

# **The economic costs of the German participation in the Afghanistan war**

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## **Abstract**

In this article, we estimate the total costs of the German participation in the Afghanistan war, both past and future. This is a hugely complex and uncertain calculation, which depends on several important assumptions. These assumptions pertain to the different cost channels and the shares of these channels that can be attributed to the German participation in the war. By calculating the costs of the German participation, we provide a framework for other researchers to do the same with respect to other countries. The article can function as a roadmap for researchers focusing on this topic. In the end we find that, in the most realistic of several possible scenarios regarding the duration and intensity of the German participation in the war in Afghanistan, the German share of the net present value of the total costs of the war ranges from 26 billion Euro to 47 billion Euro. These large ranges reflect the uncertainties with which the costs must be estimated. On an annual basis, we estimate that the German participation in the war costs between 2.5 and 3 billion Euro. This contrasts with the official war budget, which is little over 1 billion Euro for 2010, showing that governments may not adequately represent the costs of military action.

**Keywords:** Afghanistan, War, Costs of conflict, Public expenditure, Germany

**JEL code:** E65, F51, H56

## Introduction

In this article, we address how one can analyse the costs of going to war. This is an important issue, which is discussed surprisingly rarely in the decision-making process surrounding initial conflict participation. To a large extent, this has to do with the difficulties of forecasting such costs, but the result is that such decisions have been made ad hoc. Additionally, even after the occurrence of a war, there is often little debate about the calculation of the magnitude of these costs. In recent years, this issue does come up more regularly among policy makers, academics and the larger public, particularly in the United States with regard to the wars in Iraq and Afghanistan. Different studies have come up with very different estimations, which indicates the degree of uncertainty regarding both the cost channels to be included as well as the underlying data. This shows that the absence of a useful uniform framework for the analysis of the costs of going to war is an important gap in the literature.

In this contribution, we estimate the costs of the German involvement in the war in Afghanistan for the first time. Since 2001, Germany has been participating in the war in Afghanistan, in cooperation with mostly US troops under the banner of Operation Enduring Freedom. Before the start of the conflict, as is often the case, there was little discussion on the costs of going to war and, even nine years into the war, the cost issue comes up very little. It is important to note that we merely provide a partial equilibrium analysis of the German involvement. After all, the macroeconomic effects that are so important in the analysis by Stiglitz & Bilmes (2008) have to do with the occurrence of the war itself. In the case of Germany, it is reasonable to say that the war would have taken place anyway, even if Germany had not been involved. We therefore only look at the costs *to Germany* resulting from the *German participation* in the war in Afghanistan<sup>1</sup>. Methodologically, we stay relatively close to Stiglitz & Bilmes, except for several adjustments to fit with the specifics of the German situation. This particularly concerns the cost of the Department of Veterans' Affairs, which in their analysis is an important driver of the future costs to the United States resulting from contemporary conflict, while this is not for the case of Germany.

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<sup>1</sup> Different from our current aim, there is also a separate literature that looks at the global costs of conflict, including the impacts on different countries. For an overview, see Bozzoli, Brück & Sottas (2010).

Our first finding is that data availability is a large bottleneck for a calculation such as ours. A lot of the information required to make such estimations is not publicly available and can therefore only be estimated without having full access to classified data. Our second finding is that the German government, which can be expected to be quite representative for governments at large, do not provide the public with all the information. According to the German government, annual outlays for 2010 are just over €1 billion, whereas we find that under the most realistic scenario, the participation in Operation Enduring Freedom is costing the German tax payer between €2.5 and 3 billion per year, up to three times as much as the government claims. We also find that the total economic costs up to 2010 add up to between €16 and 29 billion, compared to the government's claim of €7 billion. For the entire course of the war, under a realistic scenario, the economic costs are likely to be between €24 and 47 billion, where the large band of estimation represents the uncertainty in many of the input variables. Under a scenario in which Germany stays in Afghanistan for a longer period, the costs are even expected to increase to €53 to 92 billion, while an immediate withdrawal still implies a cost of €18 to 33 billion. Unfortunately, it is not possible to compare these costs to the government's expectations, as it does not publicly acknowledge the existence of such expectations.

The way we proceed is that in the next section, we briefly discuss the background in terms of the literature on military expenditures and conflict cost calculations. Subsequently, we separately discuss all the items included in the necessary calculations and show in some detail what the assumptions that we make are. Following that, we present the results for a set of scenarios and varying assumptions. These assumptions are an important part of our estimations, but also the least certain. For some issues, we are able to make very precise estimates, while other cost factor estimations suffer a large degree of uncertainty. However, as a rule, our assumptions are conservative, particularly for cost factors where the precise numbers are currently difficult to find. In the subsequent section, we present the results of our analysis and discuss some alternative assumptions and methodologies. The final section concludes.

## **Background**

There is a broad literature available that looks at the costs of military expenditures. Examples include Smyth & Narayan (2009) and Dunne, Smith & Willenbockel (2005), who consider the

relationship between military expenditures and economic growth. Furthermore, military expenditures are used as explanatory variables for a whole range of economic issues. Examples include Murshed & Mamoon (2010), who argue that military spending, as well as many other factors, increases the probability of conflict between Pakistan and India and Lin & Ali (2009), who look at military expenditures and inequality. Collier and Hoeffler (2004) analyse what the effect is of military expenditures in post-conflict societies. They find that countries that continue to have large military spending are associated with an increased probability of returning to violence.

A great part of the literature on military expenditures addresses the US only. This is not surprising when SIPRI (2011), which is considered the authoritative source on military expenditures, shows that, with \$698 billion, the US is responsible for approximately 43% of global military expenditures. In addition to providing specific estimates for countries' expenditures, SIPRI (2011) also estimates what companies are the largest benefactors of such spending. They find that seven of the top-ten defence-based corporations are US-based. Foster et al. (2008) point out that there is a large difference between the actual military expenditures and the officially recognized expenditures. Brauer (2007) analyses what the economic impact is of such military spending on economic growth. Fontanel & Samson (2008) provide another analysis, looking explicitly at the US budget. An important distinction between those studies and studies that look at the costs of wars is that the first studies do not attribute the expenditures to specific conflicts. As a result, while some of the data on military expenditures (e.g. SIPRI, 2011) may be useful as inputs for conflict analyses, this literature does not actually answer any questions regarding the costs of specific conflicts. Additionally, authors such as Brzoska (1981) highlights that data on military expenditures may lack trustworthiness.

As mentioned above, there is a difference between measuring the costs of conflict and measuring military expenditures (and its consequences). The first important distinction is the fact that one must separate the share of military expenditures going to a particular conflict from other forms of military expenditures. The second distinction is that the costs of a conflict are not necessarily costs reflected in military expenditures. For example, societal consequences resulting from

wartime mortality would certainly be a cost of conflict, whereas it would just as certainly not be considered a military expenditure. As a result, analyses of conflict costs are very different from analyses of military expenditures.

In general, there are three types of analysis for the costs of going to war<sup>2</sup>. One can employ either the forecasting approach, which tries to estimate the costs of a war that has not started yet, or the ex-post approach, which estimates the costs of going to war after the war has occurred. The third approach is an analysis of ongoing conflict, where one can use the costs previously incurred to realistically estimate future liabilities. An interesting example from the forecasting literature with regards to the US involvement in the war in Iraq comes from Nordhaus (2002), who estimates the potential costs of such an invasion. He recognises that his estimations are highly uncertain, due to the unclear nature of both the costs and the conflict scenarios and comes up with an estimation of \$100-1,900 billion (this section uses 2002\$, unless otherwise mentioned). In this total number, he includes military spending, costs of the occupation, reconstruction, humanitarian assistance and the impact on the macroeconomic environment and oil markets. Davis, Murphy & Topel (2009) estimate a cost of \$103-872 billion in 2003\$, with channels such as direct military expenditure, occupation, fatalities, reconstruction and humanitarian assistance. Finally, although most ex ante estimations by the American government are not public (see Nordhaus, 2002), there was a study by the House Budget Committee's Democratic Staff (2002), which concludes that the total costs of the war were expected to be \$48-93 billion.

The second approach estimates the costs of having gone to war after the war has finished. While this may seem simpler than the forecasting method, this is not necessarily true in practice. It is not always certain which channels need to be included for example, particularly when it comes to conflict costs resulting from past conflict but which only accrue in the future. Additionally, one must be able to differentiate between the effects of war and other macroeconomic fluctuations. An interesting example is the role of healthcare costs. One must estimate the difference between future healthcare costs that would occur anyway due to old age and those costs resulting from the involvement of soldiers in a conflict. Nordhaus (2002) shows the costs to the United States of a

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<sup>2</sup> Rather than 'going to war', one can also analyse the broader concept of the costs of conflict. This requires a different type of methodology, which can be achieved either with accounting, or with counterfactual analysis. For more information, see Bozzoli, Brück & De Groot (2011).

number of previous wars, as collected by other sources. The American Civil War supposedly cost approximately \$62 billion (104% of annual GDP), WWII about \$2,900 billion (130% of annual GDP) and Vietnam about \$500 billion (12% of annual GDP). Interestingly, the first Gulf War in 1990-91 was a particularly cheap war, for only \$76 billion (1% of annual GDP), which led some to believe the war in Iraq would be similarly cheap. However, as the wars in Iraq and Afghanistan are still ongoing, no comparable studies are available as yet.

Most current research employs the third method. This method takes the conflict costs up to the moment of observation and uses those costs to estimate the future costs of the conflict according to some specific scenarios. Thanks to their high estimate of \$3 trillion (in 2008\$), the work by Stiglitz & Bilmes (2008) is the best known, but it is certainly not the only one. Edwards (2010) provides a thorough overview of the existing literature and discusses some of the most poignant problems. He focuses on the difficulty of including all cost channels and identifying the healthcare/veterans costs related to conflict. Orszag (2008) makes a particularly succinct point about the difficulties of separating the costs of ageing and wartime service. For the period 2003-2015, Wallsten & Kosec (2005) estimate a total expected cost of the war in Iraq for the United States to be at most \$672 billion (in 2000\$). However, these authors also note that during this same period, the United States avoids costs of about \$125 billion in (2000\$).

The current contribution fits in with the third approach. We combine some of the existing methodologies as proposed by Stiglitz & Bilmes (2008) and others, but adjust the methodology in such a way that it is more appropriate for a small participant in an overall conflict that would take place anyway, even if the participating country were absent.

## **Data and Methods**

The costs we include are discussed as four separate categories. First, there are the costs that fall to the German Ministry of Defence (Bundesministerium der Verteidigung), followed by the costs to other branches of the federal government. The third cost element is the cost of financing all the previously mentioned expenditures. After all, government expenditure needs to somehow be financed, either through loans (which implies higher interest payments), additional taxation (thus reducing consumption) or substituting other expenditures (crowding out). Finally, we add the

non-budgetary costs that accrue to the German economy. A concise list of all assumed and real values is available in an online appendix accompanying this article.

### *Expenditures by the Ministry of Defence*

The Ministry of Defence has borne a significant portion of the costs of conflict, which is published annually as the 'Antrag der Bundesregierung' [Request of the Federal Government] regarding the budgeted expenditures related to the war. However, there is a discrepancy between the planned budget published by the Ministry and the actual expenditures for the war in Afghanistan. For 2009, the budget was surpassed by an approximated 25% (Bundesministerium der Verteidigung, 2010). Lacking alternative sources, we assume that in other years, the actual expenditures are also approximately 25% above budgeted figures published by the Ministry. For future years, we use the average costs-per-soldier as reported in previous budgets to estimate future expenditures.

Table I in here

In addition to these costs acknowledged by the Ministry of Defence to be attributable to the war in Afghanistan, there are several costs that are not included by the Ministry, but that are also part of the costs of the war. The first and foremost is wages. It is argued that all the soldiers currently involved in Afghanistan would otherwise have been employed as well. Brzoska (2007) argues that this is not realistic. The Afghan war is a long-lasting effort<sup>3</sup> that can no longer be considered an incidental necessity. From a theoretical perspective, army size should be a function that depends directly on the demand for soldiers, so a continued demand for these soldiers should have an upward pressure on the size of the military. This is also testified by some of the literature on military expenditure, where it is argued that the size of MilEx responds to different kinds of potential demands for military services (Dunne & Perlo-Freeman, 2003; Dunne & Smith, 2007). For that reason, it is reasonable to assume that the decrease in size of the German army happening during the period after the Cold War would have continued if there had not been a

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<sup>3</sup> The German government, like the US and UK governments, continues to request funding for the war outside the ordinary outlays of the Ministry of Defence. This makes the cost of the conflict less transparent, but does not necessarily imply that it is unexpected that wars are costly.

permanent demand for soldiers<sup>4</sup>. Additionally, the total number of soldiers that is involved in the Afghanistan war is not a small number (see table I for the size of the German deployment over the past years). As discussed by Petersohn (2008), for each German soldier that is currently stationed in Afghanistan, it requires one soldier who has just returned from Afghanistan and another who is preparing to be deployed<sup>5</sup>. We thus take the total number of soldiers sent to Afghanistan on a yearly basis and include their wages. The cost of employment for an average soldier is based on Brzoska (2007) and estimated to be €50,000.

Another cost accruing to the Ministry of Defence includes the costs of future demobilisation. We estimate the costs of demobilisation on basis of the cost estimates by the Dutch Ministry of Defence<sup>6</sup>. The costs of the redeployment of the 1,200 Dutch troops currently stationed in Afghanistan are expected to be €229 million according to the most recent government estimates (Verhagen & Van Middelkoop, 2010). Assuming that the average costs-per-soldier is equal for Germany and the Netherlands, this implies that a 2010 withdrawal would cost €1,021 million. Of course these costs occur in the future, so the Net Present Value of the costs depends on the actual year of withdrawal.

As it can be argued that the equipment (including Tornado fighters, Transall transport planes, Marder tanks and various armoured vehicles) may have been purchased anyway in the absence of the conflict (which is a very conservative assumption), these costs are not included. However, given the circumstances in which the equipment is now being used (both in increasing intensity and in circumstances that are a lot less favourable to the value of the equipment) the increased rate of depreciation needs to be included. For this purpose, we have estimated the annual value for the ordinary depreciation of the equipment used in Afghanistan under normal circumstances, at approximately €150 million in 2010<sup>7</sup>. We assume that due to the conflict, this rate of

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<sup>4</sup> A minor example is the army of Switzerland, which has not been involved in the wars in Afghanistan and Iraq and whose 'Army XXI' programme is aiming to further reduce the size of the armed forces (US Department of State, 2011).

<sup>5</sup> Petersohn (2008) actually argues that in order to prevent soldiers from having to go twice per six months, the total number of required soldiers must be doubled again. In order to provide a conservative estimate, we choose not to do this.

<sup>6</sup> As the structures of the Dutch and German armies are comparable, soldiers and equipment need to travel back over similar distances and neither force is so much larger that it is going to benefit from a large scale benefit. For these reasons and more, we believe the comparison between the Dutch and German armies to be reasonable and fair.

<sup>7</sup> The equipment data come from Spiegel (2010), while the cost and depreciation rates are estimated on basis of

depreciation is doubled. The capital-labour ratio (i.e. equipment per soldier) in the past and future is assumed to remain constant.

The costs borne by the government due to injury and disability are another item that contributes to the total cost of the war. We assume that of those soldiers who are injured, either physically or mentally (particularly due to post-traumatic stress), 1 in 8 are permanently disabled<sup>8</sup>. According to German law, soldiers who become disabled during their service are entitled to remain in the army until retirement, receiving 80% of their salary, at a scale that is two steps higher than before. This assumption as to which percentage is permanently disabled is difficult to check and has a very high level of uncertainty. Furthermore, the government is also responsible for their healthcare costs. Healthcare costs are assumed to be €16,000 per injured person, which we believe to be a conservative estimate as well, based on the average health expenditures among people in the same age group.

Finally, for soldiers who die, their families receive compensation of €60,000 plus a widow(er)'s pension that amounts to up to 60% of the soldiers' income (Bundesministerium der Verteidigung, 2008). The exact size of the widow(er)'s pension depends on the income earned through other sources and it stops when the widow(er) remarries. We assume that the average widow(er) receives this pension for only ten years, at a rate of only €15,000 per year, which is 30% of income, to account for widow(er)s who actually earn money themselves.

### ***Expenditures by other Branches of the Government***

While the direct costs of the war are borne by the Ministry of Defence, there are many other branches of the government that are also spending more money due to the German involvement in the war in Afghanistan. For these costs categories it is particularly important to distinguish between costs that are due to the German participation and costs that would occur also in absence of the German participation. We take painstaking care to come up with conservative estimates that form only a lower bound for the overall costs. However, it is undeniable that Germany<sup>9</sup> is the

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public information sources and previous equipment purchases.

<sup>8</sup> As shown later, the number of soldiers who falls ill is approximately 4.2%. So in total, 0.52% of soldiers are assumed to become permanently disabled.

<sup>9</sup> The decision to send out German troops to fight a war on foreign soil is in itself a historical decision. As a result of

type of country that suffers a sense of guilt resulting from its participation. In any case, it is difficult to precisely distinguish the different cost categories, which is something we deal with in a sensitivity analysis further down. Finally, while it is impossible to be comprehensive in terms of categorical inclusiveness, we believe that the main categories are the following.

### *Security*

The Afghanistan war was meant to improve security in both Afghanistan and in the West, by disabling terrorists from finding a safe haven in that country. However, the Afghanistan conflict has also antagonised many people, particularly in the Middle East, who have therefore increasingly been threatening Western institutions. As a result of this, German security may have decreased and expenditures for security had to be increased. However, this is not a cost resulting from the German involvement. Instead, it is the additional increase in threats directed at Germany directly that can be attributed to the conflict<sup>10</sup>. Unfortunately, it is very difficult to quantify these additional expenditures on security, particularly because security expenditures are not contained in a single budget or even on a single government level (Schulze-Steikow, 2007). We assume a conservative €20 million for the year 2010 in additional costs and costs in other years that are proportional to the number of soldiers employed. This estimate is very small compared to overall German expenditures on security issues, which according to Schulze-Steikow (2007) already reached €56.1 billion in 2004.

### *Foreign Affairs*

The conflict in Afghanistan, and Germany's involvement therein, has also worsened Germany's standing with neighbouring countries of Afghanistan. In particular, that includes countries such as Pakistan and Uzbekistan. In order to compensate for this loss of standing, as well as to compensate the Uzbekistan government for the use of its airbase and airspace, the German government has had to spend additional resources on both its diplomatic missions and on development and other aid. Brück and Xu (2011) provide evidence that aid donors indeed

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German history, its staunchly pacifistic politics makes for an unlikely supporter of invasions. This lends credibility to the claim that the German participation leads to a feeling of responsibility, which can be partly bought off by higher transfers to channels such as development and reconstruction.

<sup>10</sup> This is recognised by policymakers as well. See for example, Gillmann (2009) or Focus Online (2009).

respond to such incentives. For example, according to the Auswärtiges Amt (Ministry of Foreign Affairs), Pakistan was promised €87 million in aid during the years 2008-2009, while nearby Bangladesh, despite its larger population, was promised only €55 million during the same period. Comparing Uzbekistan and Kazakhstan, it is immediately clear that Uzbekistan has been a much larger recipient of development funds. Since the mid-nineties, Uzbekistan has received €265 million against Kazakhstan's €115 million. However, since these costs are very difficult to quantify, we assume €30 million to the 2010 budget for additional costs, and vary these costs with the number of soldiers engaged in Afghanistan for other years.

### *Development Programmes*

While the German government has long had an active policy in participating in development programmes in Afghanistan and elsewhere, there are several programmes that can be directly attributed to the German participation in the war. In 2002, the Federal government started a bilateral development programme at €80 million per year, which has since increased to €125 million per year. The Stabilitätspakt Afghanistan (Stability Pact Afghanistan) is another nation building programme started in 2009 at a cost of €115.7 million (€180.7 million in 2010). Both these programmes may have taken place in the absence of the German involvement, so for that reason, we attribute only half of these costs to the war. Finally, we assume that Germany has also increased its expenditures to multilateral development programmes targeting Afghanistan (UN, NATO, EU, World Bank): a cost we conservatively assume to be €20 million for the year 2010, with costs varying on basis of the number of soldiers employed during other years.

### *Police Training Missions*

The German government is involved in two main police training missions. The first mission is with EUPOL, a European Union Police mission, the costs of which are borne by the governments' contributions to the EU. Clearly, this is not a cost that has increased due to the German military presence in Afghanistan. The German Police Project Team (GPPT), on the other hand, is made possible due to the German army's presence. The costs of this programme (€128.3 million for the period 2007-10) can be fully attributed to the war.

### *Financing Government Expenditure*

All government expenditure has to be financed and a government has several ways of doing so. First, it can raise taxes, which bears a cost in terms of forgone income. Second, it can reassign funds from other expenditures, which bears a cost if the reassignment is from a productive use to a less productive one. Finally, governments may also borrow money, although that money does have to be repaid in the future, and it incurs interest costs.

As there was never a specific decision on how to pay for the Afghanistan war<sup>11</sup>, we have to make an assumption about the way the war is financed. In order to accommodate different viewpoints on the issue of government financing, we use two different methodologies for the calculation of the financing costs. Method A assumes that the financing of the war is similar to the financing of the overall budget, while method B assumes the war is financed entirely through borrowing.

In method A, we assume that the war expenditure is part of the overall budget and thus has shares of tax-financing and bond-financing that are equal to that of other expenditures. According to the long-run average, this means that approximately 90% of expenditures is tax-financed, although in 2010 this number is down to less than 75% due to the global financial crisis. The tax-financed share of the war budget is assumed to lead to crowding out of other investments, for example education. This way, we can use the estimated value of the multiplier for military expenditures and the estimated multiplier for other government expenditures in order to take the difference as the opportunity costs of financing for tax-financed expenditures. Following Stiglitz & Bilmes (2008), we assume this difference in the multipliers to be 0.4, although the openness of the German economy makes it likely that the difference between these two values is actually significantly larger. For the loan-financed share of the war expenditures, we assume that the government implicitly takes out 10-year war bonds to finance the war, which at maturity are paid back in full, together with the interest. At the time of repayment, this yields a cost of the war equal to the accumulated interest, plus a cost of financing the war equal to the multiplier difference times the sum of principal and interest. We employ an interest rate of 3%, but show as a robustness check that the value of the interest rate does not influence the results a lot.

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<sup>11</sup> This is in contrast to the writings of David Ricardo (1820), who uses the outbreak of a war as an example to prove that the financing method is actually irrelevant, and John M. Keynes (1940), who tackles the same issue explicitly. Ricardo's theory, while elegant, has since been widely questioned.

The difficulty of estimating the multiplier difference and the fact that this method of calculating the costs of access to finance is considered somewhat controversial<sup>12</sup> makes it necessary to consider an alternative financing method as well. In method B, we instead assume that the government borrows all the money required for the participation in the war. Assuming no payback takes place, the interest is then compounded. We only consider the necessary interest payments until 2020, which is similar to what Stiglitz & Bilmes (2008) do. This method has a major advantage, because it does not require any specific assumptions regarding the size of the different multipliers. However, it has the unattractive property that the loan itself is never actually repaid, thereby creating a loose end that is unexplained. Additionally, the decision to cap interest payments in 2020 is seemingly random and not grounded in theory.

Since the issue of whether debt repayments are indeed part of the economic costs resulting from a conflict, we report the financing costs separately from the other results, in order to remain entirely transparent. In fact, even Bilmes and Stiglitz (2006) and Stiglitz and Bilmes (2008) are not entirely in agreement about this issue, where we follow the more recent arguments made.

### ***Non-Budget Costs***

Finally, there are several costs that cannot be allocated to the government, but that do entail an economic cost to society at large. These costs that need to be added include medical costs that are not borne by the government, the loss of lives of soldiers and the loss-of-productivity of injured soldiers. The valuation of the lives of soldiers is a particularly sensitive issue, because answering questions regarding the value of a person's life may be considered unethical. However, there are scientific methods for calculating the Statistical Value of a Life (SVL), and we follow such a methodology. In their book, Stiglitz & Bilmes use a value of \$7.2 million per American life lost, but this SVL is based on American numbers. Instead, we use three European studies (De Brabander & Vereeck, 2007; Raad voor de Volksgezondheid en Zorg, 2006; Spengler, 2004), that all come up with valuations that are very similar to each other. In order for our analysis to be conservative, we use the lowest estimate of these three, which values a life at €2.05 million. For the loss of productivity due to injury, we use the same numbers to calculate the loss.

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<sup>12</sup> Several authors, such as Garcia-Milà (1989) and Arin & Koray (2005) argue that the difference is smaller, or even non-existent.

## *Sensitivity*

Before presenting our estimates, it must once again be pointed out that we are making a series of assumptions, some of which are more precise than others. For that reason, we present a sensitivity analysis for our point estimates to indicate how precise our estimates are. To do this, we have analysed the accuracy of our assumptions and categorised them as high, medium or low. The precision attached to these categories is 20%, 50% and 100%, respectively. The lower and upper bounds of the estimation consist of the point estimate minus or plus that percentage, respectively. This means that in the lower bound, the items for which we can only give a very imprecise estimate are entirely excluded. Table II shows our own assessments of the precision of our assumptions.

Table II in here

## **Scenarios**

For our estimations of the costs of the German involvement in the conflict in Afghanistan, we estimate three separate scenarios. The first scenario assumes that all German troops are withdrawn by the end of 2011. This is not a very realistic scenario, knowing that Germany has a long term commitment to both the Afghan people and its NATO partners. For that reason, we also discuss a more realistic scenario of troops staying until 2016, in which the German involvement continues at the same level during the period 2011-2013, withdrawing one third of its troops during each of the years 2014-2016. A final scenario, called the full engagement scenario envisages the German contribution to the ISAF forces to double in 2011 and remain at that level until 2020. The latter scenario assumes that Germany raises its commitment in the face of initially continuing military opposition. In that scenario, after 2016 the war indeed subsides and German soldiers will function merely as peacekeepers. This decreases the injury and death rates to 0.

For those time periods where the death rate is not 0 yet, we assume that the average risk of death per soldier over the past years is continued in the future. As the mortality is in fact trending strongly upward, this is a rather conservative assumption. For the number of battle-related

injuries, we do the same. However, the number of injuries that occur on the battle field (146 until 01.05.2010) are only a small percentage of the total people who get injured or disabled. In addition to that, there are non-combat injuries and, more importantly, post-traumatic stress and other stress-related mental health problems. The only years for which information is available are 2006 and 2008. We use those years to estimate that approximately 4.2% of soldiers reported a war-related illness or injury, be that either mental health-related or physical. This is a very low estimate, with Stiglitz & Bilmes (2008) estimating the US army's rate of injury (including mental health) to be approximately 40%.

## **Results**

### ***Total Costs***

The results from our analysis are presented in Tables 3 and 4. Table 3 contains the estimates for the budgetary costs. As can be seen, in the most realistic scenario, these costs range from €17.3 to 31.6 billion, with an expected cost of nearly €24.5 billion. This is the total budgetary expenditure for the entire war, expressed in Net Present Value (NPV), with a discount rate of 3%, which is close to the long-run interest on German government bonds (European Central Bank, 2010). If, on the other hand, Germany withdrew its forces in 2011, the budget costs would be between €12.1 and 22.1 billion. Under the full engagement scenario, on the other hand, Germany suffers a total NPV budget cost of between €35.5 and 62.8 billion. As the point estimates presented in table III indicate a false sense of precision, we also present the range of our estimates in the last line.

Table III in here

However, as we argue above, there are also non-budgetary costs: both economic costs and the costs of financing government expenditure. As the decision regarding the method for financing the war is likely to be controversial, we present in table IV the separate estimations for the different methodologies discussed. Under method A, which assumes that the war is financed in the same way as the rest of the budget, the total non-budgetary costs for the realistic scenario are estimated between €9 and 15 billion. Under method B, which assumes the entire war is loan-

financed and interest is paid for only ten years, the total non-budgetary costs are estimated to be between €6 and 11 billion.

Table IV in here

Combining the different cost categories, table V shows the total costs of the German involvement in the war in Afghanistan using the more comprehensive financing method A. In the case of quasi-immediate withdrawal, table V indicates a total cost of €18 to 33 billion, with a point estimate of €24 billion. For the more realistic scenario, the estimates range from €26 to 47 billion, with an expected value of nearly €36.5 billion. In the scenario of full engagement, the costs are estimated to be between €53 and 93 billion, with €3 billion as the point estimate. All these estimates concern the NPV of the costs over the entire war period, expressed in 2010€.

Table V in here

### ***Distribution of Costs***

Of the non-interest government costs, approximately 91% falls to the ministry of defence, while the other 9% is borne by other departments. According to our estimates, only 40% of the government expenditures (excluding interest) are declared by the government to be a cost of the Afghanistan conflict. Even of the costs within the Ministry of Defence, only about 44% of the costs are declared to be part of that sum. For the entire war cost, including the economic costs, only about 27% belongs to the official government budget for the war.

### ***Marginal Costs***

An interesting number that does not become immediately clear from tables 3 and 4 is the cost of staying in Afghanistan for an additional year. As the costs are expressed here in NPV terms, future added years are cheaper in current terms than current years. For that reason, we can compare the costs of a withdrawal during the current calendar year (which is obviously not feasible in practical terms) and the costs of a withdrawal during the next year (the withdraw in 2011 scenario). The budget cost difference is nearly €2 billion, which is thus the budgetary cost of staying in Afghanistan for an additional year at the current level of commitment and casualties.

In addition to that, the non-budget costs add an additional €709 to 1,282 million, based on financing method A. The expected value of the marginal cost of an additional year of committing German troops to the war in Afghanistan to German society at large is about €2,970 million. In order to put this in perspective, the total 2010 budget of the German Department of Development Aid was €6,070 million .

### *Alternative Assumptions*

Several important caveats need to be mentioned. Due to a lack of data, many of the figures in the preceding tables are approximations, and the range of these approximations is also highly variable. Some of the numbers are fairly precise, whereas others have had to be estimates or even guesses. However, particularly when calculating the least certain contributing factors, we believe our estimates to be highly conservative. Furthermore, even where our initial estimates are very imprecise, having a first estimate helps to identify future data needs and hence contributes to a debate on the transparency of the costs of the German participation in the war in Afghanistan. Furthermore, even the imprecise estimates indicate the structure of the costs of the German war effort.

Another assumption that we have made in this analysis concerns the interest and discount rates. In order to see the sensitivity of our results, we compared the results for different values of the interest and discount rates. As expected, the costs of the full engagement scenario decrease in the level of the discount rate, whereas the costs in both the immediate withdrawal and the likely scenario increase with increasing discount rates. Moving from a discount rate of 3% to a discount rate of 7%, increases the likely scenario's point estimate of total costs from €36.5 billion to 38.1 billion. The immediate withdrawal scenario increases more strongly, moving from €25.5 billion to 28.7 billion, while under full engagement, the costs are reduced from €72.6 billion to 67.2 billion. All in all, not a significant change<sup>13</sup>.

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<sup>13</sup> The results under financing plan B depend on whether or not one assumes the discount rate to be equal to the interest rate. Under equal rates, increases of total costs are from €33.2 to 44.4 billion , €24.2 to 35.5 billion and €61.2 to 69.2 billion for the likely, immediate withdrawal and full engagement scenarios respectively. Keeping the interest rate constant at 3% and increasing only the discount rate from 3% to 7%, leads to minor changes. The respective scenarios see point estimate changes from €33.2 to 32.8 billion, €24.2 to 25.2 billion and €61.2 to 54.8 billion respectively.

Comparing our results to those of Stiglitz & Bilmes (2008), there are several cost channels that they include but we do not. These channels particularly pertain to macroeconomic effects that are due to the war and not due to the German participation in the war. Additionally, there are several issues that are very specific for the United States, and are not as relevant for the German case. Issues that are excluded due to their occurrence as a result of the war include the influence of the conflict on oil prices and stock markets. US-specific topics include insurance premiums for contractors, official veterans' services and sacrifices made by family members in order to take care of loved ones.

Finally, we only consider the conflict's costs to Germany. A large share of the costs, however, is not borne by Germany at all, but instead by Afghanistan or its neighbours. Such costs are beyond the scope of this estimation, but should certainly be included if one were to study the global economic costs of conflict (e.g. Bozzoli, Brück & Sottas, 2010).

## **Conclusions**

In this article, we provide a comprehensive estimate of the economic costs of the German involvement in the war in Afghanistan. We do so by looking at the past government expenditures and by estimating future expenditures based on currently available evidence, while recognising that there are remaining insufficiencies in the data. Using the available data, we are able to provide ranges of total costs, expressed in net present values. Additionally, this study provides a uniform framework for other researchers to analyse the costs of going to war for other countries and/or conflicts. If this indeed happens, it will be possible to combine the different studies and calculate the total costs of the conflict, which is going to be useful if one were to analyse whether the costs of the Afghanistan war outweighed the benefits.

Our conclusion is that in a realistic security scenario, the annual costs of the German engagement are nearly €2 billion, excluding significant interest costs. This is clearly much higher than what government data have suggested in the past. Once financing costs are included, the total annual costs to the German government exceed €2.5 billion, contrasting with the government's 2010 request of only €1,059 million. This implies that the actual outlays for the war in Afghanistan make up 0.6% (excluding financing costs) of the total federal budget, which may be small, but is

still a significant sum that is not properly accounted for.

The Net Present Value of the costs to the government (excluding financing) of the entire German engagement in the war in Afghanistan sum up to between €17 and 32 billion. Furthermore, the other economic costs add up to between €6 and 15 billion. These items include the costs of the financing of the war effort and societal costs at large. Hence, costs beyond the budgeted costs are a further important element when assessing the total costs of the German contribution to the war in Afghanistan. These estimates are still uncertain and we hope to have more complete data available in the future to make the estimation more precise. In all fairness, the total annual costs of the participation are thus very small compared to the overall German economy at 1.2%, but its total impact over all the years engagement still adds up.

If this article were a cost-benefit analysis, we would also discuss the benefits that have resulted from the involvement in the war, but as the benefits of this war are largely non-monetary and thus very difficult to estimate, we choose not to. For that reason, we can also not examine whether the war effort has been worth the costs incurred. We can say, however, that there is a large discrepancy between the Ministry of Defence's estimations of the total costs and our own. These discrepancies are largely due to the types of costs included, but we firmly believe that the current costs included in our study are relevant and appropriate.

However, it must also be said that there is a large difference between ex ante and ex post analyses of the economic costs of conflict. Regarding the war in Iraq, studies estimating the potential costs of the war before it had started yielded very different results from studies that came out while the war was underway. After all, the outcome of any conflict is highly uncertain and this makes ex ante cost estimations subject to a large margin of error.

**Data replication:** The dataset, codebook and framework for the empirical analysis in this article can be found at <http://www.prio.no/jpr/datasets>.

## References

- Arin, Kerim Peren & Faik Koray (2005) Fiscal policy and economic activity: U.S. evidence. *CAMA Working Papers* No. 2005-09.
- Bilmes, Linda & Joseph Stiglitz (2006) The economic costs of the Iraq war: An appraisal three years after the beginning of the conflict. *NBER Working Papers* No. 12054.
- Bozzoli, Carlos; Tilman Brück & Simon Sottas (2010) A survey of the global economic costs of conflict. *Defence and Peace Economics* 21(2): 165-176.
- Bozzoli, Carlos; Tilman Brück & Olaf J de Groot (2011) How many bucks in a bang: On the estimation of the economic costs of conflict. Forthcoming in: Michelle Garfinkel & Stergios Skaperdas (eds.) *Oxford Handbook of the Economics of Peace and Conflict*. Oxford: Oxford University Press.
- Brauer, Jurgen (2007) Data, models, coefficients: The case of United States military expenditure. *Conflict Management and Peace Science* 24(1): 55-64.
- Brück, Tilman and Guo Xu (2011) Who gives aid to whom and when? Aid accelerations, shocks and policies. *DIW Discussion Papers* No. 1033.
- Brzoska, Michael (1981) The reporting of military expenditures. *Journal of Peace Research* 18(3): 261-275.
- Brzoska, Michael (2007) Sind militärische Interventionen ihr Geld wert? Zur Notwendigkeit begleitender Kosten- und Nutzenanalysen [Are military interventions worth their money? Regarding the necessity of accompanying cost-benefit analyses]. In: Bruno Schoch, Andreas Heinemann-Grüder, Jochen Hippler, Markus Weingardt & Reinhard Mutz (eds.) *Friedensgutachten 2007* [Experts' Peace Report 2007]. Berlin: LIT-Verlag, 75-85.
- Bundesministerium der Verteidigung (2008) *Wichtige Hinweise zur finanziellen und sozialen Absicherung bei besonderen Auslandsverwendungen* [Important information regarding financial and social insurance during special foreign deployments]. Info 4: DSK



(<http://www.ecb.int/stats/money/long/html/index.en.html>).

Focus Online (2009) *Geheimerbericht warnt vor Anschlägen* [Secret report warns for attacks]. ([http://www.focus.de/politik/deutschland/bka-geheimerbericht-warnt-vor-anschlaegen\\_aid\\_433565.html](http://www.focus.de/politik/deutschland/bka-geheimerbericht-warnt-vor-anschlaegen_aid_433565.html)).

Fontanel, Jacques & Ivan Samson (2008) The determinants of military expenditures. In: Chatterji, Manas (ed.) *War, Peace and Security (Contributions to Conflict Management, Peace Economics and Development, Volume 6)*. Bingley, UK: Emerald, 125-132.

Foster, John Bellamy; Hannah Holleman & Robert W. McChesney (2008) The U.S. imperial triangle and military spending. *Monthly Review* 60(5): 1-19.

Garcia-Milà, Teresa (1989) Some empirical evidence on government purchase multipliers. *Economics Letters* 31(4): 375-380.

Gillmann, Barbara (2009) *Schäuble sieht höhere Terrorgefahr* [Schäuble sees increased danger of terrorism] (<http://www.handelsblatt.com/politik/deutschland/schaeuble-sieht-hoehere-terrorgefahr;2139040>).

House Budget Committee, Democratic Staff (2002) *Assessing the cost of military action against Iraq: Using Desert Shield/Desert Storm as a basis for estimates* ([http://budget.house.gov/analyses/spending/iraqi\\_cost\\_report.pdf](http://budget.house.gov/analyses/spending/iraqi_cost_report.pdf)).

Keynes, John Maynard (1940) *How to Pay for the War: A Radical Plan for the Chancellor of the Exchequer*. New York: Harcourt Brace.

Lin, Eric S & Hamid E Ali (2009) Military spending and inequality: Panel Granger causality test. *Journal of Peace Research* 46(5): 671-685.

Murshed, Syed Mansoob & Daewood Mamoon (2010) Not loving thy neighbour as thyself: Trade, democracy and military expenditure explanations underlying India-Pakistan rivalry. *Journal of Peace Research* 47(4): 463-476.

Nordhaus, William Dawbney (2002) The economic consequences of a war in Iraq. *NBER*

Working Paper No. W9361 (<http://www.nber.org/papers/w9361>).

Orszag, Peter Richard (2008) The cost of the war: A comment on Stiglitz-Bilmes, *CBO Director's Blog*. (<http://cboblog.cbo.gov>).

Petersohn, Ulrich (2008) Outsourcing the big stick: The consequences of using private military companies. *Weatherhead Center for International Affairs Working Paper Series* No. 08-0129: 73.

Raad voor de Volksgezondheid en Zorg (2006) *Zinnige en Duurzame Zorg* [Useful and lasting care]. Policy Advice to Ministry of Health ([http://rvz.net/uploads/docs/Advies - Zinnige en duurzame zorg.pdf](http://rvz.net/uploads/docs/Advies_-_Zinnige_en_duurzame_zorg.pdf)).

Ricardo, David (1820) *Essay on the Funding System*, various editions.

Schulze-Steikow, Renate (2007) *Öffentliche Ausgaben für Äußere und innere Sicherheit 2004* [Public expenditures for external and internal security 2004]. Wiesbaden: *Wirtschaft und Statistik* 5: 499-505.

SIPRI (2011) *SIPRI Yearbook 2011: Armaments, Disarmament and International Security*. Oxford: Oxford University Press.

Smyth, Russell & Paresh Kumar Narayan (2009) A panel data analysis of the military expenditure-external debt nexus: Evidence from six Middle Eastern countries. *Journal of Peace Research* 46(2): 235-250.

Spengler, Hannes (2004) *Kompensatorische Lohndifferenziale und der Wert eines statistischen Lebens in Deutschland* [Compensatory wage differences and the value of a statistical life in Germany]. Darmstadt: Darmstadt Discussion Papers in Economics 133 ([http://www.download.tu-darmstadt.de/wi/vwl/ddpie/ddpie\\_133.pdf](http://www.download.tu-darmstadt.de/wi/vwl/ddpie/ddpie_133.pdf)).

Spiegel (2010) *Thema: Bundeswehreinsatz in Afghanistan, alle Artikel, Hintergründe und Fakten* [Theme: Military deployment in Afghanistan, all articles, backgrounds and facts]. ([http://www.spiegel.de/thema/bundeswehreinsatz\\_afghanistan/](http://www.spiegel.de/thema/bundeswehreinsatz_afghanistan/)).

Stiglitz, Joseph E & Linda J Bilmes (2008) *The Three Trillion Dollar War: The True Cost of the Iraq Conflict*. London: Penguin Books.

US Department of State (2011) *Background note: Switzerland*. (<http://www.state.gov/r/pa/ei/bgn/3431.htm>).

Verhagen, Maxime & Eimert Van Middelkoop (2010) *Kamerbrief inzake stand van zaken Afghanistan* [Parliamentary letter regarding current state of affairs in Afghanistan]. Official Correspondence of Dutch Parliament (<http://www.rijksoverheid.nl/ministeries/bz/documenten-en-publicaties/kamerstukken/2010/09/28/kamerbrief-inzake-stand-van-zaken-afghanistan.html>).

Wallsten, Scott & Katrina Kosec (2005) The economic costs of the war in Iraq. *AEI-Brookings joint Center Working Paper* No. 05-19 ([http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=848408](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=848408)).

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**Table I. Size of the German mission in Afghanistan per year**

Year	No of Soldiers
2001	1200
2002	2400
2003	2650
2004	2650
2005	3000
2006	3000
2007	3000
2008	4500
2009	4500
2010	5350

*Note: data originates from [www.bundeswehr.de](http://www.bundeswehr.de).*

**Table II. Assignment of different categories as good, reasonable or weak regarding the accuracy of our assumptions**

high (20%)	medium (50%)	low (100%)
War Budget	Equipment depreciation	Medical and Disability (govt)
Soldier's wages	Development programmes	Medical (non-govt)
Demobilisation	Loss-of-Lives	Security/terrorism
Widow(er)'s payments	Police mission	Productivity loss due to injury
Financing		Foreign affairs

**Table III. The estimated *budgetary* costs of the German involvement in the war in Afghanistan since the beginning of the war, under three different scenarios (expressed in 2010 millions of Euros)**

	<u>Withdraw 2011</u>	<u>Realistic</u>	<u>Full Engagement</u>
<u>Official War Budget</u>			
<b>WAR BUDGET SUM</b>	<b>6,744</b>	<b>9,730</b>	<b>20,086</b>
<u>Other Defence Ministry costs</u>			
Soldier's wages	5,932	8,822	18,844
Demobilisation	991	881	1,519
Equipment Depreciation	1,109	1,648	3,522
Widow(er)s Compensation	95	146	233
Medical and Disability	662	953	1,460
<b>DEFENCE MINISTRY COSTS SUM</b>	<b>8,790</b>	<b>12,451</b>	<b>25,579</b>
<u>Other branches of government</u>			
Security/terrorism	177	261	405
Foreign Affairs	266	391	608
Development Programmes	952	1,313	1652
Police Mission	172	317	820
<b>OTHER BRANCHES SUM</b>	<b>1,567</b>	<b>2,281</b>	<b>3,485</b>
<b><u>TOTAL BUDGET COSTS</u></b>	<b><u>17,102</u></b>	<b><u>24,462</u></b>	<b><u>49,151</u></b>
Range of estimates	12,127---22,075	17,301---31,622	35,544---62,758

**Table IV. The estimated *non-budgetary* costs of the German involvement in the war in Afghanistan since the beginning of the war, using two different methods of financing**

	<u>Withdraw 2011</u>	<u>Realistic</u>	<u>Full Engagement</u>
<b><u>METHOD A</u></b>			
<u>Financing Costs</u>			
<b>FINANCING COSTS SUM</b>	<b>7.450</b>	<b>10.632</b>	<b>21.278</b>
<u>Other Economic Costs</u>			
Medical	53	78	121
Loss of Life	128	195	311
Productivity loss due to injury	756	1,111	1,727
<b>OTHER COSTS SUM</b>	<b>937</b>	<b>1,384</b>	<b>2,160</b>
<b><u>TOTAL NON-BUDGET</u></b>	<b><u>8,387</u></b>	<b><u>12,015</u></b>	<b><u>23,439</u></b>
Range of estimates	6,024---10,751	8,603---15,428	17,178---29,698
<b><u>METHOD B</u></b>			
<u>Financing Costs</u>			
<b>FINANCING COSTS SUM</b>	<b>6.116</b>	<b>7.324</b>	<b>9.891</b>
<u>Other Economic Costs</u>			
Medical	53	78	121
Loss of Life	128	195	311
Productivity loss due to injury	756	1,111	1,727
<b>OTHER COSTS SUM</b>	<b>937</b>	<b>1,384</b>	<b>2,160</b>
<b><u>TOTAL NON-BUDGET</u></b>	<b><u>7.054</u></b>	<b><u>8.708</u></b>	<b><u>12.051</u></b>
Range of estimates	4,957---9,150	5,957---11,459	8,068---16,034

**Table V. The estimated *total* costs of the German involvement since the beginning of the war, using Financing method A, expressed in millions of 2010 €**

	<b>Lower Bound</b>	<b>Point Estimate</b>	<b>Upper Bound</b>
<b>Withdraw 2011</b>	18,151	25,488	32,826
<b>Realistic</b>	25,905	36,478	47,051
<b>Full Engagement</b>	52,722	72,589	92,456