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**Financial System Structure and  
Economic Development:  
Structure Matters**

by O. Emre Ergungor



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## **Financial System Structure and Economic Development: Structure Matters**

by O. Emre Ergungor

This paper investigates how the structure of a financial system—whether it is bank or market oriented—affects economic growth. In contrast to earlier research, which indicates that the financial system's structure is irrelevant for growth, I find that countries grow faster when they have flexible judicial system and more market-oriented financial systems.

**JEL Classification:** G0, K2, O4

**Key Words:** economic growth, judicial flexibility, banks, stock market, financial development

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# I Introduction

Are bank-based or market-based financial systems better for promoting long-run economic growth? A series of recent papers finds that the structure of the system is irrelevant. Neither type is more effective than the other at promoting growth; what matters is the financial system's overall level of development (see, for example, Rajan and Zingales, 1998a; LaPorta et al., 2000; Beck et al., 2000; Levine et al., 2000; Beck et al., 2001; Levine, 2002). The evidence I provide in this paper contradicts the first observation. I find that after controlling for the effect of overall financial development on growth, the structure of the financial system still matters; when countries have flexible judicial systems, which can adapt laws to changing economic conditions, markets are better than banks in promoting long-run economic growth. In inflexible systems, the advantage of markets disappears.

So, there is a discrepancy with the earlier studies because I factor in judicial flexibility. Beck et al. (2003) show that legal origin matters in financial development because legal traditions differ in their ability to adapt. This appears to be the most economically meaningful factor that sets legal traditions apart —compared to the differences in property rights protection. Ergungor (2003) shows that in civil-law countries where judges lack interpretive flexibility (i.e., the ability to adapt by interpreting the laws and creating new rules), financial systems are bank-oriented. The reason is that in inflexible judicial systems, the risk of an unfair verdict makes the writing of one-time

bilateral (market) contracts problematic. Banks emerge in civil-law countries as institutions that can resolve conflicts using their market power and enforce contracts without court intervention.<sup>1</sup>

Based on these observations, I argue in this paper that in an inflexible judicial environment, banks' vital role in the economy as contract enforcers makes them an important engine for economic growth. In other words, the positive influence of markets on growth disappears in these economies because banks assume additional roles to compensate for the inflexibility of the judicial system. As flexibility increases, this role becomes less critical and the advantage of a market-based system becomes apparent.

This paper also investigates the channels through which judicial flexibility and financial structure influence output growth; namely the growth of the capital stock and productivity. I find that the main channel linking judicial flexibility and output growth runs through the growth of the capital stock. A flexible judicial system together with a market-oriented financial system induces more capital-intensive investment. Although the connection between liquid markets and a high rate of capital stock growth is well-established (see, for example, Levine and Zervos, 1998), the observation that markets are better than banks only in flexible judicial environments is new.

The rest of the paper is organized as follows. Section II describes the data. Section

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<sup>1</sup>Also see Rajan and Zingales (1998b), LaPorta et al. (2000), Johnson et al. (2000), and Egli et al. (2001). The source of the civil-law courts' inflexibility is deeply rooted in history. See, for example, Glaeser and Shleifer (2002), Ergungor (2003) and Beck et al. (2003) for the historical background.

III presents the results from cross-country regressions. Section IV concludes.

## II Data and Method

I estimate a model that expresses real per capita GDP growth (*Growth*), the growth rate of the per capita capital stock (*Cap\_Growth*) and productivity growth (*Prod\_Growth*) as a function of overall financial development measured by the activity of markets *and* banks (*Fin\_Dev*).<sup>2</sup> I also include the structure financial system, which is measured by the activity of markets *relative to* banks (*Fin\_Str*; higher values indicate more dominant markets), the flexibility of the judicial system (*Flexibility*), and a number of economic, social, and political factors listed in Table 1. Simple correlations are presented in Table 2.

I use two estimation techniques. The first is ordinary least squares using White’s heteroscedasticity-robust standard errors. The regression is of the form:

$$\begin{aligned} \text{Growth} = & \alpha + \beta_{fin}Fin\_Dev + \beta_{str}Fin\_Str + \beta_{str \times flex}Fin\_Str \times Flexibility \quad (1) \\ & + \beta_{flex}Flexibility + \beta'[Control\ Variables] + \epsilon \end{aligned}$$

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<sup>2</sup>I study the growth rate of per capita GDP in the 1980–1995 period. Using a longer time horizon such as 1960–1995 does not have any material effect on the results. To obtain productivity growth, Levine and Zervos (1998) let per capita output growth equal  $\kappa(\text{per capita capital stock growth})+(\text{productivity growth})$ . After obtaining output and capital stock growth data, they set the capital share parameter equal to 1/3 and compute productivity growth as a residual. It is a reasonable measure given the large number of countries and I use it in this paper.

As Beck et al. (2001) and Levine (2002) point out, pure size of the financial system is not a robust predictor of growth. It is the liquidity that matters. That is why I use an activity measure that includes total value traded in the stock market rather than a size measure that would include market capitalization (see Table 1 for more details). *Flexibility* captures how much flexibility judges have in their decision making. It is calculated as one minus the “Legal Justification” index developed by Djankov et al. (2003) that measures the level of legal justification required in the legal process.<sup>3</sup> If complaints and/or rulings must be justified by statutory law, the legal system has low *Flexibility*. The intuition is that the requirement to explain the ruling with reference to the word of law shows how difficult it is for the court system to move beyond the law and adapt itself to changing conditions without legislative action. Also, if the legal system forbids the judge to justify her judgment in equity, the system has low *Flexibility* (equity is justice given according to the judge’s conscience; see Mattei, 2000).<sup>4</sup> “Legal Justification” has also been used by Beck et al. (2003) as a measure of “inflexibility”. I change it to a “flexibility” measure by subtracting it from one.<sup>5</sup>

The interaction term explains how judicial flexibility influences the effect of financial

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<sup>3</sup>Djankov et al. (2003) measure the degree of legal justification required in two cases: eviction of a tenant and check collection. To capture the overall flexibility of the system, I use the average of the two measures.

<sup>4</sup>See Table 1 for a more detailed definition and Table 3 for country values.

<sup>5</sup>I do this conversion because I prefer to talk in terms of flexibility rather than inflexibility. It has no impact on the results.



system structure on growth. Bank (relationship)-based systems are superior to market-based systems in economies where courts' extreme obedience to the word of law leads to unfair rulings and increases contracting costs for individual investors. So, I expect to see a relatively less significant role for markets in countries where equity is not allowed to be the basis of judgment. In other words, I expect  $\beta_{str \times flex}$  to be positive. Note that I include in the analysis a measure of each country's rule of law tradition (*Law*) as well as the integrity of its judicial system (*Jud\_Efficiency*) to make sure that *Flexibility* is not simply capturing the efficiency of the legal environment.

My second estimation technique controls for potential simultaneity. The first stage consists of estimating the predicted values for *Fin\_Dev* and *Fin\_Str*. I follow the three steps described below to obtain the predicted values:

1. For each variable, I choose the instruments that have the greatest explanatory power measured by Adjusted R-square. This approach allows me to explain the variability of the endogenous variables to the greatest extent possible. This is important, as the predicted values are used as regressors in the next stage.
  - The set that best explains *Fin\_Dev*,  $\mathbf{x}_1$ , consists of Shareholder, GDP, Government, Inflation,  $\Delta$ Inflation, Ethnic, Creditor, BlackMarket, and Common
  - The set that best explains *Fin\_Str*,  $\mathbf{x}_2$ , consists of Assassination, GDP, Government, Inflation,  $\Delta$ Inflation, School, BlackMarket, Trade, and Common

2. Using a Chow-test, Ergungor (2003) finds that common-law and civil-law countries have different economic environments, where some economic and political factors have dissimilar effects on the financial system. I run a Chow-test to control for this possibility. Note that in the following regressions,  $\mathcal{X}_1$  and  $\mathcal{X}_2$  do not contain ‘Common’.

- I estimate

$$Fin\_Dev = \alpha_{1,CO} \times Common + \alpha_{1,CI} \times Civil + \beta'_{1,CO} \mathcal{X}_1 \times Common + \beta'_{1,CI} \mathcal{X}_1 \times Civil + \epsilon$$

where Civil is one minus Common. Then, I test the restriction  $\beta'_{1,CO} - \beta'_{1,CI} = \mathbf{0}$ . The restriction is *rejected* at 1 percent.

- I estimate

$$Fin\_Str = \alpha_{2,CO} \times Common + \alpha_{2,CI} \times Civil + \beta'_{2,CO} \mathcal{X}_2 \times Common + \beta'_{2,CI} \mathcal{X}_2 \times Civil + \epsilon$$

Then, I test the restriction  $\beta'_{2,CO} - \beta'_{2,CI} = \mathbf{0}$ . The restriction is *rejected* at 1 percent.

3. Because both restrictions are rejected in step 2, I use the predicted values from that step,  $\widehat{Fin\_Dev}$  and  $\widehat{Fin\_Str}$ , in the growth regression.

The growth regression is again of the form:

$$\begin{aligned} \text{Growth} = & \alpha + \beta_{fin} \widehat{Fin\_Dev} + \beta_{str} \widehat{Fin\_Str} + \beta_{str \times flex} \widehat{Fin\_Str} \times Flexibility \\ & + \beta_{flex} Flexibility + \beta'_3 \mathcal{X}_3 + \epsilon \end{aligned} \quad (2)$$

where  $\mathbf{x}_3$  contains initial per capita GDP, schooling (investment in human capital), and a standard set of identifying variables (see below). As before, I expect  $\beta_{str \times flex}$  to be positive.

### III Results

Table 4 presents the results from the OLS regressions (1). Overall financial development promotes output growth ([1]). But financial system structure does matter. Keeping financial development constant, countries that have market-oriented financial systems grow faster if they have flexible judicial systems ([2]-[9]). The surprising result is that when I control for the structure of the financial system, the importance of overall development disappears.

Keeping the level of judicial flexibility constant at 0.33 (lowest level of flexibility in the high-flexibility sample; see Table 3), a one standard deviation increase in the relative market activity (1.2) adds 1.4 percentage points —significant at 5 percent— to the annual growth rate of the real per capita GDP using the *largest* estimate in [5]. This corresponds to 85 percent of the mean growth rate in the sample. However, a low level of flexibility ( $Flexibility=0$ ) destroys the positive impact of more active markets and creates an environment in which financial system structure is irrelevant. In other words, banks assume a greater role in the economy as courts become less flexible and overshadow the markets.

Yet one must be cautious in interpreting the OLS results because they do not take simultaneity into consideration. In Table 5, I present the IV estimates. The results are fundamentally the same. Overall financial development promotes economic growth but its effect disappears when I control for the financial structure ([10] and [11]). In regressions [12]-[18], I control for various social, political, and economic factors. Markets are still better than banks in promoting economic growth *if* countries have flexible judicial systems. Keeping the level of judicial flexibility constant at 0.33 and using the *largest* estimate in [17], a one standard deviation increase in  $\widehat{Fin\_Str}$  (0.8) adds 1.15 percent to the real per capita GDP growth rate —significant at 5 percent. Even when I use the smallest estimate in [11], the effect is still positive (0.64) and significant.

In Table 6, I analyze the channels that link flexibility and financial structure to output growth. There are four crucial observations. First, overall financial development matters for capital stock growth but not for productivity growth. Because of the low capital share parameter (1/3), the positive effect of development disappears in the output-growth regressions. Second, in an inflexible judicial environment (*Flexibility*=0), the negative estimate for  $\beta_{Fin\_Str}$  indicates that bank-oriented systems are robustly associated with high levels of capital stock growth. As flexibility increases, however, the positive  $\beta_{Fin\_Str \times Flexibility}$  suggests that financial systems dominated by liquid markets induce more capital-intensive investment. Third, judicial flexibility is robustly correlated with capital stock growth. Fourth, neither flexibility nor its interac-

tion with financial structure matters for productivity growth. Markets are clearly better than banks in promoting higher-return projects that stimulate productivity growth.

As a final note, I ran influence diagnostics to make sure that a small number of observations do not have a large influence on the parameter estimates (available upon request). Deleting odd countries such as Ghana and Trinidad and Tobago (extremely high flexibility values) does not alter the results. The conclusions are not driven by influential observations.

## **IV Conclusion**

This paper finetunes the standard growth model commonly used in the literature. I use a conditioning variable set that accounts for various political, economic, and social factors, particularly the flexibility of judicial decision making.

The results contrast sharply with those in earlier papers. Financial system structure matters for economic growth. Markets are better than banks in stimulating the economy in countries with flexible judicial systems. In fact, the importance of financial structure overwhelms the importance of overall financial development in output growth regressions. Although financial development still has a positive and significant impact on capital stock growth, productivity seems to be influenced only by the structure of the financial system.

These results have interesting implications. For example, as continental Europe

moves toward more flexible Anglo-American principles in commercial and private law (Wiegand, 1991), one would expect to see higher growth rates in those countries that shift toward larger markets. This remains to be tested.

## References

- Beck, T., Demirguc-Kunt, A., Levine, R., 2003. Law and finance: Why does legal origin matter? *Journal of Comparative Economics* (forthcoming), –.
- Beck, T., Demirguc-Kunt, A., Levine, R., Maksimovic, V., 2001. *Financial Structure and Economic Development: Firm, Industry, and Country Evidence*. The MIT Press, Cambridge: Massachusetts, Ch. 5, pp. 189–241.
- Beck, T., Levine, R., Loayza, N., 2000. Finance and the sources of growth. *Journal of Financial Economics* 58, 261–300.
- Bruno, M., Easterly, W., 1998. Inflation crises and long-run growth. *Journal of Monetary Economics* 41, 3–26.
- Demirguc-Kunt, A., Levine, R., 2001. *Financial Structure and Economic Growth: A Cross-Country Comparison of Banks, Markets, and Development*. The MIT Press, Cambridge: Massachusetts.
- Djankov, S. D., LaPorta, R., de Silanes, F. L., Shleifer, A., 2003. Courts. *Quarterly Journal of Economics* 118, 453–517.
- Egli, D., Ongena, S., Smith, D. C., 2001. On the sequencing of projects, reputation building, and relationship finance. Center for Economic Research Working Paper No. 2001-01, Tilburg University, Tilburg, The Netherlands.

- Ergungor, O. E., 2003. Market- vs. bank-based financial systems: Do rights and regulations really matter? *Journal of Banking and Finance* forthcoming, –.
- Glaeser, E. L., Shleifer, A., 2002. Legal origins. *Quarterly Journal of Economics* 117, 1193–1229.
- Johnson, S., LaPorta, R., de Silanes, F. L., Shleifer, A., 2000. Tunneling. *American Economic Review* 90, 22–27.
- LaPorta, R., de Silanes, F. L., Shleifer, A., Vishny, R. W., 1998. Law and finance. *Journal of Political Economy* 106, 1113–1155.
- LaPorta, R., de Silanes, F. L., Shleifer, A., Vishny, R. W., 2000. Investor protection and corporate governance. *Journal of Financial Economics* 58, 3–27.
- Levine, R., 2002. Bank-based or market-based financial systems: Which is better? *Journal of Financial Intermediation* 11, 398–428.
- Levine, R., Loayza, N., Beck, T., 2000. Financial intermediation and growth: Causality and causes. *Journal of Monetary Economics* 46, 31–77.
- Levine, R., Zervos, S., 1998. Stock markets, banks, and economic growth. *American Economic Review* 88, 537–558.
- Mattei, U., 2000. *Comparative Law and Economics*. The University of Michigan Press, Ann Arbor: Michigan.



Rajan, R. G., Zingales, L., 1998a. Financial dependence and growth. *American Economic Review* 88, 559–586.

Rajan, R. G., Zingales, L., 1998b. Which capitalism? lessons from the east asian crisis. *Journal of Applied Corporate Finance* 11, 40–48.

Wiegand, W., 1991. The reception of law in europe. *American Journal of Comparative Law* 39, 229–248.

Table 1: **Data Definitions**

| Variable    | Definition  | Sources                         |
|-------------|---|---------------------------------|
| Cap_Growth  | The average growth rate of real per capita capital stock over 1980-92   | Demirguc-Kunt and Levine (2001) |
| Growth      | The rate of real per capita GDP growth in the 1980-1995 period.   | Same as above.                  |
| Prod_Growth | $\text{Growth}_{1980-1992} - 0.3 \times \text{Cap\_Growth}$ . Conglomerate indicator of technological change, quality advances and resource allocation enhancements. See Levine and Zervos (1998).  | Same as above.                  |
| Fin_Dev     | Measure of the activity of stock markets <i>and</i> banks. It equals the logarithm of the value of domestic equities traded on domestic exchanges divided by GDP <i>times</i> the value of bank credits to the private sector divided by GDP.   | Same as above.                  |
| Fin_Str     | Measure of the activity of stock markets relative to that of banks. It equals the logarithm of the value of domestic equities traded on domestic exchanges <i>divided by</i> the value of deposit money bank credits to the private sector.   | Same as above.                  |
| Flexibility | Average of six dummies that indicate whether or not the complaint and ruling must be legally justified and whether the ruling must be founded on the law rather than general equity arguments in disputes related to the eviction of a tenant and check collection. It is defined as one minus the “Legal Justification” variable in Djankov et al. (2003). Higher values indicate more emphasis on equity rather than law, which means more flexibility. | Djankov et al. (2003)           |

### Data Definitions (cont'd)

| Variable                            | Definition   | Sources                         |
|-------------------------------------|--|---------------------------------|
| <i>Economic Factors</i>             |  |                                 |
| BlackMarket                         | Natural log of the ratio of the black-market exchange rate and the official exchange rate  | Demirguc-Kunt and Levine (2001) |
| GDP                                 | Natural log of real per capita GDP in 1980   | Same as above.                  |
| Government                          | Share of government expenditure in GDP   | Same as above.                  |
| Inflation                           | Log of inflation rate in 1980-1995.  | Same as above.                  |
| $\Delta$ Inflation                  | Change in the inflation rate from 1980 to 1995 to capture the fact that after a high-inflation crisis, growth accelerates as inflation drops (see Bruno and Easterly, 1998); higher values indicate an increase in inflation   | Same as above.                  |
| Trade                               | The logarithm of international trade as a share of GDP   | Same as above.                  |
| <i>Social and Political Factors</i> |  |                                 |
| Assassination                       | The number of assassinations per thousand inhabitants  | Demirguc-Kunt and Levine (2001) |
| Bureau                              | Measure of the quality of bureaucracy; high scores indicate autonomy from political pressures and strengths and expertise to govern without drastic changes in policy or interruptions in government services; also existence of an established mechanism for recruiting and training. | Same as above.                  |
| Common                              | Dummy that equals 1 if a country belongs to the common-law tradition   | Same as above.                  |
| Corruption                          | An indicator of the corruption in government; lower scores for higher corruption.  | Same as above.                  |
| Creditor                            | An index aggregating different creditor rights.  | Same as above.                  |
| Ethnic                              | Average value of five indices of ethnolinguistic fractionalization, with values ranging from 0 to 1, where higher values denote higher levels of fractionalization.  | Same as above.                  |

### Data Definitions (cont'd)

| Variable                                     | Definition  | Sources                         |
|--|---|---------------------------------|
| <i>Social and Political Factors (cont'd)</i> |   |                                 |
| French                                       | Dummy that equals 1 if a country belongs to the French civil-law tradition  | Same as above.                  |
| German                                       | Dummy that equals 1 if a country belongs to the German civil-law tradition  | Same as above.                  |
| Jud_Efficiency                               | Efficiency and integrity of the legal environment based on investors' assessments of conditions in the country in question. | LaPorta et al. (1998)           |
| Law  | Measure of the law and order tradition of a country.  | Demirguc-Kunt and Levine (2001) |
| Liberty                                      | Indicator of civil liberties; lower scores for more freedom   | Same as above.                  |
| Scandinavian                                 | Dummy that equals 1 if a country belongs to the Scandinavian civil-law tradition  | Same as above.                  |
| School                                       | Natural log of (1+ average years of schooling in total population in 1980)  | Same as above.                  |
| Shareholder                                  | An index aggregating the shareholder rights.  | Same as above.                  |
| Revolution                                   | Number of revolutions and coups d'état  | Same as above.                  |

Table 2: Simple Correlations

|                | Fin_Dev  | Fin_Str | Flexibility | Law      | GDP      | Liberty  | BlackMarket | Inflation | Δ Inflation | Trade    |
|----------------|----------|---------|-------------|----------|----------|----------|-------------|-----------|-------------|----------|
| Fin_Str        | 0.69***  | 1       |             |          |          |          |             |           |             |          |
| Flexibility    | 0.09     | 0.15    |             |          |          |          |             |           |             |          |
| Law            | 0.70***  | 0.33**  | 0.26*       | 1        |          |          |             |           |             |          |
| GDP            | 0.64***  | 0.28*   | 0.15        | 0.86***  | 1        |          |             |           |             |          |
| Liberty        | -0.44*** | -0.23   | -0.08       | -0.61*** | -0.69*** | 1        |             |           |             |          |
| BlackMarket    | -0.61*** | -0.08   | 0.23        | -0.43*** | -0.42*** | 0.31**   | 1           |           |             |          |
| Inflation      | -0.37*** | 0.11    | -0.29**     | -0.36**  | -0.19    | 0.23     | 0.37**      | 1         |             |          |
| Δ Inflation    | -0.12    | 0.01    | 0.10        | -0.05    | -0.28*   | 0.07     | 0.24        | -0.28*    | 1           |          |
| Trade          | 0.18     | -0.06   | 0.41***     | 0.18     | 0.14     | -0.09    | -0.18       | -0.42***  | 0.01        | 1        |
| Government     | 0.28*    | -0.09   | 0.31**      | 0.42***  | 0.48***  | -0.31**  | -0.30**     | -0.32**   | -0.29**     | 0.25*    |
| Corrupt        | 0.71***  | 0.39*** | 0.24*       | 0.85***  | 0.85***  | -0.64*** | -0.41***    | -0.27*    | -0.19       | 0.16     |
| Bureau         | 0.71***  | 0.40*** | 0.30**      | 0.83***  | 0.76***  | -0.61*** | -0.41***    | -0.36**   | -0.06       | 0.09     |
| School         | 0.64***  | 0.36**  | 0.20        | 0.71***  | 0.84***  | -0.67*** | -0.43***    | -0.21     | -0.44***    | 0.13     |
| Assassination  | -0.19    | 0.04    | -0.42***    | -0.45*** | -0.31**  | 0.06     | 0.01        | 0.20      | -0.08       | -0.37*** |
| Revolution     | -0.25*   | 0.02    | -0.16       | -0.47*** | -0.40*** | 0.36**   | 0.24        | 0.14      | -0.08       | -0.18    |
| Shareholder    | 0.17     | 0.15    | 0.30*       | -0.08    | -0.12    | 0.21     | 0.00        | -0.03     | -0.18       | -0.29*   |
| Creditor       | -0.07    | -0.16   | 0.27*       | -0.12    | -0.34**  | 0.22     | 0.04        | -0.26     | 0.10        | 0.20     |
| Jud_Efficiency | 0.52***  | 0.21    | 0.45***     | 0.65***  | 0.71***  | -0.67*** | -0.41***    | -0.37**   | -0.12       | 0.26*    |
| Ethnic         | -0.23    | 0.05    | 0.22        | -0.43*** | -0.55*** | 0.45***  | 0.34**      | 0.01      | 0.13        | -0.01    |

  

|                | Government | Corrupt  | Bureau   | School  | Assassination | Revolution | Shareholder | Creditor | Jud_Efficiency |
|----------------|------------|----------|----------|---------|---------------|------------|-------------|----------|----------------|
| Government     | 1          |          |          |         |               |            |             |          |                |
| Corrupt        | 0.56***    | 1        |          |         |               |            |             |          |                |
| Bureau         | 0.47***    | 0.92***  | 1        |         |               |            |             |          |                |
| School         | 0.43***    | 0.76***  | 0.67***  | 1       |               |            |             |          |                |
| Assassination  | -0.32**    | -0.34**  | -0.32**  | -0.15   | 1             |            |             |          |                |
| Revolution     | -0.28*     | -0.38*** | -0.38*** | -0.16   | 0.54***       | 1          |             |          |                |
| Shareholder    | 0.07       | 0.05     | 0.06     | 0.04    | 0.08          | 0.05       | 1           |          |                |
| Creditor       | 0.33**     | -0.10    | -0.03    | -0.28*  | -0.25         | -0.04      | 0.09        | 1        |                |
| Jud_Efficiency | 0.60***    | 0.80***  | 0.74***  | 0.76*** | -0.33**       | -0.42***   | 0.11        | 0.04     | 1              |
| Ethnic         | -0.11      | -0.30**  | -0.25*   | -0.33** | 0.23          | 0.42***    | 0.27*       | 0.33**   | -0.331**       |

\*\*\* Significant at 1 percent    \*\* Significant at 5 percent    \* Significant at 10 percent

Table 3: **Country List**

| <b>Low Flexibility</b>                 |                    | <b>High Flexibility</b>                |                       |
|--|--------------------|--|-----------------------|
| <i>Flexibility</i> Below Mean (Median) |                    | <i>Flexibility</i> Above Mean (Median) |                       |
| Argentina (0.00)                       | Ecuador (0.17)     | Chile (0.33)                           | Denmark (0.67)        |
| Austria (0.00)                         | Israel (0.17)      | Cyprus (0.33)                          | Australia (0.67)      |
| Brazil (0.00)                          | Italy (0.17)       | Finland (0.33)                         | Belgium (0.67)        |
| Colombia (0.00)                        | Japan (0.17)       | Netherlands (0.33)                     | Ireland (0.67)        |
| Egypt (0.00)                           | Sri Lanka (0.17)   | Norway (0.33)                          | Jamaica (0.67)        |
| France (0.00)                          | Switzerland (0.17) | Pakistan (0.33)                        | Kenya (0.67)          |
| Germany (0.00)                         | Thailand (0.17)    | Taiwan (0.33)                          | New Zealand (0.67)    |
| Greece (0.00)                          | Turkey (0.17)      | Tunisia (0.33)                         | Sweden (0.67)         |
| Honduras (0.00)                        |                    | Zimbabwe (0.33)                        | U.K. (0.67)           |
| India (0.00)                           |                    | U.S.A. (0.33)                          | Canada (0.83)         |
| Mexico (0.00)                          |                    | South Africa (0.50)                    | Malaysia (0.83)       |
| Panama (0.00)                          |                    |  | Ghana (1.00)          |
| Peru (0.00)                            |                    |  | Trin. and Tob. (1.00) |
| Philippines (0.00)                     |                    |  |                       |
| Portugal (0.00)                        |                    |  |                       |
| Spain (0.00)                           |                    |  |                       |

Note: *Flexibility* values are in parantheses. The mean is 0.31 and the median is 0.25. *Low Flexibility* versus *High Flexibility* classification above is intended to make it easier for the reader to see which countries rely more heavily on law. The mean (median) is an ad hoc choice.

Table 4: The Effect of Financial System Development and Structure on Economic Growth (OLS Estimates)

Dependent Variable: Real Per Capita GDP Growth (1980-1995)

|   | [1]                  | [2]                  | [3]                  | [4]                  | [5]                  | [6]                  | [7]                  | [8]                  | [9]                  |
|---|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Intercept   | 9.559***<br>(2.151)  | 7.377***<br>(1.819)  | 7.375***<br>(1.831)  | 11.330***<br>(2.113) | 9.286***<br>(2.980)  | 9.462***<br>(2.252)  | 9.687***<br>(1.902)  | 8.021***<br>(2.232)  | 6.585***<br>(2.068)  |
| Fin_Dev   | 0.286*<br>(0.147)    | -0.171<br>(0.287)    | -0.170<br>(0.285)    | -0.056<br>(0.224)    | -0.335<br>(0.304)    | -0.317<br>(0.296)    | -0.302<br>(0.308)    | -0.146<br>(0.288)    | -0.101<br>(0.292)    |
| Fin_Str   |                      | 0.342<br>(0.436)     | 0.340<br>(0.433)     | 0.386<br>(0.393)     | 0.740<br>(0.508)     | 0.711<br>(0.493)     | 0.683<br>(0.503)     | 0.296<br>(0.441)     | 0.104<br>(0.434)     |
| Fin_Str x Flexibility                                 |                      | 1.487***<br>(0.393)  | 1.488***<br>(0.394)  | 1.044**<br>(0.426)   | 1.358**<br>(0.615)   | 1.400***<br>(0.492)  | 1.466***<br>(0.481)  | 1.497***<br>(0.395)  | 1.696***<br>(0.374)  |
| Flexibility   | -1.556<br>(0.982)    | 0.721<br>(0.874)     | 0.727<br>(0.877)     | 0.361<br>(0.879)     | 0.144<br>(1.627)     | 0.343<br>(0.965)     | 0.437<br>(0.990)     | 0.878<br>(0.798)     | -0.300<br>(1.228)    |
| Law   | 0.482<br>(0.400)     | 0.702**<br>(0.326)   | 0.704**<br>(0.340)   | 0.613**<br>(0.231)   | 0.900**<br>(0.346)   | 0.887**<br>(0.351)   | 0.876**<br>(0.372)   | 0.703**<br>(0.314)   | 0.749**<br>(0.296)   |
| GDP   | -0.942**<br>(0.426)  | -0.825**<br>(0.328)  | -0.826**<br>(0.333)  | -1.295***<br>(0.311) | -1.035**<br>(0.496)  | -1.032**<br>(0.478)  | -1.068**<br>(0.433)  | -0.854**<br>(0.351)  | -0.379<br>(0.396)    |
| School  | -1.146<br>(0.846)    | -1.224<br>(0.818)    | -1.224<br>(0.816)    | -1.162<br>(0.729)    | -1.351<br>(0.850)    | -1.366<br>(0.845)    | -1.099<br>(1.066)    | -1.345*<br>(0.761)   | -1.584**<br>(0.736)  |
| Revolution  | -0.905<br>(0.705)    | -1.208**<br>(0.561)  | -1.214*<br>(0.684)   | -0.687<br>(0.480)    | -1.385**<br>(0.664)  | -1.364**<br>(0.645)  | -1.527**<br>(0.688)  | -1.086*<br>(0.557)   | -0.892<br>(0.645)    |
| BlackMarket   | 0.861<br>(1.057)     | 0.760<br>(0.816)     | 0.765<br>(0.863)     | 0.998<br>(0.728)     | -2.049<br>(2.290)    | -1.959<br>(2.127)    | -1.650<br>(2.202)    | 0.715<br>(0.811)     | 1.060<br>(0.899)     |
| Inflation   | -2.695***<br>(0.782) | -3.761**<br>(1.605)  | -3.756**<br>(1.625)  | -3.788***<br>(1.292) | -3.631*<br>(2.030)   | -3.653*<br>(2.020)   | -3.752*<br>(2.001)   | -3.620**<br>(1.629)  | -3.164**<br>(1.461)  |
| Δ Inflation   | -7.217***<br>(1.347) | -8.830***<br>(1.636) | -8.828***<br>(1.627) | -8.717***<br>(1.279) | -8.249***<br>(2.483) | -8.353***<br>(2.240) | -8.250***<br>(2.251) | -8.888***<br>(1.631) | -8.400***<br>(1.737) |
| Trade   | 0.018**<br>(0.008)   | 0.020**<br>(0.008)   | 0.020**<br>(0.008)   | 0.020**<br>(0.007)   | 0.012<br>(0.008)     | 0.011**<br>(0.005)   | 0.011**<br>(0.005)   | 0.019**<br>(0.007)   | 0.026***<br>(0.007)  |
| Government  | -0.092**<br>(0.037)  | -0.067*<br>(0.033)   | -0.067*<br>(0.033)   | -0.058*<br>(0.029)   | -0.026<br>(0.040)    | -0.031<br>(0.043)    | -0.022<br>(0.039)    | -0.068**<br>(0.033)  | -0.146***<br>(0.042) |
| Corrupt   | -0.265<br>(0.511)    | -0.880*<br>(0.443)   | -0.880*<br>(0.443)   | -0.520<br>(0.402)    | -0.588<br>(0.427)    | -0.556<br>(0.415)    | -0.557<br>(0.412)    | -0.865*<br>(0.423)   | -1.080***<br>(0.376) |
| Bureau  | 0.660**<br>(0.317)   | 1.048***<br>(0.333)  | 1.047***<br>(0.334)  | 0.918**<br>(0.341)   | 0.636**<br>(0.277)   | 0.620**<br>(0.297)   | 0.645**<br>(0.299)   | 1.023***<br>(0.328)  | 1.061***<br>(0.279)  |
| Assassination   |                      |                      | 0.008<br>(0.365)     |                      |                      |                      |                      |                      |                      |
| Ethnic  |                      |                      |                      | -2.421***<br>(0.823) |                      |                      |                      |                      |                      |
| Shareholder   |                      |                      |                      |                      | 0.035<br>(0.227)     |                      |                      |                      |                      |
| Creditor  |                      |                      |                      |                      |                      | 0.019<br>(0.124)     |                      |                      |                      |
| Jud_Efficiency  |                      |                      |                      |                      |                      |                      | -0.077<br>(0.189)    |                      |                      |
| Liberty   |                      |                      |                      |                      |                      |                      |                      | -0.068<br>(0.150)    |                      |
| French  |                      |                      |                      |                      |                      |                      |                      |                      | -1.397*<br>(0.742)   |
| German  |                      |                      |                      |                      |                      |                      |                      |                      | -1.521<br>(0.911)    |
| Scandinavian  |                      |                      |                      |                      |                      |                      |                      |                      | 0.958*<br>(0.525)    |
| Adj. R <sup>2</sup>                                   | 38                   | 51                   | 49                   | 56                   | 52                   | 52                   | 53                   | 49                   | 58                   |
| DF  | 32                   | 30                   | 29                   | 29                   | 23                   | 23                   | 23                   | 29                   | 27                   |
| $(\beta_{Str} + 0.33 \times \beta_{Str \times Flex})$ |                      | 0.83*                | 0.83*                | 0.73*                | 1.19**               | 1.17**               | 1.17**               | 0.79*                | 0.66                 |

Heteroscedasticity-robust standard errors in parentheses.

\*\*\* Significant at 1 percent \*\* Significant at 5 percent \* Significant at 10 percent

Table 5: The Effect of Financial System Development and Structure on Economic Growth (IV Estimates)

Dependent Variable: Real Per Capita GDP Growth (1980-1995)

|   | [10]                 | [11]                 | [12]                 | [13]                 | [14]                 | [15]                  | [16]                 | [17]                  | [18]                  |
|---|----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|----------------------|-----------------------|-----------------------|
| Intercept   | 12.205***<br>(3.223) | 14.499***<br>(2.972) | 15.408***<br>(3.024) | 15.049***<br>(3.102) | 15.565***<br>(2.861) | 14.315***<br>(3.105)  | 13.535***<br>(2.328) | 15.907***<br>(3.146)  | 17.856***<br>(3.209)  |
| Fin_Dev   | 0.609**<br>(0.224)   | 0.501<br>(0.320)     | 0.331<br>(0.326)     | 0.212<br>(0.342)     | 0.257<br>(0.284)     | 0.219<br>(0.350)      | 0.397<br>(0.266)     | 0.290<br>(0.307)      | 0.503<br>(0.331)      |
| Fin_Str   |                      | 0.150<br>(0.437)     | 0.478<br>(0.579)     | 0.500<br>(0.599)     | 0.547<br>(0.518)     | 0.528<br>(0.568)      | 0.376<br>(0.497)     | 0.652<br>(0.566)      | 0.273<br>(0.598)      |
| Fin_Str x Flexibility                                 |                      | 2.136**<br>(0.910)   | 2.428**<br>(1.063)   | 2.219*<br>(1.143)    | 2.538**<br>(1.049)   | 2.090*<br>(1.125)     | 2.487***<br>(0.861)  | 2.383**<br>(1.070)    | 3.019**<br>(1.208)    |
| Flexibility   | -0.634<br>(1.054)    | 4.217*<br>(2.099)    | 4.649**<br>(2.191)   | 4.149*<br>(2.314)    | 4.990**<br>(2.149)   | 3.941<br>(2.351)      | 3.315*<br>(1.887)    | 4.504*<br>(2.245)     | 5.823**<br>(2.341)    |
| GDP   | -0.755**<br>(0.354)  | -1.004**<br>(0.397)  | -1.163**<br>(0.487)  | -1.193**<br>(0.517)  | -1.165**<br>(0.470)  | -0.953*<br>(0.520)    | -0.963**<br>(0.432)  | -1.163**<br>(0.478)   | -1.318**<br>(0.483)   |
| School  | -1.010<br>(0.959)    | -1.534<br>(0.955)    | -1.924*<br>(1.064)   | -1.714<br>(1.052)    | -1.638<br>(1.178)    | -2.172**<br>(1.037)   | -1.545<br>(0.932)    | -1.989*<br>(1.029)    | -1.840<br>(1.100)     |
| Inflation   | -3.351***<br>(1.045) | -4.195**<br>(1.568)  | -4.289**<br>(1.572)  | -3.505*<br>(1.861)   | -4.625***<br>(1.468) | -4.595**<br>(1.676)   | -2.907*<br>(1.415)   | -4.778***<br>(1.538)  | -3.667**<br>(1.621)   |
| $\Delta$ Inflation                                    | -5.461***<br>(1.688) | -7.538***<br>(2.047) | -9.781***<br>(2.396) | -8.955***<br>(2.684) | -9.940***<br>(2.346) | -10.004***<br>(2.424) | -8.815***<br>(2.018) | -10.254***<br>(2.281) | -10.026***<br>(2.350) |
| Revolution  | -1.724**<br>(0.733)  | -2.182***<br>(0.732) | -1.671**<br>(0.806)  | -1.737**<br>(0.815)  | -1.921**<br>(0.850)  | -1.468*<br>(0.844)    | -1.796**<br>(0.799)  | -1.477<br>(0.893)     | -1.805**<br>(0.840)   |
| French  | 0.575<br>(0.496)     | 1.175*<br>(0.619)    | 0.962*<br>(0.510)    | 0.742<br>(0.585)     | 0.916<br>(0.552)     | 0.585<br>(0.753)      | 0.334<br>(0.597)     | 1.133**<br>(0.494)    | 0.713<br>(0.659)      |
| German  | 0.309<br>(0.791)     | 1.240<br>(0.841)     | 0.989<br>(0.657)     | 0.870<br>(0.661)     | 1.140*<br>(0.657)    | 0.622<br>(0.844)      | 0.337<br>(0.713)     | 0.983<br>(0.673)      | 0.740<br>(0.765)      |
| Scandinavian  | 0.631<br>(0.492)     | 1.907**<br>(0.758)   | 2.197**<br>(0.790)   | 1.905**<br>(0.861)   | 2.288***<br>(0.797)  | 2.004**<br>(0.822)    | 2.284***<br>(0.750)  | 2.327***<br>(0.798)   | 2.281***<br>(0.802)   |
| Bureau  |                      |                      | 0.268<br>(0.380)     | 0.167<br>(0.381)     | 0.245<br>(0.374)     | 0.227<br>(0.378)      | 0.644*<br>(0.370)    | 0.282<br>(0.392)      | 0.307<br>(0.346)      |
| Law   |                      |                      | 0.704*<br>(0.403)    | 0.723*<br>(0.404)    | 0.691<br>(0.431)     | 0.709*<br>(0.404)     | 0.685*<br>(0.366)    | 0.661<br>(0.414)      | 0.665*<br>(0.374)     |
| Corruption  |                      |                      | -0.722*<br>(0.407)   | -0.607<br>(0.443)    | -0.625<br>(0.381)    | -0.585<br>(0.442)     | -1.353***<br>(0.464) | -0.724*<br>(0.405)    | -0.784*<br>(0.391)    |
| BlackMarket   |                      |                      |                      | -2.339<br>(2.869)    |                      |                       |                      |                       |                       |
| Jud_Efficiency  |                      |                      |                      |                      | -0.135<br>(0.225)    |                       |                      |                       |                       |
| Government  |                      |                      |                      |                      |                      | -0.043<br>(0.059)     |                      |                       |                       |
| Trade   |                      |                      |                      |                      |                      |                       | 0.022***<br>(0.007)  |                       |                       |
| Assassination   |                      |                      |                      |                      |                      |                       |                      | -0.278<br>(0.449)     |                       |
| Shareholder   |                      |                      |                      |                      |                      |                       |                      |                       | -0.277<br>(0.189)     |
| Adj. R <sup>2</sup>                                   | 28                   | 30                   | 38                   | 36                   | 36                   | 35                    | 46                   | 36                    | 40                    |
| DF  | 29                   | 27                   | 24                   | 23                   | 23                   | 23                    | 23                   | 23                    | 23                    |
| $(\beta_{Str} + 0.33 \times \beta_{Str \times Flex})$ |                      | 0.86*                | 1.28**               | 1.23*                | 1.38**               | 1.22**                | 1.20**               | 1.44**                | 1.27**                |

Heteroscedasticity-robust standard errors in parentheses.

\*\*\* Significant at 1 percent \*\* Significant at 5 percent \* Significant at 10 percent



Table 6: The Effect of Financial System Development and Structure on Components of Output Growth  
(IV Estimates)

Dependent Variable: Per Capita Capital Stock and Productivity Growth (1980-1992)  
Productivity Growth=Per Capita Output Growth - 0.3 Per Capita Capital Stock Growth

|                       | Capital Growth     |                      |                     |                      |                      |                      | Productivity Growth |                  |                   |                   |                    |                    |                   |
|-----------------------|--------------------|----------------------|---------------------|----------------------|----------------------|----------------------|---------------------|------------------|-------------------|-------------------|--------------------|--------------------|-------------------|
|                       | [19]               | [20]                 | [21]                | [22]                 | [23]                 | [24]                 | [25]                | [26]             | [27]              | [28]              | [29]               | [30]               | [31]              |
| Fin_Dev               | 0.788**<br>(0.304) | 0.958***<br>(0.293)  | 0.665**<br>(0.280)  | 0.932***<br>(0.291)  | 1.007***<br>(0.275)  | 1.178***<br>(0.283)  | 0.364**<br>(0.171)  | 0.044<br>(0.272) | 0.033<br>(0.271)  | -0.023<br>(0.294) | -0.023<br>(0.250)  | 0.084<br>(0.222)   | 0.102<br>(0.291)  |
| Fin_Str               |                    | -0.991*<br>(0.516)   | -0.937*<br>(0.530)  | -0.967*<br>(0.485)   | -1.067**<br>(0.469)  | -1.253**<br>(0.500)  |                     | 0.776<br>(0.495) | 0.875*<br>(0.467) | 0.872*<br>(0.474) | 0.937**<br>(0.438) | 0.802**<br>(0.379) | 0.822*<br>(0.461) |
| Fin_Str x Flexibility |                    | 5.624***<br>(0.834)  | 5.110***<br>(0.930) | 5.662***<br>(0.858)  | 5.667***<br>(0.735)  | 6.377***<br>(0.874)  |                     | 0.741<br>(0.931) |                   |                   |                    |                    |                   |
| Flexibility           | -0.752<br>(1.519)  | 11.135***<br>(1.884) | 9.909***<br>(2.007) | 11.254***<br>(1.907) | 10.141***<br>(1.978) | 12.634***<br>(1.879) | -0.639<br>(0.777)   | 1.309<br>(1.996) | -0.272<br>(0.825) | -0.297<br>(0.815) | -0.190<br>(0.810)  | -1.395<br>(0.888)  | -0.307<br>(0.816) |
| BlackMarket           |                    |                      | -5.736**<br>(2.238) |                      |                      |                      |                     |                  |                   | -1.122<br>(2.452) |                    |                    |                   |
| Jud_Efficiency        |                    |                      |                     | -0.047<br>(0.199)    |                      |                      |                     |                  |                   |                   | -0.101<br>(0.179)  |                    |                   |
| Trade                 |                    |                      |                     |                      | 0.016**<br>(0.007)   |                      |                     |                  |                   |                   |                    | 0.017**<br>(0.006) |                   |
| Shareholder           |                    |                      |                     |                      |                      | -0.354**<br>(0.142)  |                     |                  |                   |                   |                    |                    | -0.115<br>(0.159) |
| Adj. R <sup>2</sup>   | 7                  | 40                   | 43                  | 38                   | 43                   | 44                   | 28                  | 30               | 32                | 29                | 30                 | 39                 | 30                |
| DF                    | 26                 | 24                   | 23                  | 23                   | 23                   | 23                   | 26                  | 24               | 25                | 24                | 24                 | 24                 | 24                |

For the sake of brevity, I only include the results on the variables of interest. All regressions include GDP, School, Inflation,  $\Delta$  Inflation, Revolution, French, German, Scandinavian, Bureau, Law, Corruption.

Heteroscedasticity-robust standard errors in parentheses.

\*\*\* Significant at 1 percent    \*\* Significant at 5 percent    \* Significant at 10 percent

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