

There is a great body of literature hypothesizing that differences in economic prosperity can be traced to the legal systems of countries. Some research has posited that countries with a legal system originating in the English common law tradition have enjoyed greater per capita growth than countries whose legal systems originated in the French civil law tradition, deriving from the European civil codes, especially the Napoleonic Code. This appendix explores whether legal origins affect the performance of countries on the DB indicators. The results show that common law countries perform better in four indicators, yet differences wane in two of them as additional control variables are included.¹

Regression analysis was performed using the 32 subindicators that feed the 10 indicators. The subindicators served as the dependent variable. The controls variables included were income per capita and a dummy variable for civil law legal origin. The results are displayed in table D.2. The 175 countries in *Doing Business 2007* were coded into five categories according to legal origin²: common law (59), civil law (76), German (20), Nordic (5), and Socialist (11). Four of the 175 countries were excluded because their legal origin was not clear. When testing for differences between common and civil law origin, the sample was limited to those 135 countries.

There are 4 indicators and 13 subindicators where civil law countries perform significantly worse than common law countries. These are:

- The four subindicators that comprise the *starting a business* indicator
- The director liability index and shareholder suits index that comprise *protecting investors*

- Three of the indicators for *employing workers*: rigidity of hiring index, rigidity of hours index, and rigidity of firing index
- The legal rights subindicator under the *getting credit* indicator.

In addition, the number of procedures and time under the *paying taxes* and the time under *dealing with licenses* indicators are significantly different, favoring common law countries. The only indicator that favors countries with a civil law origin is the credit information index in *getting credit*. This, according to Djankov and others (2006), can be attributed to the presence of a public credit registry in countries with a French civil law tradition. Differences in all other subindicators are not statistically significant.

What Explains the Differences?

The four subindicators in *starting a business*—number of procedures, time, cost, and minimum capital requirement—are significantly higher in French-origin countries. It is plausible that in the case of the first three, the differences are a result of the participation of notary publics in the business registration process.

The differences in *protecting investors* and *getting credit* could also be attributed to legal origin, since the Napoleonic Code deals with commercial procedures, among other issues. However, there are no statistically significant differences between the two groups of countries in any of the subindicators for *enforcing contracts*, which could have been plausibly attributed directly to differences in legal origin as well.

The differences in *employing workers* are not as

easy to understand, since the Napoleonic Code does not delve deeply into this issue. A general hypothesis could be that, on average, countries with a civil law tradition favor direct supervision of markets. In this case, civil law countries would prefer more government regulation to protect the rights of workers.

The differences in *paying taxes* are also not easy to understand, since the number of payments and the time it takes to file taxes would depend more on the efficiency of tax collection than legal origin. For instance, DB rewards countries with full online filing by counting the tax as paid once a year, even if the payment is more frequent.

Controlling for Additional Factors

As a second stage of the analysis, additional control variables were introduced to test the robustness of the differences in DB indicator rankings, specifically for the *employing workers* and *paying taxes* indicators. For example, the difference in ratings for the *employing workers* indicator may reflect the preference for greater social welfare, specifically in continental European countries. Similarly, on *paying taxes*, the differences may reflect the level of efficiency of the state. In sum, the differences based on legal origin for *employing workers* are somewhat less robust, and disappear for *paying taxes* once other factors are accounted for. (The analysis is summarized in table D.1 and detailed in Attachment D.1.)

Table D.1: Differences between Countries Based on Legal Origin on *Employing Workers* and *Paying Taxes* Wane after Adding Other Control Variables

Controls	Employing workers		
	Difficulty of hiring	Difficulty of firing	Rigidity of hours
1) None	Significant (99%)	Significant (99%)	Significant (99%)
2) Welfare variables (individually and together)	Not significant	Significant (99%)	Significant (99%)
3) Welfare variables (excluding small countries)	Significant (99%)	Not significant	Significant (99%)
4) Continental Europe	Significant (95%)	Significant (95%)	Significant (95%)
5) Income group (with welfare controls)			
• High income	Significant (95%)	Significant (95%)	Significant (95%)
• Upper-middle income	Not significant	Not significant	Significant (95%)
• Lower-middle income	Significant (95%)	Not significant	Significant (95%)
Controls	Paying taxes		
	No. of procedures	Time	Total tax rate
1) None	Significant (95%)	Significant (95%)	Not significant
2) Revenue collection proxy	Not significant	Not significant	Not significant

ATTACHMENT D.1: RESULTS OF REGRESSION ANALYSIS FOR TEST DIFFERENCES
 BASED ON LEGAL ORIGIN ON *EMPLOYING WORKERS* AND *PAYING TAXES*

Employing Workers

Controlling for welfare preferences. A possible explanation for the differences in *employing workers* could be the preferences for more social welfare in countries with a civil law tradition. To proxy for this, aside from income per capita, three additional control variables were introduced into the regression: (a) revenue as a share of GDP,³ (b) tax revenue as a share of GDP, and (c) public health and education expenditures as a share of GDP.⁴ When these are included individ-

ually in the regression, the difference between common and civil law legal origin countries is statistically significant (99 percent level) on two subindicators—difficulty of hiring and rigidity of hours. The significance of the differences in the difficulty of firing index depends on the control variable. The results do not change if revenue or tax revenue is used simultaneously with health and education spending in the regression.

Subindicator	Scale (0 is best)	Common vs. civil law legal origin subindicators for <i>employing workers</i>			Significance of difference between countries of common and civil law legal origin, controlling for income per capita and—		
		Common law average	Civil law average	Difference	Total revenue as share of GDP	Tax revenue as share of GDP	Public health and education spending as share of GDP
Difficulty of hiring index	0 – 100	17.0	46.2	29.2	0.99	0.99	0.99
Rigidity of hours index	0 – 100	20.7	48.7	28.0	0.99	0.99	0.99
Difficulty of firing index	0 – 100	20.4	40.0	19.6	Not significant	Not significant	0.99
Firing costs (weeks of wages)	0 – infinity	58.3	51.3	–7.0	Not significant	Not significant	Not significant
Number of observations		59	76		135	135	135

Creating a continental Europe origin group. The analysis has so far excluded Nordic (Denmark, Finland, Iceland, Norway, and Sweden) and German legal origin countries (Austria, Germany, Switzerland, and Eastern European countries). It can be argued that these countries might have similar preferences for the level of taxation and the provision of public goods as do French origin countries. Therefore, a new group was created, continental Europe, which

adds civil law legal origin countries with the German and Nordic countries of Europe. When this group is paired against common law countries, all differences in the values of the subindicators remained statistically significant, at least at a 95 percent level. That is, on average, countries with common law legal origin continue to perform better in all three subindicators—difficulty of hiring, of firing, and rigidity of hours.

Subindicator	Continental European vs. English legal origin				Significance of difference between common law and continental European legal origin countries, controlling for income per capita and–		
	Scale (0 is best)	Common law average	Continental European legal origin		Total revenue as share of GDP	Tax revenue as share of GDP	Public health and education spending as share of GDP
			average	Difference			
Difficulty of hiring index	0 – 100	17.0	43.3	26.3	0.99	0.99	0.99
Rigidity of hours index	0 – 100	20.7	49.2	28.5	0.99	0.99	0.99
Difficulty of firing index	0 – 100	20.4	38.3	17.9	0.95	0.95	0.99
Firing costs (weeks of wages)	0 – infinity	58.3	45.7	–12.6	Not significant	Not significant	Not significant
Number of observations		59	98		81	79	93

Stratifying by income group. The analysis was also performed by income group because associations with the welfare variables could be influenced by a country's revenue-collecting capacity. When controlling for the three welfare state proxies for the high-income-country group, differences

between legal origins for the three subindicators are still statistically significant. The hypothesis that there are differences between the rigidity of labor laws in common law and continental European tradition high-income countries, as measured by DB, cannot be disproved.

Subindicator	Limiting to high-income countries, N=30				Significance of difference between common law and continental European legal origin countries, controlling for income per capita and–		
	Scale (0 is best)	Common law average	Continental European legal origin		Total revenue as share of GDP	Tax revenue as share of GDP	Public health and education spending as share of GDP
			average	Difference			
Difficulty of hiring index	0 – 100	5.5	33.3	27.8	0.95	0.95	0.95
Rigidity of hours index	0 – 100	13.3	48.9	35.6	0.99	0.99	0.99
Difficulty of firing index	0 – 100	5.9	32.2	26.3	0.99	0.99	0.99
Firing costs (weeks of wages)	0 – infinity	37.6	29	–8.6	Not significant	Not significant	Not significant
Number of observations		12	18		23	24	24

When the analysis is performed on the upper-middle-income group, only the rigidity of hours

index continues to be statistically higher in countries with a continental European origin.

Subindicator	Limiting to upper-middle-income countries, N=34				Significance of difference between common law and continental European legal origin countries, controlling for income per capita and–		
	Scale (0 is best)	Common law average	Continental European legal origin		Total revenue as share of GDP	Tax revenue as share of GDP	Public health and education spending as share of GDP
			average	Difference			
Difficulty of hiring index	0 – 100	0 – 100	15.7	40.1	24.4	Not significant	Not significant
Rigidity of hours index	0 – 100	0 – 100	16.7	51.8	35.1	99	95
Difficulty of firing index	0 – 100	0 – 100	19.2	39.1	19.9	Not significant	Not significant
Firing costs (weeks of wages)	0 – infinity	0 – infinity	43.7	42.4	–1.3	Not significant	Not significant
Number of observations			12	22		20	18

However, in the case of lower-middle-income countries, it is the difficulty of hiring index that continues to be statistically greater in continental law origin countries after controlling for proxies

of the welfare state. The significance of differences for the rigidity of hours index and the difficulty of firing index wane when welfare proxies are added.

Subindicator	Limiting to lower-middle-income countries, N=47				Significance of difference between common law and continental European legal origin countries, controlling for income per capita and–		
	Scale (0 is best)	Common law average	Continental European legal origin		Total revenue as share of GDP	Tax revenue as share of GDP	Public health and education spending as share of GDP
			average	Difference			
Difficulty of hiring index	0 – 100	12.6	44.9	32.3	0.99	0.99	0.95
Rigidity of hours index	0 – 100	20	43	23	Not significant	Not significant	0.95
Difficulty of firing index	0 – 100	12.9	39.1	26.2	Not significant	Not significant	Not significant
Firing costs (weeks of wages)	0 – infinity	40.9	58.6	17.7	Not significant	Not significant	Not significant
Number of observations		14	33		25	24	24

In the low-income group, only the rigidity of hours index continues to be statistically higher in countries with a continental European origin after controlling for proxies of the welfare state.

Nevertheless, in this particular group, the information for the control variables is scarce, which led to only using 13 or 17 observations in the regressions.

Subindicator	Limiting to low-income countries, N=46				Significance of difference between common law and continental European legal origin countries, controlling for income per capita and–		
	Scale (0 is best)	Common law average	Continental European legal origin		Total revenue as share of GDP	Tax revenue as share of GDP	Public health and education spending as share of GDP
			average	Difference			
Difficulty of hiring index	0 – 100	27.2	51.4	24.2	Not significant	Not significant	Not significant
Rigidity of hours index	0 – 100	27.6	55.2	27.6	0.95	0.99	0.99
Difficulty of firing index	0 – 100	34.3	40.8	6.5	Not significant	Not significant	Not significant
Firing costs (weeks of wages)	0 – infinity	90.1	44.2	–45.9	Not significant	Not significant	Not significant
Number of observations		21	25		13	13	17

The results of these regressions do not change substantially when comparing common law versus civil law origin instead of continental European. Although some of the differences remain despite the inclusion of the control variables, the disappearance of some could be evidence that other factors aside from legal origin are important for explaining performance on the *employing workers* indicator.

Controlling for small-country outliers. Some small countries in the sample have unusually high values for the welfare control variables. Therefore, countries with a population of less than 2 million (the Bank's suggested definition of a small country) were excluded from the analysis. Once the proxies for the welfare state were added and small countries were excluded, the differences in the difficulty of firing index were not statistically significant.

Subindicator	Excluding countries with population of less than 2 million				Significance of difference between common law and continental European legal origin countries, controlling for income per capita and—		
	Scale (0 is best)	Continental		Difference	Total revenue as share of GDP	Tax revenue as share of GDP	Public health and education spending as share of GDP
		Common law average	European legal origin average				
Difficulty of hiring index	0 – 100	18.9	44.2	25.3	0.99	0.99	0.99
Rigidity of hours index	0 – 100	23.3	49.4	26.1	0.99	0.99	0.99
Difficulty of firing index	0 – 100	25.3	36.1	10.8	Not significant	Not significant	Not significant
Firing costs (weeks of wages)	0 – infinity	76	43.8	–32.2	Not significant	Not significant	0.95
Number of observations		36	84		71	68	74

Paying Taxes: Controlling for Additional Factors

Two of the subindicators for *paying taxes*, number of payments and time, are statistically significantly higher in civil law countries than in common law

countries. However, these differences could be attributed to the government's efficiency in tax collection. When an additional control variable, tax revenue as a share of GDP, is introduced into the regression, the differences cease to exist.

Subindicator	Scale	Controlling for income per capita and tax revenue as share of GDP		Difference	
		Common law average	Civil law average		
Payments (number)	0 – infinity	28.9	37.2	8.3	Not significant
Time (hours)	0 – infinity	207.1	314.5	107.4	Not significant
Total tax rate (% profit)	0 – infinity	46.9	57.3	10.4	Not significant

Table D.2: Regression Results for Common and Civil Law Countries at the Subindicator Level

Indicator	Subindicator	Scale	Common law average	Civil law average	Difference	Significance of difference after controlling for income per capita - Oct. 2007
Starting a business	Procedures (number)	0 – infinity	8.2	10.9	2.6	0.99
	Time (days)	0 – infinity	37.8	64.2	26.4	0.95
	Cost (% of income per capita)	0 – infinity	44.4	96.3	51.9	0.99
	Min. capital (% of income per capita)	0 – infinity	16.0	154.1	138.1	0.99
Dealing with licenses	Procedures (number)	0 – infinity	16.5	18.6	2.1	Not significant
	Time (days)	0 – infinity	190.8	231.4	40.6	0.95
	Cost (% of income per capita)	0 – infinity	539.6	693.7	154.1	Not significant
Employing workers	Difficulty of hiring index	0 (best) – 100 (worst)	17.0	46.2	29.2	0.99
	Rigidity of hours index	0 (best) – 100 (worst)	20.7	48.7	28.0	0.99
	Difficulty of firing index	0 (best) – 100 (worst)	20.4	40.0	19.6	0.99
	Firing costs (weeks of wages)	0 – infinity	58.3	51.3	–7.0	Not significant
Registering property	Procedures (number)	0 – infinity	6.2	6.5	0.3	Not significant
	Time (days)	0 – infinity	78.3	88.7	10.4	Not significant
	Cost (% of property value)	0 – infinity	6.9	8.4	1.5	Not significant
Getting credit	Credit information index	0 (worst) – 6 (best)	1.9	2.8	0.9	0.99
	Legal rights index	0 (worst) – 10 (best)	5.3	3.4	–1.9	0.99
Protecting investors	Disclosure index	0 (worst) – 10 (best)	4.9	4.8	–0.1	Not significant
	Director liability index	0 (worst) – 10 (best)	5.5	3.3	–2.1	0.99
	Shareholder suits index	0 (worst) – 10 (best)	6.5	4.7	–1.8	0.99
Paying taxes	Payments (number)	0 – infinity	28.9	37.2	8.3	0.95
	Time (hours)	0 – infinity	207.1	314.5	107.4	0.99
	Total tax rate (% profit)	0 – infinity	46.9	57.3	10.4	Not significant
Trading across borders	Documents for export (number)	0 – infinity	7.1	7.7	0.6	Not significant
	Time for export (days)	0 – infinity	25	29.6	4.6	Not significant
	Cost to export (US\$ per container)	0 – infinity	1,128.1	1,298.6	170.5	Not significant
	Documents for import (number)	0 – infinity	8.3	9	0.7	Not significant
	Time for import (days)	0 – infinity	30.2	35.7	5.5	Not significant
	Cost to import (US\$ per container)	0 – infinity	1,340.4	1,529.7	189.3	Not significant
Enforcing contracts	Procedures (number)	0 – infinity	38.1	39.1	1.0	Not significant
	Time (days)	0 – infinity	609.2	672.7	63.5	Not significant
	Cost (% of debt)	0 – infinity	33.2	40.9	7.7	Not significant
Closing a business	Recovery rate (cents on the dollar)	0 to \$1.00	32.2	24.1	–8.0	Not significant

Note: N = civil law, 76; common law, 59; significant levels set at 95 percent or higher.