

Estimating Guard Labor

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1 Introduction

An industrial army of workers under the command of a capitalist requires, like a real army, officers (managers), and N.C.O.'s (foremen, overseers) who command during the labor process in the name of capital. The work of supervision becomes their established and exclusive function. ... The leadership of industry is an attribute of capital, just as in feudal times the functions of general and judge were attributes of landed property.

Karl Marx, Capital, I (Marx(1976):450-451)

This paper presents some estimates of the size of Marx's 'army' of supervisors and allied labor, in the United States over the course of the last century, and in several OECD countries in the 1990's. Bowles and Jayadev (2004) define as 'guard labor' labor devoted through the use of power to advance distributional claims and to perpetuate the economic institutions of a society. Such a definition, while perhaps inevitably imprecise, allows us a basis by which to group individuals in a classical framework; as those whose activities primarily is involved in production and those who are primarily involved in activities which sustain and preserve the social structure.

Bowles and Jayadev (2004) present a model in which the reproduction of the economy is determined through the optimization problem of an 'owning class' which seeks to maximize the rate of growth of the capital stock. The owning class determines the level of monitoring and the level of investment in protective services. The government imposes a tax on profits and devotes the proceeds from taxes to protecting property, incarcerating those convicted of property crimes, and defending national borders. It also determines the level of employment through monetary policy.

To emphasize their particular roles in sustaining the distribution of property rights and claims, we focus on certain elements of labor. Supervisors and guards perform the labor associated with the actions of the owning class in the model above. Prisoners and the unemployed and defense related personnel by contrast are determined by the optimization problem of the owning class, and for the former two, their presence is an intrinsic part of the incentive structures in the system.

Following previous work by Gordon (1989) and Bowles and Roditi (1986), therefore, this calculation of guard labor is intended to give an approximation of the human resource costs in terms of employment in these categories as a fraction of the labor force.

Table (1) provides a breakdown of the categories constituting guard la-

bor and their components in the United States over time. Table (2) lists the components of guard labor for the cross country data. There has been a concerted effort to develop and maintain comparability and consistency between years and between countries in order to derive accurate estimates. This has involved making a few assumptions about the data which are detailed in what follows. The remainder of this paper provides a detailed description of the sources of data as well as specific explanations of the calculations involved in obtaining these estimates. It is hoped that any researcher will be able to replicate these results following the methods outlined.

Table (1) Components of Guard Labor in the United States(1890-2002)

Supervision: *Either* (Definition 1) Non-Production and Supervisory Employees in Private Non Agricultural Industries, *or* (Definition 2) Employees in occupations coded in the Dictionary of Occupational Titles as having supervisory or related relations to people.

Protective Guard Labor: Police Employees at all levels of Government *and* Judicial and Corrections Employees at all Levels of Government *and* Private Guards

Defense Related Employment: Active Duty Military Personnel *and* Civilian Employees of the Department of Defense *and* Indirect Employment from Defense Related Expenditure

Unemployment: Unemployed Individuals and Discouraged Laborers

Prisoners: Prisoners in Federal Correctional Institutions *and* Prisoners in State Correctional Institutions

Table (2) Components of Guard Labor in Selected OECD countries(1996)

Supervision: Legislators, Senior Officials and Managers' from the International Standard Classification of Occupations(1988) categories.

Military: Active Duty Military Personnel

Unemployment: Unemployed Individuals

Prisoners: Incarcerated Individuals at all levels

The years for which the calculations for the United States were done are 1890, 1929, 1948, 1966, 1973, 1979, 1987, 1989 and 2002. All but the last year are business cycle peaks in order to account for any cyclical variations that may occur in the employment of guard labor. For the cross country sample, the year is 1996.

2 Estimates for United States Guard Labor

2.1 Supervisors

2002

Supervisors (Category I): One definition of supervisory labor is from the Bureau of Labor Statistics: Non Production and Supervisory Employees in Private Non- Agricultural Industries. The data was calculated as the residual employment from Private Non- Agricultural Industries after accounting for Non-Supervisory production employees. The source for this data was the difference in the series CEU0500000001 (total employees in private non-farm employment- CEU0500000003 non-supervisory production workers in private non-farm employment), Bureau of Labor Statistics

Supervisors (Category II): Supervisors here, following Gordon (1989) are enumerated using the codes in the Dictionary of Occupational Titles. The middle three digits of the DOT occupational code are the Worker Functions Ratings of the tasks performed in the occupation. Every job requires a worker to function to some degree in relation to data, people, and things. A separate digit expresses the worker's relationship to each of these three groups, 'data', 'people' and 'things'. Supervisors are calculated and the number of employees having 'supervisory' or related 'relations to people'. Unfortunately, this categorization of work was changed with the shift to ONET codes from DOT codes in 1992. These data are not completely bridgeable given the different ways in which the two methodologies classify occupations. As a consequence, we are forced to use an approximation based on the statistical abstract of the United States. The census departments categories "Managers and administrators", as it turns out, closely approximated the series using DOT classifications for the three most recent years in our data (1989, 1987 and 1979, the ratio being about 1.04 to 1 for those years). We extrapolate the current level of supervisory labor by assuming that the ratio between the two series remained the same for 2002.

1948-1989

Supervisors (Category I): These were defined as Non Production and Supervisory Employees in Private Non- Agricultural Industries. The data was calculated as the residual employment from Private Non- Agricultural Industries after accounting for Non-Supervisory production employees. The sources for this data were The Handbook of Labor Statistics, 1981 and Table C-2, Employment and Earnings for various years.

Supervisors (Category II): Supervisors here are enumerated using the codes in the Dictionary of Occupational Titles. The middle three digits of the DOT occupational code are the Worker Functions ratings of the tasks performed in the occupation. Every job requires a worker to function to some degree in relation to data, people, and things. A separate digit expresses the worker's relationship to each of these three groups, 'data', 'people' and 'things'. Supervisors are calculated and the number of employees having 'supervisory' or related 'relations to people'. The figures were derived by estimating employees in supervising occupations and then linearly interpolating or extrapolating those numbers for 1950, 1960, 1970, 1980, and 1985 into point estimates for 1948, 1966, 1973, 1979, 1987 and 1989. The source of this data is David M Gordon, " Who Bosses Whom", long version.

1890 and 1929

Supervisors (Category I): Supervisors are defined as Non Production and Supervisory Employees in Private Non- Agricultural Industries. The data for this definition is only available from 1948 and hence is assumed for 1929 and 1890 to be the same ratio to supervisory category (II) (which was available in both years) as in 1929.

Supervisors (Category II): Supervisors were calculated as 50% of the sum of managers, foremen, officials, weighers, collectors, government officials and overseers in the economy. The results obtained from using this method yield broadly comparable results to the method used by David Gordon for calculating supervisory labor from 1948-2002 (which we follow for those years). This was checked by reproducing this method for 1966 and 1979 and comparing it Gordon's results. For 1929, the data was obtained from the Fifteenth Census of the U.S 1930, General Report on Occupations Table I- Gainful Workers 10 years old and over, by occupation and sex .For 1890, the data was obtained from the Eleventh Census of the U.S,1890- Table 29- Number of Persons in the United States 10 years of age and over engaged in each specified occupation, classified by sex, 1890.

2.2 Protective Guard Labor

2002

Police: Calculated as police employees at all levels of government: 2002 figures done by linear extrapolation from 1980 -1997 data, Source; Sourcebook of Criminal Justice Statistics, 2002 CD ROM

Courts: Calculated as judicial employees at all levels of government: 2002 figures done by linear extrapolation from 1980 -1997 data, Source; Sourcebook of Criminal Justice Statistics, 2002 CD ROM

Corrections: Calculated as corrections employees at all levels of government: 2002 figures done by linear extrapolation from 1980 -1997 data, Source; Sourcebook of Criminal Justice Statistics, 2002 CD ROM

Private Guards: Calculated as the difference between all guards and guards in public service. The data was from the Statistical Abstract of the United States 2003, no615

1989

Police: Calculated as police employees at all levels of government: Data is for 1988 and was obtained from The Sourcebook of Criminal Justice Statistics, 1988, Table 1.14

Courts: Calculated as judicial employees at all levels of government: Data was for 1988 and was obtained from The Sourcebook of Criminal Justice Statistics, 1988, Table 1.14

Corrections: Calculated as corrections employees at all levels of government: Data is for 1988 and was obtained from The Sourcebook of Criminal Justice Statistics, 1988, Table 1.14

Private Guards: Calculated as the difference between all guards and guards in public service.. The data was from the Statistical Abstract of the United States 1991, No 652

1987

Police: Calculated as police employees at all levels of government: Data is for 1986 and was obtained from The Sourcebook of Criminal Justice Statistics, 1988, Table 1.14

Courts: Calculated as judicial employees at all levels of government: Data was calculated as the ratio of (courts employees/courts+legal employees) in 1979 times (courts+legal employees) in 1986. Data was obtained from The Sourcebook of Criminal Justice Statistics, 1988, Table 1.14

Corrections: Calculated as corrections employees at all levels of government: Data is for 1986 and was obtained from The Sourcebook of Criminal

Justice Statistics, 1988, Table 1.14

Private Guards: Calculated as the difference between all guards and guards in public service. The data was from the Statistical Abstract of the United States 1989, No 642

1979

Police: Calculated as police employees at all levels of government: Data was obtained from The Sourcebook of Criminal Justice Statistics, 1988, Table 1.14

Courts: Calculated as judicial employees at all levels of government: Data was obtained from The Sourcebook of Criminal Justice Statistics, 1988, Table 1.14

Corrections: Calculated as corrections employees at all levels of government: Data was obtained from The Sourcebook of Criminal Justice Statistics, 1988, Table 1.14

Private Guards: Calculated as the difference between all guards and guards in public service. The data was obtained by multiplying the ratio of guards/ all protective services employees in 1981 to the number of employees in protective services in 1980. The data was from the Statistical Abstract of the United States 1982-83, No 651

1973

Police: Calculated as police employees at all levels of government: Data was obtained from The Sourcebook of Criminal Justice Statistics, 1988, Table 1.14

Courts: Calculated as judicial employees at all levels of government: Data was obtained from The Sourcebook of Criminal Justice Statistics, 1988, Table 1.14

Corrections: Calculated as corrections employees at all levels of government: Data was obtained from The Sourcebook of Criminal Justice Statistics, 1988, Table 1.14

Private Guards: Calculated as the difference between all guards and guards in public service. The data was from the Statistical Abstract of the United States 1982-83, No 651

1966

Police: Calculated as police employees at all levels of government: The figures for employment in 1966 were estimated by the calculated ratio for 1971 of employment (in thousands) to expenditures (in millions) at all levels of government for police and multiplying those ratios times the figures for expenditures at all levels of government for police for 1966. Data from 1971

was obtained from The Sourcebook of Criminal Justice Statistics, 1988, Table 1.14 while the data for 1966 was obtained from Historical Statistics of the United States : Colonial Times to 1970, Series H1013-1015

Courts: Calculated as judicial employees at all levels of government: The figures for employment in 1966 were estimated by the calculated ratio for 1971 of employment (in thousands) to expenditures (in millions) at all levels of government for judicial officers and multiplying those ratios times the figures for expenditures at all levels of government for judicial officers for 1966. Data from 1971 was obtained from The Sourcebook of Criminal Justice Statistics, 1988, Table 1.14 while the data for 1966 was obtained from Historical Statistics of the United States : Colonial Times to 1970, Series H1013-1015

Corrections: Calculated as corrections employees at all levels of government: The figures for employment in 1966 were estimated by the calculated ratio for 1971 of employment (in thousands) to expenditures (in millions) at all levels of government for corrections officers and multiplying those ratios times the figures for expenditures at all levels of government for corrections officers for 1966. Data from 1971 was obtained from The Sourcebook of Criminal Justice Statistics, 1988, Table 1.14 while the data for 1966 was obtained from Historical Statistics of the United States : Colonial Times to 1970, Series H1013-1015

Private Guards: Calculated as the difference between all guards and guards in public service. The data was a linear interpolation between the values for the Census of the United States 1960 and the Census of the United States 1970

1948

Police: Calculated as police employees at all levels of government: The data was obtained by multiplying the ratio (expenditure on police in 1948/expenditure on police in 1950) times the number of police employees from the 1950 Census of the United States Occupational Data (Table D590). Data on expenditure on police in 1948 was obtained from the Historical Statistics of the United States : Colonial Times to 1970, Series H1013-1015

Courts: Calculated as judicial employees at all levels of government: The data was obtained by multiplying the ratio (court employees in 1954/police employees in 1954) times the number of police employees in 1948 from above. Data from 1954 was obtained from the Historical Statistics of the United States : Colonial Times to 1970, Series H1013-1015

Corrections: Calculated as corrections employees at all levels of government: The data was obtained by multiplying the ratio (corrections employees

in 1954/police employees in 1954) times the number of police employees in 1948 from above. Data from 1954 was obtained from the Historical Statistics of the United States : Colonial Times to 1970, Series H1013-1015

Private Guards: Calculated as the difference between all guards and guards in public service. The data was for 1950 and was obtained from Historical Statistics of the United States : Colonial Times to 1970, Series H1013-1015 and D589, D591

1929

In 1929 the category consists of 4 series.

The series are "guards, watchmen and doorkeepers", "marshals, sheriffs, detectives etc", "police" and "keepers of charitable and penal institutions". The data was obtained from the Fifteenth Census of the U.S 1930, General Report on Occupations Table I- Gainful Workers 10 years old and over, by occupation and sex with the occupations arranged according to the classification on 1930

1890

Guard Labor in 1890 is not broken up by subcategory. The series is "watchmen, policemen and detectives". The data was obtained from the Eleventh Census of the U.S 1890, Table 29- Number of Persons in the United States 10 years of age and over engaged in each specified occupation, classified by sex, 1890.

2.3 Defense Related Employment

2002

Active Duty: The series used is the number Military personnel on Active Duty obtained from The Statistical Abstract of the United States 2003, no519

Civilian Employees of the Department of Defense: This series is derived by subtracting active military personnel from "Total Defense Department Manpower". The data was obtained from "Department Of Defense Worldwide Distribution of Manpower 2002", July 2003

Indirect Employment from Defense Related Expenditures: Calculated as non-personnel defense related expenditure times the inverse of average productivity in manufacturing. The former was calculated as gross investment in defense. The data was obtained from Table 3.9.5 "Government Consumption Expenditures and Gross Investment", National Income and Product Accounts, Bureau of Economic Analysis 2004. For average productivity in manufacturing, the calculation is gross value added or gross national income

from manufacturing divided by employees in manufacturing. Employment-Series CEU3000000001, Bureau of Labor Statistics " Unadjusted Employment in Manufacturing Industries, Data on output was obtained from Statistical Abstract of the United States,2003 Gross National Income by Industry (series was manufacturing). Data on Employment was obtained from Series CEU3000000001, Bureau of Labor Statistics " Unadjusted Employment in Manufacturing"

N.B For all years for defense related employment; we needed to do a correction to avoid double counting. Since all employees in this category who have supervisory roles have already been included in the data on supervisory employees, the estimated proportionate supervising employees in defense related labor are subtracted from these three categories and are consequently left in the supervisory category. The estimates are derived by multiplying for each year the supervising share (from the supervisory figures) times the aggregate total for the respective categories in defense related employment for the same year.

1989

Active Duty: The series used is the number Military personnel on Active Duty. The data was obtained from "Statistical Abstract of the United States 1992, No 542

Civilian Employees of the Department of Defense: This series is derived by subtracting active military personnel from "Total Defense Department Manpower". . The data was obtained from "Statistical Abstract of the United States 1992, No 542

Indirect Employment from Defense Related Expenditures: Calculated as non-personnel defense related expenditure * inverse of average productivity in manufacturing. The former was calculated as Gross Investment in defense. The data was obtained from Table 3.9.5 "Government Consumption Expenditures and Gross Investment", National Income and Product Accounts, Bureau of Economic Analysis 2004. For average productivity in manufacturing, the calculation is gross value added or gross national income from manufacturing divided by employees in manufacturing. Employment- Series CEU3000000001, Bureau of Labor Statistics " Unadjusted Employment in manufacturing Industries, Data on output was obtained from Statistical Abstract of the United States,1989 Gross National Income by Industry (series was manufacturing). Data on Employment was obtained from Series CEU3000000001, Bureau of Labor Statistics " Unadjusted Employment in Manufacturing"

1987

Active Duty: The series used is the number Military personnel on Active Duty. The data was obtained from "Statistical Abstract of the United States 1989, No 543

Civilian Employees of the Department of Defense: This series is derived by subtracting active military personnel from "Total Defense Department Manpower". The data was obtained from "Statistical Abstract of the United States 1989, No 543

Indirect Employment from Defense Related Expenditures: Calculated as non-personnel defense related expenditure * inverse of average productivity in manufacturing. The former was calculated as Gross Investment in defense. The data was obtained from Table 3.9.5 "Government Consumption Expenditures and Gross Investment", National Income and Product Accounts, Bureau of Economic Analysis 2004. For average productivity in manufacturing, the calculation is gross value added or gross national income from manufacturing divided by employees in manufacturing. Employment- Series CEU3000000001, Bureau of Labor Statistics " Unadjusted Employment in manufacturing Industries, Data on output was obtained from Statistical Abstract of the United States,1989 Gross National Income by Industry (series was manufacturing). Data on Employment was obtained from Series CEU3000000001, Bureau of Labor Statistics " Unadjusted Employment in Manufacturing"

1979

Active Duty: The series used is the number Military personnel on Active Duty. The data was obtained from "Statistical Abstract of the United States 1989, No 543

Civilian Employees of the Department of Defense: This series is derived by subtracting active military personnel from "Total Defense Department Manpower". . The data was obtained from "Statistical Abstract of the United States 1989, No 543

Indirect Employment from Defense Related Expenditures: Calculated as non-personnel defense related expenditure * inverse of average productivity in manufacturing. The former was calculated as Gross Investment in defense. The data was obtained from Table 3.9.5 "Government Consumption Expenditures and Gross Investment", National Income and Product Accounts, Bureau of Economic Analysis 2004. For average productivity in manufacturing, the calculation is gross value added or gross national income from manufacturing divided by employees in manufacturing. Employment- Se-

ries CEU3000000001, Bureau of Labor Statistics " Unadjusted Employment in manufacturing Industries, Data on output was obtained from Statistical Abstract of the United States,1982 Gross National Income by Industry (series was manufacturing). Data on Employment was obtained from Series CEU3000000001, Bureau of Labor Statistics " Unadjusted Employment in Manufacturing"

1973

Active Duty: The series used is the number of military personnel on active duty. The data was obtained from "Statistical Abstract of the United States 1989, No 543

Civilian Employees of the Department of Defense: This series is derived by subtracting active military personnel from "Total Defense Department Manpower". The data was obtained from "Statistical Abstract of the United States 1989, No 543

Indirect Employment from Defense Related Expenditures: Calculated as non-personnel defense related expenditure * inverse of average productivity in manufacturing. The former was calculated as Gross Investment in defense. The data was obtained from Table 3.9.5 "Government Consumption Expenditures and Gross Investment", National Income and Product Accounts, Bureau of Economic Analysis 2004. For average productivity in manufacturing, the calculation is gross value added or gross national income from manufacturing divided by employees in manufacturing. Employment- Series CEU3000000001, Bureau of Labor Statistics " Unadjusted Employment in manufacturing Industries, Data on output was obtained from Statistical Abstract of the United States,1974 Gross National Income by Industry (series was manufacturing). Data on Employment was obtained from Series CEU3000000001, Bureau of Labor Statistics " Unadjusted Employment in Manufacturing"

1966

Active Duty: The series used is the number Military personnel on Active Duty. The data was obtained from "The Historical Statistics of the United States: Colonial Times to 1970" Series Y994, Y904-916. Incremental Vietnam Personnel for 1966 are subtracted from totals by multiplying (1- (the ratio of armed forces stationed in Vietnam to total active personnel) times the published figures for 1966

Civilian Employees of the Department of Defense: This series is derived by subtracting active military personnel from "Total Defense Department Manpower". The data was obtained from "The Historical Statistics of the

United States: Colonial Times to 1970" Series Y994, Y904-916. Incremental Vietnam Personnel for 1966 are subtracted from totals by multiplying (1-(the ratio of armed forces stationed in Vietnam to total active personnel)) times the published figures for 1966

Indirect Employment from Defense Related Expenditures: Calculated as non-personnel defense related expenditure * inverse of average productivity in manufacturing. The former was calculated as Gross Investment in defense. The data was obtained from Table 3.9.5 "Government Consumption Expenditures and Gross Investment", National Income and Product Accounts, Bureau of Economic Analysis 2004. For average productivity in manufacturing, the calculation is gross value added or gross national income from manufacturing divided by employees in manufacturing. Data on output was obtained from Historical Statistics of the U.S: Series F 226-237 National Income by Industrial Origin, in Current Prices, 1929-1971. (Series was manufacturing). Data on Employment was obtained from Series CEU3000000001, Bureau of Labor Statistics " Unadjusted Employment in Manufacturing" Incremental Vietnam Personnel for 1966 are subtracted from totals by multiplying (1-(the ratio of armed forces stationed in Vietnam to total active personnel)) times the published figures for 1966

1948

Active Duty: The series used is the number Military personnel on Active Duty. The data was obtained from "The Historical Statistics of the United States: Colonial Times to 1970" Series Y994, Y904-916

Civilian Employees of the Department of Defense: This series is derived by subtracting active military personnel from "Total Defense Department Manpower". The data was obtained from "The Historical Statistics of the United States: Colonial Times to 1970" Series Y994, Y904-916

Indirect Employment from Defense Related Expenditures: Calculated as non-personnel defense related expenditure * inverse of average productivity in manufacturing. The former was calculated as Gross Investment in defense. The data was obtained from Table 3.9.5 "Government Consumption Expenditures and Gross Investment", National Income and Product Accounts, BEA 2004. For average productivity in manufacturing, the calculation is gross value added or gross national income from manufacturing divided by employees in manufacturing. Data on output was obtained from Historical Statistics of the U.S: Series F 226-237 National Income by Industrial Origin, in Current Prices, 1929-1971. (Series was manufacturing). Data on Employment was obtained from Series CEU3000000001, Bureau of Labor

Statistics " Unadjusted Employment in Manufacturing"

1890 and 1929

Active Duty: The series used is the number Military personnel on Active Duty. The data was obtained from "The Historical Statistics of the United States: Colonial Times to 1970" Series Y994, Y904-916

Civilian Employees of the Department of Defense: This series is derived by subtracting active military personnel from "Total Defense Department Manpower". The data was obtained from "The Historical Statistics of the United States: Colonial Times to 1970" Series Y994, Y904-916

Indirect Employment from Defense Related Expenditures: Calculated as non-personnel defense related expenditure * inverse of average productivity in manufacturing. The former was calculated as Gross Investment in defense. The data was obtained from Table 3.9.5 "Government Consumption Expenditures and Gross Investment" , National Income and Product Accounts, Bureau of Economic Affairs 2004. For average productivity in manufacturing, the calculation is gross value added or gross national income from manufacturing divided by employees in manufacturing. Data on output was obtained from Historical Statistics of the United States: Series F 238-249 Value added by Selected Industries (Series was manufacturing). Data on Employment was obtained Historical Statistics of the U.S-Series D 167-181 " Labor Force and Employment, by Industry: 1800 to 1960, calculated as persons engaged in manufacturing.

2.4 Unemployment

2002

Unemployment: Calculated as the number of people belonging to the labor force who are unemployed. The data was obtained from The Economic Report of the President 2003, Table B38

Discouraged Workers: The definition of Discouraged Workers is " Persons not in Labor Force", but who " want a job now" the data is from Statistical Abstract of the United States, 2003, table 618.

Note: For all years we subtract frictional unemployment. For this series, we use the category LNU04023705 from the Bureau of Labor Statistics which (number of unemployed who answer quit their jobs (job leavers)). This series is almost constant at .7% of the labor force

1948-1989

Unemployment: Calculated as the number of people belonging to the labor force who are unemployed. The data was obtained from The Economic Report of the President 1991, Table B32

Discouraged Workers: The definition of Discouraged Workers is based on categories tabulated in "Statistical Abstract of the United States", 1989, Table 652: The category for 1948-1989 is equal to the sum of (full time jobseekers+1/2 part time jobseekers+1/2 total working part time for economic reasons+ persons not in the labor force who want a job but think they cannot get one) minus the total number of unemployed counted above in order to retain that category as conventionally defined and thus to avoid double counting of (full time jobseekers +50% of part time jobseekers).The source for this data for 1989 was "Employment and Earnings, January 1990" . The source for this data for 1948-1987 was "Labor Force Statistics Derived from the Current Population Survey, 1948-1987, Bureau of Labor Statistics".However, This data was not available for 1948 directly and was obtained by applying to 1948 the average proportion of the labor force for 1966, 1955 and 1973.

1890 and 1929

Unemployment: Calculated as the number of people belonging to the labor force who are unemployed. The data was obtained from Stanley Lebergott "Manpower in Economic Growth" Unemployment, Labor Force and Related series, table A 15

Discouraged Workers: There is no estimate for the number of discouraged workers and so this is obtained by assuming that the ratio of discouraged workers to unemployed workers in 1890 and 1929 was the same as the average ratio for the same variables for all the peak years post 1948.

2.5 Prisoners

2002

Prisoners: Calculated as Prisoners at all levels of Government.Data was from Office of justice programs, United States Department of Justice, July 27th 2003 release

1989

Prisoners: Calculated as Prisoners at all levels of Government. Data was obtained from the Sourcebook of Criminal Justice Statistics, 1990, Table 6.31

1948-1987

Prisoners: Calculated as Prisoners at all levels of Government. Data was obtained from the Sourcebook of Criminal Justice Statistics, 1988, Table 6.32

1929

Prisoners: Calculated as Prisoners at all levels of Government. The data was obtained from the Historical Statistics of the United States : Colonial Times to 1970, Series H1135-1143 Federal and State Institutions

1890

Prisoners: Calculated as Prisoners at all levels of Government. The data was obtained from The Eleventh Census of the U.S 1890, 'Crime Pauperism and Benevolence' Table (I) 'Number of Prisoners classified by sex, general nativity and color, by states and territories, 1890'.

2.6 Civilian Labor Force

1948 to 2002

Civilian Labor Force: Data was obtained from Series LNS11000000, 'Civilian Labor Force', Bureau of Labor Statistics

1890 and 1929

Civilian Labor Force: Data was obtained from "The Historical Statistics of the United States: Colonial Times to 1970" Series D 11-25 Labor Force Status of the Population 1870-1970.

3 Cross Country Estimations

In order to estimate the level of guard labor in the U.S and other OECD countries, we focus on four series: supervisors, military personnel, the prison population and the unemployed.

Supervision: Data was collected from the ILO LABORSTA Segregat database- available at <http://laborsta.ilo.org/>. Using nationally representative databases for years closest to 2002, using the International Standard Classification of Occupations(1988) categories, the subgroup consisting of "Legislators, Senior Officials and Managers" are taken to be supervisory labor. The number of employed is adjusted with the unemployment rate from the World Development Indicators, 2004, to get an estimate of the labor force. Supervision (as all categories) is calculated as a percentage of labor force.

Unemployment: The unemployment rate is obtained from the World Development Indicators CD ROM 2004. Although unemployment measures

vary across countries, a comparison between the BLS's series of a consistently defined unemployment rate and the series showed that there is little significant differences in the measures, and the former provided us with a larger dataset.

Military Personnel: The data on military personnel as a percentage of the labor force were obtained from the World Development Indicators CD ROM 2004

Prisoners: The data represents all incarcerated individuals. and was obtained from Walmsley , Roy(2003) "A World Prison Population List" Research, Development and Statistics Directorate, Home Office, UK. The data vary in terms of the year for which the data was collected. For the most part, however, the prison population used in the paper are for the closest available year to 2002 between 1998 and 2001.

The central purpose of constructing these data is to assess the changes over time and the variation between countries of guard labor. Bowles and Jayadev (2005) go on to describe the major points from this data as well point to certain potential correlates.

4 Correlates

We attempted to identify several plausible correlates of guard labor. Given below are the definitions and estimations of these variables.

4.1 Inequality

Gini Coefficient: The gini coefficient was obtained for the latest available year closest to 2002 from the high quality Deininger and Squire database. The correlation between the gini coefficient and supervision as a percentage of the labor force was 0.754 ($p=0.001$, $n=17$). Its correlation with guard labor as a percentage of the labor force was 0.405($p=0.106$, $n=17$).

Ratio of income of the top 20% to the bottom 20%: The ratio was also obtained or the latest available year closest to 2002 from the high quality Deininger and Squire database. The correlation between the ratio of the top quintile to the bottom quintile and supervision as a percentage of the labor force was 0.634 ($p=0.032$, $n=17$). Its correlation with guard labor as a percentage of the labor force was 0.423($p=0.09$, $n=17$).

Post tax and transfer gini: The variable was defined as the average post tax and transfer gini from 1970-1990. Data was obtained from (Röhme 2003). The correlation between this measure of gini and supervision as a percentage of the labor force was 0.520 (p=0.106, n=10). Its correlation with guard labor as a percentage of the labor force was 0.485(p=0.15, n=10).

4.2 Political Variables

Polarization: The polarization coefficient was obtained from Duclos, Esteban and Ray (2004). Their measure of polarization is intended to capture two aspects of an income distribution which Duclos, Esteban and Ray term identity and alienation. Identity is measured by how close one is to one's nearest neighbors. Alienation is measured by how far one and ones neighbors are from others more distant in the income distribution. We used the polarization coefficient when α , an indexation variable, is equal to one. The correlation between the polarization coefficient and supervision as a percentage of the labor force was 0.350 (p=0.298, n=11). Its correlation with guard labor as a percentage of the labor force was 0.595(p=0.05, n=11).

Political Conflict: The political conflict variable is a compound variable obtained as the normalized sum of three indices: Ethno-linguistic fragmentation in 1960, average annual general strikes, and average annual 'riots' over the years 1960 to 1998. The data on Ethnolinguistic Fragmentation is the ELF-60 series developed by Atlas Narodov Mira (1964). A strike is defined as the number of any strike of 1,000 or more industrial or service workers that involves more than one employer and that is aimed at national government policies or authority. A riot is defined as the number of any violent demonstration or clash of more than 100 citizens involving the use of physical force. The strikes and riots data is obtained from the Arthur S. Banks Cross National Time-Series Data Archive available at <http://www.scc.rutgers.edu/cnts/about.cfm>. The correlation between the political conflict index and supervision as a percentage of the labor force was 0.205 (p=0.42, n=17). Its correlation with guard labor as a percentage of the labor force was 0.616(p=0.09, n=17).

Political Legitimacy: The political legitimacy variable is a compound variable obtained as the normalized sum of two indices in our index of political legitimacy: average voter participation as a fraction of voting age population in all elections since 1945 and the number of consecutive years to the present in which universal male suffrage in competitive elections obtained. We chose

male suffrage rather than male and female because guard labor as we have measured it is not involved in the mediation of male–female conflicts to any important measure). Average Voter Participation is defined as Average Voter Participation in Elections/ Voting Age Population from 1945 to date. The data was from Lopez and Graschew(2004). The data on adult male suffrage was defined as years since first attainment of Adult Male Universal Suffrage from Meena (2001).The year for the U.S was chosen to be 1965 since the U.S. attained universal male suffrage only with the passage of the 1965 Voting Rights Act. However the results are substantially the same if one uses the end of the Civil War (1864) as the date at which universal male suffrage was attained. Great Britain was assumed to have achieved universal male suffrage in 1915 for the reasons alluded to in Acemoglu, Johnson and Robinson, 2004. The correlation between the political legitimacy index and supervision as a percentage of the labor force was -0.26 (p=0.39, n=17). Its correlation with guard labor as a percentage of the labor force was -0.505 (p=0.03, n=17).

4.3 Technology

Investment in Knowledge: The variable is defined as Investment in Knowledge as a Percentage of GDP, 1998. Knowledge includes Higher Education, R and D and Software, Education data includes post-secondary non-tertiary education (ISCED 4). The data source was OECD, National Accounts database; Education database; MSTI database and International Data Corporation, March 2001. The correlation between the variable and supervision as a percentage of the labor force was -0.20 (p=0.44, n=16). Its correlation with guard labor as a percentage of the labor force was -0.29 (p=0.27, n=16).

High- and Medium-High-Technology Manufactures as Percentage of Gross Value Added, 1988: The variable is defined as Knowledge-intensive sectors as a share of total gross value added,1998.Knowledge includes high and medium technology manufactures in 1988. The source for the data was the OECD, STAN and National Accounts databases, May 2001. The correlation between the variable and supervision as a percentage of the labor force was 0.02 (p=0.98, n=18). Its correlation with guard labor as a percentage of the labor force was 0.14 (p=0.57, n=18).

4.4 Others

Union Density: Net Union Density Data was obtained from the Repository for the Golden-Wallerstein-Lange Project on Unions, Employers, Collective Bargaining and Industrial Relations for 16 OECD Countries, 1950-1995. Net union density is defined as total membership less self-employed and retired)divided by the total dependent labor force for 1992 (the latest common year available). The correlation between the variable and supervision as a percentage of the labor force was -0.44 (p=0.94, n=11). Its correlation with guard labor as a percentage of the labor force was -0.45(p=0.14, n=11).

Corruption: The corruption measure is the standard Business International Index (BI) index which defines corruption as "the degree to which business transactions involve corruption or questionable payments": The Source is : Mauro, P.(1995). The correlation between the variable and supervision as a percentage of the labor force was 0.43 (p=0.92, n=16). Its correlation with guard labor as a percentage of the labor force was -0.20(p=0.44, n=16).

Trust: The 'Trust' index is from Knack and Keefer (1997). The correlation between the variable and supervision as a percentage of the labor force was 0.14(p=0.58, n=15). Its correlation with guard labor as a percentage of the labor force was -0.14(p=0.60, n=15).

Per Capita GDP: Per capita GDP was from the Penn World Tables 6.1 and defined as Per capita GDP (PPP values) for 2002. The correlation between the variable and supervision as a percentage of the labor force was -0.25(p=0.30, n=18). Its correlation with guard labor as a percentage of the labor force was -0.22(p=0.36, n=18).

Firm size: Firm size is defined as the share in employment of firms with less than 20 employees as a percentage of all employment. The data is from Bartelsmann et al 2005. Its correlation with guard labor as a percentage of the labor force was -0.01(p=0.78, n=10)

Welfare Spending: Average Welfare Spending from William Easterly's cross country database- calculated from WDI. Its correlation with guard labor as a percentage of the labor force was -0.51(p=0.09, n=15).

Protective Services only: Protective service occupations as a percentage of labor force by state vs. gini coefficient on family income. Sources: Bureau of Labor statistics: 2000 State Occupational Employment and Wage Estimates. Available at www.bls.gov/oes/2000/oesrcst.htm. Gini from Volscho, Thomas. 2006. "Measures of Income Distribution in the United States, 1970-2000." Department of Sociology, University of Connecticut. Available at

<http://vm.uconn.edu/twv00001/states.txt>. The correlation was 0.51($p=0.05$, $n=50$).

References

- [1] Acemoglu, Daron, Simon Johnson, and James Robinson. 2004. "Institutions as the Fundamental Cause of Long-Growth," in *Handbook of Economic Growth*. Philippe Aghion and Steven Durlauf eds.
- [2] Bartelsman, Eric, John Haltiwanger and Stefano Scarpetta. 2005. "Measuring and Analyzing Cross-country Differences in Firm Dynamics". Mimeo
- [3] Bowles, Samuel and Hannah Roditi (1986): "Guard Labor in the United States", mimeo, *University of Massachusetts, Amherst*
- [4] Bowles, Samuel and Arjun Jayadev (2004): "Guard Labor: An Essay in Honor of Pranab Bardhan", mimeo, *Department of Economics, University of Massachusetts, Amherst*
- [5] Bureau of Economic Affairs : "National Income and Product Accounts", various years
- [6] Bureau of Labor Statistics: "Labor Force Statistics from the Current Population Survey", various series
- [7] Bureau of Labor Statistics: "Employment and Earnings", various years
- [8] Bureau of the Census. 1976. : "Historical Statistics of the United States, Colonial Times to the 1970", Basic Books, New York
- [9] Bureau of the Census : "Statistical Abstract of the United States", various years
- [10] Bureau of the Census. 1900.) "Eleventh Census of the U.S 1890"
- [11] Bureau of the Census. 1940. "Fifteenth Census of the U.S 1930"
- [12] Department of Justice "Sourcebook of Criminal Justice Statistics" various years
- [13] Duclos, Jean Yves, Esteban, Joan, Ray, Debraj, 2004. "Polarization: Concepts, Measurement, Estimation", *Econometrica* 72: 1737-72
- [14] Council of Economic Advisors: "Economic Report of The President", various years

- [15] Department Of Defense .2003 " *Worldwide Distribution of Manpower 2002*" Mimeo
- [16] Gordon, David M .1990. : "Who Bosses Whom, the Intensity of Supervision and the Discipline of Labor" *American Economic Review Vol 80, No.2 pp 28-32*
- [17] Gordon, David M .1989 : "Who Bosses Whom" (long version), mimeo *Department of Economics, New School University*
- [18] Knack, S., Keefer, P., 1997. Does social capital have an economic payoff? A cross-country investigation. *Quarterly Journal of Economics* 112 (4), 1251-1288.
- [19] Lopez, Rafael and Maria Gratschew., 2002. "Voter Turnout since 1945: A Global Report", International Institute for Democracy and Electoral Assistance (International IDEA) 2002, Table 13
- [20] Lebergott, Stanley : "*Manpower in Economic Growth*", New York: McGraw Hill, 1964,
- [21] Marx, Karl. 1976. *Capital: A critique of political economy, Volume I*. Harmondsworth: Penguin (original publication, 1867).
- [22] Meena. Ruth. 2001 "Democracy, Governance and African Societies" DPMF conference, mimeo
- [23] Walmsley , Roy(2003) "A World Prison Population List" Research, Development and Statistics Directorate, Home Office, UK.
- [24] Mauro, P.1995 , Corruption and Growth, *Quarterly Journal of Economics* 110 (1995), 681-712.
- [25] Mira, Atlas Narodov.1964. Moscow: Miklukho-Maklai Ethnological Institute at the Department of Geodesy and Cartography of the State Geological Committee of the Soviet Union.
- [26] Rehme, Gunther, 2003. distribution of personal incomes, education and economic performance across countries"" Luxembourg Income Study Working Paper No. 299