

PROTECTING CULTURAL MONUMENTS AGAINST TERRORISM

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Famous cultural monuments are often regarded as unique icons, making them an attractive target for terrorists. Despite huge military and police outlays, terrorist attacks on important monuments can hardly be avoided. We argue that an effective strategy to discourage terrorist attacks on iconic monuments is for a government to show a firm commitment to swift reconstruction. Using a simple game-theoretic model, we demonstrate how a credible claim to rebuild any destroyed cultural monument discourages terrorist attacks by altering the terrorists' expectations and by increasing the government's reputation costs if they fail to rebuild.

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TERRORISM AND CULTURAL MONUMENTS

'Cultural Monuments' are understood here to be the most important buildings representing a nation's cultural identity. They are sometimes monuments of great historical importance (for example St. Peter's Basilica in Rome), but often they are 'icons' with which the whole nation identifies itself (such as the Americans with the Statue of Liberty in New York). Cultural monuments are universally famous and therefore an attractive target for terrorists. It is well known (see Hoffman 1998, Crelinsten 1990, Wilkinson 2000, Frey 2004) that a major goal of terrorists is to gain media attention. Indeed, one can speak of a symbiotic relationship: terrorists depend on the media, and the media profit from reporting terrorist attacks (Frey and Luechinger 2003, Frey and Rohner 2005). If, for instance, the 'Eiffel Tower' in Paris were to be blown up in a terrorist attack, this would generate a huge amount of media attention, thereby publicizing the terrorists' goals.

It is therefore not surprising that there have been several attempted attacks on cultural monuments in the recent past. One of the best-known terror threats against a cultural monument has been the planned, but thwarted, attack by Islamic terrorists on Strasburg Cathedral

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in December 2000, one of the most important icons of Christianity. Other prominent examples of failed plots include planned attacks on the Eiffel Tower in Paris in 2002, the St Peter's Basilica in Rome in 2005 and the House of Commons in London in 2005. US authorities are also very much concerned about a possible destruction of the Statue of Liberty. Although, fortunately, none of these attempts have succeeded so far, it seems just a question of time until one terror strike is successful.

Governments are, of course, aware of this danger and seek to protect their cultural monuments. They take defensive measures, either by closing the sites completely, or severely restricting access, causing considerable utility losses to prospective visitors. Such precautions also cause high direct costs in terms of manpower and material. For example, huge expenses have been incurred to ensure the safety of the Statue of Liberty, which had to be closed to the public for a considerable period of time. Nevertheless, experts are well aware that terrorist attacks are an ever-present threat. Thus, for example, Palac-McMiken (2005) shows for the transport sector that countering the terrorist risk is extremely costly and that it is impossible to remove the risk of terror attacks completely. When discussing terrorism, the *Economist* (8 October 2005, p. 12) accordingly entitles its article: 'The bomber will always get through'. This makes it clear that 'where there's a will, there's a way'. No matter what precautionary measures are taken, some cultural monuments will remain subject to terrorist attacks and thus liable to being completely or partially destroyed in the future.

We suggest that, in many cases, an attractive – if somewhat unorthodox – strategy is to reduce defensive protection measures to an optimal rather than maximum level, but *to be fully prepared for the eventuality and so build a rapid and identical reconstruction* once an (unavoidable) terrorist attack has occurred.

It makes sense to think of defence measures having marginally decreasing returns (as displayed in Figure 2 later). Once a reasonable ('optimal') level of protection is reached, further increases in precautionary measures will lead to increased costs and ever smaller (marginal) benefits in terms of security. Rather than seeking maximum protection, as done by numerous governments, it is in our view advisable to restrict protection to a reasonable level and commit to a policy of reconstruction.

Modern technology allows us to rebuild a monument (almost) identical to the original and to restore it to its former glory. Well-known examples are the Frauenkirche in Dresden or the Chapel Bridge in Lucerne. This strategy reduces major direct and indirect utility losses due to protective measures. Most importantly, terrorists are rational enough to comprehend that the cultural monument will be rapidly restored. Rebuilding cultural monuments has a beneficial impact on the psychological health of the concerned population, lessening the sense of grief and defeat of the citizens (see Oliver-Smith, 1986; Osborne, 2001), and reconstruction will be celebrated by the media as a victory over terrorism. Therefore, terrorists have fewer incentives to attempt an attack in the first place.

The present contribution builds on the growing literature on terrorism (see Engene, 2004; Richardson *et al.*, 2005; O'Kane, 2005). In particular, the literature applying game theoretic tools and formal theoretic frameworks to the analysis of terrorism is relevant (cf. for example Faria and Arce, 2005; Addison and Murshed, 2005; Phillips, 2005; Enders and Sandler, 2006). Although signalling issues have been linked to the study of terrorism (Lapan and Sandler, 1993), and there is a literature treating culture and terrorism (Stern, 2000; Mamdani, 2002), no paper has to our knowledge studied the protection of cultural monuments against terrorism in the light of a possible reconstruction policy, as done in the present contribution.

The next section models the presumed interaction between terrorists and the government and the section after presents some evidence about the possibilities and costs of reconstructing a cultural monument. The final section concludes.

Model of the Interaction between Terrorists and the Government

The *a posteriori* decision of a government to rebuild or not rebuild a national icon in case it gets destroyed influences the *a priori* decision of terrorists whether or not to attack a particular national icon. If terrorists expect the national monument to be rebuilt, they are less likely to attack it in the first place, as they would like to make a long-lasting symbolic impact. In this way, a credible and firm commitment by a government to reconstruct a monument, should it be destroyed, can deter terrorists from attacking, implying that reconstruction is not needed. Obviously, expectations are of crucial importance for the present issue. A relevant question to ask is: Can the terrorists' expectations be influenced in such a way as to lower the risk of them being motivated to carry out a terrorist attack?

The fundamental features of the question posed are similar to some models of financial crisis. In particular, the model of Obstfeld (1986) is relevant. The main focus is on expectations, self-fulfilling prophecies and policy recommendations.

The government of a given country has the choice between 'reconstructing' the monument after an attack, or 'not reconstructing'. Equation (1) displays its loss function:

$$L = \alpha r - \beta E(r) + c \quad (1)$$

where α =parameter, r =relative cost of reconstruction (if alternative policies are taken into account), β =parameter, $E(r)$ =expected value of r , c =reputation cost of not rebuilding the national monument after it has been destroyed.

The term $E(r)$ corresponds to the expectations of the public, which includes investors, lobbies and potential terrorists. If the public thinks that the state will rebuild the icon destroyed, then $E(r)=r$, whereas if reconstruction is not anticipated, $E(r)=0$. The expression $\beta E(r)$ has a negative sign, as it is cheaper in the long run to rebuild a national monument if the public believes that the state is determined to carry out the reconstruction. Lobbies may advocate another use for the area of land where the monument once stood if the government does not seem absolutely determined to rebuild the icon, and investors may hesitate to invest money in a project if they are not convinced that it will indeed be completed.

The reputation cost of not rebuilding is c . It represents the cost of the prestige loss due to the icon being destroyed and the reputation cost of being perceived as a 'lame duck' government.

The terrorists have the choice between 'attacking' and 'not attacking'. They are assumed to prefer 'attacking' if the monument is not reconstructed after an attack, and to prefer 'not attacking' if it is reconstructed.

As shown in Figure 1, when reconstruction is very costly and when the reputation cost of not rebuilding is very low (i.e. when $c < (\alpha - \beta)r$), the government will never rebuild and the terrorists will always attack. By contrast, when reconstruction is relatively inexpensive, and when the credibility cost of not rebuilding is high (i.e. when $c > \alpha r$), the government will always rebuild the icon and the terrorists will never attack.

There is a zone of ambiguity in between those two clear-cut cases where expectations are important. Both the government and the terrorists are assumed to undertake Bayesian updating. They know both their own expectations and those of the opponent, and assume that the opponent is consistent and correct in his beliefs. In this ambiguity zone, expectations are self-fulfilling and multiple equilibria emerge.

If the terrorists and the rest of the public expect that the government will not rebuild the national icon after an attack, $\beta E(r) = 0$. In the case of $c < \alpha r$, the terrorists will attack because they expect that the government will not rebuild the monument. In the case of $c > \alpha r$, the terrorists will not attack because they expect that the government will rebuild the monument.

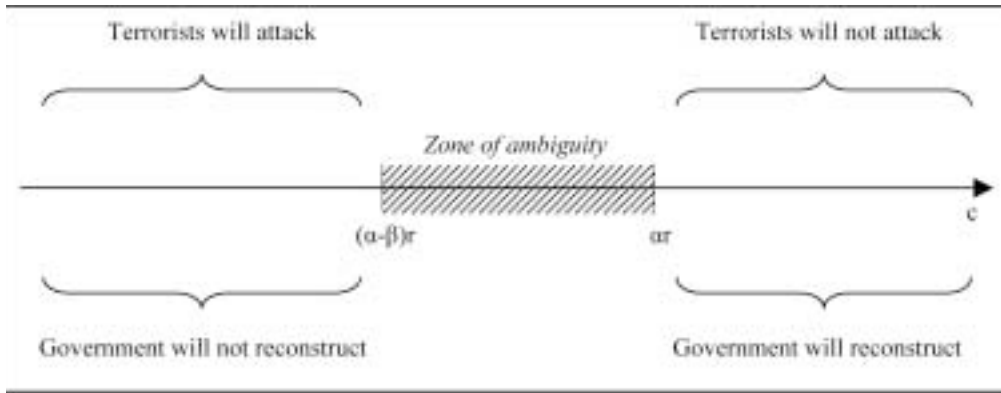


FIGURE 1 Government action and terrorist action for different values of c

By contrast, if the terrorists and the rest of the public believe that the government will rebuild the monument after an attack, $\beta E(r) = \beta r$. This results in the terrorists attacking because they believe the government will not rebuild the monument in the case of $c < (\alpha - \beta)r$, and in the terrorists not attacking because they believe the government will rebuild the cultural monument in the case of $c > (\alpha - \beta)r$.

To summarize, in the zone of ambiguity, terrorists attack if the government does not seem determined to rebuild the monument, and terrorists do not attack if the government is able to convince them and the public of its determination to rebuild the monument in case of an attack.

Thus, by showing strong determination and commitment, the government can avoid terrorist attacks in the zone of ambiguity, and at the same time can increase the credibility cost of not rebuilding, c , which also deters terrorists from attacking. Measures of showing more commitment include public announcements, drawing up reconstruction plans or putting the necessary amount of money in a blocked bank account.

Of course, credibility is crucial, and it must be in the government’s interest to rebuild the monument after destruction, in order for its commitment to be credible. Unconvincing reconstruction claims will be ignored by terrorists. Therefore, it is important that reconstruction plans are well prepared and detailed, in order to raise the reputation cost of renegeing on reconstruction. If this is the case, the government will also *ex post* have incentives to implement reconstruction.

Considerations about the Possibilities and the Costs of Reconstruction

This paper argues that a cost-effective way of diminishing the risk of cultural monuments being destroyed is for the government to be totally committed to rebuilding them in the case of a terrorist attack. However, to discourage an attack, this commitment to reconstruction has to be credible. Reconstruction has to be technically and financially feasible. For most monuments this is the case (cf. Diefendorf, 1989).

An important question is up to what extent a copy will have the same iconic and cultural value as a (destroyed) original. The fact that artistic masterpieces (for example, famous paintings by Picasso) sell for very high prices and copies would hardly find a buyer, could make us believe that people only attribute value to an original masterpiece. However, in our view, there are several reasons to think that reconstructed cultural monuments could have a similar symbolic and iconic value as the destroyed original.

First, reconstructed monuments and buildings, such as the Frauenkirche in Dresden, the ‘old town’ of Warsaw, or the Chapel Bridge in Lucerne have attracted a great number of visitors, perhaps even more than if they had not been destroyed. The tormented history of these icons

has contributed to their charm and attraction. By the same token, one could argue that the 'Leaning Tower of Pisa' would receive far less attention if it were vertical.

Second, it is important to note that the frontiers between 'original' and 'copy' have frequently been blurred in the history of art. Many centuries before Andy Warhol, famous artists have frequently 'delegated' the technical completion of a painting to assistants, and in many cases it is difficult to tell to what extent an 'old master' was involved in the creation of a given painting (cf. for example the 'Rembrandt Research Project').¹

Third, if already in the field of painting the concept of 'original' is less clear-cut than it sometimes may appear, this is even more the case for national monuments, which in most cases are architectural buildings. For artistic masterpieces like the Mona Lisa, not only the idea matters, but also the technique of the artist ('the hardware'). By contrast, for monuments such as the Eiffel Tower, above all the symbolism and architectural idea counts ('the software'). Once detailed plans of a site are available, there is no need for a particularly sophisticated technique in order to re-build a cultural monument such as the Eiffel Tower, and the reproduction is likely to be almost identical to the destroyed original.

There do not seem to be many empirical estimates for the costs of protecting a cultural monument from terrorist attacks and of reconstructing such a monument after terrorists have struck. Obviously, relative costs vary considerably according to what kind of monument is affected and to what extent it has been damaged by a successful terrorist attack. Total destruction seems to be an unlikely scenario; in most cases, a monument is only partially destroyed. This has, for instance, been the case even after prolonged bombardments from aeroplanes. Thus, the Frauenkirche in Dresden, which was subject to heavy bombing by the Royal Air Force in February 1945, and which collapsed two days later, was not totally destroyed. In the reconstruction, completed in October 2005, parts of the walls still standing were reintegrated, as well as part of the building materials still on the site.

The Frauenkirche in Dresden provides a good example for a successful and economically feasible reconstruction of an icon. The rebuilding of this church began in 1994, almost 50 years after it was destroyed. The reconstruction costs amounted to about \$130 million. Modern technology enabled this 'unique' monument to be rebuilt so that it closely resembled its original state. The restored baroque altar, for example, was assembled using more than 2000 pieces of debris.

More than half of the reconstruction costs were financed by charity donations from all over the world. Taking future benefits from tourism into account, this reconstruction is also justifiable from an economic point of view.

Other examples of successful reconstructions include the famous wooden Chapel Bridge of Lucerne after it was destroyed by fire, or the complete reconstruction of the old part of Warsaw.

A recent report from the UNESCO (2004) calculates the costs of reconstruction or renovation for 28 different cultural monuments in Kosovo, which were partially or totally destroyed by the armed conflict. These monuments include churches, monasteries and historical buildings. On average, the funds needed for a complete reconstruction or renovation amounted to about \$830,000 per monument.

Concerning the reconstruction of the World Trade Center after 9/11, most of the literature emphasises organisational and feasibility issues of construction (see Borg *et al.*, 2003; Hajer, 2005), without, however, providing numerical estimates of the costs involved. One exception is the contribution of Bram *et al.* (2002), estimating the costs of cleaning up the site and reconstructing the World Trade Center at \$21.6 billion.

For the purpose of the present contribution it would have been helpful to have more direct estimates of reconstruction costs after a terrorist attack. Fortunately, most attempts to attack

¹ The website of this project provides detailed information: <http://www.rembrandtresearchproject.org/>.

national icons have failed so far. This partial lack of hard facts does in our view not lower the value of our contribution. As the proposal advanced in our paper is new, it is necessarily somewhat speculative.

Reconstruction seems to be a relatively inexpensive option compared with high level security measures and restrictions. A RAND study by Zycher (2003) considers, for instance, the direct monetary costs of counterterrorism in the United States. He documents that US federal spending increased by \$95 billion in the aftermath of the terrorist attacks of 9/11, a substantial part of which was used for deterrence measures involving police and military outlays. Zycher also computes long-run expenditures for counter-terrorism according to different scenarios. For the 'moderate case', counter-terrorism expenditures are expected to amount to \$10 billion per year, whereas for the 'severe case' and the 'nuclear case', they would be, respectively, about \$200 billion or \$300 billion per year. These estimates, of course, are only partially relevant to the issue discussed here because this total sum would have to be broken down to refer to particular cultural monuments.

It is not feasible to provide any general estimates of the benefit–cost ratios of either protecting an iconic monument against terrorist attacks or of preparing for a rapid rebuilding in case it is attacked and damaged. Accordingly, the anti-terror policy proposed cannot be considered superior to any other policy in any general way. Rather than siding with one policy or the other, this paper proposes reconstruction as a *possibility*, which the literature so far has, rarely if ever, considered as an alternative to anti-terror policy.

It is important to note that we do not recommend cutting defence spending completely. However, what we stress are the increasing costs of protecting monuments and the rapidly decreasing marginal benefits in terms of security from additional security measures. Thus, after some reasonable ('optimal') level of protection has been reached, additional protection measures will become more and more inefficient. In addition, the indirect costs of protection measures, such as the erosion and possible destruction of human rights as well as the costs of harassing people, increase with a higher level of military deterrence. Figure 2 illustrates this reasoning for a case where protection measures have decreasing marginal returns and increasing marginal costs. Such a case seems reasonable, as standard economic theory usually assumes a concave shape of a benefit curve, and a convex shape of the cost curve resulting from public policies.

Once this optimal level of security is reached, it is more advantageous to shift additional spending away from further military deterrence to a policy of reconstruction, which also lowers the incentives for terrorists to attack.

While no general evaluation of the benefit–cost ratio of the two policies is possible, the major cost components can nevertheless be identified. Depending on the particular cost situation, or relative prices in a given country (e.g. the labour costs are higher in a rich economy than in a poor economy), the balance of economic advantage is tilted in favour of one or the other policy.

As has been pointed out, the *protection* policy is not able to ensure that an iconic monument will never be attacked. What it can achieve is a reduction in the probability of an attack. The probability of an attack may vary enormously from one monument to another. Some monuments can be protected quite effectively through structures that prevent cars loaded with explosives coming anywhere near the building; in other cases, a small number of guards can achieve the same effect. In many cases, however, it takes a substantial number of guards protecting a monument day and night to significantly reduce the probability of attack and prevent serious damage. In view of the high labour costs, such protection is expensive in highly developed economies.

A major cost of the *reconstruction* policy lies in making elaborate plans for rebuilding. A high level of expertise is necessary in these areas. The corresponding costs are lower in

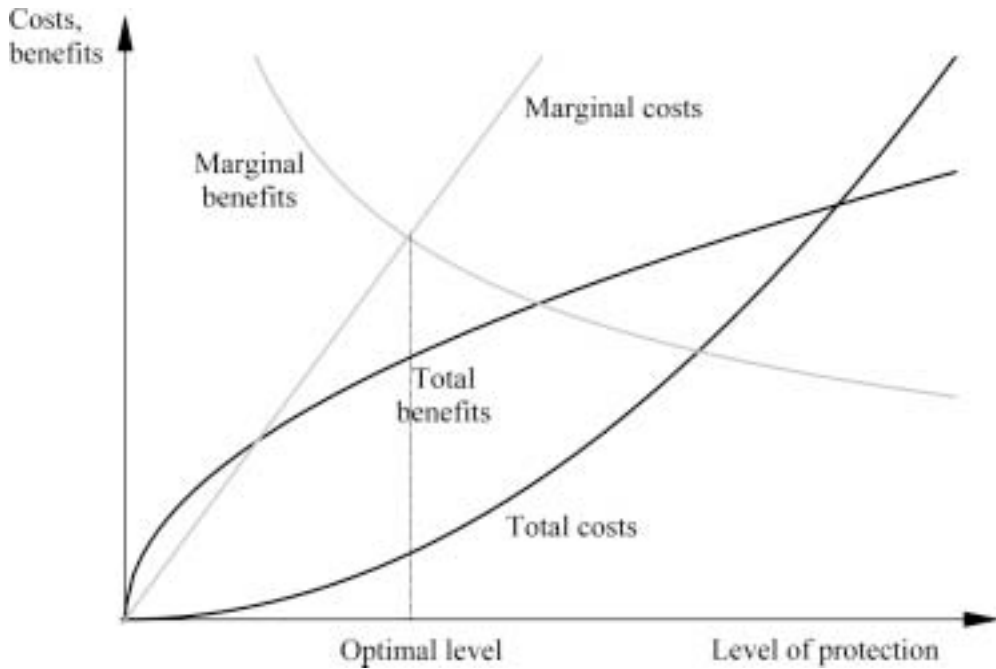


FIGURE 2 The costs and benefits of protection spending

developed economies where more sophisticated planning and building technology is easily available, than in less developed economies. In any event, it is reasonable to undertake *some* degree of protection, but the level of protection could be considerably lower.

With these considerations in mind about rebuilding a *similar* iconic monument, poorer countries might find it advantageous to employ a more protective policy, while richer countries might lean more towards a policy of reconstruction. This does not necessarily mean that richer countries will find that the optimal solution is to rely mainly on reconstruction; an iconic monument may be of a nature that makes it very expensive to rebuild – for instance, if reconstruction requires high labour input. Conversely, poorer countries may well rely on the rebuilding strategy in the case of monuments that can relatively inexpensively and easily be reconstructed.

The benefit–cost ratios used to compare the two policies should not be confined to material and labour costs. The two policies also entail differences in the extent to which access to the sites is made more difficult. This causes a loss due to the reduced exposure to a ‘national icon’. An extreme example is when a monument no longer serves the purpose for which it was built. Another cost to be taken into consideration is the possible loss of human rights produced by an anti-terrorist policy (see for example Mueller 2004, Roth 2004, Foot 2005, Gearty 2005). Taking those types of costs into consideration, the *reconstruction* policy seems to have a definite advantage.

CONCLUSION

The present contribution deals with the protection of cultural monuments (‘icons’) against terrorist attacks. Using a simple game-theoretic model, it is shown that, by firmly committing themselves to the reconstruction of icons that are destroyed, the government reduces the terrorist threat. Measures of commitment such as public announcements, the availability of

detailed reconstruction plans, and the creation of blocked bank accounts alter the terrorists' expectations and raise the loss of reputation if the government reneges from its commitment. As a result, terrorists are discouraged from attacking. Determination to rebuild the monument in the case of a terrorist attack has the consequence that reconstruction often becomes no longer necessary.

Preliminary evidence suggests that the reconstruction of attacked icons is, in many cases, less costly than expenditures for deterrence which, moreover, will never be able to provide complete protection against terrorist attacks. Reconstruction appears to be a technically and economically attractive policy option, which should be taken into consideration as a part of anti-terrorist policy.

References

- Addison, T. and Murshed, M. (2005) Transnational terrorism as a spillover of domestic disputes in other countries. *Defence and Peace Economics* **16** 69–82.
- Borg, K. P., Gambatese, J., Haines, K., Hendrickson, C., Hinze, J., Horvath, A., Koehn, E., Moritz, S. L., Mass, M. and Haughney, R. A. (2003) Rebuilding the World Trade Center. *Practice Periodical on Structural Design and Construction* **8** 137–145.
- Bram, J., Orr, J. and Rapaport, C. (2002) Measuring the effects of the September 11 attack on New York City. *Federal Reserve Bank of New York Policy Review* November 5–20.
- Crelinsten, R. (1990) Terrorism and the media: problems, solutions and counterproblems. In *Democratic Response to International Terrorism*, edited by David Charters. Ardsley-on-Hudson, New York: Transatlantic Publishers, 267–307.
- Diefendorf, J. (1989) Urban reconstruction in Europe after World War II. *Urban Studies* **26** 128–143.
- Enders, W. and Sandler, T. (2006) *The Political Economy of Terrorism*. Cambridge: Cambridge University Press.
- Engene, J. O. (2004) *Terrorism in Western Europe: Explaining the Trends since 1950*. Cheltenham: Edward Elgar.
- Faria, J. R. and Arce, D. G. (2005) Terror support and recruitment. *Defence and Peace Economics* **16** 263–273.
- Foot, R. (2005) Collateral damage: human rights consequences of counterterrorist action in the Asia-Pacific. *International Affairs* **81** 411–425.
- Frey, B. (2004) *Dealing with Terrorism – Stick or Carrot?* Cheltenham UK: Edward Elgar.
- Frey, B. and Luechinger, S. (2003) How to fight terrorism: alternatives to deterrence. *Defence and Peace Economics* **14** 237–249.
- Frey, B. and Rohner, D. (2005) Blood and ink: the common-interest-game between terrorists and the media. Working Paper, Institute for Empirical Research in Economics, University of Zurich and CREMA – Center for Research in Economics, Management and the Arts, Switzerland.
- Gearty, C. (2005) 11 September 2001, counter-terrorism, and the human rights act. *Journal of Law and Society* **32** 18–33.
- Hajer, M. (2005) Rebuilding ground zero: the politics of performance. *Planning Theory and Practice* **6** 445–464.
- Hoffman, B. (1998) *Inside Terrorism*. New York: Columbia University Press.
- Lapan, H. and Sandler, T. (1993) Terrorism and signalling. *European Journal of Political Economy* **9** 383–397.
- Mamdani, M. (2002) Good Muslim, bad Muslim: a political perspective on culture and terrorism: September 11, 2001. *American Anthropologist* **104** 766–775.
- Mueller, D. (2004) Rights and citizenship in a world of global terrorism. *European Journal of Political Economy* **20** 335–348.
- Obstfeld, M. (1986) Rational and self-fulfilling balance of payments crisis. *American Economic Review* **76** 72–81.
- O’Kane, R. (2005) *Terrorism*. Cheltenham UK: Edward Elgar.
- Oliver-Smith, A. (1986) *The Martyred City: Death and Rebirth in the Andes*. Albuquerque: University of New Mexico Press.
- Osborne, B. (2001) In the shadows of monuments: the British League for the Reconstruction of the Devastated Areas in France. *International Journal of Heritage Studies* **7** 59–82.
- Palac-McMiken, E. (2005) Economic costs and benefits of combating terrorism in the transport sector. *Asian Pacific Economic Literature* **19** 60–71.
- Phillips, P. (2005) The ‘price’ of terrorism. *Defence and Peace Economics* **16** 403–414.
- Richardson, H., Gordon, P. and Moore II, J. (eds) (2005) *The Economic Impacts of Terrorist Attacks*. Cheltenham UK: Edward Elgar.
- Roth, K. (2004) The law of war in the war on terror. *Foreign Affairs* **83** 2–7.
- Stern, J. (2000) Pakistan’s Jihad culture. *Foreign Affairs* **79** 115–126.
- UNESCO (2004) *Cultural Heritage in South-East Europe: Kosovo*. Cultural Heritage in South-East Europe Series Nr. 2. Venezia: UNESCO.
- Wilkinson, P. (2000) *Terrorism Versus Democracy: The Liberal State Response*. London: Frank Cass.
- Zycher, B. (2003) *A Preliminary Benefit/Cost Framework for Counterterrorism Public Expenditures*. Santa Monica: Rand.