Online Appendix for Technology and the Era of the Mass Army

DATA ON MILITARY MOBILIZATION

We have constructed a new data set on military mobilization for great powers from 1600 to 2000. We adopt Jack Levy's (1983) definition of a great power as a state that plays a major role in international politics with respect to security-related issues (p. 16) and adopt his operationalization of the definition. This creates a sample of thirteen states which were great powers during some portion of the 1600 to 2000 period.

The key variable in the data set is *Military Size* which is defined as troops under the command of the national government and intended for use against foreign adversaries. This definition does not include reserve troops, colonial troops, civil defense units, and domestic police forces. A common problem with statistics on the size of the military is that states have an incentive to inflate them. We made efforts to use numbers that reflected actual or effective forces rather than paper forces wherever possible. This included reading historiographies that discussed potential differences between reported army sizes and actual troops raised. However, for some cases, the only information we have is on the reported size of the army by the government and these numbers may exaggerate the size of the military, particularly in earlier periods. The data discussion for each case provides notes on this issue. We also construct the variable *Military Mobilization* which normalizes *Military Size* by dividing it by the size of the population.

Austria-Hungary, 1600–1918

Our data for Austria-Hungary's military for the seventeenth century is somewhat limited and of uneven quality. Our initial data are for 1625–1630 and are from Peter H. Wilson (2009, p. 395, table 3). For each year, we report his estimates of the probable effective size of the imperial army in the Thirty Years' War. We do not include any other estimates for the size Austria-Hungary's forces during the Thirty Years' War. Wilson (2009), however, suggests that these forces were not larger than during this early period. For the years 1649, 1650, 1655, 1656, 1661, 1664, 1668, 1673, 1675, 1677, 1679, 1681, 1683, 1684, 1685, and 1687, we have estimates from Michael Hochedlinger (2003, p. 104, table 3). These numbers are primarily estimates of effective strength except for 1664, 1679, 1684, and 1685. For the years 1695 to 1794 Peter George Muir Dickson (1987b, pp. 343–52) provides data on official infantry and cavalry sizes for the empire. These official numbers, therefore, reflect an upper bound of the size of Austrian-Hungarian forces. We identified estimates of Austrian-Hungarian forces for 1809 and 1813 in Gunther Rothenberg (1973). The latter number indicates the high point of Austrian-Hungarian mobilization during the Napoleonic Wars and should also be treated as an official, possibly inflated estimate. Finally, for 1816 to 1918, we used Correlates of War, National Material Capabilities, Version 4.0 (2010) numbers for the size of Austria-Hungary's military forces.

Population data for Austria-Hungary are also from several sources. For 1600 and 1650 we used data reported in Wilson (2009, p. 788, table 8). For 1740, 1754, 1762, 1768, and 1787, the data are from Dickson (1987a, p. 36, table 2.5) and refer to the central lands of the Habsburg monarchy. Finally, for 1816 through 1918, the data are from the Correlates of War Project (2010). Missing years for population were interpolated.

China, 1949–2000

We used military personnel and population data from Correlates of War (2010) for China. These data should be interpreted cautiously as they may inflate the actual size of Chinese forces. We note further that for the period just prior to China's great power status, John Gittings (1967, pp. 303–05) provides an informative account of the People's Liberation Army from the beginning of the Japanese war in 1937 through 1958. Since these figures are only for the PLA and not the KMT army during the anti-Japanese war and subsequent civil war, total Chinese mobilization during this period will be understated. Gittings (1967, p. 1) also provides partial details on the size of the KMT army. He suggests 1.5 million troops in 1945 and 1.5 million again in 1947. Gittings also suggests that official figures for the KMT army were substantially higher (upwards of 5 million) raising again the issue of inflated official numbers.

France, 1600–2000

Data on the French army during the seventeenth century are from three sources: David Parrott (2001) and John Lynn (1997, 2006). Our first figure is from Parrott (2001, p. 183). It represents the peacetime establishment of the army in the first decade of the seventeenth century. We use this number for the year 1605. The figure for 1630 is also from Parrott (2001, p. 187). Parrott (2001, p. 194) mentions that "some 65,000 infantry and 9,000–9,500 cavalry were briefly operational" at the beginning of the 1635 campaign. We use the number of 74,250 for this year. According to Parrott (2001, p. 199), for a short period in 1636, France probably reached the highest number of men under arms ("70,000–80,000 infantry and 10,000–15,000 cavalry") during the time of Richelieu and Mazarin. We use for this year the number of 87,500 given by the sum of midpoint estimates for the size of both the infantry and the cavalry. On the basis of Parrott (2001, p. 202) who writes that probably "some 60,000–70,000 infantry and cavalry were either in existence or levied during the first months of 1637", we use the figure of 65,000 for this year. The figure for 1660 is from Lynn (1997, p. 45 and table 2.1, p. 55; 2006, p. 53) and gives the official peacetime strength of the army. Additional figures provide estimates of the size of the army during the wars that France fought in the second half of the seventeenth century. According to Lynn (1997, p. 46 and table 2.1, p. 55; 2006, p. 54), the strength of the army in 1668 (during the War of Devolution) was on paper 134,000 men. Data for the years 1678 (Lynn 1997, p. 46, p. 51 and table 2.1, p. 55; 2006, p. 54) and 1693 (Lynn 2006, p. 57) are estimates of the effective size of the army during the Dutch War and the Nine Years' War, respectively. Further data refer to the official strength of the army in years of peace in the second half of the seventeenth century. The first one (year 1669) is provided by Lynn (1997, p. 46; 2006, p. 53). The second one is for the year 1679 (Lynn 1997, p. 46; 2006, p. 53); the third one refers to the year 1684 (Lynn 1997, p. 47; 2006, p. 53).

Our first data for the eighteenth century (year 1710) is from Lynn (1997, p. 48 and p. 55; 2006, p. 54 and p. 58) and it gives an estimate of the actual strength of the army during the War of Spanish Succession. Data for the period 1720–1790 are from two sources: Claude C. Sturgill (1991) and Jacques Gebelin (1881). The former provides figures about the strength of the army. Before 1763 this source includes the militia only if it was on active service (see Sturgill 1991, p. 129). Sturgill's figures, therefore, do not comprise the militia for the years of peace and of war demobilization before 1763. Prior to that year, militia figures are not included in the army's strength also for some of the years of war preparation (1720, 1726/27, 1756) and are missing for some

of the years of war (1757–1763). When Sturgill's figures on the army's strength do not incorporate the militia, we add to them the number of effectives of the provincial militias (soldiers and officers) provided by Gebelin (1881, p. 285). Finally, for the years from 1720 to 1763 in which figures on the militia are not available either from Sturgill or from Gebelin, we assign a missing value to our series. By adopting these coding criteria, we are able to compute figures on the strength of the army including the militia for the following years: 1726, 1728–1736, 1742–1749, 1756–1758, and 1761. Starting from 1764 figures on the strength of the army provided by Sturgill include militia and miscellaneous units, so we use these data for the years from 1764 to 1790. These figures should be considered as an upper bound estimate of the French army, since, as Sturgill (1991, p. 131) points out, militia troops were not likely to be ready immediately in the case of a mobilization for war. Data for the years 1794–1797 are troop estimates reported to the Assembly. They are provided by Jean-Paul Bertaud (1988, p. 272).

As it concerns the Napoleonic period, the figures for the years 1804, 1806–1808, and 1811/12 are taken from Jean Delmas (1992, p. 317). They represent the paper strength of the Imperial Army. Finally, the figures on the size of the military forces for the period 1816–2000 are from Correlates of War, National Material Capabilities, Version 4.0 (2010).

Data for our time series of the French population are taken from several sources. Figures for the years 1600, 1650, and 1700 are from Jan De Vries (2007, p. 36, table 3.6). We use the estimates of the French population provided by Peter Mathias and Patrick O'Brien (1976, p. 604, table 1) for the years 1715, 1725, 1730, 1735, 1740, 1745, 1750, 1755, 1765, 1770, 1775, 1780, 1785, and 1790. We take the data for the years 1801–1945 from Institut National de la Statistique et des Études Économiques (1966, pp. 66–73, tables 1A–1D); for the years 1946–1984 from Institut National de la Statistique et des Études Économiques (1990, p. 26, table 1); for the years 1985–1994 from Institut National de la Statistique et des Études Économiques (1997, p. 49, table B.01–1); for the years 1995–1999 from Institut National de la Statistique et des Études Économiques (2002, p. 49, table B.01–1); for the year 2000 from Institut National de la Statistique et des Études Économiques (2007, p. 41, table B.01–1). Missing data in our time series of the population have been interpolated.

Italy, 1861–1943

We used military personnel from the Correlates of War (2010) for Italy. The population data come from Istituto Centrale di Statistica (1976), Sommario di Statistiche Storiche dell'Italia 1861–1975, table 10 Popolazione residente calcolata a fine anno dal 1861 al 1975, p. 16, Roma.

Japan, 1905–1945

We used military personnel from Correlates of War (2010) for Japan. The population data come from Ministry of Internal Affairs and Communications, Statistics Bureau, *Historical Statistics of Japan*, chapter 2, Population and Household, Population by Sex, Population Increase and Decrease, Population Density (1872–2009) (Accessed online at http://www.stat.go.jp/english/data/chouki/02.htm).

Netherlands, 1609–1713

We used two principal sources for estimating Dutch army strength. Most historians use the *Staatsche Leger*, an early twentieth century source that although it sounds archival was not. These numbers should be treated as nominal or paper strength. Olaf Van Nimwegen (2006) presents a more contemporary set of estimates of effective strength. We use van Nimwegen wherever possible, but use the *Staatsche Leger* when we have no other estimates. To summarize, we use Van Nimwegen for 1609 (this actually Van Nimwegen's number for 1608 but is the closest number we have for the start of the period), 1629, 1640, and 1672 and the *Staatsche Leger* for 1618, 1625, 1635, 1645, 1657, 1667, 1675, 1683, 1692, 1699, and 1708. The population data is from Angus Maddison (2003) and is linearly interpolated.

Ottoman Empire, 1600–1699

The Ottoman army during the seventeenth century was comprised primarily of two groups. The first group is the sultan's permanent, standing army made of infantry (Janissaries), cavalry, and the artillery corps. We have estimates for this total for eleven years during the seventeenth century. The second group is the seasonally mobilized, provincial cavalry. For 1609 our estimate of the standing army is from Roads Murphey (1999). For 1660 we used Gabor Agoston (1999) and Murphey (1999) for the infantry estimate and Agoston (2005) for the artillery corps estimate. We used Murphey's (1999) estimate for the standing cavalry in 1670 to estimate the size of the cavalry in 1660. For 1670 we used Murphey (1999). For 1687, 1690–1694, 1996, and 1698 we used Ahmet Tabakoglu (1985) for our estimate of the total standing army. We relied on the discussion in Murphey (1999) and Virginia H. Aksan (2007) to arrive at a single estimate of 70,000 for the effective size of the provincial cavalry. This number is added to the total standing army for the eleven years that we have data for the seventeenth century to compute our total estimate for each year.

The population data is from Colin McEvedy and Richard Jones (1978) for 1600 and 1700 and is linearly interpolated. See Fernand Braudel (1972), Ömer Lütfi Barkan (2000), and Donald Quataert (2000) for additional estimates and discussion.

Prussia/Germany/West Germany, 1740–2000

For Prussia, data on military strength is available from a number of sources including Gordon Craig (1955), Wilson (1998), Curt Jany (1914), Correlates of War (2010), and the European State Finance Database. From 1740 to 1870 we rely primarily on Jany because his numbers are the most complete time series and are very close to the numbers in the other sources. In all cases, every effort was made to report either actual troop numbers or estimates adjusted to reflect actual troop strength. From 1871 to 2000 we use Correlates of War (2010) numbers. The data for 1955 to 1989 are for West Germany only.

Population data for Prussia for 1740 to 1865 are from Mark Dincecco (2009) and for 1866 to 1870 are from Hans Mauersberg (1988). We use Correlates of War population data for the remaining years of the series and again the data for 1955 to 1989 are for West Germany only.

Russia/Soviet Union, 1721–2000

Our data for Russia's military in the eighteenth and early nineteenth century are collected from a number of sources. The value for 1721 comes from a 1720 budget approved by Peter the Great (Keep 1985, p. 137); as such, the number most likely reflects an upper bound on the actual army size. Values for 1725, 1731, 1734, 1740, 1756, 1763, 1765, 1795, and 1796 all come from Walter M. Pintner (1984; estimates for 1740 and 1756 come from p. 233, and the rest are from p. 253, table 5). For the table, Pintner cites two sources: Felix von Stein (1859, pp. 92, 100, 151, 359) and Lubomir Beskrovny (1959, pp. 58, 330). The data points for 1801, 1811, and 1815 are estimates of the Russian State Military Archives (RGVIA) as reported by Beskrovny (1973, pp. 12, 15). For all reported estimates, we attempted to validate all numbers with estimates from other sources for the same time period. From 1816 onwards we take for the size of Russia's military forces from Correlates of War (2010).

We take estimates of Russia's population before 1816 from B. M. Kabuzan (1963, p. 164, table 18). These data comes from a series of revisions to an unpublished 1702 government census: 1719, 1744, 1762, 1728, 1795, 1811, and 1815. From 1816–2007 we use population estimates from Correlates of War (2010). Missing years for population were interpolated. Note: the first data point for population in the series (1721) is the number reported in the 1719 revision to the census.

Spain, 1600–1808

For Spain, we have limited information about the size of the military. For 1600 we use Geoffrey Parker's (1976, p. 206, table 1) estimate for the 1590s. Similarly, we use Parker (1976) for estimates for 1635, 1655, 1675, and 1705. Unfortunately, we have no further estimates on the overall size of the Spanish military for the remainder of the eighteenth century and into the nineteenth century when they were a great power. Parker (1972) provides additional detailed information on the Army of Flanders but again this data is for the seventeenth century. Population data is from Maddison (2003) and is linearly interpolated.

Sweden, 1617–1721

For Swedish military forces, we have several high-quality sources including Michael Roberts (1968, 1979), Alf Aberg (1973), and Claude Nordmann (1972). These sources, however, provide numbers for only six years during the period that Sweden was a major power. We use Nordmann (1972, p. 135) for 1630. For 1632 we use Roberts (1979, p. 44). Nordman cites a lower figure for this year but this is derived from earlier work by Roberts. We again use Nordmann for 1637 (p. 137), 1697 (p. 141), 1700 (p. 143), and 1707 (p. 144). Finally, Roberts (1979, p. 45) provides a number for 1708. Population data is from Maddison (2003) and is linearly interpolated.

United Kingdom, 1600–2000

The first two data on the size of the army in the seventeenth century refer to the years 1652 and 1660. They are provided by Charles H. Firth (1902, p. 35). We use figures on the strength of the army from John Childs (1996, p. 47) for the years 1670 and 1678. For the year 1685 (December) we report the data on the number of soldiers in England under James II provided by Childs (1980, p. 2). Two additional figures refer to the official strength of the army at the end of October 1688 (Childs 1980, p. 3)

and in April 1689 (Childs 1987, p. 102). It is worth noting that the last number does not include the Dutch troops stationing in England in that year (on this point, see Childs 1987, p. 102 and French 1990, p. 8). The main source for our data on the British military forces for the years from 1691 to 1815 is Roderick Floud, Kenneth Wachter, and Annabel Gregory (1990). For the period 1691–1714 we use their data on the establishment of the army (Floud, Wachter, and Gregory 1990, p. 44, table 2.1). The official strength of the British military forces for the years 1715, 1718/19, 1723, and 1728–1755 is given by the sum of the establishment of the army (Floud, Wachter, and Gregory 1990, pp. 44–45, table 2.1) and of the navy (Floud, Wachter, and Gregory 1990, p. 68, table 2.6). For the period 1756–1773 we add up the figures for the establishment of the army (Floud, Wachter, and Gregory 1990, p. 45, table 2.1), of the navy and of the marines which are reported in Floud, Wachter, and Gregory 1990, pp. 68–69, table 2.6. For the period going from the year 1774 to the year 1815, we are able to provide estimates of the actual strength of the British military forces. In specific, for the years 1774–1783 and 1785–1815 we use data on the effective size of the army provided by Floud, Wachter, and Gregory 1990, pp. 45–46, table 2.1. We add to these numbers the figures about the Seamen (including Officers), Boys, and Marines actually Borne in the naval service for the years 1774–1783 and 1785–1815. The source for these last data is the House of Commons Parliamentary Paper 1860 (168). For the years 1816–2000 we use the data on the military forces provided by Correlates of War (2010).

The time series of the total population is constructed in the following manner. For the years from 1600 to 1706 we take the population of England and Wales. We add the population of Scotland to that of England and Wales for the period 1707–1800. For the years going from 1801 to 1921 we sum the population of Ireland to that of England, Wales, and Scotland. Finally, for the years from 1922 to 2000 the total population corresponds to the sum of the population of England and Wales, Scotland, and Northern Ireland.

The source for the total population of England and Wales in the years 1650 and 1700 is De Vries (2007, p. 36, table 3.6). Missing data are interpolated. We take the estimates of the Welsh population in 1701, 1751, 1781, and 1801 from Phyllis Deane and W. A. Cole 1967, p. 103, table 24. Missing values are interpolated. We use these data as an estimate of the population of Wales for the years 1701 to 1800. The source for the population of England (which does not include Monmouthshire) for the years 1701–1800 is Brian R. Mitchell (1988, pp. 7–8). Mitchell (1988, pp. 11–14) provides data on the overall population of England and Wales for the years 1801 to 1980. We turn to Deane and Cole (1967, p. 6, table 2) for estimates of the population of Scotland in 1701, 1751, 1791, and 1801. We interpolate missing data and use this series for the years 1707–1800. We take data on the Scottish population for 1801–1980 from Mitchell (1988, pp. 11–14). Figures on the population of Ireland for 1801–1921 are taken from Mitchell (1988, pp. 11–13). The population of Northern Ireland for the years 1922–1980 are provided by Mitchell (1988, pp. 13–14). Finally, the data on the population of the United Kingdom for the years 1981–2000 are taken from the Office of National Statistics, Population estimates for the United Kingdom, England and Wales, Scotland, and Northern Ireland—current data sets. Data are available online at http://www.statistics.gov.uk/statbase/Product.asp?vlnk=15106.

United States, 1898–2000

The military personnel data for 1898 to 1995 are active duty personnel from all branches excluding the Coast Guard. The source for these data is the *Historical Statistics of the United States, Vol. 5*, table Ed26-47, Military personnel on active duty, by branch of service and sex: 1789–1995, p. 5-353-359. The data

for 1996 to 2000 are from Correlates of War (2010). The population data for the United States for 1898 to 1929 are from the *Historical Statistics of the United States*, Vol. 1, table Aa9-14, National population and the demographic components of change: 1790–2000, p. 1-30-33. From 1930 to 1949 we used *Historical Statistics of the United States*, Vol. 1, table Aa6-8, Population 1790–2000, p. 1-28-29. And from 1950 to 2000 the population data are from U.S. Census Bureau, National Estimates and Projections, table 2, Population, accessed online from http://www.census.gov/compendia/statab/cats/population.html.

Summary of Military Mobilization Data

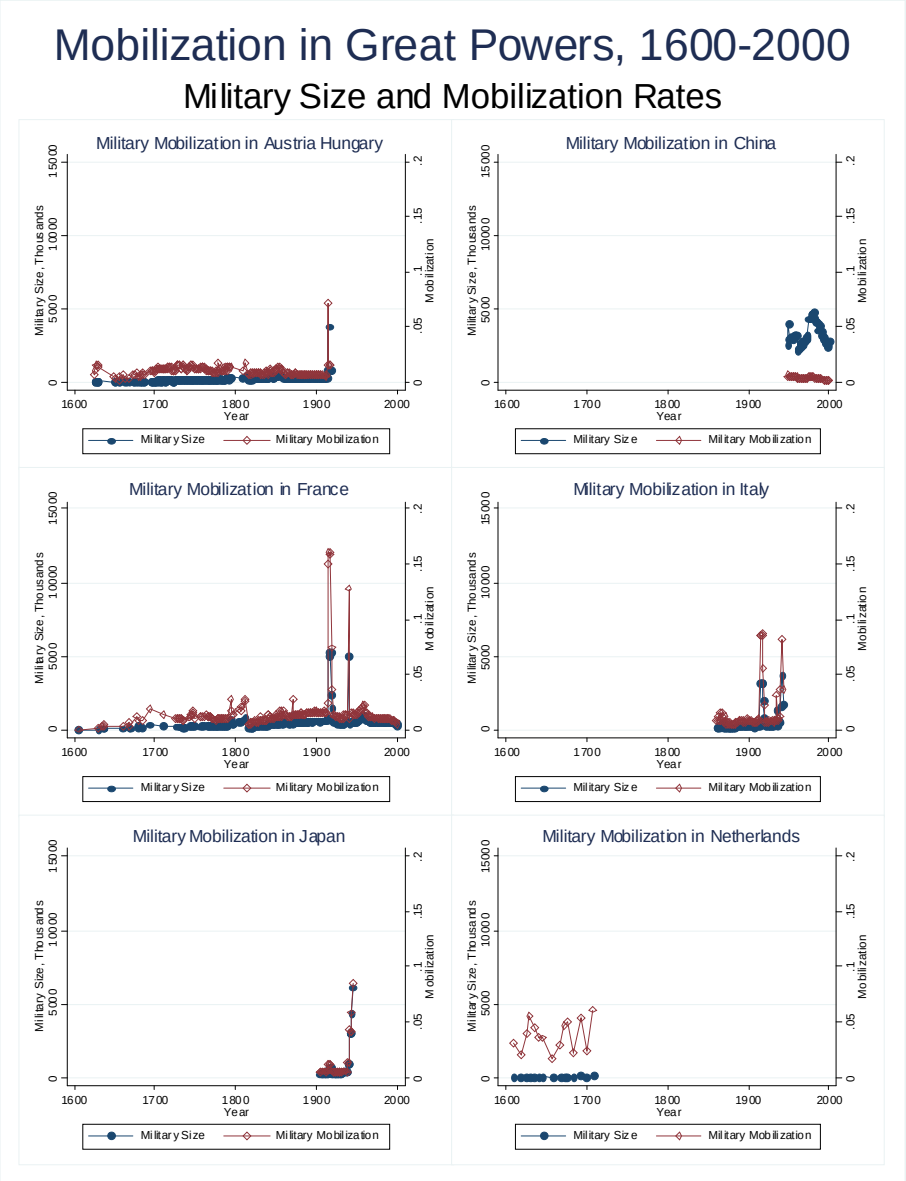
Appendix Figures 1 and 2 present our data for *Military Size* and *Military Mobilization* for each of the thirteen sample countries during the years for which they were great powers. For each country, the plot with filled-in circles records the overall size of the military in thousands (left y-axis) and the plot with hollowed diamonds records mobilization levels (right y-axis).

CENSUS DATA

The sources for the variable *Census* measuring state capacity are as follows. Austria-Hungary (Encyclopedia Britannica 1911 edition), China (Orleans 1957), France (Insee, "Le recensement de la population dans l'histoire"), Italy (Encyclopedia Britannica 1911 Edition), Japan (Eng and Smith 1976), Netherlands (Oomens and Den Bakker 1997), Ottoman Empire (Karpat 1978), Prussia, Russia, Spain (Encylopedia Britannica 1911 Edition), Sweden (Hendricks 1861), the United Kingdom (Taylor 1951), and the United States (U.S. Bureau of the Census). In the text, we report the results using *GDP per Capita* to measure state capacity simply because the results for the census measure were generally quite weak.

LITERACY DATA

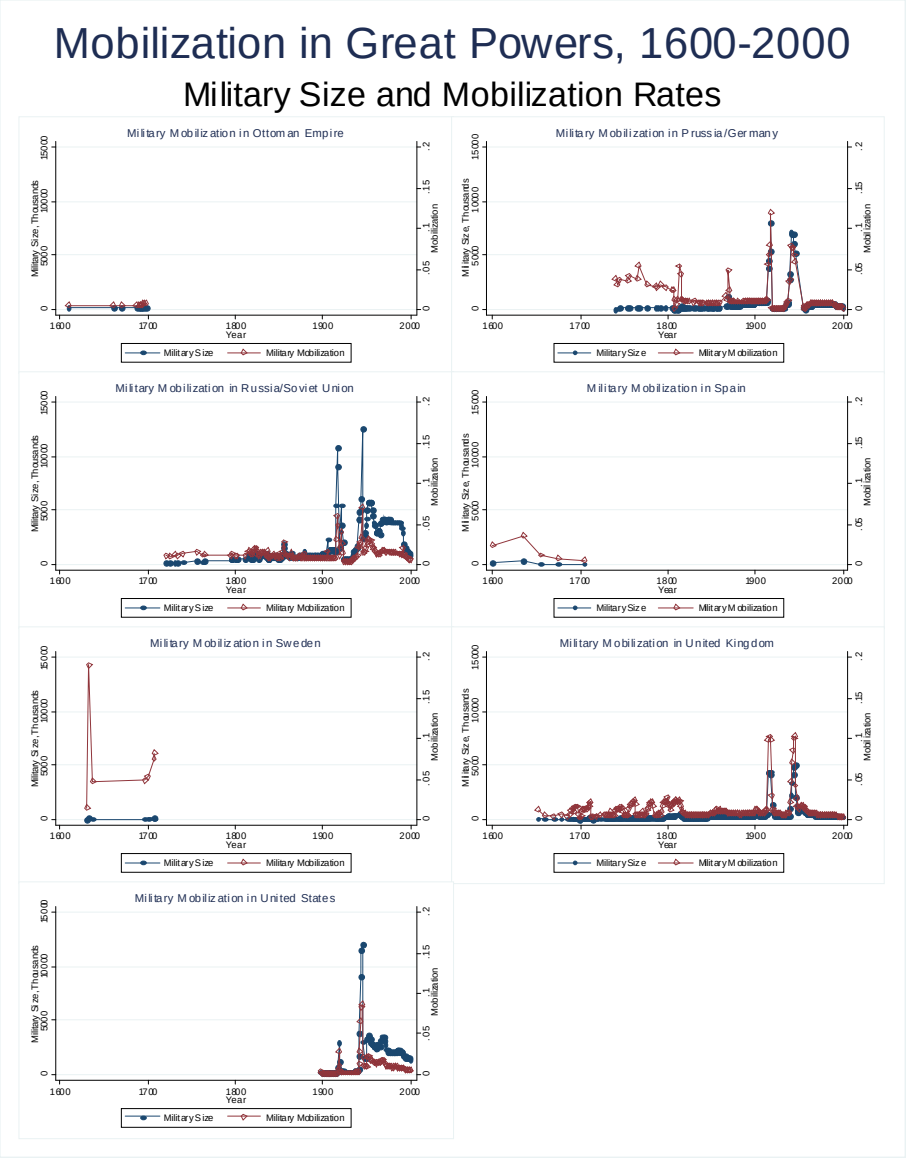
The coding and sources for our literacy variable are as follows: Austria-Hungary is coded a 1 for 1600–1749 and 2 for 1750–1849. It is coded a 3 for 1850–1888 and 4 for 1889–1918 based on Carlo Cipolla (1969). China is coded 1 for 1949–1963, 2 for 1964–1981, 3 for 1982–1989, and 4 for 1990–2000. Data for 1950 and 1958 in Heidi Ross (2005); data for 1964 in Jean Dreze and Jackie Toh (1995); and data for 1982, 1990, and 2000 from UESCO, available at http://ddp-ext.worldbank.org/EdStats/CHNgmrpro05b.pdf (Accessed January 2012). France is coded 1 for 1600–1749, 2 for 1750–1849, 3 for 1850–1888, and 4 for 1889–2000. For 1800 to 2000 the source for the French data is Boris Mironov (1991). The transition point for adult literacy in 1749 is based on a 35 percent literacy rate for males and the fact that the difference between male and female literacy rates later in the century is about 8–10 percentage points. The source for the male literacy data is Lawrence Stone (1969). Prussia/Germany is coded 2 for 1740–1799 based on data from the United Kingdom, 3 for 1800–1849, and 4 for 1850–2000. The source for 1800 to 2000 is Mironov (1991). Italy is coded 1 for 1861–1869, 2 for 1870–1899, 3 for 1900–1929, and 4 for 1930–1943. The source for this data is Gabriel Tortella (1994). Japan is coded a 4 for 1905–1945. The source is Mironov (1991) and is based on male-only data. The Ottoman Empire is coded as a 1 for 1600–1699. Literacy in the Ottoman Empire was in the single digits in 1820 and 1870 (Pamuk and Van Zanden 2010)



APPENDIX FIGURE 1
MOBILIZATION IN GREAT POWERS, 1600–2000

Notes: See the discussion in the text of the article and text of this Online Appendix for all sources and coding rules.

and we based our coding on this fact. The Netherlands is coded 3 for 1609–1713 and the source is Harvey Graff (1987). Russia/Soviet Union is coded 1 for 1721–1896, 2 for 1897–1925, 3 for 1926–1938, and 4 for 1939–2000 and the source is Mironov (1991). Spain is coded a 1 for 1600–1808. Literacy was in the first quartile in 1820 and 1870 (Pamuk and Van Zanden 2010) and we based our coding on this fact. Sweden is coded a 1 for 1617–1660, 2 for 1661–1685, 3 for 1686–1710, and 4 for 1711–1721.



APPENDIX FIGURE 2
MOBILIZATION IN GREAT POWERS, 1600–2000

Notes: See notes from Appendix Figure 1.

These estimates are based on Egil Johansson (2009). The United States is coded a 4 for 1898–2000 and the source is the National Center for Education Statistics (1993). The United Kingdom is coded 1 for 1600–1674, 2 for 1675–1799, 3 for 1800–1869, and 4 for 1870–2000. The transition date of 1674 is based on a 45 percent literacy rate for males (Stone 1969) and the fact that the differences between adult and male literacy rates in the seventeenth century were around 10 percentage points. The remainder of the series is based on data from Mironov (1991) and Tortella (1994).

ADDITIONAL ANALYSIS: TECHNOLOGY AND RECRUITMENT METHODS

In addition to the two implications tested in main article involving army sizes and levels of mobilization, we might also expect technological change to influence the way in which states recruit their armies. Since the time of Henry Sidgwick (1883) it has been suggested that very large armies will need to be recruited by conscription, which is equivalent to a tax in kind.[1] The reason is that paying each member of a very large army a market wage would require a level of taxation so high as to impose major deadweight costs on the economy. If this is the case, then we should expect the arrival of the railroad to be associated with a shift to recruitment by conscription and the arrival of precision weapons to increase the likelihood of states reestablishing a professional army. A key feature of this argument is that it applies to conscription regimes in general and not exclusively to regimes of universal conscription. Sidgwick actually believed that social welfare would be maximized with a conscription regime in which those who could earn high incomes in the market economy should be exempted from service. An alternative variant of this prediction regarding recruitment would suggest that the two technological revolutions to which we have referred had their most noticeable impact on the tendency of states to adopt *universal* conscription, and not necessarily conscription of any form. For the reasons identified by Margaret Levi (1997), if individuals are more likely to contribute to a collective project when they believe that all will contribute, then a system of universal conscription is the optimal method for raising a very large army. For this reason, we might expect the arrival of the railroad to be associated with a shift to universal conscription and the arrival of precision weapons to be associated with a shift away from this system of recruitment.

Using a variety of different sources, we have been able to provide a sketch of the evolution of recruitment practices over time across the thirteen great powers. Each country is considered only for the period in which it was classified as a great power following the classification by Levy (1983). The results of this exercise are presented in Appendix Table 1. In this table, we code a country as having had a system of conscription if there was a system by which central authorities determined how many individuals would be obliged to serve, how many from each region or locality, and if central authorities also established a rule (most commonly a lottery) through which individuals would be chosen. Situations where central authorities implicitly or explicitly sanctioned the use of force by local recruiters but did not establish a procedure for selection do not count as conscription according to this rule. In Appendix Table 1, we also identify the date at which a system of conscription became universal. Since no system of conscription is ever truly universal, it is also worth detailing how we arrived at this classification. By universal here we are referring to a system in which there are no explicit exemptions for those owning property and no possibilities for purchasing a replacement. However, according to the definition we have adopted a system of universal conscription might still have exemptions for age and educational deferments.

What conclusions can we draw from the evidence in Appendix Table 1? A first observation is that conscription of the nonuniversal variant developed quite early in a number of states, and in fact well before the French Revolution. This would seem to go against the arguments of Sidgwick (1883) and Thomas Ross (1994) who propose a causal chain running from army size, to deadweight costs, to choice of recruitment regime, unless of course the tax mechanisms used by earlier states were much more distortionary. At an earliest stage of development, recruitment tended to be

[1] See Ross (1994) for a formal treatment of this problem.

APPENDIX TABLE 1
MILITARY RECRUITMENT

	Great Power?	*Conscription?*	*Universal?*	*Foreign > = 50%?*	*Sources*
Austria	1600–1918	1771–1918	1868	No	Duffy (1977), Coxe (1820), Rothenburg (1982)
China	1949–2000	1953–2000	1953	No	Gittings (1967), Cheng (2007)
France	1600–2000	1636–2000[2]	1793/94, 1905	No	Lynn (1997), Forrest (1989), Crépin (2009)
Italy	1861–1943	1861–1943	1907	No	Prasad and Smythe (1968)
Japan	1905–1945	1905–1945	1873	No	Ogawa (1921), Hunter (1984)
Netherlands	1609–1713	No	Never	Yes	Van Nimwegen (2009)
Ottoman Empire	1600–1699	1600–1666	Never	No	Aksan (1999, 2007), Murphey (1999)
Prussia	1740–2000	1740–2000[3]	1813	No	Wilson (2000), Walter (2009)
Russia	1721–2000	1721–2000	1874	No	Duffy (1981), Wildman (1980)
Spain	1600–1808	1630–1645, 1704–1776	Never	No	Mackay (1999), Parker (1972), Black (2007)
Sweden	1617–1721	1617–1682	Never	Yes before 1660	Aberg (1973), Roberts (1979), Villstrand (2000)
United Kingdom	1600–2000	1916–1918, 1939–1960	1916	No	Clode (1869), Mccranie (2009), Gates (1996)
United States	1898–2000	1917/18, 1940–1973	1917	No	Prasad and Smythe (1968)

Notes: Conscription was practiced somewhat irregularly in France during the seventeenth century-specifically in 1636, 1643/44, 1674, and 1688–1697. After starting again in 1703, it was interrupted during a few later periods including 1716–1725 and 1815–1817. Conscription was interrupted for Germany between 1919 and 1934, as well as between 1946 and 1958.
Sources: Full references for the sources can be found at the end of the Online Appendix.

decentralized and ad hoc, potentially reflecting weak central state capacity. Central authorities would give either army captains or local authorities the responsibility for recruiting a set number of individuals within a specific region. Army captains or local authorities then had considerable discretion in deciding what types of individuals

[2] Conscription was practiced somewhat irregularly in France during the seventeenth century—specifically in 1636, 1643/44, 1674, and 1688–1697. After starting again in 1703, it was interrupted during a few later periods including 1716–1725 and 1815–1817.

[3] Conscription was interrupted for Germany between 1919 and 1934, as well as between 1946 and 1958.

would be recruited and what conditions would be offered in exchange for service. Over time, a number of states shifted toward a system of conscription in which a set number of individuals from each region had an obligation to serve, and central authorities specified the rule according to which individuals would be chosen. This was the case with the French system of militia recruitment from a very early date.

A second observation is that with the notable exception of Prussia, it was not until late into the nineteenth century, a period corresponding to the first military uses of the railroad, that one can begin to speak of the emergence of truly universal conscription in Europe. This suggests that the causal chain may in fact run from the introduction of the railroad, to an increase in army size, and thus an incentive to make conscription universal. It is generally known that European powers initially adopted conscription systems that provided the middle classes and the rich with substantial opportunities to escape service thanks to exemptions, opt-outs, or possibilities for purchasing a replacement. Even in those European cases that are sometimes offered as early examples of "universal" systems of conscription, actual practice until well into the nineteenth century involved substantial opportunities for the middle classes and the wealthy to avoid service. In France the *levée en masse* of 1793 was indeed an instance where those with wealth had few opportunities to avoid service.[4] However, this was also a very brief episode. After Thermidor and Napoleon's subsequent assumption of power, France returned to a system of conscription in which those with wealth could avoid service by purchasing replacements.[5] During the course of the nineteenth century, the legal opportunities for avoiding service evolved continuously, and as documented by Annie Crépin (2009), as late as 1905 conscription laws in France continued to offer certain social groups the opportunity of avoiding service. Prussia is often offered as another case of an early shift to universal conscription beginning in 1813, and we have used this date in Appendix Table 1.[6]

In addition to drawing conclusions about how soldiers were recruited, the sources listed in Appendix Table 1 also provide us with useful information addressing the second question referred to above—who was recruited? It seems fair to say that it was not until the late nineteenth century that one can speak of the development of mass armies in which members of the middle and even upper classes served alongside peasants and the urban poor. During the era of voluntary and decentralized recruitment regimes, the most common pattern was for recruiting agents to focus on individuals who were in sufficiently difficult economic circumstances that even a very poorly paid position in the army might be voluntarily chosen. Subsequent compliance was then ensured by implementing extremely severe punishments for shirking or desertion. Another key feature of this era was that several states made extensive use of foreigners serving in their army. This was the case for Spain's Army of Flanders during its long campaign against the Dutch Republic.[7] It was also the case for the army of the Dutch Republic during this period as well as for Sweden's army during the Thirty Years' War.[8] In fact, provided that they had access to the necessary finance,

[4] See Gagniage (1996) as well as Bertaud (1988).

[5] The most authoritative account of the system of replacement in France can be found in Schnapper (1968). This practice was abolished in 1872.

[6] With this said, it should be noted that Walter (2009) concludes that even after this date there remained very substantial opportunities for middle and upper income groups to avoid service.

[7] See the detailed evidence provided by Parker (1972).

[8] Van Nimwegen (2009) cites evidence suggesting that half of Dutch forces were foreigners. Roberts (1979) estimates that in several key battles toward the end of the Thirty Years' War, over four-fifths of the forces under Swedish command were foreign.

recruitment of foreigners provided states that had small populations, such as Sweden and the Netherlands, with a means of recruiting armies of the same size as those fielded by states with much larger populations.

The evidence in Appendix Table 1 supports the core argument of this article. Rather than the invention of the idea of universal conscription and "the nation in arms" directly leading to the development of mass armies, the evidence in Appendix Table 1 is more consistent with our alternative interpretation. It was not until the invention and perfection of railroad transport that it became feasible and desirable to mobilize a truly mass army. Once this technologically driven transformation occurred, states faced incentives to develop systems of universal military conscription.

We also conducted a more systematic test of this hypothesis. To do so, we repeated the specifications we have employed for *Military Size* and *Military Mobilization* while substituting one of two new variables as the dependent variable in the regression. The first variable, *Conscription*, is a dummy indicator that takes a value of one if a state employs conscription of any form and zero otherwise. The second variable, *Universal Conscription* takes a value of 1 in cases where universal conscription (as we define it above) is present and zero if there is either nonuniversal conscription or recruitment without conscription.

Appendix Table 2 reports results of OLS estimates with country-fixed effects and country-clustered standard errors where we use alternatively *Conscription* and *Universal Conscription* as the dependent variable. The results for the *Railroad Track* variable suggest that the expansion of railroad networks was associated with a shift to universal conscription in particular, but not with the adoption of conscription of all forms. We might also expect that our *Cruise Missile* variable should be correlated with the type of recruitment regime in place. The availability of cruise missiles might, according to the two alternative theories, be associated with either a shift away from any type of conscription or a shift away from universal conscription in particular. However, in Appendix Table 2 the coefficient on the *Cruise Missile* variable is not statistically significant.

APPENDIX TABLE 2
CONSCRIPTION IN GREAT POWER WARS, 1600–2000

	Conscription and Universal Conscription OLS Estimates			
	Conscription (1)	*Universal* (2)	*Conscription* (3)	*Universal* (4)
Railroad track	–1.259	9.293	2.824	10.851
	(4.785)	(1.456)	(4.804)	(1.654)
	0.797	0.000	0.568	0.000
Cruise missile	–0.195	–0.319	–0.245	–0.349
	(0.439)	(0.345)	(0.405)	(0.433)
	0.666	0.373	0.556	0.436
Population, billions	1.418	1.585	2.038	–3.906
	(2.197)	(0.823)	(4.446)	(3.880)
	0.531	0.078	0.655	0.334
GDP per capita, thousands	–0.019	0.037	–0.028	0.039
	(0.026)	(0.012)	(0.038)	(0.033)
	0.477	0.008	0.468	0.260
Literacy quartile	–0.127	0.046	–0.119	0.079
	(0.166)	(0.038)	(0.126)	(0.069)
	0.457	0.253	0.365	0.273
Democracy	0.293	0.128	0.045	0.208
	(0.217)	(0.061)	(0.192)	(0.077)
	0.203	0.056	0.820	0.019
Country-fixed effects	Yes	Yes	Yes	Yes
Common year trend	Yes	Yes	No	No
Country-specific year trend	No	No	Yes	Yes
Number of observations	1,046	1,046	1,046	1,046

Notes: The table reports the results of pooled-time-series-cross-sectional OLS regressions for the variables *Conscription* and *Universal*. The table reports the coefficient estimate, robust standard error clustered on country (in parentheses), and corresponding *p*-value.

REFERENCES

Aberg, Alf. "The Swedish Army, from Lutzen to Narva." In *Sweden's Age of Greatness: 1632–1718*, edited by Michael Roberts, 225–87. New York: St. Martin's Press, 1973.

Agoston, Gabor. "Ottoman Warfare in Europe, 1453–1826." In *European Warfare 1453–1815*, edited by Jeremy Black, 118–44. New York: St. Martin's Press, 1999.

_____. *Guns for the Sultan: Military Power and the Weapons Industry in the Ottoman Empire*. New York: Cambridge University Press, 2005.

Aksan, Virginia H. Ottoman War and Warfare, 1453–1812. In *War in the Early Modern World*, edited by Jeremy Black, 147–75. Boulder, CO: Westview Press, 1999.

_____. *Ottoman Wars, 1700–1870: An Empire Besieged*. Harlow, UK: Pearson Education, 2007.

Barkan, Ömer Lütfi. "Tarihi Demografi' Arastirmalari ve Osmanli Tarihi." In *Osmanli Devleti'nin Sosyal ve Ekonomik Tarihi: Osmanli Devlet Arsivleri Uzerinde Tetkikler - Makaleler*, Cilt 2., edited by H. Ozdeger, 1–27. Istanbul: Istanbul Universitesi Rektorluk Yayini, 2000 [1953].

Bertaud, Jean-Paul. *The Army of the French Revolution*. Princeton, NJ: Princeton University Press, 1988.

Beskrovny, Lubomir. *Russkaia Armiia I Flot v XVIII Veke (ocherki)*. Moscow: Voznizdat, 1958.

_____. *Russkaia Armiia I Flot v XIX Veke (ocherki)*. Moscow: Nauka Publishing, 1973.

Black, Jeremy. *European Warfare in a Global Context, 1660–1815*. New York: Routledge, 2007.

Braudel, Fernand. *The Mediterranean and the Mediterranean World in the Age of Philip II*, trans. by S. Reynolds, Vol. I. New York: Harper & Row Publishers, 1972.

Cheng, Sijin. 2007. "The Challenge of Conscription in an Era of Social Change." In *Civil-Military Relations in Today's China: Swimming in a New Sea*, edited by David M. Finkelstein and Kristen Gunness, 235–54. New York: M. E. Sharpe.

Childs, John. *The Army, James II, and the Glorious Revolution*. Manchester: Manchester University Press, 1980.

_____. *The British Army of William III, 1689–1702*. Manchester: Manchester University Press, 1987.

_____. "The Restoration Army, 1660–1702." In *The Oxford History of the British Army* edited by David Chandler and Ian Frederick William Beckett, 46–66. Oxford: Oxford University Press, 1996.

Cipolla, Carlo. *Literacy and Development in the West*. New York: Penguin Books, Ltd., 1969.

Clode, Charles Mathew. *The Military Forces of the Crown: Their Administration and Government, Vol. 2*. London: John Murray, 1869.

Coxe, William. *History of the House of Austria, from the Foundation of the Monarchy by Rudolph of Hapsburgh, to the Death of Leopold the Second: 1218 to 1792*. London: Longman, Hurst, Rees, Orme, and Brown, Paternoster-Row, 1820.

Craig, Gordon. *The Politics of the Prussian Army, 1640–1945*. Oxford: Clarendon Press, 1955.

Crépin, Annie. *Histoire de la Conscription*. Paris: Gallimard, 2009.

Deane, Phyllis, and W. A. Cole. *British Economic Growth, 1688–1959: Trends and Structure*. 2nd edition. London: Cambridge University Press, 1967.

Delmas, Jean. *Histoire Militaire de la France. Vol. 2, 1715–1871*. Paris: Presses Universitaires de France, 1992.

De Vries, Jan. *European Urbanization, 1500–1800*. London: Routledge Library Editions: The City, 2007.

Dincecco, Mark. "Fiscal Centralization, Limited Government, and Public Revenues in Europe, 1650–1913." *The Journal of Economic History* 69, no. 1 (2009): 48–103.

Dickson, Peter George Muir. *Finance and Government Under Maria Theresia, 1740–1780, Vol. 1*. Oxford: Clarendon Press, 1987a.

_____. *Finance and Government under Maria Theresia, 1740–1780, Vol. 2*. Oxford: Clarendon Press, 1987b.

Dincecco, Mark, and Mauricio Prado. "Warfare, Fiscal Capacity, and Performance." *Journal of Economic Growth* 17, no. 3 (2012): 171–203.

Dreze, Jean, and Jackie Toh. "Literacy in India and China." *Economic and Political Weekly* 30, no. 45 (1995): 2869.

Duffy, Christopher. *The Army of Maria Theresa: The Armed Forces of Imperial Austria, 1740–1780*. London: David & Charles, 1977.

_____. *Russia's Military Way to the West*. London: Routledge and Kegan Paul Ltd., 1981.

Eng, Robert, and Thomas Smith. "Peasant Families and Population Control in Eighteenth-Century Japan." *Journal of Interdisciplinary History* 6, no. 3 (1976): 417–45.

Firth, Charles H. 1902. *Cromwell's Army*. London: Methuen & Co.

Floud, Roderick, Kenneth Wachter, and Annabel Gregory. *Height, Health, and History: Nutritional Status in the United Kingdom, 1750–1980.* Cambridge: Cambridge University Press, 1990.

Forrest, Alan. *The Soldiers of the French Revolution*. Durham, NC: Duke University Press, 1990.

Gagniage, Jean. "La levée de 1793 en Beauvaisis." In Actes du 2e colloque international organisé par les Archives départementales de l'Oise, Beauvais, 23–24 October 1993. Beauvais: Conseil Général de l'Oise, 1996.

Gates, David. "The Transformation of the Army, 1783–1815." In *The Oxford History of the British Army* edited by David Chandler and Ian Frederick William Beckett, 132–60. Oxford: Oxford University Press, 1996.

Gebelin, Jacques. *Histoire des milices provinciales (1688–1791).* Paris: Hachette, 1881.

Gittings, John. *The Role of the Chinese Army*. New York: Oxford University Press, 1967.

Graff, Harvey. *The Legacies of Literacy.* Bloomington: Indiana University Press, 1987.

Hendricks, Frederick. "On the Vital Statistics of Sweden from 1749 to 1855." *Journal of the Statistical Society of London* 25, no. 2 (1862): 111–74.

Hochedlinger, Michael. *Austria's Wars of Emergence*. London: Pearson Education Limited, 2003.

House of Commons Parliamentary Papers. 1860 (168). Navy. Available at http://parlipapers.chadwyck.com/home.do.

_____. 1914–16 (96). Navy. Appropriation account, 1913–1914. Available at http://parlipapers.chadwyck.com/home.do.

_____. 1928–29 [Cmd. 3253]. Board of Trade. (In conjunction with the Ministry of Labour and the registrars-general.) Statistical abstract for the United Kingdom for each of the fifteen years from 1913 to 1927. Seventy-second number. Available at http://parlipapers.chadwyck.com/home.do.

Hunter, Janet E. *Conscription in Concise Dictionary of Modern Japanese History*. Berkeley: University of California Press, 1984.

Institut National de la Statistique et des Études Économiques. *Annuaire Statistique de la France. 1966. Résumé Rétrospectif*. Paris, 1966.

_____. *Annuaire Rétrospectif de la France 1948–1988*. Paris, 1990.

_____. *Annuaire Statistique de la France. Édition 1997*. Paris, 1997.

_____. *Annuaire Statistique de la France. Édition 2007*. Paris, 2007.

Istituto Centrale di Statistica. *Sommario di Statistiche Storiche dell'Italia, 1861–1975*. Roma: L'Istituto, 1976.

Jany, Curt. *Geschichte de Preussischen Armee vom 15*. Jahrhundert bis 1914. Verlag: Osnabruck, 1928.

Johansson, Egil. "The History of Literacy in Sweden." In *Understanding Literacy in its Historical Contexts: Socio-Cultural History and the Legacy of Egil Johansson*, edited by Harvey Graff, Alison Mackinnon, Bengt Sandin, and Ian Winchester, 151–82. Lund: Nordic Academic Press, 2009.

Kabuzan, B. M. 1963. *Narodnaceleniye Rossii v XVIII – pervoi polovinye XIX vekov*. Moscow: USSR Academy of Sciences.

Karpat, Kemal. "Ottoman Population Records and the Census of 1881/82–1893." *International Journal of Middle Eastern Studies* 9 (1978): 237–74.

Keep, John L. H.. *Soldiers of the Tsar: Army and Society in Russia, 1462–1874*. Oxford: Clarendon Press, 1985.

Levi, Margaret. *Consent, Dissent, and Patriotism*. New York: Cambridge University Press, 1997.

Levy, Jack. *War in the Modern Great Power System, 1495–1975*. Lexington: University Press of Kentucky, 1983.

Lynn, John A. "The Growth of the French Army During the Seventeenth Century." *Armed Forces & Society* 6 (1980): 568–85.

_____. *Giant of the Grand Siècle: The French Army, 1610–1715*. Cambridge: Cambridge University Press, 1997.

_____. "Revisiting the Great Fact of War and Bourbon Absolutism: The Growth of the French Army During the Grand Siècle." In Guerray Sociadaden a Monagovia Hispanica edited by Enrique García Hernán and Davide Maffi, 49–74. Madrid: Ediciones del Laberinto, Fundación Mapfre, CSIC, 2006.

Mackay, Ruth. *The Limits of Royal Authority: Resistance and Obedience in Seventeenth-Century Castile*. Cambridge: Cambridge University Press, 1999.

Maddison, Angus. *The World Economy: Historical Statistics.* Paris: OECD, 2003.

Mathias, Peter, and Patrick O'Brien. "Taxation in Britain and France, 1715–1810: A Comparison of the Social and Economic Incidence of Taxes Collected for the Central Governments." *The Journal of European Economic History* 5, no. 3 (1976): 601–50.

Mauersberg, Hans. *Finanzstrukturen deutscher Bundesstaaten zwischen 1820 und 1944*. St. Katharinen: Scripta Mercaturae Verlag, 1988.

Mccranie, Kevin. "The Recruitment of Seamen for the British Navy, 1793–1815 'Why Don't You Raise More Men?' In *Conscription in the Napoleonic Era*, edited by Donald Stoker et al. 84–101. London: Continuum, 2009.

McEvedy, Colin, and Richard Jones. *Atlas of World Population History*. New York: Facts on File, 1978.

Ministry of Internal Affairs and Communications, Statistics Bureau. *Historical Statistics of Japan, Chapter 2 Population and Household, Population by Sex, Population Increase and Decrease, Population Density (1872–2009)*, 2011.

Mironov, Boris. "The Development of Literacy in Russia and the USSR from the Tenth to the Twentieth Centuries." *History of Education Quarterly* 31, no. 2 (1991): 229–52.

Mitchell, Brian R. *British Historical Statistics.* Cambridge: Cambridge University Press, 1988.

Murphey, Roads. 1999. *Ottoman Warfare, 1500–1700*. New Brunswick, NJ: Rutgers University Press.

Nordmann, Claude. "L'armee suedoise au XVII siècle." *La Revue du Nord* 54 (1972): 133–47.

Ogawa, Gotaro. *Conscription System in Japan*. New York: Oxford University Press, 1921.

Oomens, Cees, and Gert den Bakker. "Dutch Historical Statistics: Nineteenth-Century Population Censuses." *Netherlands Official Statistics* 12 (1997): 5–17.

Orleans, Leo. "The 1953 Chineses Census in Perspective." *The Journal of Asian Studies* 16 (1957): 565–73.

Pamuk, Sevket, and Jan-Luiten van Zanden. "Standards of Living." In *The Cambridge Economic History of Modern Europe, Volume 1: 1700–1870*. Edited by Stephen Broadberry and Kevin H. O'Rourke, 217–34. New York: Cambridge University Press, 2010.

Parker, Geoffrey. *The Army of Flanders and the Spanish Road 1567–1659*. Cambridge: Cambridge University Press, 1972.

Parrott, David. *Richelieu's Army: War, Government, and Society in France, 1624–1642*. Cambridge: Cambridge University Press, 2001.

Pintner, Walter M. "The Burden of Defense in Imperial Russia, 1725–1914." *Russian Review* 43, no. 3 (1984): 231–59.

Prasad, Devi, and Tony Smythe, eds. *Conscription: A World Survey: Compulsory Military Service and Resistance to It*. London, UK: War Resisters' International, 1968.

Quataert, Donald. *The Ottoman Empire, 1700–1922.* Cambridge: Cambridge University Press, 2000.

Roberts, Michael. *Gustavus Adolphus*. London: Longman, 1958.

_____. *Sweden as a Great Power, 1611–1697: Government, Society, Foreign Policy*. New York: St. Martin's Press, 1968.

_____. *Sweden's Age of Greatness: 1632–1718.* London: Macmillan, 1973.

_____. *The Swedish Imperial Experience: 1560–1718*. Cambridge: Cambridge University Press, 1979.

Ross, Heidi. China Country Study." Paper commissioned for *EFA Global Monitoring Report 2006, Literacy for Life*, 2005.

Ross, Thomas. "Raising an Army: A Positive Theory of Military Recruitment." *Journal of Law and Economics* 37, no. 1 (1994): 109–13.

Rothenberg, Gunther. "The Habsburg Army in the Napoleonic Wars." *Military Affairs* (February 1973): 1–5.

_____. *The Army of Francis Joseph*. West Lafayette, IN: Purdue University Press, 1976.

Schnapper, Bernard. *Le remplacement militaire en France: Quelques aspects politiques, économiques et sociaux du recrutement au XIX siècle*. Paris: SEVPEN, 1968.

Sidgwick, Henry. *The Principles of Political Economy*. London: Macmillan, 1883.

Stone, Lawrence. Literacy and Education in England, 1640–1900. *Past & Present* 42 (1969): 69–132.

Sturgill, Claude C. "The French Army's Budget in the Eighteenth Century. A Retreat from Loyalty." In Change, Continuity, and the French Revolution, edited by David G. Troyansky, Alfred Cismaru, and Norwood Andrews, Jr., 123–34. Westport, CT: Greenwood Press, 1991.

Tabakoglu, Ahmet. *Gerileme Donemine Girerken Osmanli Maliyesi.* Isantbul: Dergah Yayinlari, 1985.

Taylor, A. J. "The Taking of the Census: 1801–1951." *British Medical Journal* 1, no. 4709 (1951): 715–20.

Ticchi, Davide, and Andrea Vindini. "War and Endogenous Democracy". IZA Discussion Paper No. 3397, 2008.

Tortella, Gabriel. 1994. "Patterns of Economic Retardation and Recovery in South-Western Europe in the Nineteenth and Twentieth Centuries." *The Economic History Review* 47(1).

United States Government. *Historical Statistics of the United States, Vol. 5*, Table Ed26-47, Military personnel on active duty, by branch of service and sex: 1789–1995, p. 5-353-359. Cambridge: Cambridge University Press, 2006.

van Nimwegen, Olaf. *The Dutch Army and the Military Revolutions, 1588–1688.* Woodbridge: Boydell Press, 2006.

Villstrand, Nils Erik. "Adaptation or Protestation Local Community Facing the Conscription of Infantry for the Swedish Armed Fources, 1620–1679." In *A Revolution from Above? The Power State of Sixteenth- and Seveneteenth-Century Scandinavia*, edited by Leon Jeperson, 249–78. Odense: Odense University Press, 2000.

Von Stein, Felix. *Geschichte der Entwickelung des russichen Heeres*. Leipzig: Zuckschweldt, 1895.

Walter, Dierk. "Meeting the French Challenge: Conscription in Prussia, 1807–1815." In *Conscription in the Napoleonic Era*, edited by Donald J. Stoker et al., 24–45. New York: Routledge, 2009.

Wildman, Allan. *The End of the Russian Imperial Army*. Princeton, NJ: Princeton University Press, 1980.

Wilson, Peter H. *German Armies: War and German Politics*. London; Bristol, PA: UCL Press, 1998.

_____. "Social Militarization in Eighteenth-Century Germany." *German History* 18, no. 1 (2000): 1–39.

_____. *The Thirty Years' War*. Cambridge, MA: Harvard University Press, 2009.