088	0.133	0.134
	(0.016)**	(0.016)**	(0.018)**	(0.016)**	(0.034)**	(0.034)**
(4) Income (in logs)^^	-1.336	-1.337	-1.505	-1.337	-1.102	-1.099
	-(0.101)**	(0.101)**	(0.114)**	(0.101)**	(0.222)**	(0.222)**
(5) Age^^^	0.035	0.035	0.023	0.035	0.073	0.073
	(0.004)**	(0.005)**	(0.005)**	(0.005)**	(0.011)**	(0.011)**
(6) Female^^^	0.311	0.298	0.082	0.298	0.668	0.672
	(0.124)*	(0.124)*	(0.137)	(0.124)*	(0.272)*	(0.271)*
(6) Family size	0.228	0.228	0.381	0.228	0.245	0.245
	(0.036)**	(0.035)**	(0.042)**	(0.035)**	(0.071)**	(0.071)**
(6) Recent immigrant^^^^^	1.328	1.342	0.805	1.342	2.388	2.375
	(0.153)**	(0.153)**	(0.162)**	(0.153)**	(0.390)**	(0.389)**
(7) Observations	9811	9811	6566	6566	3245	3245

Notes:
& Jerusalem, Tel-Aviv and Haifa.
&& All other locations
^ Suicide bomber attacks = the average number of suicide bomber attacks
^^ Income = all source of income
^^^ Head's age / gender.
^^^^ Recent immigrant is a dummy variable which equals 1 if person immigrated to Israel since 1990
( ) Robust standard errors in parenthesis

Table ISR.18:
The Effect of Suicide Bomber Attacks Carried Out on Buses on the Use of Taxi Services
Family Expenditure Surveys, 1999 through 2002
Dependent variable: family expenditures (in logs) on taxi services

Variables	Location: All (i)	Metro Cities(&) (ii)	Others(&&) (iii)
(1) Suicide bomber attacks curried out on a bus^	-0.085	0.758	-0.314
	(0.158)	(0.342)*	(0.179)
Personal characteristics:			
(2) School years completed	0.016	0.194	-0.062
	(0.023)	(0.045)**	(0.028)*
(3) Income (in logs)^^	-1.132	-1.072	-1.076
	(0.150)**	(0.283)**	(0.177)**
(4) Age^^^	-0.016	-0.019	-0.018
	(0.007)*	(0.014)	(0.008)*
(5) Female^^^	0.420	-0.129	0.592
	(0.183)*	(0.401)	(0.205)**
(6) Family size	0.107	0.036	0.130
	(0.052)*	(0.107)	(0.060)*
(7) Recent immigrant^^^^^	0.463	-0.428	0.777
	(0.227)*	(0.516)	(0.254)**
(8) Observations	9811	1898	7913

Notes:
& Jerusalem, Tel-Aviv and Haifa.
&& All other locations
^ Suicide bomber attacks = the average number of suicide bomber attacks
^^ Income = all source of income
^^^ Head's age / gender.
^^^^ Recent immigrant is a dummy variable which equals 1 if person immigrated to Israel since 1990
( ) Robust standard errors in parenthesis

Table ISR.19:
The Effect of Suicide Bomber Attacks Carried Out on Buses on the Use of Public Bus Transportation
Consumption by Daily Tickets Vs. Consumption by Multiple-Rides ticket or Monthly Passes
Family Expenditure Surveys, 1999 through 2002
Dependent variable: family expenditures (in logs) on public bus rides

Variables	Daily	Multiple-Rides / Monthly
	(i)	(ii)
(1) Suicide bomber attacks curried out on a bus^	-0.390	-0.007
	(0.125)**	(0.279)
Personal characteristics:		
(3) School years completed	0.032	0.115
	(0.019)	(0.044)**
(4) Income (in logs)^^	-1.462	-1.541
	(0.122)**	(0.279)**
(5) Age^^^	0.025	0.033
	(0.005)**	(0.013)*
(6) Female^^^	0.345	0.541
	(0.148)*	(0.338)
(6) Family size	0.300	0.883
	(0.044)**	(0.099)**
(6) Recent immigrant^^^^^	0.624	2.562
	(0.185)**	(0.409)**

Notes:
^ Suicide bomber attacks = the average number of suicide bomber attacks
^^ Income = all source of income
^^^ Head's age / gender.
^^^^ Recent immigrant is a dummy variable which equals 1 if person immigrated to Israel since 1990
( ) Robust standard errors in parenthesis

Table ISR.20:
The Effect of Suicide Bomber Attacks Carried Out on Buses on the Use of Public Bus Transportation
Daily Rides by Family Income
Family Expenditure Surveys, 1999 through 2002
Dependent variable: family expenditures (in logs) on public bus rides

Variables	Income level		
	All	5 to 10K	10 to 20K
	(i)	(ii)	(ii)
(1) Suicide bomber attacks curried out on a bus^	**-0.499**	**-0.552**	**-0.483**
	(0.171)**	(0.242)*	(0.241)*
Personal characteristics:			
(2) School years completed	0.005	-0.005	-0.014
	(0.029)	(0.041)	(0.040)
(3) Income (in logs)^^	-1.124	-0.917	-1.314
	(0.299)**	(0.546)	(0.650)*
(4) Age^^^	0.032	0.015	0.050
	(0.008)**	(0.012)	(0.013)**
(5) Female^^^	0.304	-0.283	0.807
	(0.205)	(0.294)	(0.288)**
(6) Family size	0.281	0.217	0.332
	(0.061)**	(0.086)*	(0.088)**
(7) Recent immigrant^^^^^	0.893	0.764	0.952
	(0.251)**	(0.343)*	(0.371)*
(8) Observations	4757	2209	2548

Notes:
& Jerusalem, Tel-Aviv and Haifa.
&& All other locations
^ Suicide bomber attacks = the average number of suicide bomber attacks
^^ Income = all source of income
^^^ Head's age / gender.
^^^^ Recent immigrant is a dummy variable which equals 1 if person immigrated to Israel since 1990
( ) Robust standard errors in parenthesis

Table ISR.21:
The Effect of Terror Fatalities and Suicide Bomber Attacks Carried Out on Buses on Coffee Shops Consumption
Family Expenditure Surveys, 1999 through 2002
Dependent variable: family expenditures (in logs) in Coffee Shops

Variables	Location: All (i)	Metro Cities(&) (ii)	Others(&&) (iii)
(1) Suicide bomber attacks curried out on a bus^	0.076	0.276	-0.018
	(0.191)	(0.358)	(0.224)
(2) Fatalities^^	-0.011	-0.020	-0.008
	(0.005)*	(0.009)*	(0.005)
Personal characteristics:			
(3) School years completed	0.141	0.139	0.112
	(0.021)**	(0.037)**	(0.025)**
(4) Income (in logs)^^^	2.223	1.907	2.423
	(0.130)**	(0.216)**	(0.161)**
(5) Age^^^^	-0.066	-0.083	-0.058
	(0.006)**	(0.011)**	(0.007)**
(6) Female^^^^	0.355	0.558	0.301
	(0.152)*	(0.290)	(0.178)
(7) Family size	-0.717	-0.710	-0.630
	(0.049)**	(0.093)**	(0.058)**
(8) Recent immigrant^^^^^^	-1.386	-2.029	-1.037
	(0.216)**	(0.434)**	(0.249)**
(9) Observations	9811	1898	7913

Notes:
& Jerusalem, Tel-Aviv and Haifa.
&& All other locations
^ Suicide bomber attacks = the average number of suicide bomber attacks
^^ Fatalities during the month
^^^ Income = all source of income
^^^^ Head's age / gender.
^^^^^ Recent immigrant is a dummy variable which equals 1 if person immigrated to Israel since 1990
( ) Robust standard errors in parenthesis

Table ISR.22:
The Effect of Suicide Bomber Attacks Carried Out NOT on Buses on Coffee Shops Consumption by Marital Status
Family Expenditure Surveys, 1999 through 2002
Dependent variable: family expenditures (in logs) in Coffee Shops

Variables	Marital Status			
	Married, no children		Singles	
	(i)	(ii)	(iii)	(iv)
(1) Suicide bomber attacks curried out on a bus^	-0.276 (0.081)**	-0.797 (0.364)*	0.035 (0.120)	0.356 (0.245)
Personal characteristics:				
(2) School years completed	0.111 (0.030)**	0.016 (0.155)	0.210 (0.046)**	0.063 (0.130)
(3) Income (in logs)^^^	3.060 (0.199)**	0.734 (0.606)	1.364 (0.261)**	-0.131 (0.462)
(4) Age^^^^	-0.056 (0.009)**	0.293 (0.129)*	-0.084 (0.012)**	0.220 (0.095)*
(5) Female^^^^	0.429 (0.224)	0.711 (0.849)	-0.236 (0.332)	1.106 (0.655)
(6) Family size	-0.517 (0.073)**		-0.185 (0.140)	
(7) Recent immigrant^^^^^^	-1.386 (0.319)**	-1.445 (1.171)	-1.705 (0.410)**	-1.779 (0.910)
Age	All	22-35	All	22-35
(8) Observations	6346	291	2070	327

Notes:
& Jerusalem, Tel-Aviv and Haifa.
&& All other locations
^ Suicide bomber attacks = the average number of suicide bomber attacks
^^ Fatalities during the month
^^^ Income = all source of income
^^^^ Head's age / gender.
^^^^^ Recent immigrant is a dummy variable which equals 1 if person immigrated to Israel since 1990
( ) Robust standard errors in parenthesis

Table FRC.1:
The Effect of Stock on Changes in the Demand for Quality
Source: Adda (2001)

Variable	Before Crisis	During Crisis
Stock [20%,40%]	**-0.410**	**1.89**
	(0.513)	(0.995)
Stock [40%,60%]	**0.280**	**1.92**
	(0.467)	(0.960)
Stock [60%,80%]	**-0.210**	**0.37**
	(0.420)	(0.925)

Notes:
Adda Jerome (2001):
Behavior Towards Health Risks: An Empirical Study Using the CJD Crisis as an Experiment"
Heteroscedastic corrected standard errors were computed.
Regression also controls for lagged changes in quality, region of living, size
of city, occupation, education, family size and income.