

Country survey: Military expenditure and defence policy in Norway 1970–2013

Johnson, Alexander Urnes ^{*1}, Hove, Kjetil ^{†1}, and Lillekvelland, Tobias ^{‡1}

¹Norwegian Defence Research Establishment, PO BOX 25, 2027 Kjeller, Norway

October 29, 2015

Abstract

This article examines military expenditure and defence policy in Norway from 1970 to 2013. Until 1990 Norwegian military expenditure remained between 2.5 and 3.0 per cent of Gross Domestic Product (GDP). Despite constant GDP shares, the military expenditure could not sustain a large and properly armed mobilization army. The constant nominal defence budgets of the 1990s accentuated the Norwegian Armed Forces' underlying imbalance between tasks, structure and budget. Around year 2000, large organizational reforms were effectuated, in which costs, the number of man-years, and underlying imbalances between tasks, structure and budget were reduced. Military expenditure increased in nominal terms between 2003 and 2013, while real military expenditure remained practically constant.

Keywords: Armed forces, Defence, Defence policy, Military expenditure, Norway.

*Corresponding author: Alexander-Urnes.Johnson@ffi.no; + 47 63 80 76 45

†Kjetil.Hove@ffi.no; +47 63 80 77 91

‡Tobias.Lillekvelland@ffi.no; +47 63 80 77 85

1 Introduction

1.1 Background and contents

Norway has been, and still is, a small European power, dependent on allies for territorial protection. Norway achieved independence in 1905 after being in a union since the Late Middle Ages, first with Denmark from 1524, and then with Sweden from 1814. Norway remained neutral in the First World War. In the Second World War, Norway abandoned its neutrality after the sudden German invasion in 1940. Western Allies, in particular US and UK, ensured Norwegian independence and security after the Second World War (Skogrand 2004) and Norway was one of the twelve founding NATO members. From 1950 until 1970, 85 per cent of Norwegian military investments were financed by the US (Wiker 1997). US military aid ceased around 1970, which meant Norway had to finance its military investments alone.

This article examines military expenditure in this new financial setting and attempts to answer the following question: How has Norwegian military expenditure developed after 1970, and what caused the changes? Until 1990, real military expenditure growth approximated real GDP growth, with a growth rate close to 3 per cent annually. The 3 per cent real growth was insufficient for the large mobilization structure's sustainment. After 1990, Norwegian real GDP grew, while real military expenditures remained constant. The end of real military expenditure growth accentuated the Norwegian Armed Forces' underlying imbalances between force structure, tasks, and budget. The Soviet Union's dissolution changed the Norwegian security environment, which required a different set of capabilities. In 2001 and 2002, reforms were introduced to solve the imbalances and to adapt the Norwegian Armed Forces to the new security environment.

Norway forms an interesting case for a country survey, being a small and open country, strategically more important than justified by its economy and armed forces. Norway's strategic importance comes from its maritime area, five and a half times the size of mainland Norway, and its strategic location, controlling both the entrance to the Baltic Sea, and the Barents Sea. The article's long term horizon enables investigation of military expenditure through different security environments, organizational reforms, and technological developments.

This article contributes to the long series of country surveys in *Defence and Peace Economics*, initiated with Ward et al. (1991). Country surveys are characterized by the description of a country's military expenditure. The survey's structure, methods, and focus vary. Time spans analyzed range from two decades in Beeres et al. (2012) and Caruso and Addesa (2012) to over four in Lin, Wu, and Chou (2012), Beenstock (1998), Sezgin (1997), and Hartley and MacDonald (2010). Methods applied vary from only political or historical analysis with descriptive statistics in Alexander, King, and Robert (2002) and Molas-Gallart (1997) to inclusion of econometric analysis in Kollias (1995, 2001), Struys (2002), and Caruso and Addesa (2012). Most surveys are confined to one country, however for example Pelaez (2007) and Bae (2003) compare military expenditure between countries.

The research methodology is outlined in the remainder of this chapter. Thereafter, Norwegian defence policy and history is presented in Chapter 2, and the economic background in Chapter 3. These chapters support the Norwegian military expenditure presentation and analysis in Chapter 4. The results are summarized and discussed in Chapter 5.

1.2 Research methodology

The sources for Chapter 2 are official documents from the Ministry of Defence (MoD)¹ and publications by Norwegian authors Wiker (1997), Børresen, Gjeseth, and Tamnes (2004), Heier (2011), and Græger (2007).

Account data for Norwegian military expenditure is published in annual bill and draft resolutions (Prop. 1 S). The military expenditure includes costs for the Norwegian defence sector, i.e. the Norwegian Armed Forces, MoD, and three other defence related government agencies.² Military expenditure does not include military pensions, as Norwegian governmental pensions are administered by two central government agencies.³ We have corrected the data for accounting alterations, such as exclusion of Lebanon peacekeeping operation costs between 1978 and 1981, exclusion of parts of search and rescue costs in 2008 and 2009 and changed accounting practice for property costs from 2011.

The composition of state expenditure has changed twice between 1970 and 1991, which cause discontinuities in the state expenditure dataset. For some years, state expenditure using different definitions are available, which enables adjustment of the earliest data. The adjustment can be justified since only growth of state expenditure is discussed in the article.

Personnel numbers until 1993 come from annual bill and draft resolutions from the MoD (St.prp. nr. 1). From 1994, personnel numbers come from the Norwegian defence sector's man-years accounts. Total force after mobilization is the sum of standing forces and reserve forces. The sources for mobilization forces in 1970 and 2010 are Børresen, Gjeseth, and Tamnes (2004) and The Military Balance 2010.

For comparisons with other founding NATO members, data from the Stockholm International Peace Research Institute (SIPRI) is used.⁴ Unlike Norwegian accounts data, SIPRI data includes pensions. Different sources explain different military expenditure shares in Figure 2 and Table 5.

¹Official MoD documents used are: reports from the two defence commissions of 1974 and 1990, long term plans for the Norwegian Armed Forces, and annual defence budgets.

²The three agencies are the National Security Authority, the Norwegian Defence Research Establishment and the Norwegian Defence Estates Agency.

³The two agencies are the Norwegian National Insurance Scheme and the Norwegian Public Service Pension Fund.

⁴For the main part of the article, we have used Norwegian accounts data. Norwegian accounts data can be allocated on defence branches, investments and operating costs, and is therefore preferable to SIPRI data. For consistency, SIPRI data is used for international comparisons.

2 Defence policy and history

2.1 Norwegian defence policy after the Second World War (WWII)

Norway has been a NATO member since 1949. The Alliance has been, and still is, the backbone of Norwegian security policy. In 1949, the US created the Mutual Assistance Program (MAP) with the goal of rebuilding the European allies' combat capability. Between 1950 and 1970, Norway received US military equipment valued at 69.8 billion 2013 Norwegian kroner (NOK) through MAP (Wiker 1997).⁵ MAP was reduced in the 1960s and Norway received the last US deliveries around 1970 (MoD 1973a).

The Soviet threat was the Norwegian security policy's main concern after WWII. From 1955 Norway prioritized the defence of Northern Norway (Børresen, Gjeseth, and Tamnes 2004).⁶ The Norwegian defence policy rested on four pillars (MoD 1998). First, the defence should be structured for resisting an invasion in Northern Norway. Standing forces combined with mobilization forces secured an immediate response to potential invaders. The Norwegian forces' goal was to delay invaders until allied forces, the second pillar, arrived. An important part of the second pillar was securing earmarked allied deployment of forces to Norway, in case of war. Allied deployment required sufficient access to airports and deep water harbours. To reduce setup time and ensure equipment in case of blocked sea routes, the Norwegian government encouraged allied forces' prepositioning of military equipment. The third pillar was conscription. Article 119 in the Norwegian constitution states: 'as a general rule every citizen of the State is equally bound to serve in the defence of the Country for a specific period, irrespective of birth or fortune'.⁷ The last pillar was the total defence concept, which means that civil resources, such as the Norwegian Civil Defence, the Norwegian health service and the Norwegian merchant fleet, would be requisitioned and utilized for military goals in case of war.

2.2 Norwegian defence policy 1970–2000

The core of the Norwegian Armed Forces in 1970 were one standing and twelve mobilization Army brigades, Coastal artillery fortresses, fighting ships, fighter aircraft with support units, and the Home Guard (Børresen, Gjeseth, and Tamnes 2004). Table 1 displays a selection of the main force elements and their development from 1970.

In 1970 the Norwegian armed forces would consist of 350 000⁸ men after mobilization, as shown in Table 2. Civilian resources would be mobilized through requisitioning. Børresen, Gjeseth, and Tamnes (2004) estimate that in war 20 to

⁵Norway received 7 763 vehicles, 479 cannon artillery, 171 068 rifles, and 624 aeroplanes and helicopters (MoD 1996).

⁶Southern Norway was considered initially sheltered from a Soviet invasion by Sweden, Denmark and West Germany.

⁷Originally reserved for men, conscription encompasses women from 2015 (Søreide 2014).

⁸Equals 9 % of the Norwegian population.

30 per cent of the Norwegian population would be involved in defending Norway. The peace time military organization was considerably leaner.

	1970	1975	1980	1985	1990	1995	2000	2005	2010
Submarine	15	15	14	14	13	14	12	6	6
Frigate	5	5	5	5	5	4	4	3	5
FAC ¹	47	48	61	48	48	30	14	14	6
Mine layer	4	2	2	2	2	2	2	1	0
MCM ²	10	10	10	10	8	4	9	8	6
Brigade ³	13	13	13	13	13	6	6	2	1
F5	92	88	66	16	20	15 ⁶	15	0	0
F16	0	0	72	69	62	60	58	57	57
F104/FC104	23	46	34	0	0	0	0	0	0
MBT ⁴	78 ⁵	116	116	100	117	170 ⁶	170	165	72

¹ Fast attack craft.

² Mine countermeasure ships.

³ Mobilization and standing brigades.

⁴ Main battle tank. Models include M-48, Leopard 1 and Leopard 2.

⁵ 78 Leopard 1 under delivery in 1970. A M-48 brigade group also existed in 1970. The exact M-48 number is not specified.

⁶ Number in 1997 .

Table 1: Structural development in the Norwegian Armed Forces 1970–2010. Sources: Børresen, Gjeseth, and Tamnes (2004) and MoD (1998, 2001a, 2009b) and various versions of The Military Balance.

Branch	Standing force (1973)				Mobilization (1970)
	Officer	Civil	Conscript	Total	Total force
Army	4 650	3 140	16 450	24 240	130 000
Navy	1 937	2 333	5 700	9 970	80 000
Air Force	3 766	2 263	4 950	10 979	70 000
Home Guard	286	93	1 400	1 779	70 000
Other	1 880	2 536	750	5 166	
Total	12 519	10 365	29 250	52 134	350 000

Table 2: Military personnel in standing forces and after mobilization. Sources: Standing force (MoD 1973a), Mobilization (Børresen, Gjeseth, and Tamnes 2004).

Norway attracted increased attention from NATO in the 1970s mainly due to the expansion of Soviet’s Northern Fleet, located at the Kola peninsula (Børresen, Gjeseth, and Tamnes 2004). The Northern Fleet had, as the only European Soviet fleet, direct access to the Atlantic and 90 per cent of Soviet ballistic missile submarines were stationed there. NATO feared Norway risked being placed behind the Soviet forward Atlantic defence line, which would deny NATO access to Norwegian territorial waters. Other reasons for increased NATO interest for Norway were the French withdrawal in 1966 from the NATO military integrated command, which led to increased allied interest in utilizing Norwegian airports and facilities, and the growth of the US Navy and US maritime ambitions following the *Sea Plan 2000*, launched in 1978.

After 1970, keeping the large mobilization force properly armed became an increasing problem for the Norwegian Armed Forces. In the 1950s and 1960s,

military procurement was primarily financed through US military aid, which meant Norwegian defence budgets mainly covered operating costs. The financial demands from the military structure established in the 1950s and 1960s exceeded the Norwegian defence budgets without military aid. In addition to US military aid, Norway repossessed German military installations and equipment after WWII, and especially the installations were costly to maintain (Skogrand 2004).⁹

By 1983, the Norwegian Armed Forces faced the choice between providing first-rate equipment for some mobilization brigades or providing second-rate equipment for all 13 brigades (MoD 1983). In 1988, the long term plan states that ‘a lot of existing military equipment was received through the US military assistance in the 1960s, and the US equipment is close to the end of its expected technical lifetime’ (MoD 1988). The defence commission of 1990, which published their report in 1992, recommended reducing the number of mobilization brigades from thirteen to six (NOU 1992:12 1992). The 1992 long term plan declared that ‘the Norwegian Armed Forces has far too long attempted to sustain a structure larger than the structure justified by military budgets’ (MoD 1992). Equipment’s shortcomings were obvious in 1992. Only one of thirteen mobilization brigades would be fully operational in case of war (Johnsen, Mølmann, and Wessel 1993).¹⁰ The number of mobilization brigades was reduced to six from 1995 (MoD 1998). To ensure operational brigades, the long term plan from 1998 recommended prioritizing equipment renewal for four of six brigades (MoD 1998).

The Soviet Union’s dissolution in 1991 changed the Norwegian security environment. The immediate threat of a Soviet invasion vanished, however the fragmentation of a centrally governed union into less stable sovereign countries increased the feeling of uncertainty (NOU 1992:12 1992). Russia retained substantial forces close to Norwegian borders. The Norwegian Defence Commission recommended that future Norwegian defence structure should be dimensioned for resisting a Russian invasion in Northern Norway until the arrival of allied reinforcements (NOU 1992:12 1992). The Russian military threat against Norway diminished in the 1990s for three reasons (Børresen, Gjeseth, and Tamnes 2004). First and most important, the Treaty on Conventional Armed Forces in Europe (CFE) was signed by the NATO and the Warsaw pact countries in 1990. Second, Russia withdrew military forces from Central and Eastern Europe. Third, Russia went into a prolonged economic recession in the 1990s which contributed to disarmament. The number of Russian forces stationed at the Kola peninsula was substantially reduced between 1993 and 1997.¹¹ A changed security environment increased the need for organizational reforms in the beginning of the new millennium.

The Norwegian Armed Forces spent more time adapting to the post Cold War

⁹Norway repossessed 300 German coastal fortresses after WWII (Skogrand 2004). Due to high operating costs, only 121 were maintained in 1947.

¹⁰The number of operational brigades depend on criterion chosen for operational (Johnsen, Mølmann, and Wessel 1993). Irrespective of criterion, less than 13 brigades were fully operational in 1992.

¹¹The number of submarines and larger surface vessels were reduced by one third, aeroplanes by 20 per cent, and motorized military infantry divisions were reduced from eleven to four (Børresen, Gjeseth, and Tamnes 2004).

security environment than other European allies (Græger 2007). The Norwegian Russian border¹², political factors, judicial factors, and internal reluctance to change in the Norwegian Armed Forces hindered reforms. A large mobilization structure, in which the entire population could contribute, was politically desirable (Græger 2007). Defence policy and regional policy is highly interlinked, and defence reforms would most likely mean job reductions in sparsely populated regions (Græger 2007). The strong Norwegian Civil Service Act also made downsizing cumbersome and costly. Norway followed a Cold War defence policy through most of the 1990s. Changed rhetoric came with the 1998 long term plan, which stated that ‘Norway faces no military threat’ (MoD 1998), however the Ministry of Defence evaluated in aftermath that despite the statement the 1998 long term plan constituted only a partial break with the Cold War defence policy (MoD 2001a). Major defence reforms were undertaken first in the new millennium with substantial and growing financial imbalances serving as the necessary catalyst.

2.3 Norwegian defence policy 2000–2012

‘Norwegian Armed Forces faces a deep and persistent structural crisis. Two fundamental imbalances characterize the situation: the size of the Norwegian Armed Forces does not reflect allocated resources, and the structure is not capable of solving the tasks of the future’ (MoD 2001a). These opening words of the bill and draft resolution bluntly express the state of the Norwegian Armed Forces in 2001. Military budgets had been insufficient for years, which caused a substantial investment lag and the first imbalance. The second imbalance came from the changed security environment. A full-scale Russian invasion was considered unlikely, which meant the large mobilization force was not needed. The Norwegian contributions to Operation Allied Force and Kosovo Force (KFOR) in the late 1990s revealed weaknesses in the Norwegian Armed Forces’ capabilities (Heier 2011). Norwegian fighter aircraft lacked air-to-surface capability and participated only peripherally in air operations (Rønne 1999). The tardy deployment of the Telemark battalion, Norway’s contribution to KFOR, led KFOR chief General Mike Jackson to ask rhetorically ‘if the battalion had marched from Norway to Kosovo?’ (Heier 2011). To solve the imbalances, several reforms and organizational changes were proposed, and the most comprehensive reforms were:

- Reducing the number of mobilization brigades from six to two (MoD 2001a).
- Restructuring logistics elements to one unit, the Norwegian Defence Logistic Organization (MoD 2000).
- Replacing the Norwegian national defense high command (FO) by a leaner organization, the Defence staff, and integrating FO’s strategic functions in the MoD (MoD 2001a).

¹²The 1992 long term plan states that ‘while Russian forces were withdrawing from the continent, Norway remains neighbour to one of the world’s largest military forces’ (MoD 1992).

- Replacing previous command structures by a central joint operational command, the Norwegian Joint Headquarters, and two regional military commands (MoD 2001a).
- Establishing a public enterprise responsible for managing the Norwegian Armed Forces' real estate (MoD 2001b).

The reforms' financial goals were reductions of operating expenses by two billion NOK (ca. 10 %), downsizing by 5 000 man-years (over 20 %), and reducing the number of real estate square meters by two million (over 30 %), by the end of 2005 (MoD 2004). Operating expenses and real estate goals were quickly met, and in 2005 the downsizing goal was reached (MoD 2004). In 2006 the number of mobilization brigades was reduced to one (MoD 2009b). Structural elements were removed, as shown by Table 1. Table 3 displays the post reform personnel composition. The reforms improved the balance between the assigned tasks, structure and available resources for the Norwegian Armed Forces (MoD 2008).

Branch	Standing force*				Total	Mobilization**
	Officers	Enlisted	Civilians	Conscripts		Total force
Army	2 819	613	472	4 191	8 095	8 170
Navy	1 572	199	203	1 318	3 292	3 870
Air Force	1 504	110	436	1 108	3 158	2 500
Home Guard	409	0	100	111	620	44 725
Other	4 477	257	4 244	1 149	10 127	9 950
Total	10 781	1 179	5 455	7 877	25 292	69 215

* Source: Defence sector man-years accounts.

** Source: Military Balance 2010. Total force after mobilization equals standing forces plus reserve forces, and should by definition be larger or equal to the standing force. The different data sources explain the instances when the standing forces are larger than the mobilization forces.

Table 3: Personnel in the Norwegian Armed Forces in 2010.

The mobilization force in Table 3 is roughly 20 per cent of the mobilization force in 1970 shown in Table 2. The most notable change in the standing force is the reduction in the number of conscripts. In 1970 almost all men fit for service were drafted, while in 2010 only 26 per cent completed the military service. The conscript's reduction is caused by the reduced mobilization force. The reduced mobilization force symbolizes the desired transition from a mobilisation defence to a modern and rapid reaction defence.

3 General economic background

Norwegian military expenditure and the Norwegian economy are interlinked. Table 4 displays the main economic indicators for Norway between 1970 to 2010.

Real GDP has grown on average by 4.7 per cent from 1970 to 2010 and the strong economic performance has coincided with a low unemployment rate. Inflation

was high prior to 1990. In 2001, the central bank of Norway imposed a soft inflation target of 2.5 per cent. Average inflation after 2001 has been 1.7 per cent, well below the inflation target. The Norwegian economy has become increasingly dependent on the oil sector over the 40 years. In 2012, the oil sector employed directly and indirectly 250 000 people in Norway and generated 560 billion NOK in tax revenues, almost 50 per cent of total tax revenues (Fjose, Gulbrandsen, and Holmen 2013).

Year	GDP	GDP main.	GDP/Cap.	Inflation	Unemp.	Oil depend.
1970	681 699	630 395	175 832	10%	NA	8%
1975	852 365	792 171	212 717	12%	2%	7%
1980	1 050 559	866 672	257 113	11%	2%	18%
1985	1 197 680	965 822	288 389	6%	3%	19%
1990	1 180 525	1 001 905	278 360	4%	5%	15%
1995	1 344 047	1 149 473	308 409	3%	5%	14%
2000	1 884 196	1 416 915	419 550	3%	3%	25%
2005	2 283 973	1 708 076	494 152	2%	5%	25%
2010	2 650 936	2 070 683	542 196	2%	4%	22%

GDP is real GDP in millions 2013-NOK.

GDP main. is real GDP excluding the oil and shipping sectors, in millions 2013-NOK.

GDP/Cap. is real GDP per capita in 2013-NOK.

Oil depend. is the oil and shipping sectors' share of GDP.

Source: Statistics Norway.

Table 4: Main economic indicators for Norway 1970–2010

4 Defence spending in Norway

4.1 A general overview

Norwegian military expenditure (milex) in nominal terms has grown steadily from 1970 to 2012, as shown by Figure 1. Military expenditure has increased in 36 out of 43 years.

Real military expenditure behaves differently. Average real growth rate between 1970 and 1990 was 3.0 per cent. Between 1990 and 2001 real military expenditure was reduced on average by 0.7 per cent annually. As a consequence of the extensive reforms described in Chapter 2 and the Norwegian involvement in Operation Enduring Freedom, real military expenditure increased by 13.9 per cent from 2001 to 2002. After 2002, real military expenditure has fluctuated between 34 and 39 billion NOK. The average annual post Cold War real military expenditure growth is 0.4 per cent.

The defence burden, defined as the share of real military expenditure to real GDP, is shown in Figure 2. The defence burden fluctuated between 2.5 and 3.0 per cent until 1990, when it started to decrease. In 2013, the defence burden had sunk to 1.31 per cent, well below NATO defence burden target of 2 per cent.¹³

¹³Military pension costs, which amounted to 4 566 million NOK in 2013, are not included in

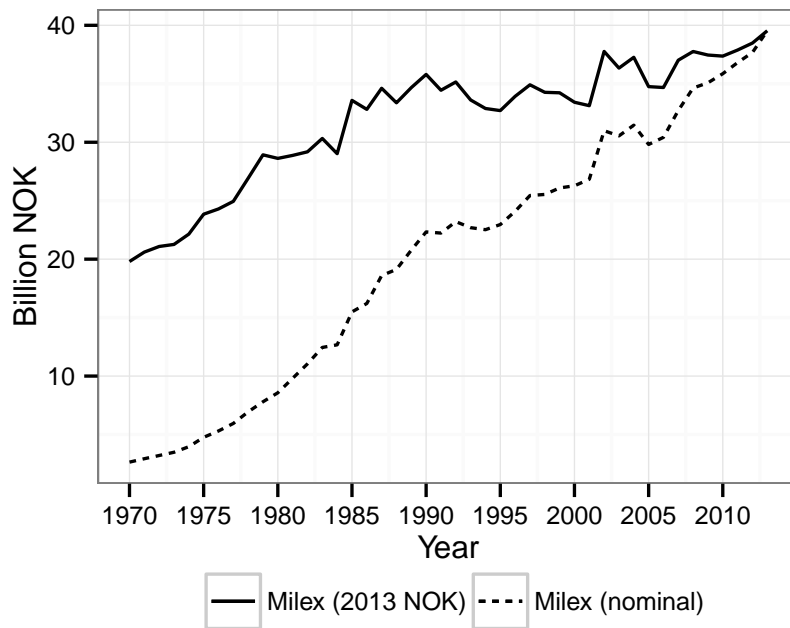


Figure 1: Military expenditure in billion NOK.
 Source: Annual draft and bill resolutions for the defence budget (Prop. 1 S).

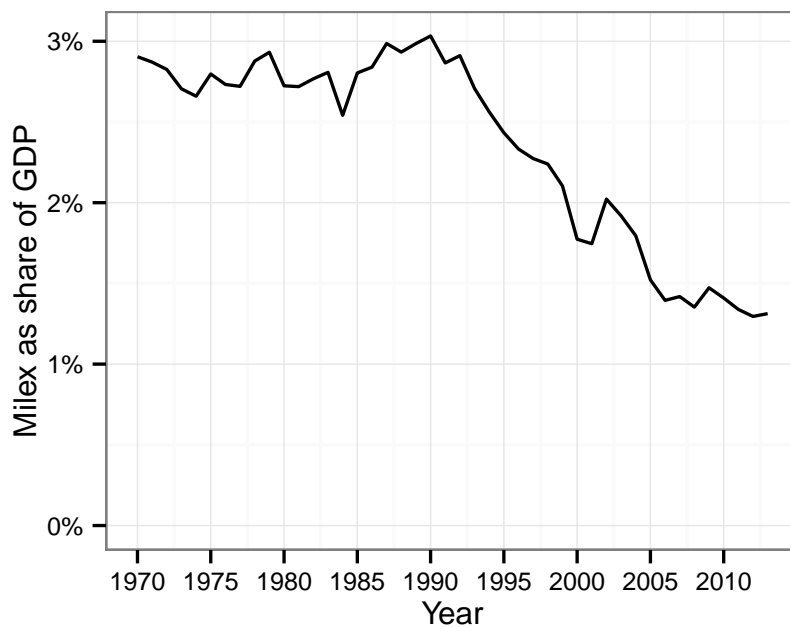


Figure 2: Defence burden – military expenditure as share of GDP.
 Source: Annual draft and bill resolutions for the defence budget (Prop. 1 S).

Since real military expenditure grew by on average 0.4 per cent annually from 1990 to 2013, the decreasing defence burden is caused by real GDP growth. The development of real GDP, real military expenditure and real public consumption can be seen in Figure 3.

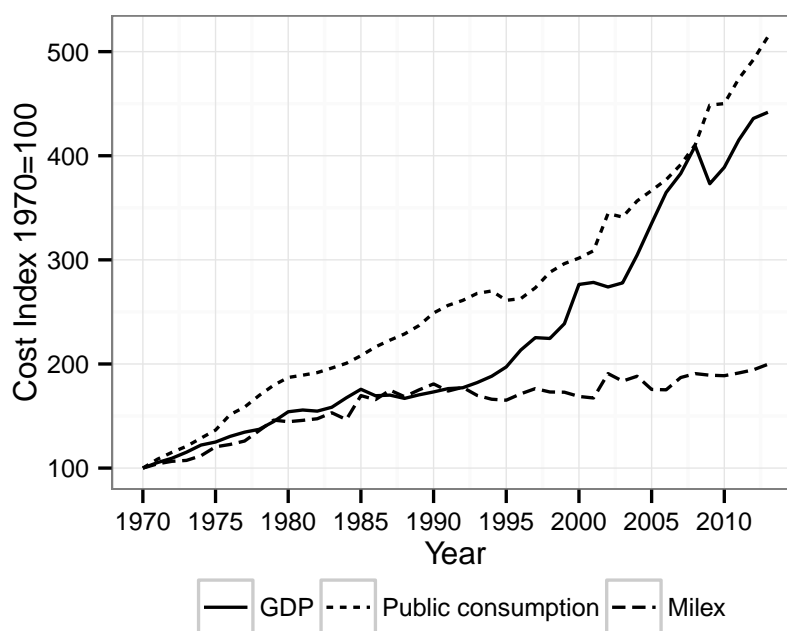


Figure 3: Norwegian real military expenditure, real GDP and real public consumption 1970–2012 (indexed values, 1970=100). Sources: Annual draft and bill resolutions for the defence budget (Prop. 1 S) and Statistics Norway.

Indexed GDP and military expenditure follow each other closely until the end of the Cold War. After 1992, GDP grows strongly while military expenditure remains relatively constant. The end of the one to one relationship between GDP growth and growth in military expenditure reflects a changed security environment. In the new security environment, income elasticity of defence drops from one to almost zero. As shown in Figure 3, state expenditure has on average grown faster than GDP from 1970 to 2013. The faster growth implies that the share of milex to state budget has decreased comparatively more than the share of milex to GDP.

4.2 Comparison with founding NATO members

Norway with a military expenditure of 7.1 billion dollars in 2010, has one of the smallest defence budgets among the founding NATO members, as seen by

our military expenditure data. If pensions cost were included the defence burden would be 1.46 per cent in 2013.

Table 5.

	1970			2010		
	Mil.	Mil./Cap.	Mil./GDP	Mil.	Mil./Cap.	Mil./GDP
USA	462 570	2 256	7.69%	720 282	2 329	4.81%
France	45 939	885	4.12%	66 251	1 019	2.40%
Great Britain	43 709	785	5.04%	62 942	1 003	2.50%
(West) Germany	50 367	644	3.20%	49 583	606	1.38%
Italy	18 876	351	2.32%	38 876	643	1.80%
Canada	11 645	546	2.19%	20 684	608	1.20%
Turkey	3 906	112	3.31%	16 955	235	2.40%
Netherlands	10 117	776	3.05%	12 061	726	1.45%
Greece	4 007	456	4.20%	8 859	783	2.70%
Norway	3 598	928	3.47%	7 099	1 452	1.50%
Belgium	6 372	660	2.92%	5 702	523	1.11%
Portugal	4 746	547	6.96%	5 294	501	2.11%
Denmark	3 898	791	2.43%	4 847	874	1.44%
Luxembourg	67	198	0.75%	360	710	0.60%

Mil. is military expenditure, including pension costs, in constant 2011 million USD.

Mil./Cap. is military expenditure per capita in constant 2011 USD.

Source: SIPRI

Table 5: Military expenditures of the 14 founding NATO members sorted by military expenditure in 2010 (Iceland excluded).

Defence burden can be measured by two ratios, military expenditure as a share of GDP or military expenditure per capita. For military expenditure divided by GDP, Norway ranks around the 14 countries' median. The ratio of military expenditures to GDP has declined for all countries from 1970 to 2010. The decline reflects both rapid GDP growth and the transition to a unipolar world, dominated by the US.

Only the US has higher military expenditure per capita than Norway. The difference in military expenditure per capita between Norway and other European allies such as France and the UK has increased from 1970 to 2010. The high and increased Norwegian military expenditure per capita reflects strong GDP growth, high and increasing Norwegian cost levels and the small size of the Norwegian Armed Forces. Two principal trends in weapon system costs are the increasing unit cost of weapons systems and the increasing dominance of fixed costs (Kirkpatrick 2004). Norway, with a small balanced force¹⁴, is highly influenced by these trends. For most main weapon systems, the number of units was reduced from 1970 to 2010, as shown by Table 1. Unit reductions within a weapon system increase the dominance of fixed costs and leads to increased unit costs.

Several weapon systems in the Norwegian Armed Forces are after the unit reductions, approaching critical mass where further quantity reductions are irrational from economic, operational, and organizational points of view (Diesen 2011). Contrary to other small countries, Norway hasn't removed any major weapon system.¹⁵ Weapon systems close to critical mass, increasing costs, and constant defence budgets necessitate a stronger international cooperation in military pro-

¹⁴A balance force is capable of warfare in all domains, i.e. land, sea, air and cyber.

¹⁵For example, Denmark chose in 2004 to remove submarines from their structure (Balsved 2004). New Zealand cut their air combat force in 2001 (Alexander, King, and Robert 2002). Belgium and the Netherlands have had permanent naval defence cooperation since 1948 (militarycooperation.eu 2012).

curement, maintenance, specialist education, and infrastructure in the future (Diesen 2011). Military cooperation with the Nordic countries was attempted strengthen in 2009 through the establishment of the Nordic Defence Cooperation (NORDEFECO), a partnership consisting of all five Nordic countries.¹⁶ A closer integration of Nordic states armed forces has proven itself difficult to achieve, mainly due to continuing concern for national sovereignty, freedom of action, and relations with NATO (Saxi 2013). The financial gains from NORDEFECO have been smaller than envisioned.¹⁷

4.3 Allocation of military expenditure

The split between investments, personnel costs and operations and maintenance (O&M) is shown in Figure 4.

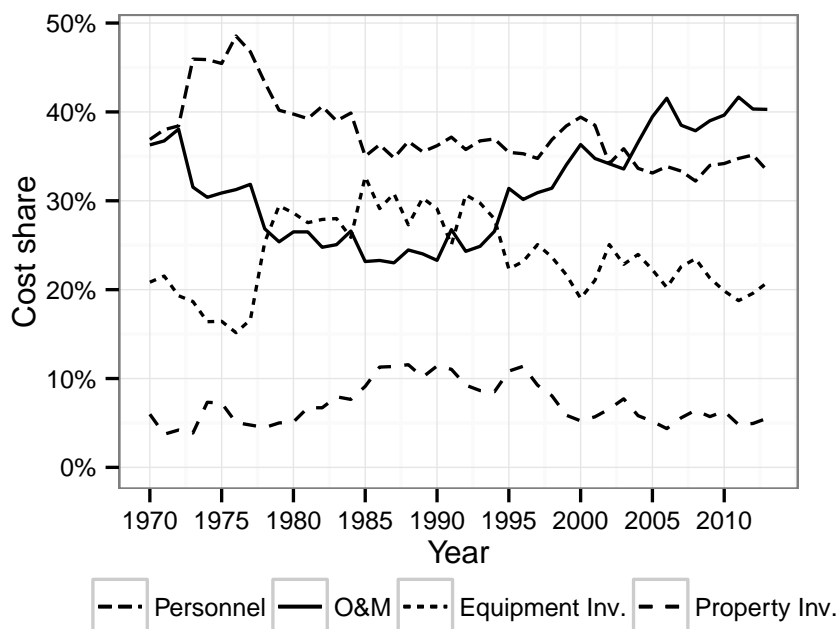


Figure 4: Personnel, operations and maintenance, and investment shares of military expenditure.

Source: Annual draft and bill resolutions for the defence budget (Prop. 1 S).

The shift between personnel and O&M shares in 1973 was caused by changes in Norwegian governmental accounting standards.¹⁸ Personnel costs increased by

¹⁶NORDEFECO replaced three previous cooperation structures: NORDCAPS, NORDAC and NORDSUP.

¹⁷Finnish Chief of Defence General Ari Puheloinen stated in March 2013 that NORDEFECO had so far failed to generate financial savings of significance for the Finnish Defence Forces (Saxi 2013).

¹⁸From 1974, salaries and benefits for educational institutions, courses and military exercises were counted as personnel costs (MoD 1973b).

20 percentage points from 1973 to 1976, which brought the personnel costs share of military expenditure to peak at 49 per cent in 1976. From 1976 to 1985 real personnel costs remained stable, while the personnel cost share declined from 49 to 35 per cent. The declining share means that the military expenditure increase, shown in Figure 1, was not spent on personnel. A Working Environment Act with a regulation of working hours was introduced for military personnel in 1981 and led to increased personnel costs (MoD 1981). Between 1986 and 2012, the personnel cost share fluctuated between 33 and 37 per cent with the exception of 1999 to 2001, the years prior to the large organizational reforms. Real personnel costs grew by 13 per cent from 1986 to 2012, while man-years were reduced by 33 per cent, from 25 700 to 17 100 as shown by Figure 5.¹⁹ Increased personnel costs combined with workforce reductions reveal a significant positive real wage growth in Norway, in this case around 2 per cent annually. The Norwegian personnel share is lower than the Dutch, Belgian and Spanish shares displayed in Beeres et al. (2012), Struys (2002), and Molas-Gallart (1997), indicating a higher capital intensity for the Norwegian Armed Forces.

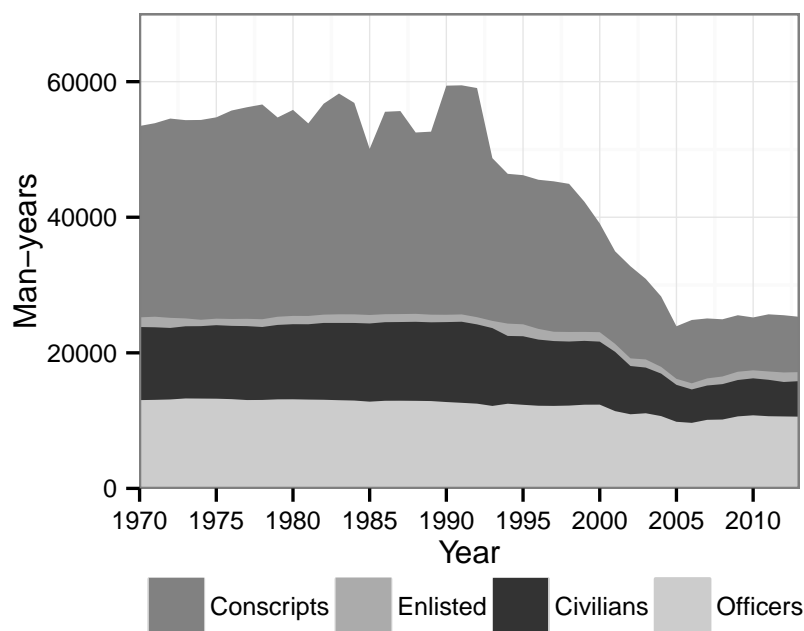


Figure 5: Norwegian Armed Forces' personnel 1970–2013, per category. Sources: Annual draft and bill resolutions for the defence budget (Prop. 1 S) and defence sector man-years accounts.

The O&M share in Figure 4 is volatile with values ranging from 23 per cent in 1986 to 43 per cent in 2006. An increasing O&M share might reflect technically more advanced weapon platforms requiring more contractual maintenance. The O&M share is influenced by the organizational reforms after year 2000, described in Chapter 2. Through the reforms 1800 man-years engaged in various real

¹⁹Man-years are the sum of officers, civilians and enlisted personnel.

estate tasks were transferred to the Norwegian Defence Estates Agency (NDEA). The accounting effect of the reorganization was that the 1800 man-years costs previously reported as personnel costs, now were reported as O&M costs. Real O&M costs almost doubled from 1970 to 2012.

The investment share is split into equipment and property investment shares. The equipment investment share varies from 15.2 per cent in 1976 to 32.2 per cent in 1982 and is highly influenced by large acquisitions. In 1978, equipment investments soared by 78 per cent following acquisitions of Coast Guard vessels and F-16 fighter aircraft. In the 1980s six submarines were purchased from Germany. The F-16 fighter aircraft and submarine acquisitions caused the record high equipment investment shares in the mid 1980s. The large acquisitions in the 1980s put a strain on the investment budget and led to postponement of other necessary investments (MoD 1979). Since 2005, the equipment investment share has fluctuated around 20 per cent, the NATO target for spending on major new equipment.²⁰ The property investment share has varied from 3.7 per cent in 1971 to 11.6 per cent in 1988 before stabilizing around 5 to 6 per cent after 2000. Historically, a significant part of property investments has been financed through the NATO security investment programme. Before 1991, half of the property investments were financed by NATO, while after 1991 only 11 per cent were financed by NATO.

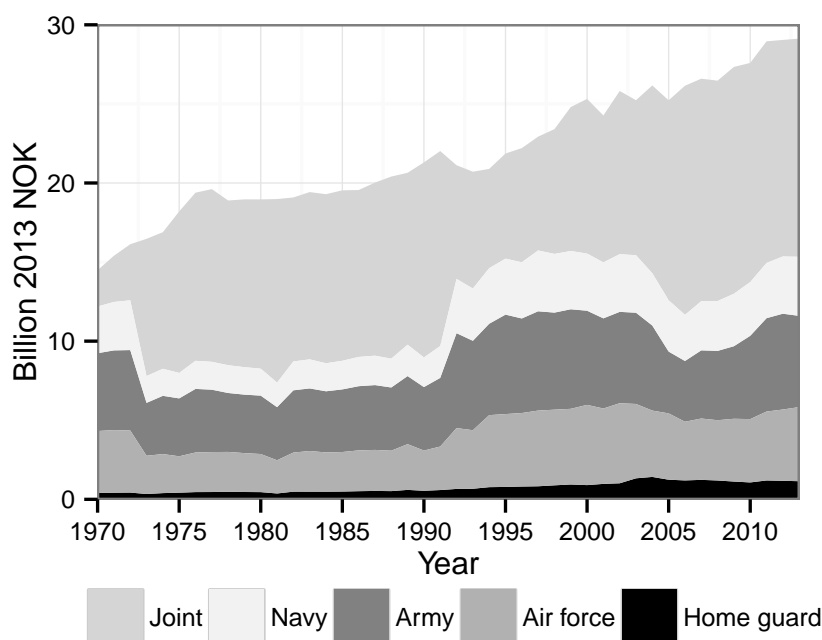


Figure 6: O&S costs divided on defence branches in billions 2013 NOK. Source: Annual draft and bill resolutions for the defence budget (Prop. 1 S).

Real operating and support (O&S) costs²¹ have increased in the period, as shown

²⁰The NATO investment target was stated in the Wales Summit Declaration from 2014.

²¹O&S costs are the sum of O&M costs and personnel costs.

by Figure 6. Most of the variation in the defence branches' share of O&S costs comes from numerous organizational reforms of the logistic commands. Between 1973 and 1991, the logistics commands for the various defence branches were classified as shared functions and a part of the support branch. The logistic commands were returned to the defence branches in 1991. The change was reversed between 2002 and 2004 when logistic elements were restructured into one unit, the Norwegian Defence Logistics Organization (NDLO) (MoD 2000). In 2010 some of the logistics functions were transferred back to the defence branches (MoD 2008). Repeated and opposing organizational reforms reflect changing management philosophies and a constant search for cost saving initiatives. The organizational reforms between 2002 and 2004 were based upon New Public Management (Heier 2011). Separating logistics commands and defence branches would create a market and improve cost efficiency. The negative effect of the reforms, i.e that the NDLO became too large and centralized, led to a partial reversal of the reform (MoD 2009a).

The support functions' growth and decline complicate an evaluation of the military branches' relative importance. Figure 7 displays the branches' shares of total O&S costs when joint functions costs are excluded.

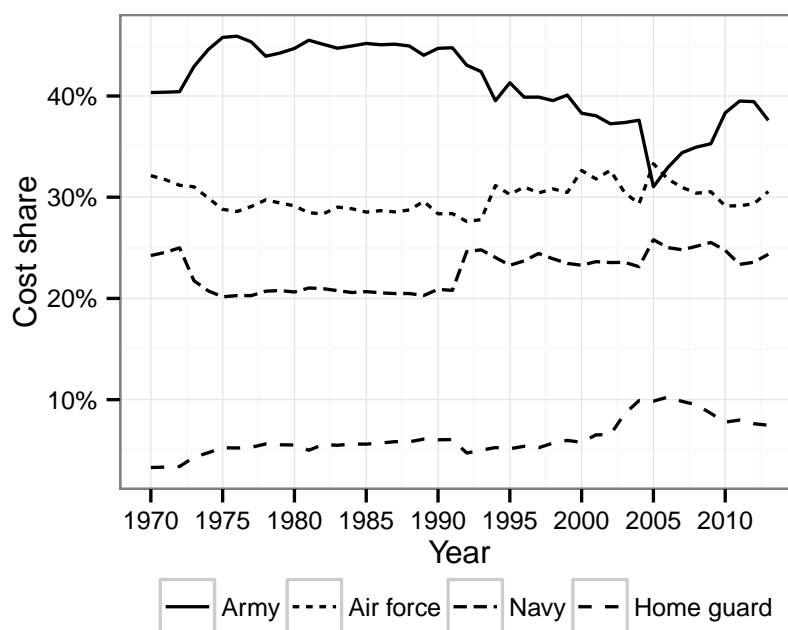


Figure 7: O&S costs divided on defence branches. Share of costs, when support functions are excluded.

Source: Annual draft and bill resolutions for the defence budget (Prop. 1 S).

The shares remained relatively stable from the introduction of new governmental accounting standards in 1973 and until the end of the Cold War. From 1992 the Air Force, the Navy and the Home Guard received a larger share of O&S costs at the expense of the Army. After hitting bottom with 31 per cent in 2005,

the Army share increased.²² In 2013 the Army's share was 38 per cent, well below Cold War levels. Historically most conscripts were assigned to the Army, which contained the largest parts of the mobilization structure. The reduced mobilization structure and number of conscripts explain the reduced army cost share.

5 Conclusion

This article analyses Norwegian defence policy and military expenditure from 1970 to 2013. The Norwegian Armed Forces have in this period transformed from a force aimed at resisting an invasion to a much smaller standing force. After the cease of US military aid in the 1960s, Norway found it difficult to properly arm the large mobilization force. The situation worsened as the US military aid equipment reached the end of its expected technical lifetime. Despite repeated warnings and requests for increased military budgets, the structural problem remained unsolved until the post year 2000 organizational reforms, when the Norwegian Armed Forces was adapted to the post Cold War security climate. The sustained inability to solve the structural problem can be explained by a combination of political and legal factors, as well as internal reluctance to change in the Norwegian Armed Forces. Downsizing is politically unpopular and the strong Norwegian Civil Service Act makes downsizing cumbersome and costly. A downsizing must be economically and politically justified, in which a feeling of crisis is often a prerequisite. The political and legal aspects can explain both the sustained imbalance between structure and resources over several decades and the dramatic opening words of the bill and draft resolution in 2001: 'Norwegian Armed Forces faces a deep and persistent structural crisis [...]' (MoD 2001a).

6 Acknowledgements

Useful comments and constructive suggestions by colleagues at the Norwegian Defence Research Establishment and an anonymous referee are gratefully acknowledged. The usual disclaimer applies.

The article is written as part of the STRATKOST-project²³ at the Norwegian Defence Research Establishment.

²²The army O&S spending level in 2005 was particular low due to repayment of an budget overrun for 2004.

²³STRATKOST supports the MoD with long term costs analysis.

References

- Alexander, J., Alan B. King, and W. Robert. 2002. "Country survey XVII: New Zealand's defence policy." *Defence and Peace Economics* 13 (4): 287–309.
- Bae, Jun Sik. 2003. "Country survey XVIII: The two Koreas' defence economy." *Defence and Peace Economics* 14 (1): 61–83.
- Balsved, Johnny E. 2004. "Nyt forsvarsforlig 2005–2009." Accessed October 30, 2014. http://www.navalhistory.dk/danish/soevaernsnyt/2004/forsvarsforlig2005_2009.htm.
- Beenstock, Michael. 1998. "Country survey XI: Defence and the Israeli economy." *Defence and Peace Economics* 9 (3): 171–222.
- Beeres, Robert, Eric Jan De Bakker, Myriame Bollen, and Eibert Westerink. 2012. "Country Survey: An Economic Analysis Of Military Expenditures In The Netherlands, 1990–2009." *Defence and Peace Economics* 23 (4): 365–387.
- Børresen, Jacob, Gullow Gjeseth, and Rolf Tamnes. 2004. *Norsk Forsvarshistorie 1970-2000, Allianseforsvar i endring*. Eide Forlag.
- Caruso, Raul, and Francesco Addesa. 2012. "Country Survey: Military Expenditure And Its Impact On Productivity In Italy, 1988–2008." *Defence and Peace Economics* 23 (5): 471–484.
- Diesen, Sverre. 2011. *Fornyelse eller forvitring? Forsvaret mot 2020*. Cappelen Damm AS.
- Fjose, Sveinung, Magnus Gulbrandsen, and Rasmus Bøgh Holmen. 2013. *Olje- og gassnæringens betydning for arbeidsplasser og skatt i Norge og Nord-Norge*. Menon Business Economics. Accessed July 30, 2014. <http://lederne.no/wp-content/uploads/2013/06/130626-Lederne-petroleumsrapport-2013.pdf>.
- Græger, Nina. 2007. "Norsk forsvarsdiskurs 1990–2005, Internasjonaliseringen av Forsvaret." PhD diss., University of Oslo.
- Hartley, Keith, and Peter MacDonald. 2010. "Country Survey XXI: The United Kingdom." *Defence and Peace Economics* 21 (1): 43–63.
- Heier, Tormod. 2011. *Nytt landskap - Nytt Forsvar Norsk militærmakt 1990-2010*. Abstrakt forlag AS.
- Johnsen, Gunnar Niles, Øyvind Mølmann, and Erling Gunnar Wessel. 1993. *Brigadens materiellbetingede operativitet i perioden 1990-95*. FFI/Rapport 93/5036. Kjeller: Norwegian Defence Research Establishment.
- Kirkpatrick, David L. I. 2004. "Trends in the costs of weapon systems and the consequences." *Defence and Peace Economics* 15, no. 3 (June 1): 259–273.
- Kollias, Christos. 1995. "Country survey VII: Military spending in Greece." *Defence and Peace Economics* 6 (4): 305–319.
- Kollias, Christos. 2001. "Country survey military expenditure in Cyprus." *Defence and Peace Economics* 12 (6): 589–607.

- Lin, Eric S., Yi-Hua Wu, and Ta-Sheng Chou. 2012. "Country Survey: Defense Policy and Military Spending in Taiwan, 1952–2009." *Defence and Peace Economics* 23 (4): 343–364.
- militarycooperation.eu. 2012. "The Belgian-Dutch Naval Cooperation." Accessed October 30, 2014. http://www.militarycooperation.eu/index.php?option=com_content&view=article&id=46:the-belgian-dutch-naval-cooperation&catid=42:the-belgian-dutch-maritime-cooperation&Itemid=53.
- MoD (Norwegian Ministry of Defence). 1973. *St.meld. nr. 9 (1973–74) - Hovedretningslinjer for Forsvarets virksomhet i tiden 1974–78*, September 7.
- MoD (Norwegian Ministry of Defence). 1973. "St.prp. nr. 1 (1973—1974)." September 7.
- MoD (Norwegian Ministry of Defence). 1979. *St meld nr 94 (1978–79) - Forsvarskommisjonens utredning og hovedretningslinjer for Forsvarets virksomhet i tiden 1979–1983*.
- MoD (Norwegian Ministry of Defence). 1981. "St.prp. nr. 1 (1981—1982)." September 7.
- MoD (Norwegian Ministry of Defence). 1983. *St.meld. nr. 74 (1982–83) - Hovedretningslinjer for Forsvarets virksomhet i tiden 1984–88*, April 15.
- MoD (Norwegian Ministry of Defence). 1988. *St meld nr 54 (1987–88) - Hovedretningslinjer for Forsvarets virksomhet i tiden 1989–93*, June 3.
- MoD (Norwegian Ministry of Defence). 1992. *St meld nr 16 (1992–93) - Hovedretningslinjer for Forsvarets virksomhet og utvikling i tiden 1994–98*.
- MoD (Norwegian Ministry of Defence). 1996. *Historisk punktum for amerikansk våpenhjelp*, September 25.
- MoD (Norwegian Ministry of Defence). 1998. *St meld nr 22 (1997–98) - Hovedretningslinjer for Forsvarets virksomhet og utvikling i tiden 1999–2002*.
- MoD (Norwegian Ministry of Defence). 2000. "St.prp. nr. 55 (1999–2000) - Forsvarets logistikkfunksjoner - Framtidig virksomhet, styring og organisering."
- MoD (Norwegian Ministry of Defence). 2001. *St.prp. nr. 45 (2000–01) - Omleggingen av Forsvaret i perioden 2002–2005*.
- MoD (Norwegian Ministry of Defence). 2001. "St.prp. nr. 77 (2000–2001) - Omlegging av Forsvarets eiendomsforvaltning."
- MoD (Norwegian Ministry of Defence). 2004. "St.prp. nr. 42 (2003–2004) - Den videre moderniseringen av Forsvaret i perioden 2005–2008."
- MoD (Norwegian Ministry of Defence). 2008. "St.prp. nr. 48 (2007–2008) - Et forsvar til vern om Norges sikkerhet, interesser og verdier." March 27.

- MoD (Norwegian Ministry of Defence). 2009. "Fokus på logistikk." May 8. Accessed September 3, 2014. <http://www.regjeringen.no/en/archive/Stoltenbergs-2nd-Government/Ministry-of-Defence/taler-og-artikler/2009/foredrag-under-flos-logistikkonferanse-7.html?id=560575>.
- MoD (Norwegian Ministry of Defence). 2009. *Gjennomføringen av St.prp. nr. 42 (2003–2004) - Den videre moderniseringen av Forsvaret i perioden 2005–2008 - En samlet vurdering*.
- Molas-Gallart, Jordi. 1997. "Country survey IX: Spain." *Defence and Peace Economics* 8 (3): 267–306.
- NOU 1992:12. 1992. *Forsvarskommisjon av 1990* 12. Oslo.
- Pelaez, Amilcar Andres. 2007. "Country Survey XX: Defence Spending and Peacekeeping in Uruguay." *Defence and Peace Economics* 18 (3): 281–302.
- Rønne, Jahn. 1999. "Norske jagerfly rustes mot bakkemål." *Forsvarsforum* 1.
- Saxi, Håkon Lunde. 2013. "Nordic Defence Cooperation (NORDEFECO): Balancing efficiency and sovereignty, NATO and nonalignment." *Perspectives on European Security*.
- Sezgin, Selami. 1997. "Country survey X: Defence spending in Turkey." *Defence and Peace Economics* 8 (4): 381–409.
- Skogrand, Kjetil. 2004. *Norsk forsvarshistorie - Alliert i krig og fred*. Vol. 4. Bergen: Eide Forlag.
- Søreide, Ine Eriksen. 2014. "Kronikk om allmenn verneplikt." March 7. Accessed October 6, 2014. http://www.regjeringen.no/nb/dep/fd/aktuelt/taler_artikler/ministeren/taler-og-artikler-av-forsvarsminister-in/2014/Kronikk-om-allmenn-verneplikt.html?id=752514.
- Struys, Wally. 2002. "Country Survey XV: Defence Policy and Spending in Belgium." *Defence and Peace Economics* 13 (1): 31–53.
- Ward, Michael D., David Davis, Mohan Penubarti, Sheen Rajmaira, and Mali Cochran. 1991. "Country Survey I–Military Spending in India 1." *Defence Economics* 3 (1): 41–63.
- Wiker, Paul V. 1997. *Amerikansk våpenhjelp til Norge 1949–1953*. Norwegian Institute for Defence Studies.