Contract Intensity of National Economies (CINE), version 2011.2.15

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SUMMARY: The contract intensity of national economies are gauged annually from 1960 to 2000. The data are constructed primarily from raw data on life insurance contracts in force obtained from Thorsten Beck and Ian Webb, "Economic, Demographic, and Institutional Determinants of Life Insurance Consumption across Countries" (*World Bank Economic Review*, Vol. 17, No. 1, June 2003, pp. 51-88).

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Variables

(1)	CCODE	Correlates of War country code
(2)	YEAR	Year
(3)	CIE	Contract Intensive Economy, continuous
(4)	CIEbinary	Contract Intensive Economy, binary
(5)	Imputed	Indicates imputed values in CIE

Steps for Replicating the Data

All the steps below can be replicated with the data Stata Do file; below the steps taken in this file are explained.

1. Annually aggregated data on life insurance contracts in force (in constant US dollars) from 1960 to 2000 were obtained using the LIFEDEER variable from Beck and Webb (2003). Missing LIFEDEER values were previously interpolated (adding 9 data points) and then imputed using the LIFEDENS variable (life insurance contracts in force in real US dollars) (adding 21 data points).

2. Data on life insurance are available for 65 of the 185 nations identified as sovereign by the Correlates of War Project (Small and Singer 1982) and in the Penn World Tables data (Heston et al. 2002) with populations over 500,000 during the 1960 to 2000 period (leaving 64 of the 157 nations available for analysis constrained by the Polity IV data, Marshall and Jaggers 2003). However, the missing data are believed to be non-random, since governments of nations with contract-intensive economies are expected to be far more likely than other governments to produce and make available economic data (Mousseau 2009: 66). The systematic difference of the missing data from the known data is confirmed with validity tests, which show that most nations with low levels of private consumption and investment (Heston et al. 2002)—a rough reflection of contract-intensive economy—are not recorded in the life insurance data. Gary King and colleagues have shown that if missing data are not random in some known way it is best to use this knowledge in order to estimate missing values (King et al. 2001). Below, the continuous and dichotomous variables for contract-intensive economy make divergent assumptions regarding missing values.

3. **Contract Intensive Economy, binary (CIEbinary)**. The bimodal distribution of the LIFEDEER variable logged means that there are fewer nations near the median than elsewhere. This makes the median (4.173) the most probable error-free cut-off point for creating the binary measure CIEbinary, given that we have no other reason to choose any other point in the scale. Table 1 lists the nations identified as having contract-intensive economies from 1960 to 2000.

Table 1. Nations with Contract-Intensive Economies, 1960 to 2000.[±]

Australia	1960	Austria	1973
Belgium	1960	Israel	1973
Canada	1960	Ireland	1979
Denmark	1960	South Africa	1979
Netherlands	1960	Singapore	1982
New Zealand	1960	South Korea	1983
Norway	1960	Taiwan	1984
Sweden	1960	Spain	1986
Switzerland	1960	Italy	1987
United Kingdom	1960	Cyprus	1988
United States	1960	Portugal	1991
German Federal Republic	1961	Greece	1992
Finland	1963	Chile	1993
Japan	1963	Malaysia	1994
France	1965	Slovenia	1995

[±]Years after 1960 indicate years of transition to contract-intensive economy.

The data appear to be most inclusive over the years 1979 to 1998. Four nations enter the data in 1979 with levels of contracting above the median: Ireland, Netherlands, New Zealand, and South Africa. Data for these economies were imputed backwards using available data as discussed below; as were the years 1999 and 2000 for several nations with contract-intensive economies.

After the above operations were complete, examination of the data revealed three cases of that required manual correcting. Two are cases where CIEbinary equaled ‘1’ but slipped to ‘0’ for only one year (Slovenia in 1998 and Israel in 1985); the third case involves a nation at ‘0’ that slipped to ‘1’ for only one year (Panama in 1986). Since all three of these cases lasted for only one year it is assumed these are statistical flukes rather than real socioeconomic transitions, and the data points for these three nation-years were smoothed by setting CIEbinary to the values surrounding these years.

4. **Contract Intensive Economy (CIE)**. The Contract Intensive Economy (CIE) variable is the natural log of LIFEDEER +1 (+1 one to facilitate logging of values less than 1), with missing values imputed from available data. Tests confirm that the following factors yield an imputed measure that correlates at 0.97 with the original data:

a. *Per capita private consumption (kc) and investment (ki)*. Obtained from the Penn World Tables (Heston et al. 2002). Private consumption and investment data were calculated using real gross domestic product per capita as reported in constant dollars using the RGDPL (L for Laspeyres) variable and the KC (percentage share of RGDPL in private consumption) and KI (percentage share of RGDPL in private investment) variables.

b. *Ratios of KC and KI to foreign trade*. Percentage of economy in foreign trade obtained using the *OpenK* variable in the PWT data.

c. *Energy consumption per capita*. COW Index of National Capability (Singer et al. 1972). Function form non-linear: logged and not-logged measures both included.

d. *Communist economy.* Nations identified as having a communist economy from 1960 to 1991 are: Albania, Bulgaria, China, Cuba, Czechoslovakia, East Germany, Hungary, Laos, Mongolia, Poland, Romania, the Soviet Union, Vietnam, and Yugoslavia. Most communist countries began allowing limited contracting after 1991. A clear exception is North Korea, which is identified as having a communist economy throughout the period 1960 to 2000.

e. *Post-communist economy*. Nations identified as having a post-communist economy are all post-1991: Afghanistan, Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, China, Croatia, Cuba, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Laos, Latvia, Lithuania, Moldova, Mongolia, Poland, Romania, Russia, Slovakia, Slovenia, Serbia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, and Vietnam.

f. *Oil-export dependency*. Binary variable (=1 if oil exports > 1/3 of all merchandise exports) obtained from James Fearon and David Laitin (2003), with missing values extrapolated or filled in using data from the World Bank's *Fuel Exports* variable (World Bank 2010) and the *CIA World Factbook*.

g. *Population*. Function form non-linear: logged measure included with the measure *Microstate*, to consider the special characteristics of micro-states. *Microstate* is calculated as the natural log (+1) of the inverse of population for states with populations smaller than one million inhabitants.

h. *Various controls for regions and sample size variations that occur over time*.
    i. Year.
    ii. Dummy variables capturing changes in sample size of the life insurance data over time: 1960 to 1978 (null set); 1979-80; 1981-85; 1986; 1987-91; 1992; 1993-98; and 1999-2000.
    iii. Variables aimed at capturing changes in overall sample size over time: 1960-70 (linear 11 pt count, as sample size increases linearly in this decade); 1971-74 (linear 5 pt count); 1975-1983 (linear 8 pt count); 1984-88 (dummy); 1989 (dummy); 1990-91 (linear 3 pt count); 1992 (dummy, null set); 1993-94 (linear 3 pt count); 1995-98 (dummy); 1999 (dummy); 2000 (dummy).
    iv. Regions are identified by COW: Africa, America, Asia, Middle-east, and West. Because the Stata imputation command has a maximum number of variables that can be used, only the dummy for Middle-east was ultimately retained, as this was the only regional variable that was significant in preliminary tests.

5. **Imputed**. Indicates CIE data points that are imputed.

6. **Dropping of micro-states**. Imputed data for nations with populations less than 500,000 were set to missing. Economic data are less reliable indicators of political economy in micro-states, due to off-shore banking and tax rules, and the presence of expatriate communities from contract-intensive nations.

7. **Note**. Because CIE and CIEbinary are calculated in different ways, there are a small number of cases where CIE is estimated at above the median (4.173) and where CIEbinary equals 0 (for contract-poor). These are Panama 1986 (discussed above); Greece 1972-78 (enters the life insurance data in 1979 as contract-poor); Singapore 1965-78 (enters the life insurance data in 1979 as contract-poor); Mauritius 1997-00; and United Arab Emirates in the year 2000. In all cases CIE is close to the median, so the CIE and CIEbinary measures are not substantively inconsistent.

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