Base Realignment and Closure (BRAC) Savings and Acquisition Risk

R2-1

Peter J. Braxton, Kevin Cincotta, Richard C. Lee

International Cost Estimating and Analysis Association (ICEAA) Annual Conference

Tuesday, June 18th, 2013 – Friday, June 21st, 2013

Abstract

The Government Accountability Office (GAO) recently released the study *Military Base Realignments and Closures: Updated Costs and Savings Estimates from BRAC 2005* (GAO-12-709R, June 29, 2012). Its appendices contain a wealth of risk data, with initial estimates (2005 BRAC commission) and final costs (Fiscal year 2011 DOD budget) for 175 distinct BRAC initiatives. Applying an innovative method for modeling within-program risk and uncertainty using cross-program data, this paper derives cost growth factors (CGFs) and coefficients of variation (CVs) for BRAC initiatives. Furthermore, the pattern in these data is astoundingly similar to that found in major defense acquisition program (MDAP) data, a strong confirmation of this modeling approach (meta analysis).

The BRAC initiatives ranged in size from very small (a few million dollars or less) to large (a few billion dollars), and they experienced a very wide range of cost growth, from -100% (i.e., a final cost of zero!) up to more than 1800% (19-fold!). The average CGF was 2.02 (102% growth), but median growth (36%) was much smaller, and dollar-weighted growth (68%) fell in between. These are typical results, especially in view of the well-documented "size effect," wherein smaller programs have much greater risk and opportunity (and hence uncertainty). While the GAO report examined how the increased one-time cost reduced the net present value (NPV) of the initiatives, which nonetheless remained positive due to real operational savings, our focus was on that up-front cost itself, as a potential analogy for acquisition programs.

Using the method pioneered in "The Perils of Portability: CGFs and CVs" (Braxton, et al., SCEA/ISPA 2011), we modeled the BRAC data using a maximum likelihood estimation (MLE) regression of final cost as a function of initial cost, with a heteroskedastic error term. This models the size effect by allowing the variation around smaller programs to be smaller in absolute (dollar) terms but larger in percent terms. For example, the BRAC data show a 30% CV at about a half billion dollars, with higher CVs for smaller projects, and asymptotically smaller CVs for larger projects (down to about 10% in the observed range). While we fail to reject the null hypothesis that the normalized errors follow a normal distribution, the eerie and unmistakable similarity of the pattern of normalized errors to that produced by the same model for the entirely distinct MDAP data leads us to investigate a different error form.

Drawing from more than 400 Selected Acquisition Report (SAR) baselines from more than 300 MDAPs as reported in "SAR Data Analysis, CV Benchmarks, and the Updated NCCA S-Curve Tool" (Lee, et al., SCEA/ISPA 2012), we updated the same MLE regression analysis and found that, like the BRAC data, the normalized errors showed a clustering below mean growth and other evidence that a skew-right distribution such as lognormal may be more appropriate. It has long been hypothesized that within-program risk is normal, in consonance with the application of the Central Limit Theorem to probabilistic cost estimates, while cross-program risk is lognormal, due to the presence of a few extremely risky programs and many moderately risky programs. This research offers unprecedented insight into within-program risk, and indications are that it too may be lognormal.

GAO BRAC Study

The Government Accountability Office (GAO) recently released the study *Military Base Realignments and Closures: Updated Costs and Savings Estimates from BRAC 2005* (GAO-12-709R, June 29, 2012). Its appendices contain a wealth of risk data, with initial estimates (2005 BRAC commission) and final costs (Fiscal year 2011 DOD budget) for 175 distinct BRAC initiatives (see Appendix).

The BRAC initiatives ranged in size from very small (a few million dollars or less) to large (a few billion dollars), and they experienced a very wide range of cost growth, from -100% (i.e., a final cost of zero!) up to more than 1800% (19-fold!). The average CGF was 2.02 (102% growth), but median growth (36%) was much smaller, and dollar-weighted growth (68%) fell in between. These are typical results, especially in view of the well-documented "size effect," wherein smaller programs have much greater risk and opportunity (and hence uncertainty). While the GAO report examined how the increased one-time cost reduced the net present value (NPV) of the initiatives, which nonetheless remained positive due to real operational savings, our focus was on that up-front cost itself, as a potential analogy for acquisition programs.

The summary statistics for the BRAC data are shown in the table.

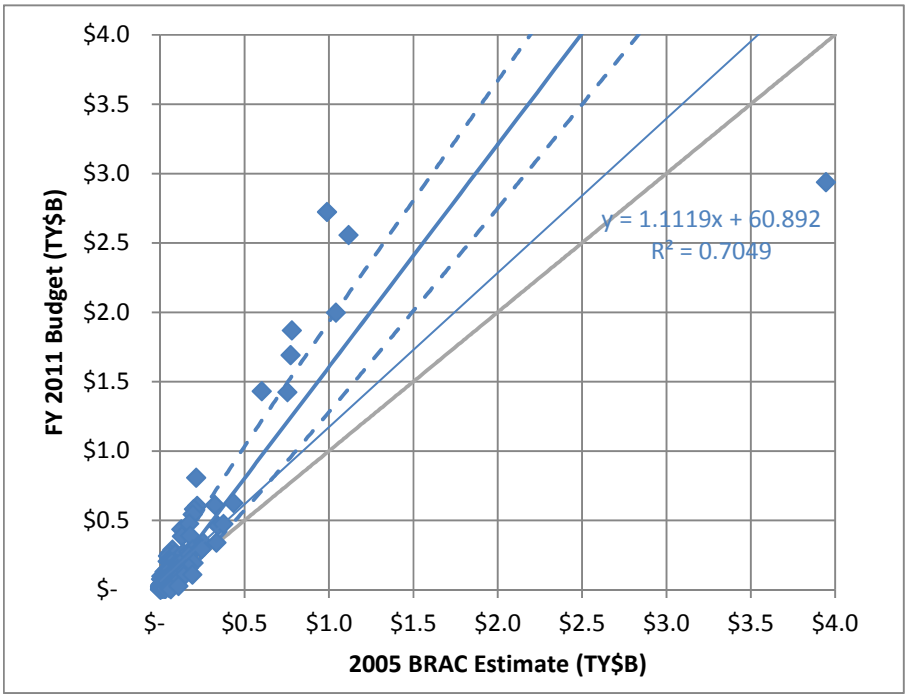
statistic	2005 BRAC Commission estimate	Fiscal year 2011 DOD budget	Dollar difference	CGF
mean	$ 119.7	$ 194.0	$ 74.3	2.02
variance	116638.1	204578.0	61831.9	6.78
standard deviation	$ 341.5	$ 452.3	$ 248.7	2.60
CV	285.3%	233.2%	334.7%	129.1%
n	175	175	175	174
median	$ 33.5	$ 50.2	$ 8.8	1.36
min	$ -	$ -	$ (1,013.0)	0.00
max	$ 3,946.0	$ 2,933.0	$ 1,731.6	19.40

MLE Regression Methodology

Applying an innovative method for modeling within-program risk and uncertainty using cross-program data, we derive cost growth factors (CGFs) and coefficients of variation (CVs) for BRAC initiatives. Furthermore, the pattern in these data is astoundingly similar to that found in major defense acquisition program (MDAP) data, a strong confirmation of this modeling approach (meta analysis).Using the method pioneered in "The Perils of Portability: CGFs and CVs" (Braxton, et al., SCEA/ISPA 2011), we modeled the BRAC data using a maximum likelihood estimation (MLE) regression of final cost as a

function of initial cost, with a heteroskedastic error term. This models the size effect by allowing the variation around smaller programs to be smaller in absolute (dollar) terms but larger in percent terms. For example, the BRAC data show a 30% CV at about a half billion dollars, with higher CVs for smaller projects, and asymptotically smaller CVs for larger projects (down to about 10% in the observed range). While we fail to reject the null hypothesis that the normalized errors follow a normal distribution, the eerie and unmistakable similarity of the pattern of normalized errors to that produced by the same model for the entirely distinct MDAP data leads us to investigate a different error form.

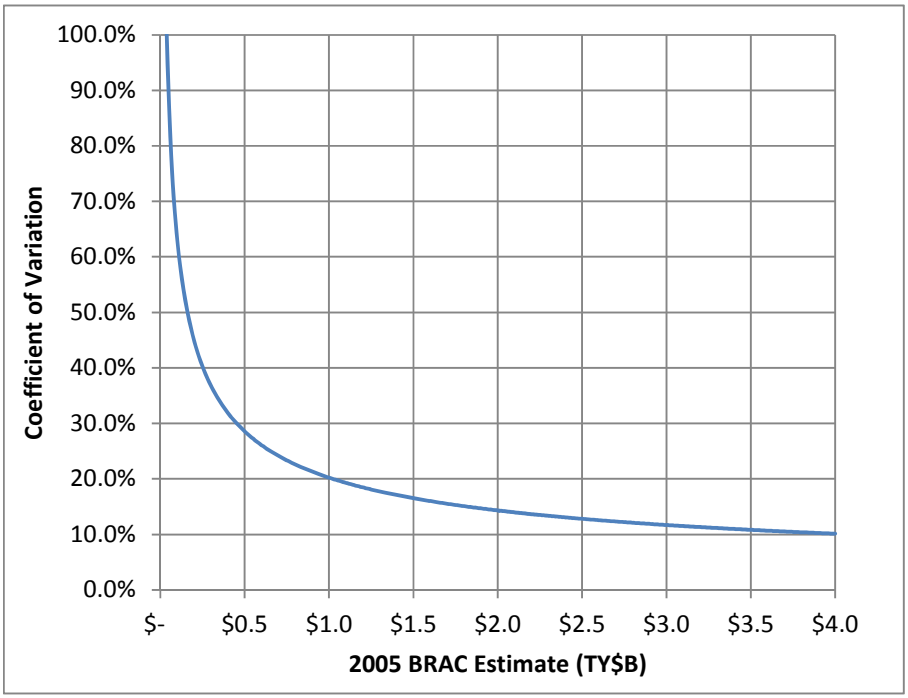
Here we see the MLE regression fit to the BRAC data:



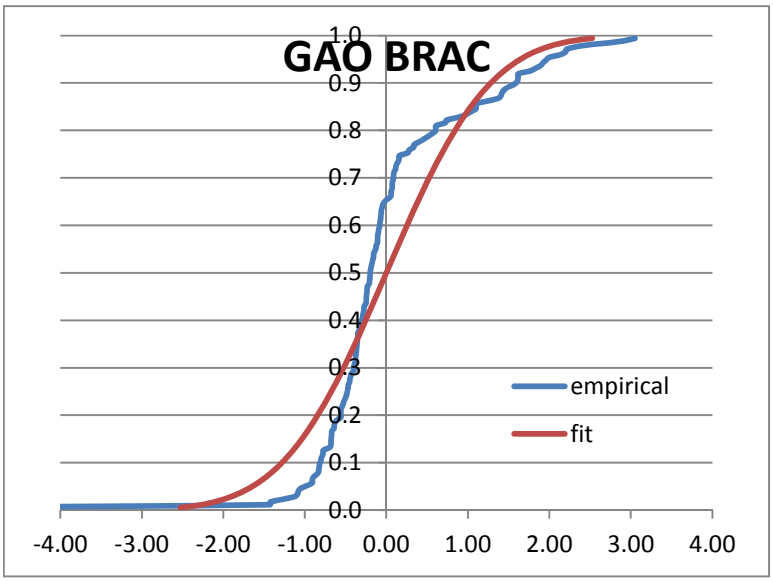
The solid blue line is the regression relationship that predicts final cost based on initial cost, with equation y = 2.044 + 1.603x, where x and y are in millions of dollars. The heteroscedastic error term is a normal distribution with mean zero and variance 105.442x. Note that since variance increases linearly, standard deviation increases quadratically, as illustrated by the dashed blue lines, which are plus or minus one standard deviation. The thin line blue line and accompanying equation are the standard ordinary least squares (OLS) regression fit to the same data. We observe that it is significantly different than the MLE regression, and in particular is more influenced by the apparent outlier at the far right. The gray line represents perfect prediction with no growth, that is, final cost = initial cost.

This graph shows the implied CGF based on the heteroscedastic error term shown in the previous graph:

Note that CGF is asymptotic to 1.6, the coefficient of x in the MLE regression. The tightening error bound illustrate the well-known "size effect," wherein cost growth is higher on a dollar value basis (as shown on the earlier regression graph) but smaller on a percentage basis for larger programs. This is further seen in the CV as a function of size in the following graph:



For each of the data points shown, a normalized residual was computed. The predicted final cost from the regression was subtracted from the actual final cost, and this delta was normalized by dividing by the standard deviation of the heteroscedastic error term from the MLE regression. If the MLE model is suitable, then these normalized residuals should follow a standard normal distribution. To test this, we conduct a Kolmogorov-Smirnov (K-S) test, the test statistic for which is the maximum vertical distance between the jagged empirical cdf and the smooth theoretical cdf shown in the following graph.



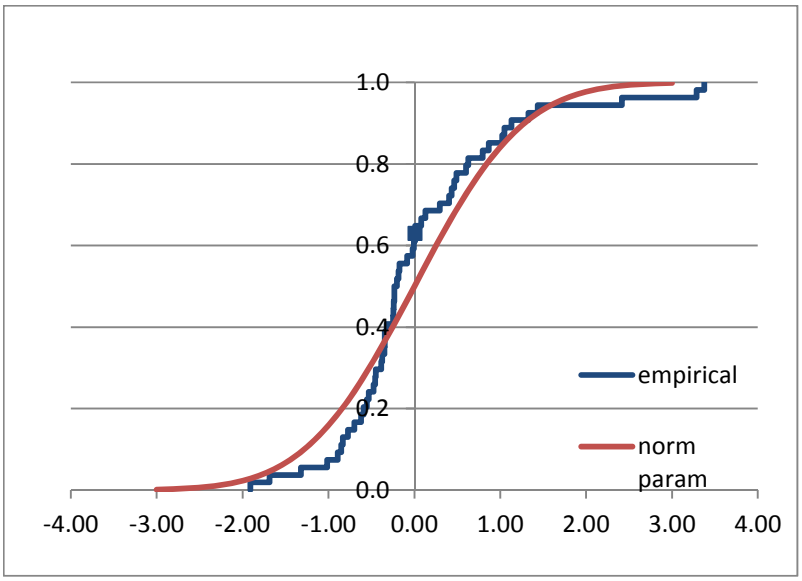
In the K-S, we fail to reject the null hypothesis that the normalized residuals follow a standard normal. However, a certain pattern emerges, with significant underruns underrepresented, and modest

underruns and overruns overrepresented. To see whether this may have happened by chance, we turn to meta-analysis.

Meta-Analysis: BRAC and SAR Risk

Drawing from more than 400 Selected Acquisition Report (SAR) baselines from more than 300 MDAPs as reported in "SAR Data Analysis, CV Benchmarks, and the Updated NCCA S-Curve Tool" (Lee, et al., SCEA/ISPA 2012), we updated the same MLE regression analysis and found that, like the BRAC data, the normalized errors showed a clustering below mean growth and other evidence that a skew-right distribution such as lognormal may be more appropriate. It has long been hypothesized that within-program risk is normal, in consonance with the application of the Central Limit Theorem to probabilistic cost estimates, while cross-program risk is lognormal, due to the presence of a few extremely risky programs and many moderately risky programs. This research offers unprecedented insight into within-program risk, and indications are that it too may be lognormal.

The graph of normalized residuals for the SAR data is shown at the top of the next page, and its pattern is eerily similar to the BRAC data. We are convinced that this is not a coincidence, but rather the natural distribution of cost growth data within DoD.



Conclusions

One of the crucial principles here is that the uncertainty associated with each data point is not constant, even in a relative sense, which is what the standard "CV of CGFs" approach assumes, the so-called "pseudo-iid" thought process. We should seek out uncertainty drivers that affect CV, and in the past these have included a risk score and program size. Here, we are using the latter.

The BRAC data show remarkable similarity to the SAR data, which suggest some universal patterns in cost growth and uncertainty, a powerful implication for cost estimating and risk analysis.

Finally, the BRAC data, which by all rights represent a simpler "commodity" (primarily facilities), show cost growth and uncertainty at least on a par with the SAR data, which represent sophisticated and complex defense platforms. In part, this may be due in part to the aforementioned size effect.

For an updated version of this paper, please contact Peter J. Braxton at PBraxton@technomics.net or (703) 944-3114.

Bibliography

"Development and Application of CV Benchmarks," Brian J. Flynn, Paul R. Garvey, Peter J. Braxton, Richard C. Lee, DoDCAS, 2011

"Testing S-Curves for Reasonableness: The NCCA S-Curve Tool," Richard L. Coleman, Peter J. Braxton, Richard C. Lee, Brian J. Flynn, Hampton Roads SCEA Chapter, DoDCAS 2011, SCEA/ISPA 2011

"The Perils of Portability: CGFs and CVs," Peter J. Braxton, Richard C. Lee, Kevin Cincotta, John S. Smuck, Megan E. Guild, Richard L. Coleman, Brian J. Flynn, SCEA/ISPA 2011

"Probability Distributions for Risk Analysis," Peter J. Braxton, Travis C. Manning, Luke H. Sayer, SCEA/ISPA 2011, 2012, ICEAA 2013

"CV Benchmarks and the NCCA S-Curve Tool: An Update" (poster presentation), Richard C. Lee, Peter J. Braxton, Kevin Cincotta, Brian J. Flynn, Benjamin F. Breaux, DoDCAS 2012

"SAR Data Analysis, CV Benchmarks, and the Updated NCCA S-Curve Tool," Richard C. Lee, Peter J. Braxton, Kevin Cincotta, Brian J. Flynn, Benjamin F. Breaux, ISPA/SCEA 2012

"Enhanced Scenario-Based Method for Cost Risk Analysis: Theory, Application, and Implementation" Paul R. Garvey, Brian J. Flynn, Peter J. Braxton, Richard C. Lee, ISPA/SCEA 2012, Journal of Cost Analysis and Parametrics

Appendix: BRAC Data

This table contains the data from Table 5: Dollar Differences in One-Time Costs From BRAC Commission Estimates to Fiscal Year 2011 DOD Budget of the GAO Report. (Current-year dollars in millions). It is sorted in descending order of dollar-value cost growth (the penultimate column).

Recommendation	2005 BRAC Commission estimate	Fiscal year 2011 DOD budget	Dollar difference	CGF
Realign Walter Reed Army Medical Center to Bethesda National Naval Medical Center, MD, and to Fort Belvoir, VA	$ 988.8	$ 2,720.4	$ 1,731.6	2.75
Close National Geospatial-Intelligence Agency leased locations and realign others at Fort Belvoir, VA	$ 1,117.3	$ 2,553.3	$ 1,436.0	2.29
Close Fort Monmouth, NJ	$ 780.4	$ 1,866.4	$ 1,086.0	2.39
Establish San Antonio Regional Medical Center and realign enlisted medical training to Fort Sam Houston, TX	$ 1,040.9	$ 1,993.9	$ 953.0	1.92
Realign Maneuver Training to Fort Benning, GA	$ 773.1	$ 1,688.2	$ 915.1	2.18
Co-locate miscellaneous OSD, defense agency, and field activity leased locations	$ 601.8	$ 1,428.3	$ 826.6	2.37
Realign to establish Combat Service Support Center at Fort Lee, VA	$ 754.0	$ 1,419.9	$ 665.9	1.88
Close Fort McPherson, GA	$ 214.5	$ 804.8	$ 590.2	3.75
Consolidate Defense Information Systems Agency at Fort Meade, MD	$ 220.0	$ 601.8	$ 381.9	2.74
Relocate Army headquarters and field operating activities	$ 199.9	$ 578.4	$ 378.5	2.89
Realign supply, storage, and distribution management	$ 192.7	$ 539.5	$ 346.8	2.80
Consolidate depot-level reparable procurement management	$ 124.9	$ 432.0	$ 307.1	3.46
Co-locate military department investigation agencies with DOD Counterintelligence and Security Agency at Marine Corps Base Quantico, VA	$ 172.0	$ 472.5	$ 300.5	2.75
Close Brooks City-Base, TX	$ 325.3	$ 608.2	$ 282.9	1.87
Consolidate/co-locate active and reserve personnel and recruiting centers for the Army and Air Force	$ 128.7	$ 381.6	$ 252.8	2.97

Close Fort Monroe, VA	$ 72.4	$ 286.1	$ 213.7	3.95
Co-locate missile and space defense agencies at Redstone Arsenal, AL	$ 178.2	$ 386.8	$ 208.6	2.17
Realign to create joint centers of excellence for chemical, biological, and medical research and development and acquisition	$ 55.2	$ 258.3	$ 203.1	4.68
Realign Naval Support Activity, New Orleans, LA	$ 46.2	$ 239.8	$ 193.6	5.19
Realign Fort Hood, TX	$ 435.8	$ 620.5	$ 184.7	1.42
Co-locate miscellaneous Air Force leased locations and National Guard Headquarters leased locations	$ 90.5	$ 254.6	$ 164.1	2.81
Co-locate miscellaneous Army leased locations	$ 44.1	$ 201.8	$ 157.7	4.58
Relocate miscellaneous Department of the Navy leased locations	$ 61.8	$ 201.5	$ 139.8	3.26
Realign defense research service-led laboratories at multiple locations	$ 136.1	$ 260.3	$ 124.3	1.91
Realign to relocate undergraduate pilot and navigator training	$ 71.7	$ 193.4	$ 121.7	2.70
Realign to create a Naval Integrated Weapons and Armaments Research, Development, and Acquisition, Test and Evaluation Center mostly at Naval Air Weapons Station China Lake, CA	$ 343.3	$ 456.6	$ 113.2	1.33
Reserve Component Transformation, OK	$ 168.7	$ 269.4	$ 100.7	1.60
Consolidate media organizations into a new agency for media and publications at Fort Meade, MD	$ 42.0	$ 142.6	$ 100.6	3.40
Close Riverbank Army Ammunition Plant, CA	$ 25.2	$ 125.7	$ 100.5	4.99
Close Lone Star Army Ammunition Plant, TX	$ 29.0	$ 127.0	$ 98.0	4.38
Reserve Component Transformation, TX	$ 375.6	$ 470.3	$ 94.7	1.25
Close Naval Air Station Brunswick, ME	$ 193.1	$ 284.8	$ 91.6	1.47
Close Kansas Army Ammunition Plant, KS	$ 25.2	$ 113.3	$ 88.1	4.50
Reserve Component Transformation, CA	$ 78.7	$ 164.8	$ 86.1	2.09
Consolidate Army Test and Evaluation Command Headquarters at Aberdeen Proving Ground, MD	$ 7.1	$ 93.0	$ 85.9	13.10
Close Fort Gillem, GA	$ 56.8	$ 140.0	$ 83.2	2.46
Consolidate Defense Finance and Accounting Service	$ 254.4	$ 336.2	$ 81.8	1.32
Consolidate Transportation Command components at Scott Air Force Base, IL	$ 101.9	$ 178.8	$ 77.0	1.75
Consolidate correctional facilities into joint regional correctional facilities	$ 171.3	$ 244.9	$ 73.5	1.43
Realign to establish Joint Center of Excellence for culinary training at Fort	$ 5.4	$ 73.1	$ 67.8	13.54

Lee, VA				
Reserve Component Transformation, AR	$ 118.9	$ 185.1	$ 66.2	1.56
Close Galena Forward Operating Location, AK	$ 11.5	$ 69.5	$ 58.0	6.04
Close Naval Air Station Willow Grove, PA, and realign Cambria Regional Airport, Johnstown, PA	$ 239.5	$ 297.4	$ 57.9	1.24
Reserve Component Transformation, IA	$ 68.9	$ 120.0	$ 51.1	1.74
Reserve Component Transformation, OR	$ 24.1	$ 68.9	$ 44.8	2.86
Reserve Component Transformation, NY	$ 103.8	$ 147.1	$ 43.3	1.42
Realign to relocate Air Defense Artillery Center and School at Fort Sill, OK	$ 247.0	$ 289.7	$ 42.7	1.17
Realign to consolidate maritime command, control, communications, computers, intelligence, surveillance, and reconnaissance; research, development, and acquisition; and test and evaluation functions at multiple locations	$ 86.6	$ 126.0	$ 39.4	1.45
Reserve Component Transformation, WV	$ 29.5	$ 64.9	$ 35.4	2.20
Close Naval Weapons Station, Seal Beach, Concord, CA	$ 14.0	$ 47.7	$ 33.7	3.41
Close Naval Station Ingleside, TX and realign Naval Air Station, Corpus Christi, TX	$ 177.1	$ 209.5	$ 32.4	1.18
Realign to relocate Army Prime Power School training at Fort Leonard Wood, MO	$ 6.0	$ 37.6	$ 31.6	6.27
Reserve Component Transformation, LA	$ 30.7	$ 60.2	$ 29.5	1.96
Close Navy and Marine Corps Reserve Centers	$ 62.4	$ 91.7	$ 29.3	1.47
Realign Otis Air National Guard Base, MA, and Lambert-St. Louis International Airport Air Guard Station, MO	$ 53.7	$ 83.0	$ 29.3	1.55
Relocate medical command headquarters	$ 106.3	$ 134.0	$ 27.8	1.26
Realign to establish Joint Center for consolidated transportation management training at Fort Lee, VA	$ 1.5	$ 29.1	$ 27.6	19.40
Realign Naval Station Newport, RI	$ 11.8	$ 39.0	$ 27.2	3.31
Realign Single Drill Sergeant School to Fort Jackson, SC	$ 1.8	$ 27.2	$ 25.4	15.11
Realign Grand Forks Air Force Base, ND	$ 104.2	$ 129.5	$ 25.3	1.24
Reserve Component Transformation, AZ	$ 31.1	$ 56.1	$ 25.0	1.80
Co-locate defense and military department adjudication activities	$ 67.1	$ 88.9	$ 21.8	1.32
Realign to establish centers for rotary wing air platform Development, and	$ 49.4	$ 71.0	$ 21.6	1.44

Acquisition, Test and Evaluation Center at Patuxent River, MD, and Redstone Arsenal, AL				
Close Navy Supply Corps School Athens, GA	$ 23.8	$ 45.0	$ 21.2	1.89
Close Naval Air Station Atlanta, GA	$ 40.4	$ 61.5	$ 21.0	1.52
Realign Bradley International Airport Air Guard Station, CT	$ 14.3	$ 35.2	$ 20.9	2.46
Reserve Component Transformation, AL	$ 109.2	$ 129.1	$ 19.9	1.18
Realign to establish fleet readiness centers	$ 33.5	$ 53.2	$ 19.7	1.59
Close General Mitchell Air Reserve Station, WI	$ -	$ 18.3	$ 18.3	
Establish Air Force logistics support centers	$ 9.3	$ 27.6	$ 18.3	2.97
Reserve Component Transformation, IL	$ 42.6	$ 59.3	$ 16.7	1.39
Consolidate civilian personnel offices within military department and defense agencies	$ 87.1	$ 103.8	$ 16.6	1.19
Reserve Component Transformation, WA	$ 61.2	$ 76.8	$ 15.6	1.25
Reserve Component Transformation, DE	$ 13.6	$ 28.3	$ 14.7	2.08
Realign to establish Joint Center of Excellence for religious training and education at Fort Jackson, SC	$ 1.0	$ 14.9	$ 13.9	14.90
Realign Naval Shipyard Detachments	$ 12.5	$ 26.2	$ 13.7	2.10
Close Deseret Chemical Depot, UT	$ 18.3	$ 31.9	$ 13.6	1.74
Reserve Component Transformation, IN	$ 47.6	$ 61.2	$ 13.6	1.29
Close Newport Chemical Depot, IN	$ 2.3	$ 15.3	$ 13.0	6.65
Reserve Component Transformation, NE	$ 33.1	$ 45.9	$ 12.8	1.39
Close Naval Facilities Engineering Field Division/Activity	$ 37.9	$ 50.2	$ 12.3	1.32
Reserve Component Transformation, KY	$ 25.3	$ 37.1	$ 11.8	1.47
Realign to create an integrated weapons and armaments specialty site for guns and ammunition at Picatinny Arsenal, NJ	$ 66.8	$ 77.2	$ 10.4	1.16
Realign Ship Intermediate Maintenance Activity Norfolk, VA	$ 10.6	$ 20.8	$ 10.2	1.96
Reserve Component Transformation, NM	$ 17.9	$ 28.1	$ 10.2	1.57
Realign Andrews Air Force Base, MD	$ 19.4	$ 29.4	$ 10.1	1.52
Reserve Component Transformation, PR	$ 87.0	$ 96.9	$ 9.9	1.11
Realign Marine Corps Logistics Base Barstow, CA	$ 26.0	$ 34.8	$ 8.8	1.34
Reserve Component Transformation, MO	$ 28.6	$ 37.2	$ 8.6	1.30

Realign Niagara Falls Air Reserve Station, NY	$ 4.8	$ 13.1	$ 8.3	2.73
Reserve Component Transformation, NJ	$ 15.1	$ 23.3	$ 8.2	1.54
Reserve Component Transformation, MD	$ 6.3	$ 14.4	$ 8.1	2.29
Reserve Component Transformation, MN	$ 17.3	$ 25.3	$ 8.0	1.46
Realign Fairchild Air Force Base, WA	$ 6.4	$ 14.2	$ 7.8	2.22
Reserve Component Transformation, WY	$ 72.4	$ 79.8	$ 7.4	1.10
Reserve Component Transformation, MA	$ 85.5	$ 92.7	$ 7.2	1.08
Realign March Air Reserve Base, CA	$ 5.2	$ 12.3	$ 7.1	2.37
Reserve Component Transformation, WI	$ 10.7	$ 17.5	$ 6.8	1.64
Close Navy Reserve Centers	$ 2.6	$ 8.9	$ 6.4	3.42
Realign Officer Training Command, Naval Air Station Pensacola, FL	$ 4.1	$ 10.1	$ 6.0	2.46
Realign Naval Weapons Station Seal Beach, CA	$ 4.0	$ 9.7	$ 5.7	2.43
Realign Hill Air Force Base, UT	$ 28.6	$ 34.3	$ 5.7	1.20
Close W.K. Kellogg Airport Air Guard Station, MI	$ 8.3	$ 13.5	$ 5.2	1.63
Reserve Component Transformation, NC	$ 9.2	$ 13.9	$ 4.7	1.51
Realign Ellington Field Air Guard Station, TX	$ 2.0	$ 6.1	$ 4.2	3.05
Realign Lackland Air Force Base, TX	$ 8.1	$ 12.2	$ 4.1	1.51
Realign to establish centers for fixed wing air platform Research, Development, and Acquisition, Test and Evaluation Center at Wright-Patterson Air Force Base, OH, and Naval Air Weapons Station China Lake, CA	$ 17.7	$ 21.6	$ 3.9	1.22
Close Marine Corps Support Activity Kansas City, MO	$ 8.2	$ 12.0	$ 3.8	1.46
Reserve Component Transformation, MI	$ 7.9	$ 11.6	$ 3.7	1.47
Establish joint bases at multiple locations	$ 50.6	$ 54.2	$ 3.6	1.07
Reserve Component Transformation, MT	$ 26.0	$ 28.2	$ 2.2	1.08
Realign Hector International Airport Air Guard Station, ND	$ 1.8	$ 3.2	$ 1.4	1.78
Realign Fort Bragg, NC	$ 334.8	$ 336.1	$ 1.3	1.00
Reserve Component Transformation, ND	$ 7.9	$ 9.0	$ 1.1	1.14
Establish F100 engine centralized intermediate repair facilities	$ 9.2	$ 10.2	$ 1.0	1.11
Close Naval Station Pascagoula, MS	$ 17.9	$ 18.8	$ 0.9	1.05
Realign to create an air integrated weapons and armaments Research, Development, and Acquisition, Test and Evaluation Center at Eglin Air Force	$ 2.7	$ 3.3	$ 0.6	1.22

Base, FL				
Realign Fort Wainwright, AK	$ 0.1	$ -	$ (0.1)	0.00
Create joint mobilization sites	$ 0.1	$ -	$ (0.1)	0.00
Close Umatilla Chemical Depot, OR	$ 13.6	$ 13.4	$ (0.2)	0.99
Realign Naval Air Station New Orleans Air Reserve Station, LA	$ 55.9	$ 55.7	$ (0.2)	1.00
Realign Great Falls International Airport Air Guard Station, MT	$ 6.8	$ 6.6	$ (0.2)	0.97
Relocate Air Force Real Property Agency	$ 4.5	$ 4.2	$ (0.3)	0.93
Consolidate Defense Commissary Agency Eastern and Midwestern Regions, and Hopewell, VA, offices	$ 31.7	$ 31.4	$ (0.3)	0.99
Realign Robins Air Force Base, GA	$ 6.2	$ 5.7	$ (0.5)	0.92
Realign Army Reserve Command and Control - Northwest	$ 80.4	$ 79.7	$ (0.7)	0.99
Realign Navy Reserve Readiness Commands	$ 2.6	$ 1.8	$ (0.8)	0.69
Realign medical functions at McChord Air Force Base, WA	$ 1.1	$ -	$ (1.1)	0.00
Realign Langley Air Force Base, VA, by establishing a centralized intermediate repair facility – F-15 Avionics at Tyndall Air Force Base, FL	$ 1.8	$ 0.6	$ (1.2)	0.33
Realign Capital Airport Air Guard Station, IL	$ 22.8	$ 21.5	$ (1.2)	0.94
Reserve Component Transformation, CT	$ 128.6	$ 127.1	$ (1.5)	0.99
Realign to consolidate sea vehicle Development, and Acquisition to Naval Surface Warfare Center Carderock Division, MD, and Naval Sea Systems Command, DC	$ 1.5	$ -	$ (1.5)	0.00
Realign commodity management privatization	$ 6.4	$ 4.9	$ (1.6)	0.77
Close Navy Recruiting Districts	$ 2.4	$ 0.8	$ (1.6)	0.33
Reserve Component Transformation, GA	$ 21.4	$ 19.7	$ (1.7)	0.92
Realign Navy Regions	$ 3.2	$ 1.2	$ (2.0)	0.38
Realign Mansfield-Lahm Air Guard Station, OH	$ 8.6	$ 5.8	$ (2.7)	0.67
Realign to consolidate ground vehicle Development, and Acquisition in a joint center at Detroit Arsenal, MI	$ 3.8	$ 0.8	$ (3.0)	0.21
Realign Defense Intelligence Agency functions	$ 96.7	$ 93.3	$ (3.4)	0.96
Realign Key Field Air Guard Station, MS	$ 10.7	$ 7.1	$ (3.6)	0.66
Realign Naval Submarine Base, New London, CT	$ 5.5	$ 1.6	$ (3.9)	0.29
Reserve Component Transformation, HI	$ 56.6	$ 52.0	$ (4.6)	0.92

Close U.S. Army Garrison Michigan at Selfridge	$ 9.5	$ 4.6	$ (4.9)	0.48
Realign Fort Smith Municipal Airport Air Guard Station, AR	$ 13.5	$ 7.4	$ (6.1)	0.55
Realign Eielson Air Force Base, AK	$ 32.9	$ 26.7	$ (6.2)	0.81
Realign Richmond International Airport Air Guard Station, VA	$ 22.0	$ 14.1	$ (7.9)	0.64
Reserve Component Transformation, PA	$ 142.7	$ 134.6	$ (8.1)	0.94
Realign Red River Army Depot, TX	$ 150.9	$ 142.5	$ (8.4)	0.94
Close Kulis Air Guard Station, AK	$ 147.4	$ 138.7	$ (8.6)	0.94
Realign Army Reserve Command and Control - Southeast	$ 29.9	$ 20.8	$ (9.1)	0.70
Realign to establish Joint Strike Fighter initial joint training site at Eglin Air Force Base, FL	$ 199.1	$ 189.4	$ (9.7)	0.95
Realign Sierra Army Depot, CA	$ 33.4	$ 23.3	$ (10.1)	0.70
Reserve Component Transformation, TN	$ 36.9	$ 26.4	$ (10.5)	0.72
Reserve Component Transformation, VT	$ 61.4	$ 49.0	$ (12.4)	0.80
Realign Boise Air Terminal Air Guard Station, ID	$ 16.7	$ 3.3	$ (13.5)	0.20
Realign Army Reserve Command and Control - Northeast	$ 171.2	$ 155.9	$ (15.3)	0.91
Realign Martin State Air Guard Station, MD	$ 24.0	$ 8.2	$ (15.8)	0.34
Close Onizuka Air Force Station, CA	$ 123.7	$ 106.8	$ (17.0)	0.86
Realign Beale Air Force Base, CA	$ 40.6	$ 23.4	$ (17.2)	0.58
Reserve Component Transformation, RI	$ 32.4	$ 14.4	$ (18.0)	0.44
Reserve Component Transformation, OH	$ 134.8	$ 115.7	$ (19.1)	0.86
Realign Rock Island Arsenal, IL	$ 27.0	$ 3.9	$ (23.1)	0.14
Realign Nashville International Airport Air Guard Station, TN	$ 48.7	$ 24.9	$ (23.8)	0.51
Realign Mountain Home Air Force Base, ID	$ 91.4	$ 66.9	$ (24.5)	0.73
Realign Springfield-Beckley Municipal Airport Air Guard Station, OH	$ 30.8	$ 4.6	$ (26.2)	0.15
Close Mississippi Army Ammunition Plant, MS	$ 32.4	$ 5.5	$ (26.9)	0.17
Realign Army Reserve Command and Control - Southwest	$ 55.5	$ 21.5	$ (34.0)	0.39
Realign Portland International Airport Air Guard Station, OR	$ 70.0	$ 30.6	$ (39.4)	0.44
Reserve Component Transformation, NH	$ 54.2	$ 9.6	$ (44.6)	0.18
Realign by converting medical inpatient services to clinics at various installations	$ 141.3	$ 95.7	$ (45.6)	0.68
Realign Army Reserve Command and Control - New England	$ 96.1	$ 43.0	$ (53.1)	0.45

Realign Watervliet Arsenal, NY	$ 63.7	$ -	$ (63.7)	0.00
Realign Cannon Air Force Base, NM	$ 108.2	$ 23.4	$ (84.8)	0.22
Realign Pope Air Force Base, NC	$ 191.3	$ 105.4	$ (85.9)	0.55
Realign Operational Army (Integrated Global Presence and Basing Strategy)	$ 3,946.0	$ 2,933.0	$ (1,013.0)	0.74
Total	**$ 20,947.4**	**$ 35,151.7**	**$ 14,204.3**	**1.68**

a

Source: GAO analysis of 2005 BRAC Commission data and DOD's fiscal year 2011 BRAC budget data.

Note: Totals may not equal the sum of the numbers in each column, due to rounding.

a Total includes $1.2 billion for BRAC program administration costs