



# Banking system control, capital allocation, and economy performance <sup>☆</sup>

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## ABSTRACT

We observe less efficient capital allocation in countries whose banking systems are more thoroughly controlled by tycoons or families. The magnitude of this effect is similar to that of state control over banking. Unlike state control, tycoon or family control also correlates with slower economic and productivity growth, greater financial instability, and worse income inequality. These findings are consistent with theories that elite-capture of a country's financial system can embed "crony capitalism."

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## 1. Introduction

The social purpose of the financial system is to allocate an economy's savings to their highest value uses (Schumpeter,

1912, 1942; Tobin, 1989; Aghion and Howitt, 1997; Wurgler, 2000). Economic growth thus correlates strongly with financial development (King and Levine, 1993a, b; Demirguc-Kunt and Levine, 1996; Levine, 1996; Demirguc-Kunt and Maksimovic,

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1998; Levine and Zervos, 1998; Rajan and Zingales, 1998; Beck, Levine, and Loayza, 2000; Levine, Loayza, and Beck, 2000; Beck and Levine, 2002). Rajan and Zingales (2003, 2004), noting the persistent financial underdevelopment of some economies and the full-scale reversal of financial development in others, posit the “elite capture” of countries’ financial systems. This occurs if an elite – in this case, the already wealthy – attain sufficient control over an economy’s financial sector to skew capital allocation in their favor. Elites come in many forms, but La Porta, Lopez-de-Silanes, and Shleifer (1999) show that most large firms in most countries are controlled by wealthy families, so linking “elite” to “business families” makes sense in this first pass investigation. The ensuing suboptimal capital allocation could substantially retard economic growth (Olson, 1965; Acemoglu, Johnson, and Robinson, 2005; Morck, Wolfenzon, and Yeung, 2005; Perotti and Volpin, 2007; Stulz, 2005; Fogel, Morck, and Yeung, 2008). Consistent with elite capture, we find less efficient capital allocation amid worse economy performance in countries whose banking systems are more predominantly controlled by wealthy tycoons or business families.

Caprio, Laeven, and Levine (2007) find that banks whose controlling shareholders have large cash flow rights outperform widely held banks. However, a wedge separates efficient bank governance at the bank and economy-levels (Saunders, Strock, and Travlos, 1990). For example, aggressively gaming deposit insurance or bailouts might raise bank shareholder value but harm the overall economy, and “excessive” bank CEO risk aversion (Kane, 1985; John, Litov, and Yeung, 2008) that depresses shareholder value might be socially preferable (Laeven and Levine, 2009). Furthermore, loans that finance technology, infrastructure, or other investments with positive spillovers (Jaffe, 1986; Nadiri and Mamuneas, 1994) may augment social welfare even if the borrowers default. Such externalities argue for state-control (Lewis, 1969), but empirical work shows “government failure” eclipsing any benefits (Dornbusch and Edwards, 1992; Krueger, 2002; La Porta, Lopez-de-Silanes, and Shleifer, 2002; Dinc, 2005). Nonetheless, these considerations make bank-level performance an unreliable indicator of economy-level implications of bank control.

The effect of tycoon or family control over banks on economy-level capital allocation efficiency is not *prima facie* obvious. Schumpeter (1912) argues that the prospect of founding a private dynasty motivates entrepreneurial effort. Shleifer and Vishny (1986) argue that large shareholders limit agency problems (Jensen and Meckling, 1976), and the most common controlling shareholders in most countries are wealthy families (La Porta, Lopez-de-Silanes, and Shleifer, 1999), and this is also true for banks (Caprio, Laeven, and Levine, 2007). Family control can be a feasible second best, absent legal systems that protect passive investors (Burkart, Panunzi, and Shleifer, 2003), because business families might resist predatory governments (Fisman and Khanna, 2004) or have valuable reputational capital and relationship networks (Khanna and Palepu, 2000; Khanna and Yafeh, 2005, 2007).

In most countries, wealthy business families use pyramiding, dual class shares, and other control enhancement devices (Bebchuk, Kraakman, and Triantis, 2000) to direct large “business groups”, each containing many listed firms

(La Porta, Lopez-de-Silanes, and Shleifer, 1999; Morck, Stangeland, and Yeung, 2000) in many different industries (Khanna, Palepu, and Garten, 2000; Khanna and Palepu, 2000; Khanna and Rivkin, 2001; Khanna and Yafeh, 2005, 2007). Morck and Nakamura (2007) use Meiji Japan to illustrate how large family-controlled business groups might effect “big push” industrialization (Rosenstein-Rodan, 1943; Murphy, Shleifer, and Vishny, 1989) using “tunneling” (Johnson, La Porta, Lopez-De-Silanes, and Shleifer, 2000) to coordinate capital investment and orchestrate cross-industry subsidies, as an idealized central planner would. All else equal, these explanations point to more efficient capital allocation in countries whose banking systems are more thoroughly controlled by tycoons or business families.

In opposition to these stand several less beneficent explanations of family control over countries’ banking systems. Family-controlled banks might pass from talented founders to less able heirs (Morck, Stangeland, and Yeung, 2000; Smith and Amoako-Adu, 2005; Perez-Gonzalez, 2006; Bennedsen, Nielsen, Pérez-González, and Wolfenzon, 2007), or might elicit reduced effort from employees who know top positions are reserved for family (Aronoff and Ward, 2000). Large shareholders can become entrenched (Morck, Shleifer, and Vishny, 1988; Stulz, 1988), extract private benefits of control (Nenova, 2003; Dyck and Zingales, 2004), and generate a host of agency problems (Bebchuk, Kraakman, and Triantis, 2000; Djankov, La Porta, Lopez-de-Silanes, and Shleifer, 2006). Banks in business groups can thus be exposed to vastly magnified agency problems (Bebchuk, Kraakman, and Triantis, 2000) that divert capital towards other group member firms (Almeida and Wolfenzon, 2006a) or losses into group banks when governments bail out banks but not other firms (Perotti and Vorage, 2008; Perotti and Volpin, 2007).

Families could use banks to limit capital to potential competitors, and this could motivate family control of banks regardless of whether or not this is efficient. There are other barriers to entry such as regulation (Djankov, La Porta, Lopez-de-Silanes, and Shleifer, 2002), tax favors (Gentry and Hubbard, 2000), subsidies (Krueger, 2002), and trade barriers (Krueger, 1974; Krueger, 2004). However, entrants’ most critical need is arguably capital (Schumpeter, 1912; Levine, 1991, 1992; King and Levine, 1993a, b; Beck, Levine, and Loayza, 2000), so controlling the financial sector could let an established business elite protect its nonfinancial firms from entrants (Rajan and Zingales, 2003, 2004; Morck, Wolfenzon, and Yeung, 2005; Perotti and Vorage, 2008) more directly than alternative approaches, such as ongoing political rent-seeking (Krueger, 1974) or keeping relatives in key government positions (Faccio, 2006; Faccio, Masulis, and McConnell, 2006).

A dynamic banking system correlates with sustained prosperity (King and Levine, 1993a) and the ready financing of entrants (Beck, Demirgüç-Kunt, and Maksimovic, 2008), so elite capture of a country’s financial system could plausibly be critically incomplete without control over its banks. We therefore focus on banks. All else equal, these explanations posit worse capital allocation in countries whose banking systems are more thoroughly controlled by tycoons or business families.

To explore these issues, we measure the fraction of each country’s largest banks, listed and unlisted, that is ultimately

controlled by a tycoon or business family, state-controlled, or widely held. For brevity, we refer to the first as *family-controlled*. Controlling for banking system size, stock market size, and other relevant factors, we find more predominantly family-controlled banking systems correlated with less efficient capital allocation. This result holds regardless of whether we gauge capital allocation quality as in Rajan and Zingales (1998), as in Wurgler (2000), or by nonperforming loans; and survives a comprehensive battery of robustness checks.

The efficiency loss is highly economically significant, and comparable to that associated with state-controlled banking systems (Wurgler, 2000; La Porta, Lopez-de-Silanes, and Shleifer, 2002; Caprio, Laeven, and Levine, 2007; Taboada, 2008). However, family-controlled banking systems also correlate with financial instability and inequality, while state-controlled banking systems do not. Family-controlled banking thus correlates with both worse inefficiency and worse inequality, escaping the classic welfare economics trade-off between the two.

We cannot preclude reverse causation or missing latent variables absolutely. Neither event studies nor Granger causality tests are viable because our banking sector control group variables exhibit almost no time variation. Also, the number of control variables we can use is limited because we must use country-level variables, most of which are highly persistent. Finally, commonly used instruments, such as legal origin and majority religion, are unlikely to act exclusively through banking system control. Nonetheless, a range of circumstantial evidence argues against exclusively reverse causality.

We tentatively conclude that entrusting the control of large banks to tycoons or old-moneyed business families provides capital allocation efficiency losses comparable to those associated with state-controlled banking, augmented by the inequality consequences associated with crony capitalism. Of course, our results imply neither that tycoon and family control is always inefficient, nor that banking systems predominantly controlled by tycoons or families always harm their countries. Our results do, however, flag such beneficent cases as atypical and therefore especially deserving of study.

## 2. Sample, data, and variable construction

We construct a set of economy-level measures of banking system control and economy performance. This section describes their construction, and that of various control variables we also require.

### 2.1. Sample

We start with the 2001 global sample of 244 banks Caprio, Laeven, and Levine (2007) use to study banks' market valuations and equity ownership structures. Although this covers 83% of the total banking assets in 44 large economies (Caprio, Laeven, and Levine, 2007), it omits unlisted banks—a potentially important subsample for our study because these firms are especially likely to be family-controlled.

We therefore augment these data to include every country's ten largest banks, listed or unlisted, as ranked

by 2001 assets in *The Banker* (2001).<sup>3</sup> If *The Banker* lists fewer than ten large banks in a country, we add all those not already included but covered by *Bankscope*.<sup>4</sup> This yields 427 banks from 44 countries. After merging our data with the Caprio, Laeven, and Levine (2007) sample we have fewer than ten banks in some countries and more than ten banks in others.

We then identify the controlling shareholder, if any, for each bank. Caprio, Laeven, and Levine (2007) detail the control structures of the 244 banks in that sample, so we need to fill in control data for the additional banks. *Bankscope* provides this information in most cases for 2001, and more comprehensively for 2002 and subsequently. This leaves us with a grand total of 324 listed and unlisted banks whose controlling owner we can identify. A controlling owner is identified by 2001 for 79% of our sample and by 2003 for 94% of the sample.

### 2.2. Defining and classifying banks' controlling shareholders

We ascertain each bank's ultimate owners, if any, as in Caprio, Laeven, and Levine (2007) and La Porta, Lopez-de-Silanes, and Shleifer (2002). That is, we first identify all shareholders with voting blocks of 5% or more. If these are state organs or biological persons, we call them *ultimate owners*. However, most blockholders in most banks are corporations. We identify these corporations' owners, their owners' owners, and so on until reaching either discernible ultimate owners (state organs or biological persons) or diffusely held entities. We then work through these chains, aggregating voting blocks of common ultimate owners by assuming members of a family act in concert and state organs obey a single authority. At each link in these chains, we assign control to the ultimate owner with the largest combined voting block of 10% or more, combining direct ownership with indirect ownership by dint of controlling other corporations owning shares in the corporation in question. If no 10% voting block exists, we say the corporation in question has no controlling shareholder.

We define each bank's *controlling shareholder*, if one exists, as the ultimate owner commanding the largest voting block of 10% or more. Since the transparency of ownership structures varies across countries, this mechanical procedure is imperfect.<sup>5</sup> We expect to underestimate the prevalence of control blocks in countries with less stringent reporting requirements.

After determining the controlling shareholder, we assign banks to one of three categories. We say a bank is *state-controlled* if its controlling shareholder is a government entity

<sup>3</sup> Including smaller banks would be desirable, but greatly magnifies data collection problems. Since we need to gauge economy-level banking system control, focusing on large banks is defensible as a first pass.

<sup>4</sup> Bureau Van Dijk provides the *Bankscope* dataset, which covers financial statements, ratings and ownership structure of 30,000 banks worldwide. This dataset is commonly used to identify the ownership structure of banks (Caprio, Laeven, and Levine, 2007; Taboada, 2008; Laeven and Levine, 2009). *Bankscope* does not always provide the identity of the ultimate controlling shareholder, which we identify using the procedures discussed below.

<sup>5</sup> Different countries have different blockholder reporting thresholds. In the US, all insider stakes and all owners of 5% or more must be disclosed. Comparable thresholds range from 2% to 25% in other countries (Schouten and Siems, 2010).

and *family-controlled* if its controlling shareholder is a tycoon or family. All others, denoted *widely held* banks, lack a controlling shareholder—because they are either widely held or controlled by 10% plus blockholders that are widely held corporations or cooperatives.

Finally, we construct three country-level *bank control indexes*: fractions of the banking system, weighted by total net credit, whose control is entrusted to the state, to business tycoons or families, or to professional managers.

**Table 1**

Control structure of banks across countries.

We start with the 2001 global sample of 244 banks from Caprio et al. (2007). We augment these data to include every country's ten largest banks, listed or unlisted, as ranked by 2001 assets in *The Banker* (2001). If *The Banker* lists fewer than ten large banks in a country, we add all those not already included but covered by *Bankscope*. We are able to identify the controlling shareholder of 324 listed and unlisted banks. Family, *state*, and *widely held* measure the fractions of banks (weighted by total credit) controlled by family groups, governments, and neither, respectively. Control is presumed to lie with the largest voting block of 10% or more. If no such block exists, we classify the bank as *widely held*. Code abbreviates the country's name in the graphs. See Table 3 for variable definitions and sources.

Country	Code	Family	State	Widely held	# of Banks
Argentina	AR	0.40	0.51	0.10	5
Australia	AU	0.01	0.00	0.99	11
Austria	AT	0.00	0.00	1.00	6
Brazil	BR	0.59	0.27	0.13	12
Canada	CA	0.00	0.00	1.00	9
Chile	CL	0.71	0.29	0.00	5
Colombia	CO	0.41	0.18	0.41	4
Denmark	DK	0.01	0.00	0.99	9
Egypt	EG	0.02	0.98	0.00	9
Finland	FI	0.00	0.00	1.00	1
France	FR	0.00	0.00	1.00	8
Germany	DE	0.14	0.24	0.62	8
Greece	GR	0.36	0.56	0.08	10
Hong Kong	HK	0.27	0.08	0.65	7
India	IN	0.00	1.00	0.00	13
Indonesia	ID	0.04	0.91	0.05	12
Ireland	IE	0.00	0.00	1.00	7
Israel	IL	0.48	0.43	0.09	8
Italy	IT	0.11	0.00	0.89	9
Japan	JP	0.00	0.22	0.78	7
Jordan	JO	0.91	0.09	0.00	8
Kenya	KE	0.03	0.83	0.15	5
Korea	KR	0.03	0.38	0.59	9
Malaysia	MY	0.93	0.00	0.07	6
Mexico	MX	0.70	0.00	0.30	3
Netherlands	NL	0.00	0.22	0.78	3
Norway	NO	0.00	0.43	0.57	9
Pakistan	PK	0.04	0.96	0.00	4
Peru	PE	0.49	0.19	0.33	4
Philippines	PH	0.68	0.21	0.11	13
Portugal	PT	0.43	0.29	0.29	7
Singapore	SG	0.56	0.44	0.00	3
South Africa	ZA	0.64	0.01	0.34	5
Spain	ES	0.34	0.01	0.65	14
Sri Lanka	LK	0.00	0.59	0.41	6
Sweden	SE	0.30	0.00	0.70	4
Switzerland	CH	0.09	0.21	0.70	9
Taiwan	TW	0.17	0.74	0.09	14
Thailand	TH	0.54	0.46	0.00	7
Turkey	TR	0.48	0.32	0.21	11
United Kingdom	GB	0.21	0.00	0.79	6
United States	US	0.02	0.00	0.98	10
Venezuela	ZM	0.76	0.00	0.24	2
Zimbabwe	ZW	0.00	0.00	1.00	2

For brevity, we call these the *state-controlled*, *family-controlled*, and *widely held* shares of countries' banking systems, and denote these  $\alpha_f$ ,  $\alpha_s$ , and  $\alpha_w$ , respectively. Table 1 displays these indexes.

Our bank categorization rules have shortcomings. For example, control by founders versus heirs has different performance implications (Villalonga and Amit, 2006), so our combining banks controlled by self-made tycoons and old-moneyed families likely includes some for which the entrenchment effects discussed above may not pertain. However, in most countries, control blocks do signal old-moneyed family control (La Porta, Lopez-de-Silanes, and Shleifer, 1999; Morck, Wolfenzon, and Yeung, 2005). An opposite problem arises for Svenska Handelsbanken, a widely held Swedish bank that holds extensive control blocks in industrial firms (Högfeldt, 2005), which it might be tempted to treat specially. Another possible distinction would separate widely held publicly traded banks from cooperative (customer or member owned) banks. However, only nine of our widely held banks are cooperative banks but not publicly traded, so we cannot explore this distinction. All of these imperfections induce noise in our bank control measures, and thus cut against our finding significant differences between them. We return to these and other shortcomings of our measures in the robustness section below.

### 2.3. Financial system efficiency

We estimate efficiency of a country's financial system in the following ways:

#### 2.3.1. Capital allocation to High value-added sectors

Following Wurgler (2000), we associate more efficient capital allocation with a country's capital investment being more predominantly concentrated in industries with faster value-added growth. We operationalize this by estimating a simple elasticity of *gross fixed capital formation* to value added growth for each country using its industry-level data. That is, a country's *Wurgler's elasticity* is the coefficient  $\eta_c$  in the regression

$$\ln \frac{I_{ict}}{I_{ict-1}} = \alpha_c + \eta_c \ln \frac{V_{ict}}{V_{ict-1}} + \varepsilon_{ict}, \quad (1)$$

with  $i$  denoting industry,  $t$  time,  $c$  country,  $I$  fixed capital investment, and  $V$  industry value-added.

Industry-level (three-digit International Standard Industrial Classification) investment and value-added data are available up to 2003 from the United Nations' General Industrial Statistics (UNIDO) database. We use the data filters in Wurgler (2000), which eliminate industries that constitute less than 1% of total value added at the beginning of the sample period. We estimate each country's capital allocation efficiency twice. Our first *Wurgler's elasticity* estimate uses data for 1993 through 2003—the ten years closest to our observation of the bank control. We would ideally base our capital allocation efficiency measurements of data subsequent to 2001, the earliest date at which we can assemble a broad international cross-section of bank control data; however, this leaves too short an estimation window. Our second *Wurgler's elasticity* estimate uses all

available UNIDO data (1963 through 2003). The longer window raises the number of countries with enough data to estimate the coefficient  $\eta$  from 33 to 39 and permits more precise estimates if capital allocation efficiency changes little through the window. If not, the first version is preferable. Table 4 shows that the two measures are highly correlated.

Since value-added growth across all sectors, by definition, sums to GDP growth, this measure gauges the strength of the link between capital spending in each industry and that industry's contribution to overall economic growth. Its weakness is that it fails to capture investments that respond to new growth opportunities yet to affect values added.

### 2.3.2. Capital allocation to sectors that rely on external financing

Our second capital allocation efficiency measure is that developed by Rajan and Zingales (1998). Using the US as a maximally frictionless benchmark, they gauge each industry's dependence on external financing, and argue that industries more dependent on external financing ought to grow more slowly in countries whose financial systems are less efficient.

Following Rajan and Zingales (1998), we gauge a US industry's external dependence from 1980 to 1990 as its average capital expenditures less cash flow from operations, all divided by capital expenditures. We then set the industry-level indicator variable *external dependence* to one if the industry is more external-finance dependent than the median industry and to zero otherwise. Using an indicator variable mitigates measurement problems and potential nonlinearity problems. However, our findings are robust to using the continuous values and other variants of the Rajan and Zingales (1998) methodology.

Using the UNIDO industry-level panel introduced in the previous section, we then regress

$$growth_{i,c} = \sum_{k=f \& s \text{ or } w} a_k \delta_i \alpha_{k,c} + b_s s_{i,c} + \mathbf{b}_c \mathbf{d}_c + \mathbf{b}_i \mathbf{d}_i + \zeta_{i,c}, \quad (2)$$

where  $growth_{i,c}$  is the annualized compound value-added growth rate from 1993 to 2003 of industry  $i$  in country  $c$ ;  $\delta_i$  is an indicator variable set to one if industry  $i$  is more dependent on external financing than the median industry and to zero otherwise; the  $\alpha_{k,c}$  are the fractions of country  $c$ 's banking system that are controlled by families ( $k=f$ ), state-controlled ( $k=s$ ), or widely held ( $k=w$ );  $s_{i,c}$  is the share of industry  $i$  in country  $c$ ; and  $\mathbf{d}_c$  and  $\mathbf{d}_i$  are country and industry fixed effects.

This approach has two important advantages. First, it does not rely on potentially noisy industry-level investment data. Second, using an interaction between country and industry characteristics exploits between-industry variation within each country, mitigating country-level latent variable problems (Rajan and Zingales, 1998).

### 2.3.3. Nonperforming loans

Our third capital allocation efficiency measure is *nonperforming loans*, measured as a fraction of each country's total gross loans outstanding. This gauges the banking system's record at picking winners, or at least avoiding losers. These data are from the World Development Indica-

tors database (WDI), provided by the World Bank, and are averaged across 1993 through 2003 to yield one observation for each country to smooth out cyclical variations. In our regressions, we logistically transform each dependent variable  $a$  bounded within the unit interval to  $\hat{a}$  ranging across the real line. That is, we transform  $a \in [0,1]$  into

$$\hat{a} = \ln\left(\frac{a}{1-a}\right) \in \Re. \quad (3)$$

A more efficiently run banking system should make fewer loans to ex ante unqualified borrowers, and should therefore bear fewer nonperforming loans. State banks pressured by politicians into lending to financially unqualified, but politically favored, borrowers often run up huge nonperforming loan problems. Banks controlled by oligarchic families can get into very similar problems by lending to related parties who, despite daunting pedigrees, are ill-qualified managers (Krueger, 2002).

However, this logic is imperfect. Because screening borrowers is costly, we should observe some nonperforming loans. Too few might actually indicate inefficiently cautious lending. Also, different financial reporting practices across countries could render nonperforming loans data noisy, or even induce bias if, for example, family banking correlates with lower transparency. The last likely works against finding significant results.

### 2.3.4. Banking crises

Our fourth banking efficiency measure, the number of *banking crises* the economy experiences, is also directly tied to the quality of banks' governance and their financial health. Although many factors can trigger banking crises (Allen and Gale, 2007), financial history reveals extensive accumulated capital misallocation, a near universal theme (Kindleberger and Aliber, 2005). We therefore expect fewer banking crises in countries where bank loans are allocated more efficiently, all else equal.

Our first *banking crises* variable is the number of banking crises in each country covered in Demirguc-Kunt, Detragiache, and Gupta (2006) or Dell'Ariccia, Detragiache, and Rajan (2008) after 1993. Dell'Ariccia, Detragiache, and Rajan (2008) presume a banking crisis if one of the following happens: extensive depositor runs; an emergency measure (e.g. bank holiday or nationalization); bank rescues costing 2% of GDP or more; or nonperforming loans rising to 10% or more of bank assets. These papers do not include the 2008 banking crisis, so we construct an alternative measure *banking crises + 2008*, which increases countries' crises counts by one where the International Monetary Fund *Global Financial Stability Report* (April 2009) indicates that governments directly intervened to rescue large financial institutions in 2008 or 2009. Unfortunately, data to replicate the criteria used in previous papers are as yet unavailable, so we treat this variable circumspectly.

### 2.3.5. Economy stability

A country's banking system is plausibly a fundamental channel through which monetary variables affect its real economy. Consequently, macroeconomic stability may correlate with the health and governance of the banking system. Banking systems that allocate capital less

efficiently might be more prone to economic booms and busts, and tend to have more exaggerated responses to these shocks. This might magnify the effect of economic shocks on the overall economy. We gauge macroeconomic volatility by *growth volatility*—the standard deviation of log first differences in real per capita GDP for each country from the Penn World Tables, averaged from 1993 through 2004.

#### 2.4. Economy performance

A country's economic performance is commonly measured by growth in per capita income, productivity, or capital. These are important metrics, but economies can also be plausibly described as better-performing if they provide more egalitarian incomes or opportunities. We therefore consider a constellation of economic growth measures augmented by measures of equality indexes.

##### 2.4.1. Economy growth

Our first set of performance measures captures the pace of economic growth. As in Beck, Levine, and Loayza (2000), we use Penn World Tables data (1993–2004), which allow us to decompose income growth into productivity growth and capital accumulation growth.

*Income growth* is the arithmetic mean of year-to-year log differences in per capita GDP for each country. This is obtained by regressing each country's log real per capita GDP on a constant and a time trend, and taking the time trend as its income growth rate.

*TFP growth* is the economy's total factor productivity (TFP) growth rate: the growth rate in the value of the outputs it can generate from inputs of a fixed value. To estimate this, we assume output in each economy obeys the aggregate production function,

$$Y_t = AK_t^\alpha L_t^{1-\alpha}, \quad (3)$$

with  $Y_t$ ,  $K_t$ , and  $L_t$  designating its GDP, capital stock, and labor force, respectively, at time  $t$ ; and with the capital share,  $\alpha$ , assumed to be 30% for all countries (Beck, Levine, Loayza, 2000). Using logarithms of first differences in time, we estimate the rate of change in  $A$  for each country and interpret this as its TFP growth rate.

*Capital accumulation* is the rate at which the economy's aggregate stock of capital assets grows through time. To estimate this, we assume its real capital stock at time  $t$ , denoted  $K_t$ , is its previous year's capital stock adjusted for depreciation at a rate  $\delta$  and for new capital investment,  $I_t$ . That is,

$$K_t = (1-\delta)K_{t-1} + I_t. \quad (5)$$

We assume all capital to depreciate at 7% per year, and assume 1964 capital stocks as starting points (Beck, Levine, and Loayza, 2000). We then apply (5) recursively to generate subsequent years' capital stocks moving forward.

##### 2.4.2. Equality

Rapid economic growth whose benefits accrue to tiny elite might be less socially desirable than slower growth whose fruits are more evenly distributed across the population. State- or family-controlled banks might distribute wealth more evenly than widely held banks if the bureaucrats

or families place social goals ahead of profits. Alternatively, either state- or family-controlled banks might distribute wealth less evenly if they favor firms controlled by cronies or relatives. Elite capture of an economy's banking systems might then concentrate wealth in the hands of a well-connected elite, skewing the economy's income distribution. We therefore consider several measures of economic inequality.

We gauge *income inequality* by a country's average Gini coefficient from 1993 through 2003.<sup>6</sup> Broad access to options for improving one's life is arguably at least as socially important as equality of outcomes (Sen, 1992). We are especially interested in *equality of opportunity* for small entrepreneurs, for which we consider two sets of proxies.

The first set gauges access to information, such as *personal computers* per thousand population averaged from 1993 through 2003. Khanna (2008) and others argue that an information technology revolution in the 1990s fundamentally changed China, India, and other developing economies by letting their small entrepreneurs access information and markets previously unavailable to them.

While the breadth of computer ownership is a defensible measure of this access, there are alternatives. We thus use *internet connections*, *telephone lines*, and *car ownership* per capita as robustness checks. While we defend all these variables as proxies for equality of opportunity for small entrepreneurs, we recognize that they also reflect the size and wealth of a country's "middle class," and thus, can be interpreted as measures of *consumption equality*, which is a plausible alternative to income inequality (Gordon and Dew-Becker, 2007).

Our second set of equality of opportunity measures gauges overt entry barriers blocking new businesses. These variables are the number of bureaucratic *procedures* a start-up must complete to operate legally, as well as the *time* (in business days) and *cost* (all identifiable official costs) required to do this. Cost is expressed as a fraction of per capita GDP, and all three variables are for 1999 and from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2002).

The owners of incumbent businesses are thought to erect entry barriers that protect them from upstart rivals, and might control banks to constrict financing to rivals and potential rivals. If control over the banking system complements other means of effecting economic entrenchment, we should see more such hindrances where wealthy business elites control banking systems. However, we might also see fewer such barriers if control of the banking system is sufficient to lock in the status quo, rendering other entry barriers superfluous. Also, state control over banks may indicate general government activism, and a heavier overall regulatory burden, so this variable might also correlate with the procedures, time, and cost of establishing a new company.

#### 2.5. Controls

Our regressions use a collection of control variables to isolate the relationship of the banking system control

<sup>6</sup> This measures the deviation of the country's income distribution from a uniform distribution, with a zero Gini coefficient indicating a perfectly egalitarian income distribution, and larger coefficients indicating greater inequality (Gini, 1921).

measures described in Section 3.3 to the economy performance variables in Section 3.4. This section explains the purpose, construction, and sources of each control variable.

*Initial general development*, gauged by the logarithm of the country's per capita GDP in 1992, appears in all of our regressions. In our growth regressions, initial general development controls for the possibility that countries already at high standards of living have less scope for very high growth rates than do poorer countries in the process of "catching up" (Solow, 1956; Mankiw, Romer, and Weil, 1992). Because Barro (1997) argues for a nonlinear relationship between economic growth and initial GDP, we also control for the square of the logarithm of the country's per capita GDP in 1992. More generally, initial economic development is also associated with higher quality institutions (North 1989, La Porta, Lopez-de-Silanes, and Shleifer, 1999), which could limit the scope for capital misallocation by providing more effective checks on bank misgovernance.

We control for a country's general financial development with measures of the sizes of its equity and credit markets relative to its GDP, following King and Levine (1993a), La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997), Rajan and Zingales (1998), and Wurgler (2000). *Stock market size* is the country's total stock market capitalization as a fraction of GDP, averaged across 1993 through 2003 to smooth out any cyclical variations. *Banking system size* is the total bank credit outstanding as a fraction of GDP, likewise averaged across 1993 through 2003. We control for stock market size because stock markets provide alternatives to banks for firms seeking capital (Levine, 2002). Consequently, a country with a large efficient stock market might allocate capital efficiently regardless of what sort of banking system it has.

Our cross-country industry-level regressions of value-added growth rates on interactions of bank control with external-finance dependence control for both industry and country fixed effects. Following Rajan and Zingales (1998), these regressions also control for *industry share*, defined as the industry's share of its country's value-added in 1992, because larger industries are less able to sustain high growth rates, all else equal.

In country-level growth regressions, we supplement the above variables with additional controls for *human capital* (Barro and Lee, 1996; Barro, 2001), *trade openness* (Krueger, 1998), and a *Sub-Saharan African dummy* (Barro, 1991), which are also shown to be important for economic growth. In our robustness tests, we also control for *inflation*, *government size*, *black market premium*, *average number of coups*, *average number of assassinations*, and *ethnic diversity*, individually and all together, as in Beck, Levine, and Loayza (2000).

To control for the extent to which economies entrust the governance of their big business sectors to business families, we take an oligarchy measure from Fogel (2006), who examines the economic and political impact of very large business empires controlled by families using an oligarchy index. First, she consolidates firms belonging to pyramidal business groups, through which one family can control many listed or unlisted firms. This lets her identify the largest ten domestically controlled non-government business empires. This list includes both very large single businesses and business groups, ranked by total employee counts in 1996.

Her oligarchy index for each country is the labor-force-weighted fraction of this list controlled by business families, defined as second generation or higher. Fogel acknowledges that this index may over or under estimate family control – for example, an economy may be dominated by many small family firms, but its largest few businesses might be widely held. However, the measure is appropriate for our purpose because large family controlled groups might have more influence on capital allocation at the economy level.

## 2.6. Persistence issues

During crises, banks may be nationalized and then quickly reprivatized, making bank control data from a period without major crises preferable for our purposes. We therefore follow Caprio, Laeven, and Levine (2007) and Laeven and Levine (2009) in using bank control data from 2001. These are the earliest available data with reasonably wide coverage after the 1997 Asian crisis was resolved.

However, our dependent variables are generally estimated using data windows ending in 2003 or 2004 because UNIDO data, upon which our investment efficiency measures are based, exist only through 2003, and the Penn World Tables data end in 2004. This has two unfortunate consequences. First, we cannot run lead and lag causality tests between bank control and economy performance. Second, our bank control structure data do not precede the period in which we observe economy-level performance. This timing mismatch is important if the category of ultimate controlling shareholder changes frequently, but less so if bank control is highly persistent.

To check this, we scan *Bankscope* data from 2001 through 2007 for bank control changes. Although banks' controlling shareholders and the sizes of their equity blocks both change during this period, the category of controlling shareholder rarely changes; family-controlled banks tend to remain family-controlled, state-controlled banks tend to remain state-controlled, and widely held banks tend to remain widely held. Indeed, we identify only 14 banks (4.3% of the total 324) switching category from 2001 to 2007. Two family-controlled banks become state-controlled and four become widely held. Four state-controlled banks become widely held. Two widely held banks become family-controlled and two become state-controlled. Laeven and Levine (2009) perform a similar exercise, checking private banks for controlling shareholder changes from 2001 to 2005, and reach the same conclusion: banks' controlling shareholder categories are very stable through time.

We are especially concerned about temporary bank nationalizations amid financial crises. For example, Sweden nationalized many of its major banks in 1992, but promptly privatized them again, and their controlling shareholder categories reverted to their pre-crisis values. One major financial crisis in our sample period is the 1997 Asian crisis. Djankov, Jindra, and Klapper (2005) analyze the resolution of financial distress after this crisis in the three most affected countries, Indonesia, South Korea, and Thailand. In these, only one Indonesian bank in our sample is nationalized. Our investigation of other East Asian, Latin American, and East European countries' banking systems

**Table 2**

Descriptive statistics of main variables.

The sample starts with the 44 countries and 324 listed and unlisted banks described in Table 1, but not all variables are available for all countries. Sample is the countries listed in Table 1; variables are defined in Table 3.

	Mean	Median	Standard deviation	Maximum	Minimum	
<i>Panel A: Bank control indexes</i>						
1	Family	0.27	0.16	0.29	0.93	0.00
2	State	0.27	0.21	0.31	1.00	0.00
3	Widely held	0.46	0.38	0.38	1.00	0.00
<i>Panel B: Financial system efficiency</i>						
4	Capital allocation efficiency, 1963–2003	0.54	0.55	0.28	1.12	–0.03
5	Capital allocation efficiency, 1993–2003	0.43	0.47	0.42	1.32	–1.02
6	Nonperforming loans	8.12	5.88	7.42	27.43	0.45
7	Banking crises	0.23	0.00	0.48	2.00	0.00
<i>Panel C: Economic growth</i>						
8	Real GDP growth	0.02	0.02	0.02	0.07	–0.02
9	TFP growth	0.02	0.02	0.01	0.07	–0.01
10	Capital accumulation	–0.01	–0.01	0.01	0.01	–0.04
11	Growth rate volatility	0.03	0.02	0.02	0.08	0.01
<i>Panel D: Crony capitalism</i>						
12	Income inequality	38.88	36.00	9.57	59.08	24.70
13	Oligarchy	0.62	0.70	0.33	1.00	0.00
14	Number of procedures	2.10	2.20	0.56	2.89	0.69
15	Time	3.38	3.61	1.00	4.85	0.69
16	Cost	6.75	6.68	1.26	8.87	4.21
<i>Panel E: Main controls</i>						
17	Initial income	8.66	9.10	1.41	10.45	5.78
18	Stock market size	3.92	3.95	0.82	5.68	2.15
19	Banking system size	4.41	4.49	0.58	5.68	2.98
20	Trade openness	4.13	4.08	0.62	5.94	2.96
21	Human capital	2.05	2.05	0.30	2.54	1.49

also reveals no substantial changes in country-level controlling shareholder categories.

Another obvious problem could be bank control changes during privatization episodes. We have data on 283 bank privatizations from Megginson (2005), and work backwards from 2001 to explore how these affect our data. For example, Italy's Banco Nazionale del Lavoro is labeled widely held in our data, but was state-controlled until November 1998. This exercise reveals 16 changes in bank control between 1993 and 2001 in our sample. We return to this issue below by directly controlling for privatizations in recalculating our bank control measures.

These exercises suggest that country-level banking system control is likely to be highly persistent. Although this validates our use of 2001 banking system control measures, this fact also means changes in banking system control cannot be used for identification. We must therefore find other approaches to contend with endogeneity problems, such as reverse causality or latent factors affecting both control over countries' banking sectors and their economies' performance (Table 2).

### 2.7. Descriptive statistics

Table 3 summarizes the definitions and sources of all our main variables; and Table 2 presents simple descriptive statistics for each.

## 3. Empirical findings

We examine the correlations between our indexes of bank control structure and various measures of economic

performance—including banking system efficiency, economic growth rates, and macroeconomic stability—as well as factors correlated with crony capitalism.

### 3.1. Simple correlations

Table 4 presents simple correlation coefficients of each country-level main variable with all the others. Several patterns emerge. First, the three bank control structure indexes sum to unity, so each should correlate negatively with the other two purely as an algebraic artifact. However, their relative magnitudes are informative nonetheless. Family control is not significantly negatively correlated with state control, but widely held banks are significantly ( $p < 0.01$ ) rarer wherever either state or family control is more prevalent. Thus, the primary difference across countries seems to be widely held banks on the one hand versus state or family-controlled banks on the other.

Second, capital allocation efficiency correlates negatively and significantly with state-control of the banking system (1963–2003), as in Wurgler (2000). However, efficient capital allocation is positively significantly correlated with widely held banks and negatively and significantly, if measured between 1993 and 2003, correlated with family-controlled banks.

Third, more prevalent family-control over banks is associated with more nonperforming loans, more banking crises, slower economic growth, slower capital accumulation, and worse macroeconomic volatility. In contrast, a more widely held banking system correlates with lower nonperforming loans, fewer banking crises, faster capital accumulation, and less macroeconomic volatility. A more

**Table 3**

Variable definitions and sources.

<b>Panel A: Bank control</b>	
<i>Family</i>	Total 2001 credit-weighted fraction of listed and unlisted banks controlled by an individual or family. Control is imputed to the largest blockholder whose voting control, direct and indirect, sums to at least 10% for 2001 or the nearest year with data. Indirect control is inferred using the “weakest link” method, as in La Porta et al. (1999). Sources: Caprio et al. (2007); Bankscope
<i>State Widely held</i>	Total credit-weighted fraction of banks controlled by state organs. Constructed analogously to <i>Family</i> Total credit-weighted fraction of banks with no controlling shareholder. Constructed analogously to <i>Family</i>
<b>Panel B: Financial system efficiency</b>	
<i>Capital allocation efficiency</i>	The efficiency of capital allocation is the estimated elasticity of manufacturing investment to value-added, estimated as in Wurgler (2000). Note: Two versions of this variable are used, one using all available data and the other using data for 1993 through 2003 only
<i>External dependence</i>	This is a dummy variable that is equal to one if the industry is externally dependent relative to the median industry. External dependence measure is from Rajan and Zingales (1998), who define external dependence as capital expenditures minus cash flow from operations divided by capital expenditures for US industries between 1980 and 1990
<i>Nonperforming loans</i>	Ratio of nonperforming loans as a fraction of total gross loans, averaged over 1993 through 2003. In regressions and correlations, this variable is log normalized by the formula: $normalized [x] = \ln[x/(1-x)]$ . Source: World Development Indicators, World Bank
<i>Banking crises</i>	The number of banking crises in each country covered in Demirguc-Kunt et al. (2006) plus Dell’Ariccia et al. (2008) after 1993
<i>Banking crises +2008</i>	This variable adds one to “ <i>Banking crises</i> ” if governments directly intervened with large financial institutions in 2008 and 2009 according to the IMF Global Financial Stability Report (April 2009)
<b>Panel C: Economic growth</b>	
<i>Income growth</i>	Real per capita GDP growth is the coefficient in an OLS regression of log real per capita GDP time trend and intercept as in Beck et al. (2000). Data are for 1993 through 2004, and are from Penn World Tables
<i>TFP growth</i>	Each country’s total factor productivity (TFP) growth is $A$ in the production function $Y = AK\alpha L^{1-\alpha}$ , with $Y$ , $K$ , and $L$ as the country’s GDP, capital stock, and labor force, respectively; and with capital share $\alpha = 0.03$ as in Beck et al. (2000). Data are for 1993 through 2004, and are from Penn World Tables
<i>Capital accumulation</i>	Average growth rate in capital stock from 1993 to 2004, assuming 1964 capital stocks are in steady state and using aggregate real investment and 7% depreciation recursively to generate capital stock estimates going forward, as in Beck et al. (2000). Data are from Penn World Tables
<i>Growth-rate volatility</i>	Standard deviation of real GDP per capita growth, 1993–2004. Source: Calculated from Penn World Tables data
<i>Industry value-added growth</i>	Annualized compounded nominal value-added growth between 1993 and 2003. Source: UNIDO General Industrial Statistics
<b>Panel D: Crony capitalism</b>	
<i>Income inequality</i>	Average <i>Gini coefficients</i> measure the deviation of income distribution from uniformity (Gini, 1921), from 1993 through 2003, where data are available. Otherwise, it is the average across available data. Data are unavailable for most countries after 2001. In regressions and correlations, this variable is log normalized by the formula: $normalized [x] = \ln[x/(1-x)]$ . Source: World Development Indicators, World Bank
<i>PCs</i>	Personal computers (PCs) per thousand people, averaged over 1993–2003. Personal computers are defined as self-contained and designed for use by one person. Source: International Telecommunication Union, World Telecommunication Development Report and database. Downloaded from World Development Indicators, World Bank
<i>Cars</i>	Passenger cars per 1000 people, average over 1993–2003. Passenger cars refer to road motor vehicles, other than two-wheelers, intended for the carriage of passengers and designed to seat no more than nine people (including the driver). International Road Federation, World Road Statistics and data files. Downloaded from World Development Indicators, World Bank
<i>Telephone</i>	Telephone lines per 1000 people, average over 1993–2003. Telephone mainlines are fixed telephone lines connecting a subscriber to the telephone exchange equipment. Source: International Telecommunication Union, World Telecommunication Development Report and database. Downloaded from World Development Indicators, World Bank
<i>Internet</i>	Internet users per 100 people, average over 1993–2003. Internet users are people with access to the worldwide network. International Telecommunication Union, World Telecommunication Development Report and database. Downloaded from World Development Indicators, World Bank
<i>Number of procedures</i>	Log number of different procedures that a start-up has to comply with in order to obtain a legal status, i.e. to start operating as a legal entity. Source: Djankov et al. (2002)
<i>Time</i>	Log time it takes to obtain legal status to operate a firm, in business days. A week has five business days and a month has 22. Source: Djankov et al. (2002)
<i>Cost</i>	Log cost of obtaining legal status to operate a firm as a share of per capita GDP in 1999. It includes all identifiable official expenses (fees, costs of procedures and forms, photocopies, fiscal stamps, legal and notary charges, etc.). The company is assumed to have a start-up capital of ten times per capita GDP in 1999. Source: Djankov et al. (2002)
<b>Panel E: Controls</b>	
<i>Initial income</i>	Logarithm of 1992 per capita GDP in US dollars at purchasing power parity. Source: Penn World Tables
<i>Initial income square</i>	Square of logarithm of 1992 per capita GDP in US dollars at purchasing power parity. Source: Penn World Tables
<i>Banking system size</i>	Log average credit outstanding to GDP averaged across 1993–2003. Source: World Development Indicators, World Bank
<i>Stock market size</i>	Log of average stock market capitalization to GDP averaged across 1993–2003. Source: World Development Indicators, World Bank
<i>Industry share</i>	Value-added share of an industry within a country in 1992. Source: UNIDO General Industrial Statistics
<i>Human capital</i>	Log of average schooling years in total population aged 15 or over, 1990. Source: World Development Indicators, World Bank

**Table 3.** (continued)

Trade openness	Log of trade/GDP: the sum of exports and imports of goods and services measured as a share of gross domestic product, over GDP. Source: World Bank national accounts data; Organisation for Economic Co-operation and Development National Accounts data
Africa dummy	Equals one if the country is located in Sub-Saharan Africa
Inflation	Inflation rates are calculated using average annual consumer price index data from the International Financial Statistics. Source: Beck et al. (2000)
Size of the government	Real general government consumption as the share of real GDP. Source: Beck et al. (2000)
Black market premium	Source: Beck et al. (2000)
Average no. of coups	Source: Beck et al. (2000)
Average no. of assassinations	Source: Beck et al. (2000)
Ethnic diversity	Source: Beck et al. (2000)
Oligarchy	Fraction of the top-ten largest (according to number of employees) nonfinancial private-sector domestically controlled freestanding businesses or business groups, including listed and unlisted firms, controlled by business families in 1996. Source: Fogel (2006)

**Table 4**

Main variables: Simple cross-sectional correlation coefficients.

The sample is described in Table 1. The variables and sources are defined in Table 3. Numbers in parentheses are probability levels for rejecting the null hypothesis of a zero correlation. Boldface indicates significance at 10% or better.

	1	2	3	4	5	6	7	8	9	10	11
1 Family	1.00										
2 State	−0.20 (0.19)	1.00									
3 Widely held	−0.60 (0.00)	−0.66 (0.00)	1.00								
4 Capital allocation efficiency, 1963–2003	−0.21 (0.19)	−0.65 (0.00)	0.70 (0.00)	1.00							
5 Capital allocation efficiency, 1993–2003	−0.30 (0.09)	−0.24 (0.18)	0.43 (0.01)	0.54 (0.00)	1.00						
6 Nonperforming loans	0.30 (0.05)	0.58 (0.00)	−0.70 (0.00)	−0.63 (0.00)	−0.37 (0.03)	1.00					
7 Banking crises	0.35 (0.02)	0.01 (0.95)	−0.28 (0.07)	−0.26 (0.11)	0.02 (0.91)	0.32 (0.04)	1.00				
8 Income growth	−0.25 (0.10)	0.03 (0.87)	0.17 (0.27)	0.16 (0.32)	0.13 (0.48)	−0.44 (0.00)	−0.30 (0.05)	1.00			
9 TFP growth	−0.20 (0.20)	0.13 (0.40)	0.04 (0.78)	0.05 (0.76)	0.05 (0.78)	−0.31 (0.04)	−0.30 (0.05)	0.97 (0.00)	1.00		
10 Capital accumulation	−0.26 (0.09)	−0.40 (0.01)	0.52 (0.00)	0.43 (0.01)	0.31 (0.08)	−0.55 (0.00)	−0.07 (0.66)	0.33 (0.03)	0.09 (0.57)	1.00	
11 Growth-rate volatility	0.51 (0.00)	0.08 (0.60)	−0.45 (0.00)	−0.37 (0.02)	−0.31 (0.08)	0.48 (0.00)	0.36 (0.02)	−0.20 (0.20)	−0.14 (0.36)	−0.24 (0.12)	1.00
12 Initial income	−0.21 (0.19)	−0.59 (0.00)	0.63 (0.00)	0.66 (0.00)	0.51 (0.00)	−0.73 (0.00)	−0.23 (0.15)	0.18 (0.25)	0.06 (0.70)	0.49 (0.00)	−0.40 (0.01)

thoroughly state-controlled banking system correlates only with more nonperforming loans and slower capital accumulation.

### 3.2. Main regression results

Fig. 1 graphs capital allocation efficiency against the fractions of banks designated family-controlled, state-controlled, and widely held. The figure shows clear general tendencies in the data, indicated by solid lines; but surrounded by substantial scatter. This suggests other variables at work in the background. We therefore turn to more formal multivariate tests to clarify the patterns in the data.

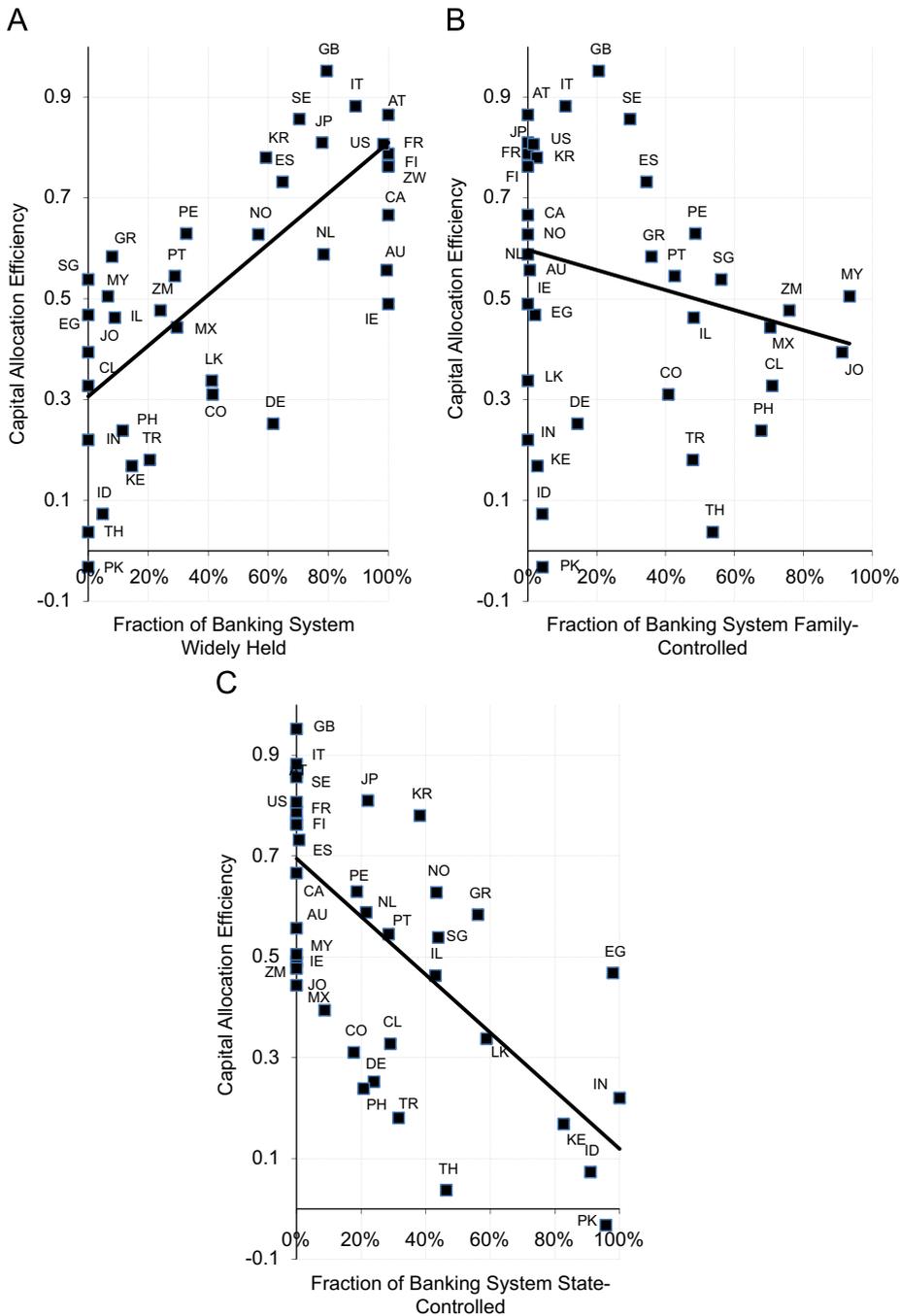
#### 3.2.1. Financial system efficiency

Table 5 explores our first question: how bank control might correlate with capital allocation efficiency. The first four rows show capital allocation efficiency, measured as in

Wurgler (2000) and across either 1993–2003 or 1963–2003, clearly correlated with who controls the banking system. Countries with more widely held banking systems allocate capital more efficiently. Countries that entrust their banking systems to either families or the state exhibit less efficient capital allocation.

The scatter evident in Fig. 1 is considerably reduced by the control variables, for the regression  $R^2$  statistics range from 33% to 61%—indicating that the variables in the regression now explain substantial fractions, by the standards of cross-sectional regression analysis, of the variation in capital allocation efficiency across countries.

Next, we explore the correlation of bank control structure with capital allocation efficiency using the methodology of Rajan and Zingales (1998). Panel B of Table 5 shows that industries typically dependent on external financing have statistically significantly slower value-added growth rates in countries whose banking systems are more thoroughly



**Fig. 1.** Capital allocation efficiency and the control of banks. Sample includes 39 countries for which the capital allocation efficiency (1963–2003) variable is available. Observations are labeled with country codes, as defined in Table 1. The vertical axis is the efficiency of capital allocation (1963–2003), in each country and the horizontal axes in Panels A, B, and C are, respectively, the fractions of the country’s banking systems that are widely held, state-controlled, and family controlled, as in Table 3.

controlled by tycoons and wealthy families. Moreover, such industries exhibit significantly faster growth in countries whose banking systems are more predominantly widely held.

Table 5 also reports regressions of nonperforming loans on the bank control structure indexes. A more widely held banking system is significantly correlated with fewer

nonperforming loans, while more predominantly state- or family-controlled banking systems both correlate with more nonperforming loans.

Next, we test the relationship between bank control structure and the number of banking crises the country experienced after 1993. Banking crises are more common

**Table 5**

Bank control and capital allocation efficiency.

Each row in Panel A summarizes country-level regressions explaining capital allocation quality with banking system control measures. Its samples include up to the 44 countries in Panel A, limited by the availability of the variables used in each regression. All regressions are OLS except for that of the numbers of banking crises, which is negative binomial, and the number of banking crises including 2008, which is a Poisson regression (as the negative binomial does not converge). Each row of Panel B summarizes a multi-country industry-level regression of value-added growth on interactions of industry external-finance dependence with banking system control measures. All variables are as in Table 3. Robust *t*-statistics are in parentheses. Boldface indicates significance at 10% or better.

PANEL A	Widely held	Family	State	Banking system size	Stock market size	Initial income	R <sup>2</sup>	N
Capital allocation efficiency (1993–2003)		<b>-0.372</b> (2.18)	-0.088 (0.43)	0.067 (0.28)	0.086 (0.86)	<b>0.093</b> (2.19)	0.35	33
	<b>0.262</b> (1.81)			0.119 (0.49)	0.045 (0.47)	0.073 (1.46)	0.33	33
Capital allocation efficiency (1963–2003)		<b>-0.284</b> (3.10)	<b>-0.462</b> (3.97)	0.003 (0.03)	0.053 (1.06)	0.043 (1.46)	0.61	39
	<b>0.353</b> (4.12)			-0.03 (0.38)	0.083 (1.43)	<b>0.055</b> (2.00)	0.59	39
Nonperforming loans		<b>1.287</b> (2.71)	<b>1.349</b> (2.74)	0.356 (1.15)	-0.266 (1.20)	<b>-0.398</b> (3.26)	0.65	43
	<b>-1.312</b> (3.15)			0.364 (1.31)	-0.274 (1.31)	<b>-0.401</b> (3.57)	0.65	43
Banking crises		<b>3.152</b> (2.83)	1.085 (1.00)	0.073 (0.11)	<b>-0.774</b> (1.68)	-0.105 (0.40)	0.21	43
	<b>-2.32</b> (2.63)			-0.496 (0.87)	-0.454 (1.06)	0.16 (0.91)	0.16	43
Banking crises, including 2008		<b>1.239</b> (1.72)	0.197 (0.25)	-0.013 (0.03)	-0.237 (0.71)	0.138 (0.70)	0.03	43
	-0.836 (1.31)			-0.189 (0.41)	-0.117 (0.36)	0.199 (1.09)	0.02	43
Growth-rate volatility		<b>0.028</b> (2.60)	-0.004 (0.33)	0.002 (0.38)	0.001 (0.42)	<b>-0.006</b> (1.76)	0.37	43
	-0.015 (1.59)			-0.002 (0.37)	0.005 (1.37)	-0.004 (1.15)	0.25	43
Panel B:	External-finance dependence interaction with							
	Widely held	Family	State	Industry share	Industry dummies	Country dummies	R <sup>2</sup>	N
Industry value-added growth		<b>-0.093</b> (2.70)	-0.013 (0.37)	<b>-0.530</b> (1.86)	yes	yes	0.32	446
	<b>0.055</b> (1.83)			<b>-0.536</b> (1.84)	yes	yes	0.31	446

in countries whose banking systems are more predominantly family-controlled ( $t=2.83$ ). In contrast, widely held banks are negatively correlated with the number of banking crises and state-controlled banks seem uncorrelated with the incidence of crises.

However, when we include the 2008 crisis, the coefficient on family control becomes less significant ( $t=1.72$ ) and that on widely held banks loses significance. Obviously, family control over banks does not explain the 2008 crisis, which began in the United States, whose banking system is predominantly widely held, and spread to other countries with largely widely held banking systems, such as the United Kingdom. However, this does not belie the strong correlation of family control with previous crises and with the overall incidence of crises.

The final two rows of Panel A check whether or not family control over the banking system correlates with the stability of economic growth. The standard deviation of a country's real per capita GDP growth rate is positively associated with family control over banks, indicating less stable economic growth where family banks predominate.

The results in Table 5 are also economically significant. A one-standard-deviation increase in the fraction of banks under family control corresponds to 25% (1993–2003) and

15% (1963–2003) worse capital allocation efficiency, assessed as in Wurgler (2000); to 68% slower value-added growth for industries that depend on external finance; to 25% more nonperforming loans, and to a 27% larger standard deviation of growth compared to sample means. For comparison, a one-standard-deviation increase in the fraction of banks controlled by the state corresponds to 26% decrease in capital allocation efficiency (1963–2003) and 27% more nonperforming loans. These results survive a wide range of robustness checks, detailed below.

In summary, Table 5 shows countries whose banks are more thoroughly controlled by tycoons and business families to have economically and statistically significantly less efficient capital allocation, relatively stunted external-finance dependent sectors, worse problems with nonperforming loans, and bumpier economic growth. Family bank control correlates strongly with more financial crises prior to 2008, although this correlation weakens if we extend the data to include the 2008 crisis.

### 3.2.2. Economy growth

Since our banking system control measures correlate with capital allocation efficiency and banking system efficiency, we expect them to correlate with economic

growth as well. Table 6 therefore regresses our economic growth measures—per capita income growth, TFP growth, and per capita capital accumulation—on our country-level bank control measures, revealing lower real per capita GDP growth and TFP growth where banking systems are more family-controlled. The coefficient of family control in explaining capital accumulation is negative, but insignificant. In contrast, capital accumulation correlates negatively with state-controlled banks and positively with widely held banks.

These results are economically significant: one-standard-deviation higher family control corresponds to a GDP per capita growth rate lower by 53% of the sample mean (1.92%). They also survive a substantial battery of robustness checks, described below. In summary, Table 6 shows slower economic growth in countries with more predominantly family-controlled banking systems.

### 3.3. Robustness

Our main results (Tables 5 and 6) pass a wide battery of robustness checks, in that alternative approaches to estimation generate qualitatively similar results, by which we mean the bank control structure measures attract the same patterns of signs and significance as in the tables. Where this is not so, we describe how the robustness checks' results differ from those shown in the tables. The relationships between bank control measures and our banking crises count that includes 2008 is only marginally significant in the tables, so we do not consider it in the robustness tests.

#### 3.3.1. Simple statistical robustness

Our results are unlikely to be driven by outliers. We check this using an iterative reweighted least squares algorithm that successively deemphasizes observations farther from the trend line until converging. This algorithm cannot be applied to the Poisson regressions explaining the number of bank crises; but converges in all other cases. This exercise leads to a much stronger negative correlation of family control with capital accumulation ( $p=0.02$ ), and also renders more state-controlled banking significantly correlated with higher growth-rate volatility and its interaction with external dependence is now negatively correlated with value-added growth. Widely held banking systems are revealed dampening growth-rate volatility and improving capital accumulation. In all other regressions, controlling for outliers in this way yields qualitatively similar results.

The statistical tests in all our regressions employ heteroskedasticity-consistent standard errors. Using standard ordinary-least-squares regression  $t$ -tests generates qualitatively similar results, except for the capital allocation efficiency measure based on 1993 to 2003 data. In the analysis of interaction between bank control and growth of externally dependent industries, clustering error terms within countries or industries provides qualitatively similar results.

Our capital allocation efficiency measures, Wurgler's (2000) elasticities, are estimated, not observed. We therefore rerun regressions using these variables weighting observations by the inverses of the standard errors of our elasticity estimates. These weighted-least-squares regressions generate qualitatively similar results to those in the tables.

**Table 6**

Bank control and economic growth.

The table shows results of cross-country OLS regressions with robust standard errors. The sample includes up to the 44 countries described in Table 1, as limited by the availability of the variables in each regression. Dependent variables are in columns and independent variables are in rows. Variables are as defined in Table 3. Robust  $t$ -statistics are in parentheses. Boldface indicates significance at 10% or better.

	Income growth		TFP growth		Capital accumulation	
Widely held		0.015 (1.43)		0.010 (0.97)		<b>0.016</b> <b>(3.46)</b>
Family	<b>-0.035</b> <b>(2.64)</b>		<b>-0.030</b> <b>(2.31)</b>		-0.015 (1.33)	
State	-0.003 (0.28)		0.002 (0.23)		<b>-0.016</b> <b>(2.00)</b>	
Human capital	0.012 (1.34)	0.015 (1.37)	0.011 (1.33)	0.014 (1.43)	0.004 (0.29)	0.004 (0.30)
Trade openness	0.003 (0.70)	0.003 (0.55)	0.005 (1.16)	0.005 (0.99)	<b>-0.006</b> <b>(2.41)</b>	<b>-0.006</b> <b>(2.43)</b>
Banking system size	0.006 (1.09)	0.008 (1.39)	0.004 (0.81)	0.006 (1.07)	0.005 (1.11)	0.005 (1.01)
Stock market size	0.005 (1.21)	0.002 (0.40)	0.005 (1.18)	0.001 (0.31)	0.001 (0.40)	0.001 (0.45)
Africa dummy	<b>-0.023</b> <b>(1.89)</b>	<b>-0.024</b> <b>(2.02)</b>	<b>-0.022</b> <b>(1.82)</b>	<b>-0.023</b> <b>(1.94)</b>	-0.004 (0.64)	-0.004 (0.62)
Initial income square	<b>-0.004</b> <b>(1.75)</b>	-0.001 (0.52)	<b>-0.004</b> <b>(1.70)</b>	-0.001 (0.35)	-0.001 (0.58)	-0.001 (1.21)
Initial income	0.064 (1.58)	0.011 (0.31)	0.058 (1.54)	0.004 (0.12)	0.021 (0.57)	0.023 (1.20)
Constant	-0.280 (1.55)	-0.077 (0.49)	-0.252 (1.52)	-0.041 (0.30)	-0.094 (0.62)	-0.120 (1.41)
$R^2$	0.41	0.31	0.39	0.28	0.45	0.45
$N$	43	43	43	43	43	43

### 3.3.2. Alternative banking system control structure indexes

We follow La Porta, Lopez-de-Silanes, and Shleifer (1999) and Caprio, Laeven, and Levine (2007) in presuming the largest equity voting block of 10% or more to confer control. Increasing this to 20%, and recalculating our bank control measures generates qualitatively similar results to those shown.

Another alternative construction of our bank control measures would use different weights. We calculate country-level bank control measures weighting banks by total net credit. Credit issued is a plausible gauge of the importance of a bank as a capital allocator; but others are also possible. We therefore reweight banks by total assets and reconstruct our bank control measures. This generates qualitatively similar results to those shown, save that widely held banking systems now correlate negatively with growth volatility and lose significance in explaining capital allocation efficiency in the shorter window.

We posit above that family controlled banking system might impede efficient capital allocation because the controlling families might divert capital to related firms and away from upstarts and competitors. These problems could arise even if the families that control the banks do not control other firms, for Faccio (2006) and others reveal numerous connections between wealthy families. However, the inefficiency may well be more serious where the families that control banks also control large nonfinancial corporations. The Orbis data set identifies other companies owned by our banking families. We augment this with an extensive online media search using family names and bank names to verify matches in Orbis and identify other firms controlled by our banking families. This admittedly crude approach probably underestimates the nonfinancial interests of these families, but nonetheless confirms that 90% of the families that control banks in our data also control other firms. We use this information to recalculate our bank control measures assuming banks controlled by families with no other firms are equivalent to widely held banks. Under this definition, 100% of Mexican banks become widely held—a call many students of the Mexican economy might find low. Still, rerunning our regressions yields qualitatively similar results.

We measure banking system control as of 2001. Above, we showed that the banking control measures are highly persistent between 2001 and 2007 (by checking for all changes in bank control) and before 2001 (by using bank privatization data to work backwards from 2001). However, we can do more with the privatization data from Megginson (2005), which indicates that 16 banks in our sample are privatized: six become family-controlled and ten become widely held. In the tables, we count these banks using their 2001 (post-privatization) control categories. An alternative approach is to calculate a duration-weighted measure of banking system control for 1993 through 2003. If a bank is state-controlled for the five years from 1993 to 1998, and then sold to a family, which controls it through 2003, we say it is 50% state-controlled and 50% family-controlled when tallying up our country-level bank control measures. This exercise generates qualitatively similar results to those shown, save that widely held banking systems are now positively correlated with growth, negatively correlated

with growth-rate volatility, insignificant in explaining the efficiency of capital allocation in the shorter window, and the interaction of the widely held banking system measure with external dependence becomes insignificant in explaining value added growth ( $p=0.11$ ).

### 3.3.3. Additional and alternative variables

If most families that control banks also control other firms, we must ascertain that our regressions are not detecting the negative economy-level outcomes Morck and Yeung (2004) and Fogel (2006) link to wealthy family control over business. We therefore rerun our regressions controlling for Fogel's *oligarchy* measure—the labor force weighted fraction of the country's top-ten businesses or business groups controlled by families. The correlation between family control of country's top banks and *oligarchy* is 0.61 among the 38 countries for which both variables are available. However, re-estimating the tables with this extra control throughout yields qualitatively similar results, except in regressions of Wurgler's (2000) capital allocation efficiency measure estimated over the longer window. Intriguingly, *oligarchy* itself is insignificant in all regressions except for regressions of Wurgler's (2000) capital allocation quality measure estimated over the short window. Thus, we conclude that tycoon or family control over the banking system has negative implications for the overall economy, and that this result is not driven by a general negative correlation between family control over business and economy performance.

The Rajan and Zingales (1998) regressions in Panel B of Table 5 also survive a battery of robustness checks, in that the interactions of external-finance dependence with tycoon or family control over banks retain negative significant coefficients in regressions explaining industry-level value-added growth rates. If tycoons and business families are more prone to control banks in countries at low overall levels of financial development, and the latter disproportionately hurts industries that need external finance, the Rajan and Zingales (1998) methodology might deliver spurious significance. However, re-estimating this panel including interactions of external dependence with total credit outstanding, stock market capitalization or summation of the two, all measured as a fraction of GDP and averaged over 1993 through 2003, generates qualitatively similar results. We also control for interaction of *oligarchy* and external dependence and get qualitatively similar results when we use average *oligarchy* values for countries that have missing data. The regressions in the panel use nominal value-added growth rates, leaving the country fixed effects to absorb any differences in general inflation rates. Converting values added to US current dollars using the year-average exchange rates reported by the IMF's International Financial Statistics and deflating these by the US producer price index for finished goods generates qualitatively similar results. The regressions in the panel use an indicator variable that designates US industries as external financing-dependent if they make more use of external capital than the median US industry. Re-estimating the panel, but instead interacting our bank control measures with mean US fractions of capital spending financed externally, causes family control to lose significance; however, winsorizing the interaction term at the 5% level to mitigate the influence of

outliers restores significance. Using an indicator variable or the fraction of capital spending financed externally based only on young firms, defined as firms listed for ten years or less, in each US industry, which are likely to be most sensitive to difficulties in obtaining external capital (Rajan and Zingales, 1998), also generates qualitatively similar results to those shown in the table.

The results in Panel A of Table 5 are stronger if initial per capita GDP is excluded, raising the possibility that our banking system control measures might proxy for a non-linear effect of initial per capita GDP. To check this, we repeat our tests controlling for initial GDP per capita and its square, as well as the other controls. Qualitatively similar results ensue, except that the bank control variables lose significance in explaining the number of banking crises.

The regressions in Table 6 include controls commonly used in the economic growth literature; but others are sometimes added. We therefore repeat the income growth regressions of Table 6 including other controls used in Beck, Levine, and Loayza (2000): *mean inflation rates, government as a fraction of GDP, black market exchange rate premiums, numbers of coups, numbers of assassinations, and ethnic diversity*—individually and all together. Qualitatively similar results ensue; family control is always negatively significantly associated with growth.

### 3.3.4. Alternative samples

We can obtain data for only a few banks in some countries. If these have only a few banks, this is not necessarily a problem; but if we are missing data for these countries, their banking control measures may be estimated less precisely. We therefore repeat our tests after dropping the countries represented in our data by fewer than three banks: Finland, Venezuela, and Zimbabwe. This exercise yields qualitatively similar results, except that our bank control measures become insignificant in explaining Wurgler's (2000) capital allocation efficiency estimated using the shorter window, though the coefficient magnitudes are roughly preserved, and that the interaction of widely held banks with external dependence becomes insignificant in explaining value-added growth.

We check that our findings are robust to different time windows. Since the Penn World Tables and UNIDO data are made available with a lag of several years, we cannot extend the windows used to construct our TFP growth rates and capital accumulation rates past 2004, nor those used to construct our Wurgler's elasticities and industry value added growth rates past 2003. However, using estimation windows ending in 2003 for per capita GDP growth, TFP growth, and capital accumulation (to match the UNIDO data) generates qualitatively similar results throughout. Data for per capita GDP growth and its volatility, and for nonperforming loans, are available through 2007 in the WDI database. We therefore reconstruct these variables using windows from 1993 to 2007, a window extending our data up to six years after our bank control cross-section. Outlier robust regressions yield qualitatively similar results to those shown.

Table 5 shows that including the 2008 financial crisis in our crisis counts greatly weakens the correlations of family control with instability and of widely held banks with

stability. Banking crises are rare events, so further checking the generality of our findings requires extending our time period back in time. We do this by counting all the crises covered in Demirguc-Kunt, Detragiache, and Gupta (2006) plus Dell'Ariccia, Detragiache, and Rajan (2008), rather than just those dated after 1993. This extends our window back to 1980. We perform this robustness check both with and without the 2008 crisis added to the total counts. Both generate qualitatively similar results: family bank control is highly significant in explaining the number of banking crises. For instance, when the 2008 crisis is included, family bank control has a coefficient of 1.03 ( $p=0.02$ ). Many factors contribute to financial crises (Allen and Gale, 2007); however, this evidence supports bank control being numbered among them (Saunders, Strock, and Travlos, 1990; Laeven and Levine, 2009), at least in some time periods and some countries.

### 3.3.5. Efficiency versus equality

Our findings above are consistent with family control over banks impairing financial system efficiency and thereby both slowing and destabilizing economic growth. This aligns with arguments that economies are subject to economic entrenchment, sometimes called crony capitalism, wherein incumbent business leaders erect barriers to entry that lock in the advantageous (to them) status quo to the detriment of their countries (Murphy, Shleifer, and Vishny, 1991, 1993; Shleifer and Vishny, 1993, 1998). Our findings also align with the thesis of Rajan and Zingales (2004) and its supporting country case studies (Haber, Maurer, and Razo, 2003; La Porta, López-de-Silanes, and Zamarripa, 2003), that this entrenchment can be effected by elite capture of countries' financial systems.

But other explanations of our findings must also be considered. For example, family-controlled banks might simply be less-competent capital allocators. Or, family-controlled banks might elevate social goals, such as equality, above economic efficiency, consistent with the solidarity, or social capital strengthening advantages attributed to family businesses by, e.g., Lester and Cannella (2006). However, both of these seem implausible given that Caprio, Laeven, and Levine (2007) find higher valuations for banks with controlling shareholders.

We apply Ockham's razor by testing for links between family-controlled banking systems and economy characteristics correlated with crony capitalism. First, crony capitalism is associated with extreme inequality. If family bank control abets crony capitalism, it should therefore correlate negatively with measures of equality. Crony capitalism is also associated with high barriers to entry. Thus, if control of the banking system alone is insufficient to achieve crony capitalism, family bank control should be positively correlated with barriers to entry. Family bank incompetence, in contrast, has no clear prediction regarding these variables; and the solidarity explanation would presumably imply greater income equality and equality of opportunity.

The first two columns of Table 7, employing *income inequality (Gini coefficients)*, reveal significantly less egalitarian income distributions in countries whose banking systems are more extensively controlled by families. In contrast, state-controlled banking systems significantly

**Table 7**

Consistency with crony capitalism.

The table shows cross-country OLS regressions with robust standard errors. The sample includes up to the 44 countries listed in Table 1, limited by the availability of variables in the regression. Dependent variables are in columns and independent variables are in rows. Variables are as defined in Table 3. Robust *t* statistics are in parentheses. Boldface indicates significance at 10% or better.

	Equality of outcomes				Equality of opportunity					
	Income inequality (Gini coefficient)		PCs per thousand population		Difficulty starting a new company					
					Number of procedures	Time		Cost		
Widely held	<b>-0.266</b> (1.78)		<b>118</b> (3.07)		<b>-0.785</b> (3.10)		<b>-1.136</b> (2.52)		<b>-1.39</b> (3.30)	
Family	<b>0.629</b> (3.52)		<b>-189</b> (6.18)		<b>1.028</b> (3.90)		<b>1.440</b> (3.09)		<b>1.277</b> (2.46)	
State	<b>-0.275</b> (1.70)		-11.5 (0.23)		0.415 (1.41)		0.674 (1.48)		<b>1.571</b> (3.06)	
Banking system size	<b>-0.174</b> (1.68)	<b>-0.303</b> (2.71)	-37.5 (1.42)	-12.1 (0.52)	<b>0.242</b> (1.79)	0.154 (1.32)	0.130 (0.55)	0.020 (0.09)	0.506 (1.40)	0.548 (1.55)
Stock market size	0.103 (1.54)	<b>0.229</b> (2.69)	<b>63.0</b> (3.42)	<b>39.9</b> (2.19)	<b>-0.382</b> (4.61)	<b>-0.302</b> (3.66)	<b>-0.545</b> (3.11)	<b>-0.446</b> (2.72)	<b>-0.583</b> (2.47)	<b>-0.621</b> (3.17)
Initial income	<b>-0.130</b> (2.90)	<b>-0.098</b> (1.84)	<b>72.9</b> (6.54)	<b>63.0</b> (4.87)	0.001 (0.02)	0.036 (0.56)	-0.102 (1.18)	-0.059 (0.61)	<b>0.880</b> (7.37)	<b>0.863</b> (7.21)
Constant	<b>0.924</b> (2.59)	<b>0.947</b> (2.23)	<b>-493</b> (5.32)	<b>-537</b> (6.08)	<b>2.132</b> (3.77)	<b>2.662</b> (6.33)	<b>5.261</b> (5.00)	<b>6.078</b> (6.97)	-1.570 (1.40)	-0.054 (0.06)
$R^2$	0.60	0.40	0.86	0.80	0.44	0.39	0.49	0.46	0.57	0.57
<i>N</i>	42	42	43	43	43	43	43	43	43	43

correlate with more egalitarianism in income distributions, as do widely held banking systems. The remaining columns use various measures of equality of opportunity. Family-control over banks correlates negatively with personal computers per thousand people, a measure of the breadth of access to new economy employment and market opportunities. Alternative measures—car ownership, internet connections, and telephone lines per capita—generate qualitatively similar results (not reported). Family-controlled banks correlate with fewer, not more opportunities. Since these measures also likely correlate with middle class purchasing power, they can also be interpreted as reinforcing our finding, based on Gini coefficients, that family-controlled banking correlates with worse income inequality.

The last six columns relate banking system control to measures of barriers to entry directly due to government bureaucratic procedures. All three measures—the *number of procedures*, *time*, and *cost* required to set up a new company legally—correlate positively with family-controlled banking and negatively with widely held banking systems. In contrast, state control over banks is insignificant, except for correlating with a higher cost of setting up a new firm.

The correlations of family control with income inequality and inequality of opportunity survive the battery of robustness checks enumerated in the previous section. All the robustness checks used above generate qualitatively similar results to those shown in the table with the following exceptions. If we restrict “family control” to mean control by tycoons or families who also control other firms, family control loses significance in regressions of the cost of starting a new business. In regressions controlling for privatizations, family control loses significance in explaining the number of procedures and the time required to start

a new business. In regressions that control for *oligarchy*, family control loses significance in explaining time and cost required to set up a new company, though *F*-statistics indicate joint significance obscured by multicollinearity.

Family control correlates positively with inequality, regardless of which dimension of inequality we measure. Of course, correlations do not resolve causation. However, correlations with third variables, such as those above, which are relevant to one causal explanation and not others, can further sharpen Ockham’s razor. We interpret these findings as reinforcing the plausibility of family control over banking systems reflecting crony capitalism (Murphy, Shleifer, and Vishny, 1991, 1993; Shleifer and Vishny, 1993; Shleifer and Vishny, 1998; Haber, 2002; Krueger, 2002; Rajan and Zingales, 2004; Daniels and Trebilcock, 2008; Fisman and Miguel, 2008; and others).

### 3.3.6. Causation

We posit that banks without controlling shareholders allocate capital more efficiently than banks with tycoons and families as controlling shareholders. However, we must consider the possibility that causation is reversed, that inefficient capital allocation causes tycoons and families to acquire control blocks in banks to access capital for their other firms. We can preclude neither absolutely. Neither event studies nor Granger causality tests are viable because banks very rarely switch from one ultimate controlling shareholder category to another. Also, the number of control variables we can use is limited because we must use country-level variables, most of which are highly persistent, so controlling for all potential latent factors is infeasible. Finally, plausibly exogenous potential instruments, such as legal origin and majority religion, are unlikely to act exclusively through banking system control.

Despite these daunting problems, our tests can eliminate some potential chains of reverse causation and many latent factors. In addition, a large body of circumstantial evidence from country historical studies and empirical work in adjacent areas makes an a priori plausible case for causation running as we posit.

Our econometric tests allow us to limit the scope for latent factors and reverse causality. When we use the approach of [Rajan and Zingales \(1998\)](#) to gauge capital allocation efficiency, we include both industry-level and country-level fixed effects, and exploit only cross-industry variation within countries. These tests are therefore robust to country-level and industry-level latent variables that do not interact with external-finance dependence, and also eliminate factors that should induce an interaction with the wrong sign. For example, if weak institutions caused tycoons and families to acquire banks so as to capitalize their firms in external-finance dependent sectors, more predominantly family-controlled banking systems should correlate with faster growth in those sectors after controlling for institutional development (country dummies); however, the opposite interaction is observed.<sup>7</sup>

If we use the popular instrumental variables legal origin, latitude, and major religion to estimate exogenous components of our bank control measures, and use these to re-estimate the tables in second stage regressions, we obtain qualitatively similar results. Although these instruments pass standard weak instruments tests, they plausibly affect economy outcomes through many channels, and therefore cannot be regarded as valid instruments. Nonetheless, this exercise indicates that exogenous elements correlated with banking system control affect the economy-level outcomes we study.

This ambiguity is further qualified by large bodies of theory ([Schumpeter, 1912](#); [Greenwood and Jovanovic, 1990](#); [King and Levine, 1993b](#); [Rajan, 1994](#); [Krueger, 2002](#); [Aghion, Howitt, and Mayer-Foulkes, 2005](#); and others) and empirical evidence ([King and Levine, 1993a](#); [Jayaratne and Strahan, 1996](#); [Levine, 1997](#); [Demirgüç-Kunt and Maksimovic, 1998](#); [Beck, Levine, and Loayza, 2000](#); [Beck and Levine, 2002, 2004](#); [Beck, Demirgüç-Kunt, and Maksimovic, 2008](#); [Levine, Loayza, and Beck, 2000](#); [Rajan and Zingales, 2001](#); [Durnev et al., 2004](#); [Djankov, Hart, McLiesh, and Shleifer, 2008](#); and others) that point to financial development facilitating economic growth. In particular, developed financial systems ease financing constraints ([Rajan and Zingales, 1998](#); [Aghion, Howitt, and Mayer-Foulkes, 2005](#)) and better allocate capital to industries with higher value-added growth rates ([Wurgler, 2000](#)). [Beck \(2003\)](#) also shows that financial development may be a source of comparative advantage in trade, which

[Rajan and Zingales \(2001\)](#) note is evidence of a causal link to economy-level outcomes. Privatization studies show that state control clearly affects the quality of banks' lending decisions ([Megginson, 2005](#)), so family control might plausibly do so too ([Krueger, 2002](#)). Family control clearly affects other firms' decisions and performance ([Smith and Amoako-Adu, 2005](#); [Perez-Gonzalez, 2006](#); [Bennedsen, Nielsen, Pérez-González, and Wolfenzon, 2007](#)); and banks' decisions have externalities that affect capital allocation and economy performance ([Saunders, Strock, and Travlos, 1990](#); [Almeida and Wolfenzon, 2006b](#); [Laeven and Levine, 2009](#); [Dell'Ariccia, Detragiache, and Rajan, 2008](#)). [Rajan and Zingales \(2003, 2004\)](#) present a host of econometric and historical evidence from a broad cross-section of countries supporting their thesis that a general financial system deterioration impedes economic growth by inhibiting efficient capital allocation. While this work cannot preclude reverse causality, it renders purely reverse causality implausible.

Country economic history studies also document tycoons and wealthy old-moneyed families striving to control banks in quests to control capital allocation. For example, [Haber, Maurer, and Razo \(2003\)](#) show elite capture of Mexican banks in the early 20th century stunting growth for decades; and [La Porta, López-de-Silanes, and Zamarrípa \(2003\)](#) argue that recent privatizations let elite business families recapture the sector and thereby gain control of capital allocation. These studies indicate that key actors believe that controlling banks lets them control capital allocation.

None of these points in isolation is a fully convincing argument as to the direction of causality. However, they combine to form a plausible body of circumstantial evidence that bank control affects the economy-level outcomes we study. Nevertheless, these issues are not fully resolved, and we invite further work to clarify causality. Event studies and country histories, in which the intentions of key decision makers can be documented, might be especially useful in this regard.

#### 4. Conclusions

Who controls a country's banks matters. Controlling for capital market development and initial GDP per capita, we find that national banking systems entrusted more predominantly to tycoons and business families (called family controlled for brevity) correlate with worse economy-level outcomes: less efficient capital allocation, more nonperforming loans, more frequent bank crises, greater macro volatility, and slower income and productivity growth rates.

Our findings support the thesis of [Rajan and Zingales \(2003\)](#) that an initial cadre of entrepreneurs (or their heirs), made rich by their country's newly developed financial system, subsequently seek to reverse that development to lock in their dominance by limiting entrants' access to external capital. Because cross-country empirical evidence suggests that banks provide essential capital for new and small firms ([Beck, Demirgüç-Kunt, and Maksimovic, 2008](#)), control over the banking system is a likely place to look for this effect. Consistent with these arguments, we find family

<sup>7</sup> In addition, the correlations of our dependent variables with initial income are generally quite weak, suggesting that the results are unlikely to be driven by a latent "bad country" effect. In fact, dropping the initial income as a control and rerunning our regressions generates qualitatively similar results to those shown, except now state bank control correlates negatively with [Wurgler's \(2000\)](#) capital allocation efficiency measure estimated using in the shorter window and positively with the number of banking crises, independent banks correlate negatively with that standard deviation of growth, and family bank control loses significance in explaining productivity growth.

control over banks correlated with traditional signs of crony capitalism, such as high inequality and barriers to entry.

Moreover, our findings emphasize family control of the banking system specifically, rather than their control of large businesses in general. That control of the financial system is especially critical supports the thesis of Rajan and Zingales (2003, 2004): incumbent elites might lock in the status quo by blocking upstarts' and competitors' access to outside capital. However, family control over banking is quite likely only part of the story, and further work exploring the importance of pyramidal business groups and their influence over other sources of capital might well be fruitful.

Of course, our findings imply neither that all controlling tycoons and families are entrenched nor that their control has these associations in all time periods and all financial crises. Rather, they render cases where the opposite result occurs especially intriguing.

Finally, our findings call for further corporate finance research into "elite capture"; wherein a minority religious group, ethnic group, or economic elite controls an economic, political, or other institution to advance the minority's interests, rather than general social welfare (Glaeser, Scheinkman, and Shleifer, 2003; Hellman, Jones, and Kaufmann, 2003; and others). Elite capture of a country's financial system may well be an important element of "crony capitalism" (e.g. Murphy, Shleifer, and Vishny, 1991, 1993; Shleifer and Vishny, 1993, 1998; Haber, 2002; Krueger, 2002; Rajan and Zingales, 2004; Morck, Percy, Tian, and Yeung, 2005; Acemoglu, Johnson, and Robinson, 2005; Daniels and Trebilcock, 2008; Fisman and Miguel, 2008) that underlies financial development reversals specifically (Rajan and Zingales, 2003, 2004) and persistent financial underdevelopment more generally (King and Levine, 1993a, b).

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