

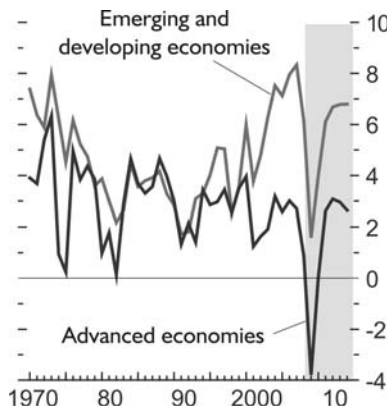
Nonkilling Economics

Calculating the Size of a Peace Gross World Product

Jurgen Brauer and John Tepper Marlin
Augusta State University; New York University

In April 2009, the International Monetary Fund (IMF) released an update of its *World Economic Outlook* (WEO) publication. Given a gross world product (GWP) in 2007, of about USD55 trillion, the IMF stated that advanced economies shrunk by an annualized 7.5% in the fourth *quarter* of 2008, and those of emerging and developing economies by 4%.¹ Nonetheless, for the *whole* of calendar year 2008, the world economy still grew by 3.2% as compared to 2007. For 2010, the IMF foresees an increase of world economic output by 1.9%. However, the worldwide economic decline that began in the second half of 2008 would result in a reduction, in 2009, of the size of the world economy by 1.3% (see Figure 1).

Figure 1. Real GDP growth (actual and projections)

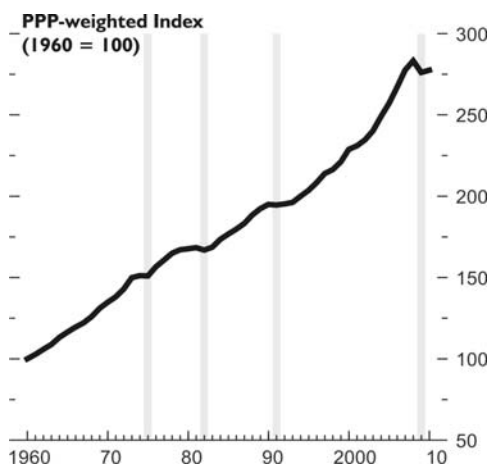


Source: IMF WEO (April 2009: 1)

¹ Unless we quote, we employ standard three-letter codes to denote currencies, e.g., for the U.S. dollar we use USD instead of US\$. See <http://www.iso.org/> and search for ISO4217 [accessed 1 September 2009].

In this chapter, we report on the computation of an estimate of the economic cost of worldwide violence for 2007. We estimate that violence, or the credible threat thereof, led the world to forgo about 9% of GWP that year. A major finding of the chapter is that the economic effects of the ongoing world violence crisis are much more severe than the effects of periodic world economic crises. For example, Figure 2 shows inflation-adjusted per capita GWP from 1960 to 2010 (projected). Worldwide recessions occurred in the mid-1970s, early 1980s, early 1990s, and late 2000s. Even if our 9% cost of violence estimate for 2007 overestimates the unknown annual cost of worldwide violence by two or three times, this cost still would easily outrank the economic crises, in part because economic crises occur only sporadically whereas the violence crisis is continuous.²

Figure 2. Real per capita World GDP



Source: IMF WEO (April 2009: 12)

Violence, or the credible threat of violence, interferes with education, health, and personal safety and thus with productivity, the pursuit of business opportunities, commerce and trade, economic development and growth, and with material well-being and subjective happiness. Business leaders might take different decisions if they knew, even approximately, not only the current

². A companion chapter appears as Brauer and Marlin, "A Method to Compute a Peace Gross World Product by Country and by Economic Sector," in Goldsmith and Brauer (forthcoming).

cost of violence to the global business environment, but also the extent of business opportunities forgone by the continuous presence of violence that in some cases renders entire states largely unfit for business.³

We distinguish between economic activity that is criminal as opposed to that which is violent or, at any rate, related to violence. We are not interested in estimating a non-criminal (“ethical”) GWP but in estimating a peace GWP or nonviolence GWP, as distinct from a violence-infused GWP. We do not argue that it is feasible to eliminate violence nor that military forces and violence-related law and order functions are or will become unnecessary; merely that societies have choices between spending money on conflict-transformation, for example, as opposed to locking up people for individual or collective violent behavior. Business, in particular, has both the resources and the incentives to affect how societies respond to violence. Our purpose is to show how society, including business, might benefit from a reduction in violence.

The Stockholm International Peace Research Institute (SIPRI) estimates that, for 2007, world military expenditure as a share of actual gross world product (aGWP) was 2.5% (SIPRI, 2008: 175). If one adjusts this number for the typical under-reporting of military expenditure and for the economic activity involved in violent activities such as the prosecution of war, civil war, political repression, and activities in conjunction with criminal violence, including maritime piracy, it can be argued that the combined effect directly or indirectly implicates a conservatively estimated 4.4% or more of aGWP in violence.⁴ The mere reallocation of economic activity from violence to peace would shift this 4.4% from violence industries to peace industries but would not, by itself, add to the size of the economic pie. We refer to this as the

³ We employ the term violence without indicating each time that we include in this the credible threat of violence or of defending against perceived, implied, threatened, or actual violence. For example, most of the time military forces are on stand-by status. They represent a threat (or counter-threat) rather than actual perpetration of violence. Similarly, private security forces, alarm systems, and bodyguards represent, in part, deterrence measures meant to lower the incidence of violence, e.g., of assault and robbery.

⁴ For the United States of America, for example, U.S. Department of Defense outlays in 2008 understate overall national defense-related outlays by at least 78%. This is so, in part, because some military-related spending occurs through the Department of Energy (e.g., military-nuclear activities) and other departments, in part because some legacy costs of past military readiness and activity are budgeted for the Department of Veterans Affairs, and in part because a properly apportioned share of the interest payment due on the national debt (the cumulative annual budget deficits) should be attributed to military activity. For 2008, these adjustments alone would bring military expenditure as a percentage of U.S. GDP to 7.3% rather than to the widely reported 4.1%, where the latter is based solely on U.S. Department of Defense outlays (see Brauer, 2007, 2009).

static peace dividend effect, meaning that the size of the economic pie remains at first unchanged. Although some industries would decline precipitously (e.g., military aircraft manufacture), others would decline only slightly (e.g., sport and hunting firearms manufacture, by far the largest part of the manufacture of firearms), and still others would probably see no decline in economic activity at all (e.g., a law firm doing business in criminal and civil law might merely see less business in its violent crime case load but more business in its corporate law cases as economic activity shifts).

Beyond the static economic effect lies the realization that by suppressing economic activity, violence reduces GWP below what it otherwise could have been. For example, one study of the economic effect of terror suggests that in the absence of terror events GWP might have been up to 11% higher per year. If violence ceases and peace obtains, otherwise idle, underused, or misdirected labor and capital resources can be liberated and enter into the economy in productive ways. We refer to this as the dynamic peace dividend effect. Combined, the static and the dynamic effects account for the total economic effect of the cessation of violence and the utopia of peace. For 2007, this total effect could have been, in foreign-exchange based nominal terms, as much as USD7.2 trillion. One-third of that would have come from the static reallocation of resources but a net gain of about USD4.8 trillion, or 8.7%, over the actual 2007 gross world product of about USD54.7 trillion could have been realized from the dynamic effects of peace.

The remainder of this chapter is arranged as follows. Firstly it discusses peace economics, of which nonkilling economics is but one part. Then it summarizes prior literature, focusing on economy-wide effects of violence. The objective is to gain from the disparate and highly case-specific literature a sense of the likely global percentages across all states and all economic sectors that would guide the assumptions to be used in the computations to follow. The two next sections discuss how we compute static and dynamic economic effects of nonviolence. And the final section discusses limitations of the calculations and concludes the chapter. Appendix A contains some tables.

Nonkilling and Peace Economics

Over the years, very many, very prominent economists have written articles, essays, chapters, and books on economic aspects of violent conflict, war, and peace.⁵ It is false to say—as is sometimes claimed for example for the case of the United States of America in World War II—that violence,

⁵ See Brauer and Dunne (2006); Coulomb (2004).

killing, and war can make an economy better off. To appreciate this point, imagine a hypothetical four-person economy. The persons are (1) a farmer (F) who produces tangible goods; (2) a military officer (M) who patrols the perimeter of the state to protect F's fields from external threat; (3) a thief (T) who during the workday threatens F's and M's unguarded residences which are vulnerable to predation; and (4) a police officer (P) who is in charge of preventing T from succeeding.

In this economy, it may be said that two persons produce protection services (M and P), one person produces tangible goods (F), and one person produces disservices (T). The survival of all four depends solely on the product of F. Suppose that T becomes a farmer as well so that the economy now has two farmers, F1 and F2. Evidently, the need for P's services ceases and s/he may become farmer F3. On the assumption that all are equally productive, economic output or gross domestic product (GDP) can be tripled on account of internal peace. Alternatively, inhabitants can make do with the prior GDP, share the work load of farming, and enjoy more leisure. With external peace, M can become a farmer (F4) as well and the economy, or time for leisure, could be larger still. Thus, even if deemed necessary, it must always be true that violence, or preparation for violence, diverts resources, disrupts gains from trade, and destroys assets.⁶ In real economies the ratio of peace to violence-based economic activity is not 1 to 3 (F as against M, P, and T) of course.

To our knowledge, the research upon which this chapter is based is the first attempt to calculate the size of world gross product (GWP) assuming the absence of violence. This is not just nonkilling but nonviolence, a more ambitious, indeed utopian, view. To undertake an estimate of this kind some broad assumptions must be made. The thinking behind our estimates is not that military expenditure and violence-oriented production have no value in imposing order and preventing disorder and further violence. Rather, we argue that if there were a way to achieve order with ever less violence production, or to reduce expenditure on violence industries, resources for peace industries would rise and generate more GWP.

GWP is a flow measure of income generated from a stock of wealth. GWP can be increased by using up wealth (e.g., paying people an income to cut down every tree in the world) but this reduces the stock of wealth (i.e., assets or capital) from which future income is derived. The economic crux of the matter lies in asset building, and therefore the economic crux of violence

⁶ For a textbook treatment, see, e.g., Anderton and Carter (2009).

lies in destroying assets or in diverting or disrupting their use, maintenance, or build-up. If a farmer in Colombia decides not to invest in irrigation because of the threat of appropriation or destruction, his/her income, and thus GWP, will be permanently reduced. Peace industries build income-generating assets. Violence industries either prevent this or help erect avoidance and defensive assets and thereby misdirect economic resources. Thus, peace brings not only static effects of reallocating resources from violence to peace but yields dynamic effects by injecting resources previously held hostage to violence into the economy. On account of peace itself, the economic pie grows. However, although income is necessary, it is not sufficient for human well-being and happiness. At some point, income is sufficiently high for people to substitute from income-generating work into pleasure and leisure. Any peace dividend that accrues may well be taken in the form of nonwork (leisure). To focus on GWP, even if it be a peace GWP, can be misleading.

Prior Literature

Forms of violence

The World Health Organization (WHO, 2002) classifies violence into the rubrics of self-harm (including suicide), interpersonal violence (e.g., violence between intimate partners and other forms of family violence, rape and sexual assault by strangers, violence committed in institutional settings such as schools, prisons, and work places), and collective violence (e.g., armed conflict within and between states, violent political repression and genocide, violent acts of terror, and organized crime) and speaks of an “ecology of violence” that progresses from individual to personal relationship-related violence to communal and broad collective levels of violence.

Violence is rarely costed, either economy-wide or business-specific, and we are not aware of any sustained effort to pull all the available information together to tell a consistent, complete, and regularly updated “story” on the cost of violence and the beneficial promise of peace. We summarize here findings from a somewhat haphazard selection of studies, the main objective of which is to gain a sense of the magnitude of the economy-wide cost of violence. No attempt has been made to conduct a comprehensive review.

A general observation is that few studies approach the question of violence from a business perspective.⁷ Like most individual victims, business

⁷ International Alert and the International Business Leaders Forum maintain programs on business and conflict. See http://www.international-alert.org/peace_and_economy/index.php and <http://www.iblf.org/> [accessed 15 April 2009].

simply adapts and rarely speaks up against violence, for peace, even though it has the resources and the economic incentive to do so. Prior studies have tended to focus, on the one hand, on war, military expenditure, and (anti)terror effects, and, on the other, on the economics of public health effects of interpersonal violence, especially sexual violence and the use of firearms. Rarely are the literatures brought together. A focused program of study on security economics, i.e., on the cost of antiviolence and security-related measures and of the cost of violence against employees, businesses, suppliers, and customers, does not exist.

Violence: interstate war or preparation therefor

There are many studies of the economy-wide costs of war and military spending budgets (for a small sample see Appendix, Table A2). These range from under 1% to well over 10% of country-specific GDPs. As regards the United States, its military budget alone, quite apart from its effects, is variously described as between 20% and 70% of the U.S. federal government budget or, for 2008, between USD500 billion and USD1 trillion (Brauer, 2007, 2009). We believe that the higher numbers are the more accurate measures, so that a peace GDP for the United States would release USD1 trillion for civilian use from the military sector alone, or over 7% of U.S. GDP. Estimates of the cumulative cost of the Iraq war to the United States, let alone to Iraq,⁸ have varied between a few billion dollars to USD3 trillion and more.⁹

Since 1991, interstate wars have become rare or, at any rate, short-duration events. Examples include the 3-week long, U.S.-led war against Iraq in March 2003 (which became a civil war thereafter), the Israeli-Lebanon war in July and August of 2006, and the Russian-Georgian war in August 2008. The Israeli war is said to have cost USD20 billion for about one month of fighting, or about 12% of Israeli GDP (Phillips, 2006: 21).

As mentioned, in 2007, average world military expenditure, as measured by SIPRI, amounted to 2.5% of GWP that year. This number serves as a minimum guide of violence-related costs that, in a utopian world, could be converted and applied to an economy of peace.

⁸ On the war cost to Iraq see, e.g., Yousif (2006).

⁹ See John Tepper Marlin, "Why Estimates of the Cost of the War in Iraq Have Been Rising," http://www.huffingtonpost.com/john-tepper-marlin/why-estimates-of-the-cost_b_74026.html [accessed 10 September 2009].

Violence: transnational and domestic terror events

We reviewed 23 studies that included estimates of the effect of terror events on the economies of various states (see Table A1).¹⁰ Among those, Crain and Crain examine macroeconomic consequences of terror events using data from 147 countries from 1968 to 2002. Estimates for the economic effect of terror events on GDP, GDP growth, investment, and consumer spending, including tourism, suggest that a reduction in terror could yield large economic benefits, with the size of the effect depending on a country's demographics, base level of output, and investment level. The study provides a foundation for computing the costs of terror and the benefits of antiterror activities by analyzing 11,723 terrorist acts that killed or wounded 37,137 people. The authors use data compiled by the ITERATE project. For the United States, the study concludes that a reduction in incidents from 3 to 2 per year would be associated with a GDP increase of about USD40 billion and add nearly USD5 billion in fixed capital investment to the U.S. economy. For the world as a whole, the authors estimate that without terror incidents, GWP would have been USD3.6 trillion higher in 2002. This is 10.9% of the USD33 trillion GWP that year. Carrying this percentage forward to 2008 would result in a USD6 trillion number. Since terror is only one of several kinds of violence, the total GWP effect of violence, and therefore the GWP potential from peace, would be larger still.

Violence: other collective and personal violence

Although interstate war and transnational terror loom large in the world's public attention, in fact transnational terror events are relatively rare and no major interstate armed conflict, defined as involving at least 1,000 battle-related deaths during at least one calendar year of a conflict and at least 25 battle-related deaths in other calendar years, has been recorded at all since 2004 (SIPRI, 2008: 73). Instead, in economic terms some of the worst violence occurs in sovereign countries that are poor or to individuals in wealthy countries who are poor. The poor lack voice, and violence to them is, on the global communications network, often noiseless.

There are at least two ways to arrive at estimates of nonwar, nonterror costs of violence. One is to collect estimates from specific case studies on human rights violations, violent crime, and so on. The World Health Or-

¹⁰ The frequency of domestic terror events is about 10 times that of transnational terror events (Anderton and Carter, 2009: 128-129). The studies listed in Table A1 include transnational and domestic terror studies.

ganization, in a 2002 report, summarizes some economic research on the cost of violence as follows:

studies sponsored by the Inter American Development Bank between 1996 and 1997 on the economic impact of violence in six Latin American countries calculated that expenditures on health services alone amounted to 1.9% of the gross domestic product in Brazil, 5.0% in Colombia, 4.3% in El Salvador, 1.3% in Mexico, 1.5% in Peru and 0.3% in Venezuela. A 1992 study in the United States put the annual cost of treating gunshot wounds at US\$126 billion. Cutting and stab wounds cost an additional US\$51 billion.¹¹

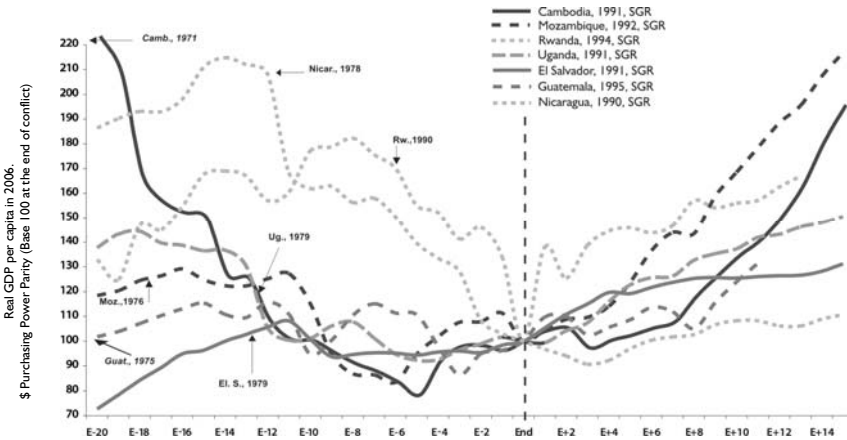
A follow-on WHO report in 2004 on the economic dimensions of interpersonal violence states that for the United States alone the cost is on the order of 3.3% of GDP. Intimate partner violence in Nicaragua was estimated at 1.6% of GDP, and in Chile at 2.0% of GDP (see WHO, 2004: x). Cook and Ludwig (2000) estimate the cost of gun-related crime in the United States at USD115 billion in nominal 1997 dollars (USD148 billion in nominal 2008 dollars, or about 1 percentage point of U.S. GDP). A 2006 World Bank working paper put the total cost of crime and violence in Latin America and the Caribbean at 14.2% of GDP for the region (Heinemann; Verner, 2006).

The methods underlying these studies are diverse and not necessarily consistent and focus, understandably, on personal costs to the victims and on public sector costs. Costs to business—direct, indirect, and in terms of forgone opportunities—are rarely mentioned.

The United Nations Development Programme (UNDP) summarizes recent studies estimating the economic cost of civil war, especially for Africa, as lying somewhere between 2.2% and 3.3% of GDP per country per conflict year prior to 1990 and perhaps as much more than 10% of GDP post-1990, that is, in the post-cold war era (UNDP, 2008: 35). Figure 3 provides an impression, in per capita purchasing power parity terms (ppp), of the drastic cumulative cost of violence in selected civil war countries. At the same time, the figure provides evidence that postconflict economic recovery is possible (all the lines turn upward) but that policy plays a role in the strength of the recovery (SGR and WGR stand for “strong” and “weak” growth recovery, respectively).

¹¹ See WHO (2002). The quoted passage is taken from page 8 of the Summary, available at http://www.who.int/violence_injury_prevention/violence/world_report/en/summary_en.pdf [accessed 15 April 2009].

Figure 3. GDP per capita in selected civil war states (year conflict ended, group)



Note: Arrows point to starting year of conflict, unless where conflict is ongoing over the entire period covered (Cambodia, Guatemala), in which case the arrow points to the first year of the series.

Source: UNDP (2008: 111, Figure 4.2)

A Small Arms Survey review study done for the Geneva Declaration on Armed Violence and Development on the cost of lost productivity due to criminal violence estimates annual costs on the order of USD95 billion to USD163 billion, or about 0.14% of (2004) GWP.¹² The same study suggests that the consequences of armed conflict “decreases the GDP growth of an average economy by at least two per cent per year” and that the subjective cost of insecurity generated by armed violence results in costs of USD400 billion annually. Of course, many war-torn African country hardly reach 2% GDP growth to begin with, let alone in per capita terms. Losses stem from “fiscal effects, loss of productive capital, depleted financial capital, eroded human capital, rising transaction costs, and reallocation of development assistance (to less risky environments)” (GD, 2008: 89-90).

This state-by-state approach demands a painstaking, but eventually inevitable, trekking through the literature to arrive at a complete listing of these sorts of estimates. Although expensive in labor resources, this would be a merit-full undertaking because it would result in a specific and detailed shared resource and starting point for outcome-oriented, collaborate research in violence, nonkilling, and peace economics.

¹² See <http://www.genevadeclaration.org/resources-armed-violence-report.html> (GD, 2008).

In the absence of state-by-state estimates, another, and necessarily cruder, approach is to look only at the easily identified business costs of violence, especially from the terrorism-related studies, and assume for instance that terror or the threat thereof accounts for 80% of all violence-related costs. One could then argue that the Crain and Crain estimate of terror costs of 10.9% of GWP be boosted by the “missing” 20% to take account of nonterror-related costs of violent conflict. The total would come to 13.6% of foreign exchange based actual GWP of USD54.7 trillion. For 2007, this would be about USD7.4 trillion. Alternatively, if the terror-related costs, on the Crain and Crain estimates are only 50%, rather than 80%, of all violence costs to business, the total suppressed foreign-exchange based actual GWP would come to 21.8%, or USD12 trillion, of GWP—too high an estimate in our view.

In sum

Although the numbers vary widely across countries and studies, figures of the annual costs of violence of up to 10% of GDP are not uncommon, certainly not for cases of acute mass violence. Even in cases of “routine” violence, estimates run to 2% to 5% of GDP as the cost of perpetrated interpersonal violence, let alone for defending against perceived, implied, or explicitly stated threats of violence. Taking these results, we calibrated the base scenario coefficients used in a spreadsheet to arrive at what we believe is a plausible, indeed conservative, estimate of 4.4% of GWP as the current cost of violence and of about 9% in addition to current GWP (the dynamic peace dividend) if violence were to cease. In 2007 foreign-exchange based dollar terms the combined effect would be an annual USD7.2 trillion.

Static analysis

Results (summary)

Given certain general assumptions, detailed in section 4.2, we compute in nominal 2007 terms a static peace dividend of USD2.4 trillion, or 4.4% of actual GWP. Of the total sum, USD1.0 trillion would be contributed by industry and the remaining USD1.4 trillion by the service sector. We develop a spreadsheet setup that permits future refinement of the calculations as our general assumptions are gradually replaced by country-specific information.¹³

Method and details

¹³ See note 2.

Static effects are computed both in terms of fx-based aGDP and ppp-based aGDP across 140 countries.¹⁴ For now, we refer only to fx-based calculations. We collected data on nominal aGDP from the IMF's World Economic Outlook data base, which in 2007 summed to USD54.7 trillion in fx based dollars. The United States accounts for about 25% of that, the non-U.S. G7 (Canada, France, Germany, Italy, Japan, and the United Kingdom) for about 30%, and the BRIC countries (Brazil, Russia, India, and China) for about 13%.¹⁵ We used World Bank data to record the breakdown of aGDP into percentage shares contributed by the primary, secondary, and tertiary sectors, that is, agriculture, industry, and services. Sectoral percentage shares of aGDP are converted into their USD equivalents. Using a summation function, aggregate worldwide dollar values for agriculture (USD2.1 trillion), industry (USD16.3 trillion), and services (USD36.4 trillion) can be computed. Military expenditure data is taken from the Stockholm International Peace Research Institute (SIPRI), with missing data supplied by recourse to CIA World Factbook data. Military expenditure as a percentage of aGDP is converted into U.S. dollar values. Summing this, world military expenditure in 2007 is about USD1.36 trillion. As a percentage of GWP, this amounts to 2.5% which, in spite of missing data for some countries, corresponds exactly to the SIPRI estimate.

We now assume that all of agriculture counts as a peace industry. Its violence share, and therefore the associated dollar value, is zero. With regard to industry, we assume that on the average across all countries one-half of world military expenditure goes to purchase inputs from industry and that an additional 2% of industrial output stems from production related to other violence-related activities (e.g., alarm systems to deter violence). If this assumption is correct, the worldwide violence industry-related output would amount to about USD1.0 trillion or 6.2% of all industrial activity.¹⁶ As to services, we assume that the remaining one-half of world military expenditure buys service inputs and that an additional 2% of services is violence-related. We believe that this is a mild assumption, especially as all of government is part of the service category. Thus, all government functions at municipal, provincial, and federal levels related to violence prevention, administration of justice, rehabilitation, and restoration are part of the service category. If our assumption is

¹⁴ Fx-based: foreign-exchange based; ppp-based: purchasing power parity-based.

¹⁵ In ppp-terms, the shares are rather different: U.S. 21%, non-U.S. G7 22%, and BRIC 21%.

¹⁶ Half of world military expenditure amounts to USD0.678 trillion, and 2% of world industrial activity of USD16.3 trillion is USD0.326 billion, so that the sum is almost exactly USD1 trillion.

warranted, USD1.4 trillion worldwide is spent on violence service-related activity, or 3.9% of all service activity.

As mentioned, we assume that agriculture itself is not a violence industry. It is wholly a peace industry, called pGDP_{ag}. Therefore the size of world agriculture of USD2.1 trillion is agriculture's contribution to peace. As to peace industry, pGDP_{in} subtracts the violence-related part of industry from the overall dollar value of industry. The peaceful part of industry amounts to USD15.3 trillion, or about 93.8% of all industrial activity worldwide. The exercise is repeated for pGDP_{sv}, the service sector, with the finding that about USD34.9 trillion are peace-related, or 96.1% of all service activity. In the aggregate, this sums to USD52.3 trillion. This, plus the violent part of aGWP (USD2.4 trillion) sums, as it should, to overall aGWP of USD54.7 trillion. In a final step, it is assumed that if all violent activity stopped, then all of vGDP (violence GDP) would be costlessly converted into pGDP (peaceful activity) so that the converse of vGDP becomes the static peace dividend of USD2.4 trillion. For the year 2007, this would have amounted to the aforementioned 4.4% of aGWP.

Scenario analysis and simulations

The base spreadsheet in hand, it is now a simple matter to change formulas, e.g., those that assign assumed coefficients to the violence share of the industry and service sectors, and to compute the effects on the size of the static peace dividend. For illustration, suppose that the service sector formula is changed to the assumption of one-half of world military expenditure plus 5% (instead of plus 2%) of all other service activity—still a conservative assumption given that the government sector and virtually all private household and business functions related to violence prevention or treatment of the effects of violence are captured in the service category. The dollar value of worldwide violence-related business would then amount to USD3.5 trillion, or 6.4% of aGWP.

Because the spreadsheet is country-based, future research may make it possible to insert country-specific coefficients into the relevant cells. For example, research may establish that there are systematic differences among high-income, middle-income, and low-income countries or between countries in acute violent social conflict (e.g., war, civil war, ongoing terror) and those that are not. In that case, it would be a simple matter to change the country coefficients in the spreadsheet and recompute the static peace dividend. Indeed, the point of setting up the spreadsheet on a country-by-country basis in the first place is precisely to permit this future development.

Dynamic analysis

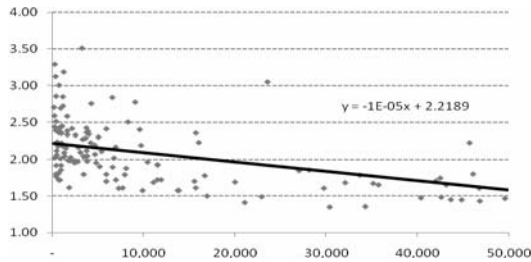
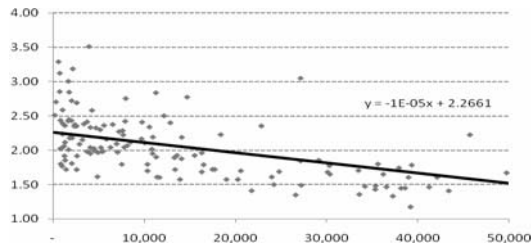
Results (summary)

According to our assumptions and calculations, peace gross world product (PGWP) might be on the order of 9% larger than current actual GWP (aGWP). Actual GWP measured in nominal terms was USD54.7 trillion in 2007. A peace GWP might result in a (fx-based) gain of about USD4.8 trillion. When allowance is made for effects attributable to internal as opposed to external peace, using Global Peace Index data, the calculations change slightly (more information yielding more precise results), and the PGWP then amounts to USD4.7 trillion, USD2.8 trillion of which would accrue to peace internal to countries, and the remaining USD1.9 trillion to peace between and among them. This dynamic peace dividend effect is in addition to the static effect discussed in the previous section.

Method and details

Figures 4 and 5 show on the vertical axes Global Peace Index (GPI) scores for 140 countries against, respectively, fx-based and ppp-based actual per capita GDP on the horizontal axes. Per construction, the lower is the GPI score, the more peaceful the country. Thus, the superimposed downward-sloping linear trend line shows an association to the effect that, on average, more peaceful countries also obtain higher per capita GDP or income levels. (A curvilinear line would show a more pronounced effect.) The causal effects run both ways: for example, peace makes capital investment safer from appropriation or destruction than otherwise would be the case, and it thereby stimulates growth and higher living standards. This, in turn, makes investing in peace more important as well in order to safeguard the economic achievements. Thus, a virtuous cycle between peace and prosperity can emerge. The World Economic Forum's Business Competitiveness Index and the World Bank's Ease of Doing Business Index correlate with the GPI in a similar way. Thus, basing our dynamic projections of PGDP on the GPI itself seems to be a reasonable first approach to take.

Our spreadsheet contains several PGDP sheets. The PGDPxI sheet contains our base scenario. Other PGDP sheets contain additional scenarios. The overall dynamic peace dividend is split into a part due to achieving internal peace and a part due to external peace. All calculations are carried out in fx-terms as well as in ppp-terms. The fx-based results are employed to gain a sense of the global effects of peace; the ppp-based results are used to gain a sense of country-specific effects of peace.

Figure 4. GDP per capita in selected civil war states**Figure 5.** GDP per capita in selected civil war states

The basic spreadsheet setup is as follows. Column A lists 140 countries, column B records the 2008 GPI rank, and column C the 2008 GPI score. Columns D and E contain the internal and external GPI sub-scores.¹⁷ Column F expresses the raw internal score as a percentage of the sum of the raw internal and external scores. For example, for the United Kingdom that percentage is 40%. This means that its internal peace score is small relative to its external peace score (the remaining 60%). Put differently, the U.K. scores better on internal than on external peace. In contrast, Zimbabwe's percentage is, at 62%, relatively high. This means that its internal peace score is worse than its external peace score. Consequently, we would expect that the economic effects of peace for a specific country depend on

¹⁷ The sub-scores are confidential data made available to the authors and cannot be released. When these sub-scores are weighted by 60% for the internal and 40% for the external peace categories, and then summed, the overall GPI score results. The 60/40 weighting is arbitrarily chosen by a committee of scholars overseeing the GPI work and does not reflect the implied weights given by the raw internal and external scores. We chose to work with the implied rather than the arbitrary weights.

whether that country is primarily at internal or at external peace (or not), or both, or in what mixture. For example, if state-on-state wars were abolished and the need for military forces disappeared, the United Kingdom would gain relatively much, whereas Zimbabwe would gain relatively little. If, in contrast, civil strife ceased, the United Kingdom would gain relatively little and Zimbabwe would gain relatively much.

Columns N and O contain the fx-based and ppp-based aGDP data. Columns H to K and columns P and Q convert the raw data into logarithms, a mathematical trick to eliminate country size effects. (This is necessary because, e.g., larger countries necessarily have a larger aGDP than smaller countries even if of equal development status.) Columns S to AF contain our base scenario assumption, expressed as a peace multiplier of size I . We proceed in three steps. First, column S adjusts a country's fx-based aGDP for 2007 for the size of its economy by using the logarithmic form of the raw data. Second, it multiplies the result by the country's size-adjusted overall GPI. The reason for this is that, by construction, a small GPI score means that the country is relatively peaceful to begin with and that the cessation of violence therefore cannot add much to its already existing aGDP. In contrast, a larger GPI score reflects a large upside economic potential to be obtained from peace. And third, a peace multiplier of size I is applied. This multiplier reflects an arbitrary assumption about how much of an economic boost may be expected from peace. This assumption is based on the literature review summarized earlier on this chapter. Although we believe the size of the multiplier to be plausible, reasonable, and conservative, it remains an assumption and is the principal reason why we varied it in the scenario sheets from a factor of 0 to a factor of 2 in increments of 0.5. We discuss this in the next subsection.

Columns T, V, and X repeat the calculations but applied to the internal and external GPI scores rather than to the overall GPI score. Our splitting of the calculations enables us to see how much each country might gain from pursuing internal as opposed to pursuing external peace. For example, for the United Kingdom about 43% of any gain would come from internal peace, whereas for Zimbabwe about 73% of any gain would stem from internal peace.

The remaining columns calculate the percentage gain of PGDP relative aGDP (for fx- and ppp-based aGDP). Under the assumption of a peace multiplier of size I , a worldwide change from violence to peace results in a 9% economic gain over current aGDP (with respect to the 2007 reference year used throughout).

Scenario analysis and simulations

Table 1 shows the result of scenario analyses carried out in the various PGDP sheets wherein the peace multiplier size ranges from a factor of 0 to a factor of 2. The first line in the table assumes that if there were peace there would be no economic benefit whatsoever and therefore returns the current actual fx-based and ppp-based GWP numbers. The base case, discussed in the prior subsection is highlighted in **bold type font**. The base case should not be interpreted as our preferred case. We express no preference; our intent is to produce a general method of computation of PGDP—and one that appears to return a result in line with the established case-study literature. As research progresses, it will be possible either (1) to chose a proper weight to be applied across all countries or (2) to apply country-specific factors for individual countries and sum up the resulting returns.

Table 1. PGWP scenarios

<i>Factor</i>	<i>FX-based (USD bn)</i>	<i>PPP-based (ppp bn)</i>
x 0.0	54,727.40	65,479.67
x 0.5	57,116.38	68,480.75
x 1.0	59,505.35	71,481.83
x 1.5	61,894.33	74,482.90
x 2.0	64,283.31	77,483.98

That a peace multiplier of size 1 is a plausible number might be illustrated with the example of the United States. From 1991 to 2000, the Clinton-era years following the end of the cold war, inflation-adjusted GDP in the United States grew at the high rate of an average of 3.7% per year, or roughly USD300 billion annually (base year 2000). During this time, inflation-adjusted U.S. military expenditure fell from USD730 billion to USD607 billion, or about 16%. Projecting this to a military expense of zero dollars, in 2008 terms, generates a nominal USD1 trillion available for reallocation between economic sectors right away, and it is not unrealistic to believe that an additional USD1.2 trillion could be generated through economy-wide follow-on effects, the way the post-cold war peace dividend appears to have worked in the 1990s. Note, in passing, that because of both the military and the economic size of the United States, 24.3% of the world-wide dynamic peace dividend effects would come from the United States.

Limitations and conclusion

Limitations

There are several important limitations to our approach. First, among economists it is well-known and acknowledged that measurement of GDP, and hence of GWP, is far from being a settled matter. For example, a long-standing and regularly updated effort by Professor Friedrich Schneider of Johannes Kepler University, Linz, Austria, estimates that in 2008 the average size of the shadow-economy in 21 of 30 OECD countries equaled 13.3% of measured aGDP. This refers to unreported rather than illegal economic activity.¹⁸ This percentage varies from year to year and is likely to be higher in non-OECD countries. In addition to non-measurement, there is mis-measurement. As mentioned, GDP even if comprehensively measured, is no more than a measure of income and expenditure flows, or throughput. Thus, paying people to cut down every tree in the land or harvest every fish from the sea, generates wage expenditures on the workers, and this is counted in GDP. Focusing on GDP, and GDP growth, can therefore be a misleading measure of well-being, and this is part of the reason for questioning the portion of GDP related to violence in the first instance.

Also related to questions regarding measurement is a second limitation, namely that part of our calculations are based on fx-based dollars. For comparability across states, any one country's currency may be used as the standard of comparison, or *numeraire*. In practice, this is the U.S. dollar. Non-numeraire countries' GDPs are converted to the numeraire currency at the average of the prevailing exchange rate for a given time period, usually a calendar year. Annual exchange rate fluctuations can greatly affect the resulting U.S. dollar value of non-U.S. economic output. One way economists address this is by converting countries' currencies into purchasing power parity (ppp) values. Thus, a haircut that in New York might cost USD20 and in India USD1 (at foreign-exchange rate conversion) are equally valued under ppp-measurement so that both are valued at ppp20. The activity itself is valued rather than its monetary equivalent. India's ppp20 haircut GDP therefore is an "artificial" number and cannot be taken at face value. Using ppp permits comparability across currencies but at the disadvantage that the monetary values are value placeholders rather than actual dollar numbers by which business could gauge the size of potential markets.

¹⁸ *The Economist*, 2 April 2009.

For example, a dynamic peace dividend for India of ppp321 billion is, in USD-terms only USD135 billion at the exchange rates of 2007.

A third measurement-related limitation is that military expenditure, or *milex*, the one violence-related variable for which numbers for all states are available, also is mis-measured. As argued, it is a fair assumption that *milex* is under-measured. Other violence-related variables such as the cost of civil war, violent crime, administration of states' justice systems, and so on, likewise are inadequately measured. The very study of the economic causes, costs, and consequences of violence is not much advanced and is addressed in very disparate ways in the literature. There are no universal numbers available, let alone recorded to a uniform standard. We addressed this limitation by using coefficients in our spreadsheet that we regard as plausible, yet conservative.

Fourth, we examine numbers for only a single year, 2007, the most recent year for which reasonably complete data were available. It would be worth the effort to expand our spreadsheet to capture the other years for which the GPI has been produced and to keep both the GPI and the PGDP exercises going for some time to come to learn what variations occur in PGDP as the GPI changes.

Conclusion and recommendations

The overriding message is that business has nothing to fear from peace. For business as a whole, there only are upsides to peace. If 4.4% of business derives gains from violence, the other 96.6% derives gains from peace. Moreover, the 4.4% suppress the scope of peaceful business by about another 9% of gross world product. This alone should convince business leaders to be much more vocal and active in discouraging violence and promoting peace.

In conjunction with the G8, G20, and other such political meetings, it is now commonplace to see civil society organizations throng the streets of the locations where such meetings are held. Business is largely absent. Here is an opportunity to create an E20 and a B20—groups of 20 highly successful global entrepreneurs and of 20 traditional global businesses—and have them issue a common, evidenced-based statement and research update on the economics of violence, nonkilling, and peace. This should be careful to include not merely “western” entrepreneurs but to draw them from across the globe such as Mo Ibrahim of Africa and the Tata family in Asia. We imagine that media coverage would be huge, and influence-taking to turn the world away from violence toward nonkilling, nonviolence, and peace could be of epoch-making significance. An E20 might form a coalition with a

P20, that is, 20 renowned academically focused peace institutes, and perhaps even with an S20, leaders of social movements and civil society organizations. This would ally entrepreneurs and business with a very credible subset of civil society. Business is often looked at askance. To be able to form a credible alliance or coalition with 20 (or some other number) of renowned, academically based, globally distributed peace institutes would provide consistent civil society input into business and vice versa. A coalition for nonviolence and peace would permit previously disparate and often antagonistic groups to pull on the same string in the same direction.

As leaders of commercial, civil, and political society increasingly turn to theoretically informed and evidence-based decisionmaking, basic and applied research becomes more, not less, necessary. The pGDP and PGDP (the static and dynamic peace dividend) calculations should be carried out for the other years for which the GPI is already available and then continued each year so that along with a measure of relative peacefulness an economic measure can be reported as well. The cost of maintaining our spreadsheet will be comparatively minor.

The spreadsheet we constructed is aimed at providing a foundational structure that is logical, coherent, and substantive to permit one to produce systematic, feasible, replicable, spreadsheet-based computations by country by year and have it tied to the already existing annual production of the Global Peace Index. But although the structure now exists, the “sharing down” of the static and dynamic peace dividend calculations into economic sectors and subsectors still needs to be completed.

More important, and more costly, is the need to gradually replace the assumed coefficients underlying our computations with country and sector-based specific information on the cost of violence. At the moment, for example, we assume a reasonable but uniform peace multiplier of size 1, applied across all countries. Self-evidently, differences across countries imply differences in the multiplier to be used. Specifically commissioned studies could replace the single peace multiplier value with a range of country and sector-specific values. It might, at first, be easier to apply differentiated multipliers for groups of countries, but the ultimate goal should be to aim at country-specific multipliers, regularly reviewed and updated.¹⁹

¹⁹ The dynamic peace dividend is already computationally tied to the GPI. The GPI itself thus cannot be used as a multiplier. Instead the function of the peace multiplier is to translate how relative peacefulness multiplies into economic benefits, and this translation will vary from country to country even when two countries have identical GPIs.

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References

- Abadie, A.; Gardeazabel, J. (2007). "Terrorism and the World Economy," *European Economic Review*, 52(1):1-27.
- Anderton, C. H.; Carter, J. R. (2009). *Principles of Conflict Economics*. New York: Cambridge University Press.
- Bandara, J. S. (1997). "The Impact of the Civil War on Tourism and the Regional Economy," *South Asia* (special issue), 20(1):269-279.
- Barzilai, A. (2006). "Terrorism, War Cost Economy NIS 108b a Year," *Knight Ridder Tribune Business News*, 19 December 2006, p. 1.
- Brauer, J. (2007). "Data, Models, Coefficients: The Case of United States Military Expenditure," *Conflict Management and Peace Science*, 24(1):55-64.
- Brauer, J. (2009). "The Trillion Dollar Military," <<http://www.aug.edu/~sbajmb/abc156.pdf>> [accessed 10 April 2009].
- Brauer, J.; Dunne, J.P. (2006). "Introduction: A New Journal," *The Economics of Peace and Security Journal*, 1(1):4-5.
- Cook, P.; Ludwig, J. (2000). *Gun Violence: The Real Costs*. New York: Oxford University Press.
- Coulomb, F. (2004). *Economic Theories of Peace and War*. London: Routledge.
- Crain, M.W.; Crain, N.V. (2006). "Terrorized Economies," *Public Choice*, 128(1-2):317-349.
- Eckstein, Z.; Tsiddon, D. (2004). "Macroeconomic Consequences of Terror: Theory and the Case of Israel," *Journal of Monetary Economics*, 51(5):971-1002.
- Enders, W.; Sandler, T. (1996). "Terrorism and Foreign Direct Investment in Spain and Greece," *Kyklos*, 49(3):331-353.

- GD - Geneva Declaration on Armed Violence and Development (2008). "Global Burden of Armed Violence," Geneva: Geneva Declaration Secretariat. <<http://www.geneva-declaration.org/resources-armed-violence-report.html>> [accessed 11 April 2009].
- Goldsmith, B.E.; Brauer, J. eds. (Forthcoming). *Economics of Peace and War*. London: Emerald Publishing Group.
- GPI - Global Peace Index (2009). Institute for Economics and Peace. <<http://www.economicsandpeace.org>> [accessed 2 September 2009].
- Heinemann, A.; Verner, D. (2006). "Crime and Violence in Development: A Literature Review of Latin America and the Caribbean," *World Bank Policy Research Working Paper 4041* (October). Washington, D.C.: The World Bank.
- IMF - International Monetary Fund (2009). *World Economic Outlook* (April). Washington, D.C.: International Monetary Fund
- Karolyi, G.A.; Martell, R. (2006). "Terrorism and the Stock Market," *Working papers*. Ohio State University. Department of Finance and Barclays Global Investors.
- Knight, M.; Loayza, N.; Villanueva, D. (1996). "The Peace Dividend: Military Spending Cuts and Economic Growth," *International Monetary Fund Staff Papers*, 43(1):1-37.
- Negus, S. (2005). "Egyptian Investors Take Red Sea Attacks in Their Stride," *Financial Times* (Edition 1. London), 2 August 2005, p. 35.
- Phillips, D. J. H. (2006). "Reducing the Cost of Inter- and Intrastate Conflict over Water in the Jordan River Basin," *Economics of Peace and Security Journal*, 2(2):19-25.
- SIPRI - Stockholm International Peace Research Institute (2008). *SIPRI Yearbook 2008: Armaments, Disarmament and International Security*. New York: Oxford University Press.
- UNDP - United Nations Development Programme (2008). *Crisis Prevention and Recovery Report 2008. Post-Conflict Economic Recovery: Enabling Local Ingenuity*. New York: UNDP Bureau for Crisis Prevention and Recovery.
- WHO - World Health Organization (2002). *World Report on Violence and Health*, Krug, E.G.; Dahlberg, L.L.; Mercy, J.A.; Zwi, A.B.; Lozano, R., eds. Geneva: WHO. Available at http://whqlibdoc.who.int/publications/2002/9241545615_eng.pdf [accessed 15 April 2009].
- WHO - World Health Organization (2004). *The Economic Dimensions of Interpersonal Violence*, Waters, H.; Hyder, A.; Rajkotia, Y.; Basu, S.; Rehwinkel, J.A.; Butchart, A., eds. Geneva: WHO. Available at <http://whqlibdoc.who.int/publications/2004/9241591609.pdf> [accessed 15 April 2009].
- Yoursif, B. (2006). "Economic Aspects of Peacekeeping in Iraq: What Went Wrong?" *The Economics of Peace and Security Journal*, 1(2):24-30.

Appendix A: Tables

Table A1. Studies of the cost of terror events (billions of 2008 USD)

<i>Country (event)</i>	<i>Cost</i>	<i>GDP loss (%)</i>	<i>Source</i>
Argentina (cost of a terrorist act)	0.30	0.14	Crain, 2005: 335
Colombia (cost of a terrorist act)	0.10	0.06	Crain, 2005: 335
Colombia (annual cost of terror)	14.47	8.60	Karolyi, Martell, 2006: 12
Egypt (costs of terrorist attacks, July 05)	1.42	1.45	Negus, 2005: 35
Egypt (cost of a terrorist act)	0.26	0.25	Crain, 2005: 335
France (cost of a terrorist act)	1.37	0.05	Crain, 2005: 335
France, Ireland, U.S., Singapore (cost of a terrorist act)	64.00	0.36	Crain, 2005: 329
Germany (cost of a terrorist act)	1.90	0.07	Crain, 2005: 318
India (cost of a terrorist act)	1.34	0.23	Crain, 2005: 335
Indonesia (cost of a terrorist act)	1.81	0.78	Crain, 2005: 335
Israel (costs of terrorism per year, 2000-2003)	low: 13.69 high: 20.53	low: 10 high: 15	Eckstein, Tsiddon, 2004: 29
Israel (annual cost of terror)	2.36	2.00	Eckstein, Tsiddon, 2004: 23
Italy (cost of a terrorist act)	1.54	0.11	Crain, 2005: 335
Countries > 250 million pop. (cost of a terrorist act)	36.03	0.20	Crain, 2005: 335
Nigeria (annual cost of terror)	11.84	7.60	Karolyi, Martell, 2006: 12
Philippines (cost of a terrorist act)	0.14	0.16	Crain, 2005: 335
Russia (annual cost of terror)	2.75	0.26	Karolyi, Martell, 2006: 12
Spain (costs of ETA terror, Basque country)	low: 7.7 high: 10.2	low: 12 high: 16	Abadie, 2003
Spain (cost of a terrorist act)	108.77	13.36	Crain, 2005: 335
Sri Lanka (costs of LTTE terror to tourism)	0.18	0.93	Bandara, 1997: 272
United Kingdom (cost of a terrorist act)	0.98	0.04	Crain, 2005: 335
United States (cost of a terrorist act)	48.03	0.33	Crain, 2005: 335
World (global costs of terror, 2002)	4,300.00	10.91	Crain, 2005: 336

Table A2. Cost of war and defense (billions of 2008 USD and % change)

<i>Country (event)</i>	<i>Cost</i>	<i>GDP</i>	<i>Source</i>
Eastern Europe (no military spending)	333.2	9.8	Knight, et al, 1996: 31
Middle East, Asia, North Africa (no military spending)	116.0	0.6	Knight, et al, 1996:31
Israel (cancel defense increase of NIS3)	9.4	8.2	Barzilai, 2006: 1
Israel (end Israel's war spending, annually)	24.1	12.8	Barzilai, 2006: 1