First Draft, February 8th 2001
This Draft, June 7th 2007
Comments Welcome

Big Business Stability and Economic Growth:
Is What's Good for General Motors Good for America?

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We are grateful for insightful suggestions and help from Philippe Aghion, Melsa Ararat, Africa Ariño, Daron Acemoglu, Edgar Cabral, Petra Christmann, Mara Faccio, Joseph Fan, Ray Fisman, Pankaj Ghemawat, Klaus Gugler, Campbell Harvey, Peter Holgfelt, Simon Johnson, Boyan Jovanovic, Andrew Karolyi, Tarun Khanna, E. Han Kim, Jung-Wook Kim, Bent Kromand, Larry Lang, Don Lessard, Ross Levine, Vikas Mehrotra, Joel Mokyr, Emi Nakamura, Andris Nobl, Hakan Orbay, Federica Pazzaglia, Enrico Perotti, Raghuram Rajan, Eric Rasmusen, Rahul Ravi, Joan Enric Ricart, Tom Scott, Andrei Shleifer, Jeremy Stein, Jan Svejnar, Steen Thomsen, Daniel Trefler, Saif Warraich, Marina Whitman, Clas Wihlborg, and Luigi Zingales. We also thank participants at the Academy of Management 2001 All Academy Symposium, Canadian Economics Association, Canadian Institute for Advanced Research Institutions, Organizations and Growth Program meeting at the University of Toronto, Copenhagen Business School, Concordia University, Duke University, Financial Management Association 2001 Doctoral Student Seminar, Harvard Business School, IESE Business School and Harvard Business School's 1st International Workshop on Creating Value through Global Strategy in Barcelona, Spain, Korea University's Asian Institute for Corporate Governance, Multinational Finance Association, Third Asian Corporate Governance Conference at Korea University, NBER 2002 Summer Institute in Corporate Finance, Swedish Institute of Economic Research conference at Mölle, Turkish Corporate Governance Forum, American Finance Association Meetings (2005), University of Alberta, University of Amsterdam, University of California at Berkeley, University of Toronto, Baruch University, University of Illinois, University of Maryland, Washington University at St Louis, World Bank Global Corporate Governance Forum, and Yale's International Institute of Corporate Governance. Kathy Fogel gratefully acknowledges an International Research Grant from the Western Center of Economic Research at the University of Alberta. Randall Morck gratefully acknowledges financial support from the SSHRC.

Abstract

What is good for a country's biggest businesses is not good for its overall economy, at least in the late 20th century. More turnover in a country's list of top ten businesses from 1975 to 1996 is associated with faster per capita GDP growth, productivity growth, and (in low income countries) capital accumulation. This accords with Schumpeter's early concept of creative destruction, *wherein growth is a positive feedback process of innovative firms blooming as stagnant firms wither. Positive feedback blears standard techniques for inferring causation. However, our finding that growth correlates with old big businesses declining and disappearing, not just new ones arising, seems more consistent with creative destruction than with other theories of economic growth. Consistent with Aghion and Howitt's (1992) theory that creative destruction matters more to economies nearer the technological frontier, growth correlates more strongly with big business turnover in higher income countries. More rapid turnover of big business also correlates with smaller government, Common Law, a less bank-dependent economy, stronger shareholder rights, and greater openness. Only the last is more prominent in low than high-income countries. In low income countries, the turnover of onetime state controlled big businesses correlates markedly with growth.*

Big Business Stability and Economic Growth

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1. Introduction

National economies have landmark corporations. Maersk shipping symbolizes Denmark's maritime history, as Nokia marks Finland's "new economy." Many, often the principals of such great businesses, link an economy's fortunes to those of its landmark firms. Most famously, Charles Wilson, Chairman of the now financially shaky GM, testified at his 1953 Senate Armed Services Committee confirmation hearing to become US Defense Secretary, "What is good for the country is good for General Motors and *vice versa*."

Plausible arguments imply the opposite. Schumpeter (1912) attributes economic growth to upstart innovative firms arising and ruining doddering behemoths, a process Schumpeter (1942) dubs *creative destruction*. A feedback ensures, for today's upstarts not only become tomorrow's behemoths, but also inspire a new generation of upstarts that eventually repeat the cycle. Aghion and Howitt (1992, 1998), Aghion *et al.* (2005), and others model this process formally. Nelson and Winter (1982) explain creative destruction by visualizing firms as collections of "routines" that develop slowly and resist change. Routines let firms prosper if they fit current economic conditions – institutional constraints, consumer preferences and production technologies. But as conditions change, an economy needs upstarts with new routines to displace past winners, which intrinsically have difficulties changing their ways. All these arguments imply that Wilson is wrong, and that we should observe a negative correlation between the continuous dominance of large businesses and economic growth.

But Wilson's thesis has champions. A positive link might reflect large corporations prospering because they are well managed, and the wealth they create spilling over the economy (Chandler, 1977). Schumpeter (1942) amends his vision of creative destruction, arguing that large, quasi-monopolistic businesses can best finance ongoing innovation, which sustains both their dominance and their economy's

growth. Schumpeter (1942) adds that such stability provides job security, which Holmstrom (1989) argues permits high risk-high return undertakings, including investments in firm-specific human capital that would be unacceptable career risks to managers and employees in smaller firms. Galbraith (1967) adds that larger firms are better able to absorb the advertising investments that shape demand for their products. Romer (1986) formalizes Schumpeter (1942), positing that investment in innovation is worth more to a larger firm because its innovation can enhance productivity on a larger scale of operations. Chandler (1990) likewise posits rising economies of scope and scale in ever larger corporations as the motive force beneath economic growth in industrial economies. In the management literature, D'Cruz and Rugman (2000) and others suggest large business enterprises create and capture various economies of scale and scope. In each of these views, a positive feedback ensues, with the dominance of large businesses enhancing their economic fortunes, which further heightens their dominance. This feedback, in turn, fuels overall economy growth. All of these perspectives imply a positive correlation between and economy's prosperity and that of its large corporations.

Signing the relationship between economic growth and big business stability lets us hone away one or the other class of theories. Establishing a predominant direction of causality, though of interest *per se*, is thus not critical for this exercise. Schumpeter (2002), in the initially omitted chapter seven of Schumpeter (1912), reflects on the slippery epistemology of 'causation' in economic growth. Recognizing that "[t]he distinction between both forces and their repercussions is of great analytical value in this as in any particular case;" he nonetheless concludes that economists must learn to deal with a dynamic growth process, "not with a causal chain of explanation." We sidestep all this because our objective here is distinguishing one class of dynamic processes from the other, as a first pass at least, by signing the correlation in question.

We regress real *per capita* gross domestic product (GDP) growth, capital accumulation, and total factor productivity (TFP) growth from 1990 to 2000 for 44 countries on the stability of their top ten firms

from 1975 to 1996; with controls for initial *per capita* GDP, level of education, and capital stock.[1] We say a leading 1975 business is *stable* if it survives to 1996 – it need not remain in the top ten – and explore different definitions of "survival". The 1975 to 1996 window includes the first and last years for which we had comparable lists of leading businesses when we began this project; and measuring growth in a ten-year window around the endpoint of the stability window smoothes business cycle and transient crisis effects.

We find faster growth in countries where big business is less stable, and the finding survives numerous robustness tests. This supports Schumpeter (1912), Nelson and Winter (1982), Aghion and Howitt (1992, 1998), Aghion *et al.* (2005), and other like theories; but suggests more limited traction for theories of Chandler (1977), Schumpeter (1942), Galbraith (1967), Romer (1986), Chandler (1990), and D'Cruz and Rugman (2000) – at least in the late twentieth century. The latter class may predominate in other periods, or in certain industries. We relegate these issues to future research.

Establishing a predominant direction of causality is still "of great analytic value." Granger causality tests are unviable because the processes we study work over what Schumpeter (1912) calls the "very long run" – time in generations, not years. A useful panel would require past data at generational intervals; not filling in higher frequency data. We relate big business turnover to end-of-period growth because the latter is an overarching policy objective. Curiously, growth measured around the beginning of our window is uncorrelated with our big business stability measures. This is far from conclusive, but loosely suggests big business stability 'causing' slow growth in this era. We attempt more rigorous identification with instruments commonly used in the literature, but all fail standard weak instruments tests – implying instrumental variables regressions using any or all of these variables provide no more information abut causality than OLS (Staiger and Stock, 1997). But despite failing to identify a predominant direction of causality, this exercise elucidates the economics underlying our finding

[1] Note that the question of large firm stability is distinct from that of optimal firm size. Acs *et al.* (1999) find that US industries containing larger firms post faster productivity growth. Rapid turnover of large firms need not imply a steady state characterized by a preponderance of small firms.

First, enumerating alternative stories consistent with a negative correlation underscores the relative plausibility of Schumpeter's (1912) theory of economic development. This is because we link faster growth to a higher *death rate* of old leading firms, not just to their eclipse by new bigger firms. A range of reverse causality stories might link growth to the rise of new leading firms that eclipse still prosperous old firms; but the only reverse causality story plausibly linking growth to the *destruction* of old leading firms is creative destruction itself, for Schumpeter (1912) explicitly envisions corporate turnover causing growth and growth causing corporate turnover.

Second, although they fail as instruments, we can usefully recast a cadre of institutional variables as potential latent factors – things that enhance both corporate turnover and economic growth – associated with the most plausible alternative stories. We propose that the size and quality of government, the development of the financial system, and the degree of economic openness all encapsulate such alternative stories. We therefore identify the proxies for these most correlated with big business stability and rerun our regressions of growth on stability adding these as additional controls. Because these factors are also all potentially related to the intensity of creative destruction itself, this procedure works against us. That is, controlling for these factors arguably also drains our analysis of much variation driven by creative destruction. Nonetheless, our results persist – big business stability retains a negative sign, consistent with Schumpeter's (1912) view of upstart firms undermining stagnant behemoths. Unfortunately, since no list of potential latent variables can be exhaustive, this too can only provide circumstantial evidence consistent with creative destruction.

A final set of clues lie in subsample regressions. Aghion and Howitt (1998) argue that growth in high-income countries, already on or near the production possibilities frontier, requires creative destruction to push that frontier outwards; but that rapid growth in low-income countries can arise from improved factor allocation – outward movement from deep beneath the frontier – in applying off-the-shelf technologies. Consistent with this, we find a stronger relationship between big business stability and slow growth in a subsample of high income countries.

Intriguingly, high income countries' growth correlates most strongly with large private sector

firm turnover, while low income countries' correlates mainly with one-time state owned enterprise (SOE) turnover. Because we disregard nationalizations and privatizations in calculating turnover, the destruction of one-time SOEs, not their privatizations, correlates with growth. Moreover, the institutional variables discussed above are less important for low-income countries, suggesting a more direct link. We speculate that onetime SCEs in low-income countries might retain political influence to soften their budget constraints, distorting resource allocation and slowing growth (Kornai, 1986). Also, Marshall (1907) writes that "a government could print a good edition of Shakespeare's works, but it could not get them written"; and Shleifer and Vishny (1994a, 1994b) and Shleifer (1996) formalize this to explain the museum pieces prominent in transition economy factories. If distrust of innovation persists in onetime SCEs, this too might directly retard growth. Thus, though privatization raises firm-level performance (Megginson, Nash, and van Randenborgh, 1994; La Porta and Lopez-de-Silanes, 1997; World Bank, 1995), a drag on economy-level growth could linger if onetime SOEs continue to dominate.

None of these tests conclusively confirms our thesis, but they coalesce into strong circumstantial evidence that Schumpeter's (1912) process of economic development underlies economic growth in the late twentieth century.

The paper is organized as follows: Section 2 reviews the construction of our key variables and section 3 presents our main results. Section 4 discusses causality, identification, and latent variables. Section 5 describes subsample regressions, and section 6 concludes.

2. Data and Variables

This section describes the raw data used to construct our big business stability indexes. It then explains the indexes themselves, the growth measures and the other variables central to our empirical tests.

2.1 Big Business Sector Data

Our data are hand-collected from the 1978 and 1998/99 editions of *Dun & Bradstreet's Principals of*

International Business. We use this source because it includes a wide spectrum of businesses: privately held companies, publicly held companies, cooperatives, and state controlled enterprises (SCEs).[2] This circumvents sample selection problems due to stock exchanges, and hence listed firms, being less important in some countries than others. Comparisons with annual reports show the 1978 volume to contain mainly 1975 figures, so we call this 1975 data. The 1998/99 volume generally contains 1996 figures, so we call it 1996 data.

Our final sample of 44 countries, listed in Table 1, meets the following criteria:

1. The country must appear in both the 1978 and 1998/99 editions of *Principals of International Business*. This eliminates transition economies.

2. We delete small economies whose tenth largest company has fewer than 500 employees or which have less than ten companies whose labor forces are listed in both editions. This removes microstate economies, which may differ fundamentally from larger countries.

3. We drop countries involved in major wars, including civil wars, between 1975 and 1996.

4. We require data on education and capital assets because these initial conditions are known to affect economic growth, and are needed as controls in our regressions.

5. We require comparable national income accounts data to construct comparable economic growth measures. This limits us to countries included in the Penn World Tables.

[Table 1 about here]

2.2 Measuring the Stability of Leading Businesses

We first need a list of each country's top businesses in each of 1975 and 1996. La Porta *et al.* (1999a), Claessens *et al.* (2000), Faccio and Lang (2002), and others show that large businesses in many countries, the US and UK being notable exceptions, are not single firms but business groups – constellations of

[2] We use the term *state controlled enterprise* (SCE) rather than *state owned enterprise* (S.O.E.) because the state

listed corporations tied together by equity control blocks and usually all ultimately controlled by a single wealthy individual or family. We therefore define a country's largest *businesses* as the union of its largest freestanding firms and business groups.

We start with the list of firms in Dun & Bradstreet and determine the ultimate controlling shareholder of each. To do this, we search *Google*, online databases such as *Hoover's online*, corporate websites, *Worldscope*, *SDC*, Forbes' annual lists of billionaires, newspaper archives, case studies, and academic research papers. We define a firm as controlled if it is so defined in any of these sources, or if 20% or more of its stock is voted by a firm, wealthy family, government, trust, or bank.[3] We then consolidate affiliated firms into business groups accordingly.

We define a business's *size* as the number of people it employs. For business groups, this is the total number of employees in all the group's component firms. Employee tallies for business groups are cross-checked whenever possible across the various sources mentioned earlier.[4] We measure firm size by employees because this lets us include both listed and private firms. The latter typically do not disclose their assets or sales, other common measures of firm size.

The consolidation of firms into business groups leaves some countries, like Sweden and South Africa, with a very few very large dominant businesses. Thus, even the 15th or 20th largest business in some countries is quite small. We therefore define each country's *big business sector* as its 10 largest businesses. If ties occur for the tenth business, all the ties are included.

In smaller countries, or countries with business groups rather than freestanding firms, this is an exhaustive list of large businesses. In larger economies, it is a sampling of big businesses biased towards the biggest. For a very small economy, even the top ten list can still include what would be considered "small firms" in larger countries. This necessitates controlling for country size, or for the importance of

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may hold a control block without owning the firm outright.

[3] La Porta et al. (1999a) shows that 51% is not necessary as a single dominant shareholder can exert effective control when all other shareholders are small. We use voting rights to assign control, for cash flow rights and voting rights diverge substantially in some countries because of dual share classes and control pyramids.

[4] Some holding companies claim their subsidiaries employees, despite Dun and Bradstreet's instructions otherwise. Cross checking, including phoning companies, resolved such data problems, at least to a first approximation.

the top ten firms relative to the economy, in subsequent analyses.

The next issue is what sorts of businesses to include. We exclude enterprises not normally included in countries' private sectors: educational services (SIC: 82), health services (SIC: 80), membership organizations (SIC: 86), noncommercial research organizations (SIC: 8733), and government agencies (SIC: 91-97). Beyond this, a degree of judgment is inevitable, for excluding any or all of three other categories of businesses might also be reasonable:

Financial businesses might be excluded. King and Levine (1993) show that capital market development positively affects growth. Including financial businesses in our top ten lists might capture spuriously the impact of financial system development on growth. Business groups containing financial and non-financial firms are assigned to one category that accounts for the greater share of their employees.

Foreign owned enterprises might be excluded. Multinational subsidiaries are plausibly more affected by global conditions than by their host countries' economic conditions. However, some domestically based businesses might also have foreign operations, so this argument is not clear-cut. Countries that open up to the global economy gain multinational subsidiaries, and countries that isolate themselves lose multinational subsidiaries. Either could alter their top ten lists. Sachs and Warner (1995) and others show that openness contributes to economic growth and global convergence. Hence, including foreign owned enterprises might capture spuriously the impact of openness on growth.

Finally, any firm that was a state controlled enterprise (SCE) in any part of our window might be excluded. SCE.s' economic motives might differ from those of purely 'for-profit' businesses. These motives might range from the efficient provision of public goods and promotion of new industries to wasteful government activism, bureaucratic entrenchment, and blatant corruption. These motives aggregate to an uncertain effect on growth; though Hayek (1944) and others argue eloquently that their net effect is negative. Regardless of the sign, including SCEs might capture spuriously the impact of the size of the government on growth. Since import substitution and socialist ideologies induced extensive nationalizations in the 1970s and a resurgence of liberal ideology in the 1990s induced waves of

privatizations, this problem may be especially severe during our time window.

To deal with these issues, we construct several alternative lists of top ten businesses in 1975, and again in 1996:

- List I – Includes all businesses: financial and non-financial, domestically controlled and foreign controlled, as well as private sector and state controlled. Privatizations and nationalizations are taken as continuations of the same business, but SCEs that fail, are taken over, or are broken up are classified as not surviving. These are our *maximally inclusive* lists.
- List II – List I, but excluding businesses primarily in the financial sector – banks, insurance companies, and investment banks. We define the financial sector as SIC codes 60 – 64, as reported in Dunn and Bradstreet's *Principals of International Business.*
- List III – List II, but excluding foreign-controlled enterprises. We infer foreign control if a foreign person votes at least a twenty percent stake and is the largest shareholder.
- List IV – List II, but excluding SCEs. We consider an enterprise to be state controlled if a government holds at least a twenty percent voting stake and is the largest shareholder.
- List V – The intersection of Lists III and IV; that is, list I excluding financial companies, SCEs, and foreign controlled enterprises. These are our *minimally inclusive* lists.

We wish to see if economic growth is related to the stability of a country's largest businesses. To quantify this, we must define which leading businesses from 1975 remain *stable as leading businesses* through 1996. One obvious approach is to define *stable* as "still in the top ten list in 1996". But a growing economy might let new businesses join the top ten, even though the 1975 top ten still prosper. A more nuanced definition of *stability* might spotlight 1975 top ten businesses that grew at least as fast as GDP, regardless of the 1996 top ten list. Other alternatives might define *stability* as a 1975 top ten business retaining at least *n* percent of its 1975 labor force, where *n* can be e.g. 50%, 25%, or 10%. A combined definition might designate a top 1975 business as *stable* if it is either in the 1996 top ten list or it grew (or shrank) at some minimal rate from 1975 to 1996. While each definition is arbitrary in some respect, robustness checks discussed below show that all yield similar empirical results.

In the tables, we use a combined definition – a leading 1975 business is *stable* if it remains in the top ten list in 1996 *or* grew at least as fast as its country's GDP from 1975 to 1996. That is, we define a country's *employee-weighted stability index* as

$$\Omega_{L75}^{GDP} = \frac{\sum_{i=1}^{10} \max\left[\delta_i, \eta_i\right] L_i}{\sum_{i=1}^{10} L_i} \tag{1}$$

where L_i is the 1975 labor force of 1975 top ten business i,

$$\delta_i = \begin{cases} 1 & \textit{if } i \textit{ is in the top ten lists in both } 1975 \textit{ and } 1996 \\ 0 & \textit{otherwise} \end{cases} \tag{2}$$

and

$$\eta_i = \begin{cases} 1 & \textit{if its employment grew no slower than GDP in both } 1975 \textit{ and } 1996 \\ 0 & \textit{otherwise} \end{cases} \tag{3}$$

We construct one such index for each variant of each country's list of top ten businesses. We also construct a set of analogous equally weighted stability indexes denoted Ω_E^{GDP}; defined

$$\Omega_E^{GDP} = \frac{1}{10} \sum_{i=1}^{10} \max\left[\delta_i, \eta_i\right] \tag{4}$$

To construct these indexes, we must assess the 1996 fate of each 1975 top ten business. This requires assembling a detailed history of each business.

Some businesses change names. For example, some Malaysian company names contain the abbreviation *BHD* in one *Dun and Bradstreet* volume, but *Berhad* (*corporation* in Malay) in the other. Likewise, Finland's Nokia is listed as *OY NOKIA AB* in one edition and *NOKIA OYJ* in the other. The choice of language sometimes causes confusion too. For example, the Japanese company listed in the 1975 data as *Sumitomo Kinzoku Kogyo KK* is listed under its English name, *Sumitomo Metal Industries Limited*, in 1996. These changes are easily traced.

Other name changes are less obvious, but are revealed in the detailed histories we construct for each business. We compile these from company websites, business history books, and biographies of the

principals of our 1975 top ten businesses. Where this leaves ambiguities, we scan through newspaper records, and, in many cases, phone archivists at particular companies. These efforts, plus telephone inquiries to bankers, brokers, and finance professors in different countries, clarify the fates of all our 1975 top ten businesses.

The fates of a few businesses are intrinsically ambiguous. For example, some spin off divisions. Although the core business may be smaller in 1996, the aggregation of all successor businesses might be large. In general, we follow the principal successor business only. In some cases, this is problematic. For example, the Argentine state controlled enterprise Servicios Electricos del Gran Buenos Aires SA (Segba) is one of that country's top ten businesses for 1975. In the early 1990s, it split into Edenor and Edusur – with roughly equal numbers of employees going into each. In this case, we take the combined employees of the two successors in assigning continued importance to the predecessor business.

Table I reports the employee-weighted and equal-weighted stability indexes based on lists I and V for each of our 44 countries. Interpreting these indexes is straightforward. For example, the stability index of the United States based on list I, the minimally inclusive list which excludes financial, government controlled, and foreign controlled enterprises, is $\Omega_{L75}^{GDP} = 0.531$. This means that 53.1% of the employees of the top 10 businesses of 1975 worked for businesses that either remain in the top 10 list for 1996 or created jobs at least as fast as the growth rate of US GDP from 1975 through 1996. Similarly, Japan's equal-weighted stability index is $\Omega_{E}^{GDP} = 0.7$, indicating that seven of Japan's top ten employers in 1975 either remain among it's top ten in 1996 or created jobs at least as fast as Japanese GDP grew. In general, the top businesses in higher income countries are more stable than those in developing economies.

Our employee-weighted and equal-weighted indexes are highly positively correlated, with $\rho = 0.851$ ($\pi < 0.01$) for the maximally inclusive indexes and $\rho = 0.824$ ($\pi < 0.01$) for the minimally inclusive indexes. The indexes based on minimally versus maximally inclusive lists are also highly significantly correlated with each other ($\pi < 0.01$ in all cases), with point estimates in the 0.52 to 0.66 range. Indexes based on different lists are more highly correlated among higher income countries.

The upper panel of Table 2 presents univariate statistics for our stability indexes.

[Table 2 about here]

2.3 Measuring Economic Growth

Ideally, we would measure economic growth subsequent to, and therefore potentially 'caused by' top business stability. However, Schumpeter (1912, 1942) and others stress that the economic effects we study operate only over the very long term – time clocked in generations rather than years. More frequent data would therefore not be helpful. Genuinely augmenting our data with more time periods would require going further back in time to the mid and early 20th century. This is not possible given available data, so we are limited to a single cross section of data, in which we use our big business stability indexes, measured over 1975 to 1996, to explain long run growth at that window's endpoint.

Long-run growth cannot be measured easily at a point in time, for annual growth rates are distorted by business cycles and even transient crises. We therefore gauge long-term growth using observed growth over a window attached to 1996. Requiring that the window begin at 1996 would let us use past stability to predict future growth – an econometrically desirable temporal arrangement of variables. However, a short window beginning in 1996 generates noisy variables because its endpoints are contaminated by economic crises in East Asia and parts of Latin America as well as the bursting of the "Dot Com" bubble. A very long window beginning in 1996 is not possible yet, for many countries publish national income accounts data with a lag of several years and these are rendered in comparable form in the Penn World Tables only after further delay.

We therefore define *long-term economic growth* as per capita GDP growth

$$\Delta \ln(y) = \ln(\textit{per capita } GDP_{2000}) - \ln(\textit{per capita } GDP_{1990}) \qquad (5)$$

from 1990 to 2000 – a ten year window roughly centered on the endpoint of the window over which we gauge big business sector stability. Data are from the Penn World Tables, Version 6.1, which include

comparable national income accounts figures through 2000.[5] GDP figures are in US dollars at purchasing power parity, and inflation-adjusted to 1996 dollars to remove differences in inflation rates and living costs across countries. Since $\Delta \ln(y) \cong \Delta y / y$, we interpret $\Delta \ln(y)$ as a fractional growth rate in *per capita* GDP.

The Penn World Tables let us decompose overall growth into growth due to capital accumulation and growth due to increased total factor productivity (TFP). To do this, we first measure each country's rate of *per capita* physical capital growth, $\Delta\ln(k)$, from 1990 to 2000. To estimate *ln(k)* at each endpoint, we assume an initial capital stock of zero for 1950 and construct a time series $K_{i,t}$ of total stock of physical capital in country *i* in year *t* recursively as

$$K_{i,\,t+1} = K_{i,\,t} + I_{i,\,t} - \delta K_{i,\,t} \qquad (6)$$

where $I_{i,t}$ is aggregate real investment for country *i* in year *t*, from Penn World Table 6.2, and δ is a depreciation rate of 7% under the perpetual inventory method. Scaling the total real physical capital stock by population yields *per capita* real physical capital stock. This procedure is similar to that in King and Levine (1994).

We then follow the methodology of Beck, Levine and Loayza (2000) to estimate each country's TFP growth as the growth in its *per capita* GDP minus 0.3 times the growth of its *per capita* physical capital.[6]

Table 2 panel A presents summary statistics. The mean of 0.223 for $\Delta \ln(y)$ indicates that the typical country's *per capita* GDP rose by about 22.3% from 1990 to 2000 in real US dollars at purchasing power parity. Likewise, the average growth in real *per capita* physical capital stock is 26.3% and the average total factor productivity growth is 14.4%. The ranges of these three measures are wide: from -8.3% (Venezuela) to 62.4% (Israel) in total growth, from -4.2% (Venezuela) to 46.7% (Israel) in total

[5] The Penn World Tables are available from the National Bureau of Economic Research at www.nber.org.
[6] Caselli (2005) shows this decomposition of economy growth changes nontrivially at capital shares above 0.4. As robustness checks, we experiment with a range of capital share assumptions. Estimates based on Caselli's methodology with constant assumptions up to 0.4 generate results similar to those shown. We follow the conventional approach of setting the capital share to 0.3 in the tables.

factor productivity growth, and from -21.7% (South Africa) to 67.4% (Korea) in real *per capita* physical capital accumulation.[7]

3. Main Findings

Our central finding is that a more stable list of large businesses is associated with slower growth. We first show this with simple correlations and then turn to regressions analogous to the basic models surveyed in Mankiw (1995), but adding *stability* as an additional independent variable. The section concludes with a robustness discussion.

3.1. Simple Correlations

Table 2 Panel B presents simple correlations between our growth measures and stability indices. All our maximally inclusive stability indexes are significantly negatively correlated with *all three* growth measures – with significance levels somewhat lower for equally weighted than employee-weighted stability indexes. The minimally inclusive indexes – which drop financial, foreign-controlled, and state-controlled businesses – tell a slightly different story. Total *per capita* GDP growth and TFP growth are negatively correlated with these stability indexes, but capital accumulation is not significantly correlated with our minimally inclusive stability indexes– though the correlation point estimates remains negative.

3.2 Regressions of Long-Term Economic Growth on Big Business Stability

Economic growth rates are known to be higher for countries with lower initial levels of income, more educated workforces, and more extensive capital assets.[8] Table 2 Panel B shows that our big business stability indexes correlate with these initial condition determinants of economic growth. Thus, the simple

[7] Another approach would look analogously at the turnover in each country's list of leading industries. We are pursuing this elsewhere. While this might seem a simpler line of attack, data problems actually make it considerably more complicated.

[8] See Barro (1991), Mankiw (1995), and others. Barro uses initial capital investment, rather than assets. Our results are robust to using either.

correlations described above might only reflect known determinants of economic growth.

We therefore follow Mankiw (1995) and regress our growth measures on a big business stability index controlling for initial income, initial stock of physical capital, and initial stock of human capital. Thus, we run regressions of the form

$$\begin{bmatrix} economy \\ growth \\ rate \end{bmatrix} = \beta_0 + \beta_1 \begin{bmatrix} initial \\ income \\ level \end{bmatrix} + \beta_2 \begin{bmatrix} initial \\ physical \\ capital \end{bmatrix} + \beta_3 \begin{bmatrix} initial \\ human \\ capital \end{bmatrix} + \beta_4 \begin{bmatrix} corporate \\ stability \\ index \end{bmatrix} + \varepsilon \qquad (7)$$

where the *economic growth rate* is either *per capita* GDP growth, TFP growth, or capital accumulation and *big business stability index* is one of the stability indexes, all as defined above.

The control variables in (7) are as follows.

Initial income level is the logarithm of 1990 real PPP US dollar *per capita* GDP, ln(y), as in the Penn World Tables. *Initial physical capital* stock is the logarithm of real *per capita* physical capital in 1990, ln(k), from (6) in Section 2. As a proxy for the *initial human capital* stock *per capita*, we take the logarithm of the average years of education for people aged 25 or over, ln(h), from Barro and Lee (2001).

Thus, the regressions we run take the forms

$$growth = \beta_0 + \beta_1 \ln(y) + \beta_2 \ln(k) + \beta_3 \ln(h) + \beta_4 \Omega + \varepsilon \qquad (8)$$

where Ω is Ω_{L75}^{GDP} or Ω_{E}^{GDP}. Table 3 presents regression coefficients and heteroskedasticity consistent t-statistics.

[Table 3 about here]

Panel A reports full details for regressions using minimally inclusive equal-weighted stability indexes. The index attracts significant negative coefficients in regressions explaining all three growth measures. That is, more stable dominant businesses are associated with slower economic growth, slower productivity growth, and slower capital accumulation. Our stability indexes can be interpreted as inverse measures of the marginalization of previously dominant businesses. This interpretation of our result

implies that a greater marginalization of past leading businesses is significantly associated with faster growth, faster productivity growth, and even faster capital accumulation.

Panel B reports regression results using stability indexes based on each variant of our top ten lists described above. For brevity, the table reports only the regression coefficients on those indexes. In every case, big business stability is negatively and significantly related with both *per capita* GDP growth and TFP growth. While the stability measures also attract negative coefficients in every regressions explaining capital accumulation, these are significant only for three of the ten stability variants; and two of are for indexes constructed from top 10 lists including sometime SCEs.

[Figure 1 about here]

Figure 1 plots per capita GDP growth, TFP growth, and capital accumulation against the maximally and minimally inclusive labor weighted indexes, respectively, in Panels A, B, and C These figures "partial out" the control variables used in the regressions. That is, we regress the two graphed variables on the controls and plot the residuals of these against each other.

Although some scatter is evident, the plots vividly illustrate the regression results from Table 3-B. Robustness tests, described below, reject outliers and validate these plots.

Our findings are *economically* as well as statistically significant. To save space, and to be conservative, we discuss only the results for indexes based on the minimally inclusive top ten lists, which also have the least significant results. A one standard deviation increase in the labor-weighted stability index is associated with a *per capita* GDP growth drop of 0.227 x 0.199 or 4.5%. This is approximately 33% of the cross-country standard deviation in real *per capita* GDP growth. Similarly, a one standard deviation increase in the equal-weighted stability index is associated with a *per capita* GDP growth depressed by 5.79%, about 42% of the standard deviation of that variable. A one standard deviation increases in these same labor or equal-weighted indexes is likewise associated with total factor productivity growth reductions of 30% or 41%, respectively, of the standard deviation of that variable.

Likewise, a one standard deviation rise in these indexes is associated with *per capita* capital accumulation lower by 24% and 27%, respectively, of its standard deviation.

Finally, we consider a more generous stability definition, including all firms that still employ at least ten percent of their 1975 labor forces in 1996. This reproduces the pattern of signs and significance in the tables. That is, growth is higher in countries where a larger fraction of leading 1975 firms are diminished by over 90%. Growth is associated with the drastic withering of leading firms, not merely with their eclipse by new giants.

In summary, there is no support for big business stability augmenting economy growth; rather the marginalization of old big businesses correlates with faster growth.

3.3 Robustness Tests

These basic results in Tables 3 survive a battery of robustness checks. Reasonable changes in regression specifications and variable definitions generate *qualitatively similar results*. By this we mean that these changes do not alter the sign, approximate magnitude, or significance of the coefficient on the big business stability indexes.

Although the general inclinations in Figures 1 clearly illustrate our regression results, the scatter in these plots raises concerns about outliers affecting our results. Residual diagnostics tests reject this, for Cook's D and DFFITS tests indicate no outliers. Student residuals flag Ireland as a potential outlier. Since Ireland's status as a tax haven policy might bolster its growth, an economic argument for excluding it also has traction. However, rerunning our regressions without Ireland yields qualitatively similar results. We nonetheless successively eliminate observations with the worst Cook's Ds, first one-by-one and then two-by-two, rerunning our regressions after each elimination. Significance levels, signs, and rough coefficient magnitudes survive through the first few eliminations; and signs and rough coefficient magnitudes persist long after significance levels fall below standard thresholds.

Although generalized White tests reject heteroskedasticity, we use heteroskedasticity-consistent

standard errors throughout. Replicating the regressions with OLS standard errors generates qualitatively similar results to the tables.

We wish to insure that differences in country size do not affect our results. The biggest ten businesses in a small economy might be smaller in absolute size than those in a large economy; and yet might constitute a larger part of the overall corporate sector. We control for this with *country size*, gauged by the logarithm total 1990 GDP, in 1996 dollars at purchasing power parity, which we denote *ln(Y)*, from Penn World Table 6.2, and run

$$growth = \beta_0 + \beta_1 \ln(y) + \beta_2 \ln(k) + \beta_3 \ln(h) + \beta_4 \ln(Y) + \beta_5 \Omega + \varepsilon \qquad (9)$$

The country size variable is uniformly insignificant, and its inclusion yields qualitatively similar results for the other variables. Using log of total population, or log area in square kilometers, to control for country size has the same effect.[9]

The biggest ten businesses in some countries, such as Sweden and South Africa, are essentially the population of large businesses. In others, like the United States and United Kingdom, the top ten are merely the largest from a broad range of big businesses. Countries with only a few truly huge businesses might be qualitatively different from those with many roughly equally big businesses. To control for this, we include the labor force of the top ten businesses as a fraction of national population (or GDP) in 1975 as an additional control. This also generates qualitatively similar results to those shown.

Our results might also depend on the industrial structures of economies. Specifically, dependence on natural resources might affect big business stability and economic growth. Resource abundant countries may have long-lived resource extraction businesses that remain large to exploit economies of scale. Yet, for political and institutional reasons, these countries might also remain poor (Rodriguez and Sachs, 1999 and Sachs and Warner, 2001). However, including the resource dependence measure of Hall

[9] One alternative approach is to make the length of our lists of large businesses proportional to the size of the economy by including more firms in larger economies. However, this is operationally difficult because gleaning accurate corporate histories in remote countries is often quite involved. Moreover, the choice of the proportionality factor also introduces a new degree of arbitrariness. We leave this to possible future research.

and Jones (1999) as an additional control variable again generates qualitatively similar results.[10]

We can also define big business stability in various ways. Defining stability as a 1975 top ten business remaining in the 1996 top ten list; retaining 50%, or 25%, or 10% of its 1975 employment in 1996; or a disjunction of the former with any of the later criteria all generate results qualitatively similar to those described above. The reported indexes capture the extent to which 1975 top businesses remain important; the alternative indexes gauge the extent to which they evade ruination.[11] All these alternatives yield results qualitatively similar to those shown.

One alternative stability index generates qualitatively different results. We constructed a *continuity of control* index based on the family name of each company's top executive in 1975 and 1996. Our idea was to capture the fraction of the big business sector under the control of the same individuals or families over the two decades. We wondered if a change in control might rejuvenate an old firm. Labor-weighted and equal weighted indexes of continuity of control are uncorrelated with GDP growth, productivity growth, and capital accumulation. One interpretation is that creative destruction requires more than a turnover of top management. A turnover of big businesses, and perhaps of their intangible corporate routines as well as physical assets, is needed. Another is that our continuity of control index is too noisy to be of use because different last names may correspond to continuity if CEOs are replaced by nephews, acolytes, and the like; and that the same last name may correspond to discontinuity if a son's policies differ greatly from his father's. Further research is needed to clarify these issues.

A further set of robustness tests substitute alternative productivity growth measures for those in the tables. Proposed by Mankiw (1995) and Hall and Jones (1999), respectively, these include human

[10] Hall and Jones (1999) describe their mining variable as for 1988 "when possible or the closest available year." We follow their procedure, using 1975 and 1996 World Development Indicators data, to construct two sets of control for natural resource dependence using fuel, oil, and metals exports over merchandise exports (FOM). The first set includes two variables – the level of FOM in 1975 and its change from 1975 to 1996. The second set is the average of FOM in 1975 and again in 1996. Including either set preserves the magnitudes and significance levels of the stability variables in *per capita* GDP and TFP growth regressions.

[11] Since results based on these other versions of the continued importance indexes are similar to those in the tables, we do not report them to conserve space. These results are available from the authors upon request.

capital as a factor of production.[12] Qualitatively similar results ensue.

We next replace real *per capita* GDP growth with real *per capita* gross national income (GNI) *growth*. GNI can be measured in two ways: the Atlas Method converting national currency to current US dollars or converting national dollars to "international dollars" at purchasing power parity. Both produce qualitatively similar results to those in the Tables.

Finally, we gauge initial stock of human capital by the logarithm of the average number of years of total education in the male population over 25 in 1990, rather than the general adult population (on the grounds that males are more likely to be in the work force in many countries). Again, we obtain qualitatively similar results.

4. Causality

Section 3 establishes a robust negative relationship between big business stability and growth but its causal interpretation remains hypothetical. Growth might destabilize old big businesses, or the instability of old big businesses might fuel growth. Because Schumpeter's (1912) description of creative destruction explicitly implies both, while many alternative theories of economic growth imply neither, our result is useful without a clear delineation of causality. Nonetheless, ascertaining the dominant direction of causality in effect during our sample period is intrinsically interesting, as is an exploration of possible latent factors.

4.1 Timing

One approach is Granger causality tests. If past corporate turnover correlates with current growth, the latter 'Granger causes' the former, if current turnover correlates with past growth, the converse is indicated.

We relate past big business turnover to current end-of-period growth because the latter is an

[12] See Beck, Levine, and Loayza (2000) for a comparison of the two methodologies.

overarching policy objective. In contrast, growth measured analogously around the beginning of our window is uncorrelated with big business stability during it. This loosely suggests big business stability 'causing' slow growth, more than the converse, during this period.

Formal Granger causality tests would require **a** long panel of country level data. Because Schumpeter (1912, 1939, 1942, 2002) specifically describes growth in the "very long run", with time measured in *generations*, not years, assessing economic growth and big business stability over higher frequency intervals within a relatively short window is not useful. Adding a meaningful time dimension requires constructing a panel of stability indexes at appropriately long intervals into the deeper past. This is difficult because compiling the indexes in the tables took the better part of two years. Extending the data into the more remote past is beyond the scope of this study. Still, careful historical studies of individual countries might be useful in further exploring this issue.

4.2 Plausible Alternative Causality Explanations

Another approach is to examine the economic plausibility of reverse causality. This approach requires modification here, for in most situations, the purpose of ascertaining causality is to reject alternative theories in which the causality flows in reverse. Here, we distinguish alternative views of growth, both of which envisage bidirectional causality, with opposite implications for the sign on big business stability in regressions of economic growth.

We therefore evaluate alternative implications in other ways; chiefly by altering our definition of big business stability to accord more or less closely to different alternative explanations. Recall that our robustness tests include big business stability constructed with steadily more generous definitions of a 1975 "surviving" in 1996. These culminate in saying a business "survived" if its 1996 employee count is at least ten percent of that in 1975.[13] We find significantly faster economy growth where more 1975 big businesses have withered by at least 90%.

Virtually any theory of economic growth links faster economy growth to more new firms, larger existing firms, or both. However, we find growth correlated with the *demise* of old big businesses.

Alternative explanations to creative destruction consistent with this are scarce. Might growth cause old big businesses to wither in some way unconnected with creative destruction? Conceivably, consumer tastes or worker job preferences might change with rising incomes in ways that harm old big businesses. Or growth might alter institutions so as to undermine old big businesses. We concede that such a theory might be developed, though none is prominent in the literature to date. Further tests must await theoretical developments of this sort. For now, we rely on Ockham's favoring creative destruction as the most straightforward explanation of the correlations we find.

4.3 Instrumental Variables Regressions

Another alternative is instrumental variables regressions. These require valid instruments for big business stability: exogenous variables highly correlated with big business stability and correlated with economic growth solely through their effect on big business stability.

Beck *et al.* (2003) use *hierarchical religion*, *French legal origin*, and *ethnic fractionalization* as instrumental variables. A highly hierarchical religion may render people submissive to clerical elite unconcerned with growth and innovation (La Porta *et al.* 1997b). A French Legal heritage (La Porta *et al.* 1997a) and ethnic fractionalization (Easterly and Levine, 1997) prefigure tenuous private property rights, which might discourage the pooling of resources to finance upstart firms and capture growth opportunities.

Instrumental variables regressions using these variables as instruments generate results similar to those in the tables. Big business stability is significantly associated with lower *per capita* GDP growth, TFP growth, and capital accumulation.

Unfortunately, these IV regressions cannot be used to ascertain a predominant direction of

[13] Using cut-offs even smaller than 10% becomes impractical because data are unavailable for very smaller firms in

causality because all fail the *weak instruments test* of Staiger and Stock (1997), and therefore provide no more information about the direction of causality than OLS regressions in this context.[14]

Widening our search for useful instruments, we consider variants of those in Beck *et al.* (1997) – substituting indicator variables for continuous ones, adding interaction terms, etc. In addition, we explore different indicators of legal origin (i.e. separate socialist and Islamic origins); religion dummies, religious history; colonial history; years of independence since 1776, latitude, continent dummies, various land use measures, various climate-based variables, democratic experience, political rights, civil liberties, and many others. In every case, we consider a range of threshold indicator variables, as well as continuous measures and interaction terms. Wherever possible, we use values of these variables both circa 1975 and as early as available. In every case, the resulting IV regressions provide no additional information about the direction of causation because they fail standard *weak instruments tests* (Staiger and Stock, 1997).[15]

Reluctantly, we conclude that identification eludes us and the option of using instrumental variables cannot assist us in extracting a dominant direction of causality.

4.4 Latent Variables

Since we must rely on economic reasoning, rather than econometric tests, explicitly considering latent variables – factors that might 'cause' both growth and big business turnover, but that are not necessarily associated with creative destruction.

The literature links a number of closely related factors to economic growth. We therefore check to see which of these might also correlate with big business stability. We then partial out the effects of these variables to see if big business stability continues to be associated with growth.

To operationalize this, we run regressions of the form

$$\Omega = c_0 + c_1 \ln(y_0) + c_2 \ln(k)_0 + c_3 \ln(h_0) + c_4 \Phi + u \qquad (10)$$

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many counties, and name changes are also harder to verify

[14] For more detail, see Greene (2007, ch. 12)

[15] The instruments might be noisy or inconsistently related to the main variables – see §4.4 on latent variables.

where Ω is one of our big business stability measures, the controls for initial income, physical capital, and human capital controls are as in (8) but for 1975, and Φ is one or more institutional variables.

The institutional development variables Φ measures the size and quality of the government, the development of the financial system, and the country's openness to the global economy. We now explain each in turn.

Government

The size and quality of the government sector correlate with economic growth; and might plausibly also correlate with big business stability.

The literature linking government qualities to economic growth is too wide ranging to summarize fully here, so we focus on specific connections that might plausibly also involve big business stability.

One linkage pertains to a benevolent interventionist government that views enhanced corporate stability as a tool for stabilizing employment and promoting egalitarian goals.[16] For example, such a government might view general economic stability *per se* as a public good.[17] But big businesses can also be handy channels through which politicians can effect social and political policies, as in Högfeldt (2005), so politicians – benevolent or self interested – might protect such businesses to preserve their ability to advance those policies.[18] Big government might also *crowd out* private investment, as in neo-Keynesian

[16] For example, when the German government bailed out Philipp Holzmann, Finance Minister Hans Eichel declared that "the government has a responsibility to step in if a major German company is about to collapse and cost thousands of people their jobs." (See Edmund Andrews 'Navigating the Economy of a Changing Germany', *New York Times*, December 7, 1999.) The same motive seems to underlie Chancellor Gerhard Schroeder's pressure on German banks to save the jobs of the 22,000 employees of the bankrupt engineering firm Babcock Borsig AG with a $700 to $800 million bailout. (See 'Schroeder Seeks bailout Aid for Bankrupt Firm' *International Herald Tribune*, July 6, 2002, p 11.)

[17] Such beliefs seem to have led the Japanese government to propose a ¥200 billion ($1.90 billion) bailout of Sogo Department Stores, which *Asiaweek* described as part of Japan's long tradition of corporate bailouts designed to minimize "confusion". See Jonathan Sprague and Murakami Mutsuko 'Tokyo's Sogo Shocker - A bailout and a reversal show no policy at all' *Asiaweek*, 26(29), July 28, 2000. Note, however, that *Asiaweek* continues that, to the bewilderment of senior politicians, the bailout was derailed when "[t]he public exploded over the use of their tax money to rescue a poorly managed private company."

[18] For example, *Business Week* reports Malaysian Prime Minister Mahathir unapologetic about his government's policy of selecting a handful of wealthy businessmen for privileges and assigning them the role of creating jobs, implementing big projects, and keeping the economy growing. The article quotes Mustapha Mohamed of the Finance Ministry saying "We view Malaysia as a corporation, and the shareholders in the government are

macroeconomics. And government intervention, no matter how benevolent, inevitably adds political risk to normal business risks, deterring investment. Unavoidable red tape, delays, and other political fixed costs block entry by new competitors, as in Djankov *et al.* (2002), Krueger (1974), and Olson (1963, 1982). For these and other reasons, big benevolent government might correlate with both enhanced big businesses stability and slow growth.

A second set of arguments pertain to a government manipulated by its great businesses for their benefit, as in Hayek (1960). Stigler (1971) argues that large businesses routinely *capture* their regulators, and Beason and Weinstein (1996), among others, present evidence of this. Rajan and Zingales (2003); Morck, Wolfenzon, and Yeung (2005), and others posit more generally that corporate elites invest in political influence to lock in a *status quo* that preserves the dominance of established big firms – which they control. Olson (1963, 1982), Tullock (1967) and Krueger (1974) argue more generally that returns to political rent-seeking rises with the extent of state interventionism and retard overall growth.[19] For these reasons, among others, big corrupt government might also correlate with both enhanced big businesses stability and slow growth.

Unfortunately, big government as a latent factor explaining both growth and corporate sector stability is not cleanly separable from creative destruction. This is because Krueger (1993), Murphy *et al.* (1991, 1993), and others argue that, by making political rent-seeking more lucrative, big government – benevolent or not – diverts talent and resources towards influencing government and away from investment in innovation. This slows big business turnover and growth by slowing creative destruction.[20]

We gauge the sheer importance of government in the economies of each country with 1975 public sector consumption over GDP, as reported in *World Development Indicators*. As more nuanced measures of the role of the government in the economy, we also use the 1975 GINI coefficients from Deininger and

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companies." and "To the extent you help the bigger guys, the smaller guys benefit." See Sheri Prasso, Mark Clifford and Joyce Barnathan 'Malaysia: The Feud - How Mahathir and Anwar became embroiled in a clash that threatens to send Malaysia into upheaval' *Business Week*, October 28, 1998.

[19] Morck and Yeung (2004) argue that large, established, family controlled corporate groups are especially able rent-seekers.

Squire (1996) and the World Income Inequality database to measure income inequality, which benevolent government intervention arguably reduces. We also use a *legal origin indicator* variable, set to one for Common Law legal systems and to zero otherwise; and a measure of red tape barriers to entry. The legal origin indicator is from La Porta *et al.* (1997a), who link Common Law legal origins to better government institutions, especially to an independent judiciary and reduced official corruption. The red tape barrier measure is the logarithm of the "time required to obtain legal status for new business" in days, from Djankov (2002, Table 3). Unfortunately, the last variable is measured as of 1999, and so might be a result of faster growth or big business instability, rather than a cause. We examine it because entry barriers are clearly relevant to our stability measures, but concede that interpreting its coefficients is problematic.

[Table 4 about here]

Panel A of Table 4 shows that higher government consumption is significantly correlated with greater labor-weighted stability indexes; but only if they are based on lists IV and V, which exclude financial companies and sometime SCEs. This is consistent with big government favoring the continued economic importance of established big businesses. Greater stability is usually negatively, but insignificantly, related to income equality – undermining the idea that big business stability might promote egalitarian goals. Civil Code legal systems and longer delays in establishing new businesses legally are also associated with more big business stability, but only using indexes based on Lists I, II, or III, which include SCEs.

Other tests we perform searching for links between stability and laudable social *outcomes* are uniformly insignificant. GINI coefficients in 1996 are uncorrelated with stability, as are changes in GINI coefficients. Other equality or social policy outcome measures – unemployment, the variance of the unemployment rate, and indicator variables for various sorts of crises – are also unrelated to our stability

[20] Though Haber *et al.* (2003) argue that government capture by the business elite may be an optimal second best outcome absent the rule of law.

indexes. The only exception is hardly breathtaking: 'government crises' are less frequent in rich countries with contemporaneously more stable large corporate sectors. If governments stabilize their large corporate sectors to promote such social goals, these interventions seem of limited success.

Big business stability is thus associated with Civil Law Legal systems and with worse red tape if we include SCEs in our top ten lists. Otherwise, only the sheer size of government is robustly related to larger stability indexes.

Financial System Characteristics

Another potential latent factor is financial development, which affects growth and might plausibly affect big business turnover too. [21]

The latter link might arise in a variety of ways. For example, a bank-based financial system might provide creditors more influence over corporate governance, and induce lower risk strategies, curtailing both radical successes by newcomers and failures of established big businesses. [22] Or weak shareholder or creditor rights might undermine savers' willingness to invest in new firms, restricting firms to using retained earnings to finance new ventures and locking in the dominance of established firms.[23]

Again, financial development cannot be neatly severed from creative destruction. Wurgler (2000) and others posit a variety of channels ranging from more informed corporate strategies to better capital budgeting decisions to superior governance. Others argue that financial development has various cultural infrastructure antecedents. [24] But King and Levine (1993) argue explicitly that financial development hastens growth by fomenting creative destruction; reiterating Schumpeter (1912) who also stresses this

[21] On the link between financial development and growth, see King and Levine (1993); Bekaert and Harvey (1998), Khanna and Palepu (2000), Morck *et al*. (2000b); Olsen (2000); Wurgler (2000);La Porta et al. (2002), Levine (2002), Rajan and Zingales (2003), Johnson and Mitton (2003), Rajan and Zinglaes (2003); Morck, Wolfenzon and Yeung (2005) and others.

[22] See also Rajan (1992) on bank versus stock market centered financial systems.. Beck and Levine (2002) and Levine (2002) present evidence suggesting this is a second order issue. But see also e.g. Maurer and Haber (2004).

[23] See La Porta *et al.* (1997a, 1997b, 1998, 1999b, 2002), Levine *et al.* (2003), and others. Rosenthal and Lamoreaux (2004, 2006), Aganin and Volpin (2005) and others argue that this cross-country relationship is a recent phenomenon. For overviews, see Glaeser and Goldin (2006) and Morck and Steier (2005). For US evidence see, John, Litov, and Yeung (2006).

connection, noting that brilliant but impecunious innovators need a dynamic financial system to underwrite the development of their new technologies.

Nor can financial development be neatly distinguished from effects of government. For example, Rajan and Zingales (2003) link atavistic financial markets to rent-seeking by the insiders of established big businesses aimed at weakening their countries' financial sectors precisely to stymie any upstart who might challenge their large established businesses.[25] Undermined financial systems thus block creative destruction much like any other government imposed barrier to entry.

We gauge financial development by the sheer size of the financial system and by the strength of investor protection. Financial system size is measured by 1975 credit to the private sector and by 1978 stock market capitalization, both as fractions of GDP, from Beck *et al.* (2000) and the World Development Indicators database. We gauge investor protection, institutional quality measures of financial development, with the creditor and shareholder rights tallies assembled by La Porta *et al.* (1998).[26]

Panel B of Table 4 show that a large banking system (private sector credit is large relative to GDP) is associated with greater equally weighted stability indexes, and with two of the five the labor weighted stability indexes too. In contrast, stock market size is unrelated to stability. Yet creditor rights appear unimportant, while shareholder rights are associated with reduced stability indexes based on any lists that include onetime SCEs.

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[24] La Porta et al. (1997a, 1997b, 1998), Stulz and Williams (2003), and others.

[25] See Morck et al. (2000b), Pagano and Volpin (2001), Rajan and Zingales (2003), Perotti and Volpin (2007), Morck, Wolfenzon, and Yeung (2005), Acemoglu et al. (2005), Stulz (2005), and others.

[24] La Porta et al. (1998) index creditor rights from zero to four, assigning one point each when: (1) the country imposes restrictions, such as creditors' consent or minimum dividends to file for reorganization; (2) secured creditors are able to gain possession of their security once the reorganization petition has been approved (no automatic stay); (3) secured creditors have first priority on distribution of proceeds from asset sales of a bankrupted firm; and (4) management does not have to stay pending the resolution of a reorganization. Their shareholder right index ranges from zero to six, assigning one point each when: (1) proxy vote by mail is allowed; (2) shareholders are not required to deposit their shares prior to the General Shareholders' Meeting; (3) cumulative voting or proportional representation of minorities in the board of directors is allowed; (4) an oppressed minority mechanism exists (meaning that minorities shareholders have legal mechanisms against perceived oppression by directors); (5) the minimum percentage of share capital that entitles a shareholder to call for an Extraordinary Shareholders' Meeting is less than or equal to 10 percent, and (6) shareholders have preemptive rights that can only be waved by a shareholders' vote.

That a large banking system is associated with a more stable big business sector is consistent with other work. For example, Morck and Nakamura (1999) and Morck *et al.* (2000a) argue that Japanese banks use their corporate governance influence to induce stability in that country's large businesses, rather than growth and dynamism. This is because banks' primary concern is timely loan repayment, not firm value maximization. Likewise, Perotti and von Thadden (2003) argue that, where the median voter seeks stability to protect her human capital, democracy favors large influential banking systems precisely because banks act in this way.

Our shareholder rights measures are for the 1990s, rather than for 1975, and thus might measure effects, rather than causes of big business stability. For example, countries with large state controlled sectors in 1975 might have enacted shareholder rights so that privatizations would fetch more for their treasuries. However, La Porta *et al.* (1997a, 1997b) argue that shareholder rights are intrinsically stronger under Common Law legal systems, which were all in place long before 1975. The finding in Panel A that Common Law systems are associated with reduced stability when SCEs are included in compiling those indexes suggests that SCEs are less durable in Common Law countries. One possibility is that governments in these countries are more prone to privatize SCEs when their social purposes cease, and these businesses are then taken over, merged, or fail. In Civil Code countries, with weaker shareholder rights, governments may find privatization less remunerative, and so hold on to their SCEs.

Economic Openness

Trade openness encourages businesses to specialize according to their countries' comparative advantages, while capital account openness lets domestic businesses access capital from abroad. Standard trade and investment theories imply that either form of openness should enhance growth. For example, Bekaert, Harvey and Lundblad (2005) show that capital account liberalization increases subsequent real economic growth by about 1% per year on average. From 1975 through 1996, most economies grew more open, and

this appears to have induced more rapid growth.[27]

But openness also exposes domestic industries to global competition and shocks. Lower stability indexes might thus reflect increasing openness forcing more frequent corporate sector adjustments to changing comparative advantage, capital costs, and competitive pressures.

But again, openness intertwines with creative destruction. Innovations often arise abroad. Trade and capital barriers can limit inflow of all manner of foreign influences, including foreign innovations.[28]

Nor can openness be distinguished from effects associated with government or financial development. Benevolent governments might invoke protectionism as part of an overall platform of corporatist intervention, aiming at laudable social goals. Or, established big business insiders might lobby for protectionism to lock in a *status quo* biased in their favor[29] Rajan and Zingales (2003) link openness to financial development and rent seeking, arguing that the principals of large established businesses are less able to hobble the financial systems of more open countries. This might be because politicians' ability to serve special interests is more restricted in more open economies.[30]

We capture trade openness with exports plus imports over GDP and capital account openness with foreign direct investment inflow over GDP. Panel C of Table 5 shows less trade and capital account openness corresponding to greater stability of leading private sector businesses (lists IV and V).[31]

4.5 Further Robustness Checks

Generalized White tests reject heteroskedasticity and residual diagnostics again show that outliers do not drive the results. As before, we report heteroskedasticity consistent t-tests nonetheless.

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[27] See Sachs and Warner (1995), Henry (2000a, 2000b, 2003), Bekaert *et al.* (2005, 2006), and others; but also Edison *et al.* (2002).
[28] See Caves (1995) and Grossman and Helpman (1991).
[29] See Krueger (1993), Morck *et al.* (2000b), Johnson and Mitton (2003), Rajan and Zingales (2003), and others.
[30] *Ibid*.
[31] Nevertheless, the result on trade openness is weak. Our trade openness variable is for 1975. The impact of openness on stability could stem from both the level of openness and the increase in openness. The former is positively related to 1975 trade openness while the latter could behave in the opposite manner. Hence, the two forces could offset each other. We included change in trade openness from 1975 to 1996 as a right hand side variable, overlooking endogeneity. We still found little significance for both the change and the initial level of trade openness.

Substituting alternative variables likely to capture the same effects as those used yields qualitatively similar results. For example, using government spending instead of government consumption, or the "cost of obtaining legal status for a new business" as fraction of *per capita* GDP instead of the "number of days of delay" all yield results qualitatively similar to those shown in Panel A of Table 5. Using "total domestic credit", rather than "total credit to the private sector", over GDP likewise yields similar results to those shown in Panel B. Using the modified index of trade openness recommended by Frankel (2001) generates results similar to Panel C[32].

4.6. Isolating Creative Destruction?

It is tempting at this point to run IV regressions, but again, IV procedures using any or all of these institutional variables fail standard weak instruments tests. More importantly, we cannot reasonably argue these variables to be exogenous, or to affect growth only via corporate sector stability. We therefore instead use them to tease out further information about the economics underlying Table 3.

The results in the previous subsection suggest that certain institutions – big government, financial system qualities, and protectionism – might mediate the link between slower growth and big businesses stability.. We explore this by regressing growth on stability with the controls in (8) plus institutional variables, *viz*.

$$growth = \gamma_0 + \lambda_1 \ln(y) + \gamma_2 \ln(k) + \gamma_3 \ln(h) + \gamma_4 \Omega + \gamma_5 \Phi + \varsigma \qquad (11)$$

where Ω is either Ω_{L75}^{GDP} or Ω_{E}^{GDP} and Φ represents the institutional variables shown to be significant in Table 4 – government as a fraction of GDP, a Common Law dummy, red tape, banking system size, and trade openness. Limited degrees of freedom preclude using the whole list of Table 4 variables, but the institutional variables are highly correlated so a representative measure for each economic effect suffices.

[32] Frankel (2001) points out that smaller countries are naturally more dependent on trade than larger ones, and so recommends "imports over GDP minus all foreign countries' GDP over world GDP." Intuitively, in a world without

[Table 5 about here]

To conserve space, Table 5 reports only results for stability indexes based on maximally and minimally inclusive top ten lists. Even after including government size, a Common Law legal system indicator, the red tape measure, banking system development, and trade openness; stability retains its significant negative relationship with GDP growth and productive growth. Its negative relationship with capital accumulation remains significant only in regressions using equally weighted stability based on List V. Stability indexes based on List II, III and IV (not shown) yield almost identical results if GDP and productivity growth are the dependent variables. In regressions explaining capital accumulation, stability retains a significant negative coefficient only if it is defined using top-ten List II (value-weighted) or List III (both value and equal weighted).

These results are robust. Student residual statistics again highlight Ireland as a potential outlier in the TFP growth regressions, but dropping it changes neither signs nor significance. White general tests reject heteroskedasticity.

Table 5 thus suggests that stability *per se* has a negative relationship with growth, even in the presence of these institutional control variables which arguable remove variation associated with possible latent variables and, most likely, much variation associated with creative destruction as well. Since no list of latent variables can be exhaustive, these findings do not confirm creative destruction, but only exclude certain other plausible stories. Other latent effects may be shown in future research to explain our finding, but at present, Ockham's razor again leaves us favoring creative destruction.

5 Subsample Regressions

Aghion *et al.* (2005) argue that economic growth differs qualitatively in high versus low-income countries. They posit that creative destruction is important in developed countries, where growth requires

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border, imports over GDP should equal foreign production over world production. If imports are higher than this,

innovation to extend the production possibilities frontier outwards. In contrast, they argue that growth in developing countries requires capital accumulation to apply known technologies, moving the economy from deep inside the production possibilities frontier towards its surface.

[Table 6 about here]

5.1 Stages of Development?

Table 6 reproduces the Table 3 regressions for subsamples of high and low countries with above versus below-median 1990 *per capita* GDP.

In high-income countries, slower *per capita* GDP and total factor productivity growth correlate significantly with more stable minimally inclusive (non-financial private sector domestically controlled) big businesses. Including foreign controlled enterprises generates similar results, with slightly less statistical significance; and including SCEs renders all the indexes entirely insignificant – though negative signs persist in almost every case. Thus, for developed countries, the marginalization of top non-financial domestically controlled private sector businesses is most significantly associated with faster per capita GDP and TFP growth. Capital accumulation, in contrast, is unrelated to any variant of the stability indexes in high-income countries.

In low-income countries, significant results obtain *only if SCEs are included* in tallying the stability of large businesses.[33] In these cases, labor-weighted stability indexes are associated with slower real *per capita* GDP growth, total factor productivity growth, and capital accumulation. Recall that we ignore nationalizations and privatizations in calculating our stability indexes. Thus, our findings link faster growth in low-income countries to the accelerated marginalization of sometime SCEs.

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the economy is more open.

[33] Fogel (2006) reports SCEs accounting for significantly higher fractions of the big business sectors of countries with lower *per capita* GDP, and our data confirm this.

[Figures 2 and 3 about here]

Figures 2 and 3 plot the growth measures against the maximally and minimally inclusive labor-weighted big business stability indexes for high and low-income countries, respectively. As in Figure 1, we "partial out" control variables from the regressions. The plots plainly illustrate the results in Table 6. In high-income countries, the minimally inclusive index plainly aligns inversely with per capita GDP growth, TFP growth, and capital accumulation, despite the statistical insignificance of the last in Table 6. In low income countries the maximally inclusive index does the job.

These results survive the battery of robustness checks applied to the earlier tables.[34] Restricting our attention to high or low-income countries does not resolve the identification problems discussed in section 4. Weak instruments tests once again preclude all plausible I.V. specifications. Replicating Tables 4 and 5 for high and low-income countries separately (not shown) preserve signs consistently, but significance levels only sporadically. The sharply curtailed degrees of freedom available in this exercise render statistical inferences highly problematic, so we are reluctant to press nuanced interpretations of these coefficients' magnitudes or significance.

Overall, these results support Aghion et al. (2005), who model creative destruction as more important in more developed economies. But our findings also link the demise of SCEs and onetime SCEs with growth in low-income countries.

5.2 Different Roles for the State?

Table 6 and Figures 2 and 3 suggest a different role for the state in countries at different stages of economic development. Our low-income countries do not include the poorest of the poor because the data needed to construct stability indexes for many African and South Asian countries are unavailable.

[34] The sole exception is that Cook's D statistics show Ireland to be an outlier, in the developed country subsample. Dropping it does not affect the results, but exposes Singapore as a statistical outlier. Dropping this does not affect the results qualitatively. Continued outlier pruning, as in §3.3 eventually leaves the stability indexes insignificant, but negative signs and rough coefficient magnitudes persist.

The role of the State in very poor countries is therefore outside our scope. For example, many of the countries we consider 'low-income' may have experienced successful state-run development that raised them from extreme poverty. If so, our results might support a well- timed and complete exit by the State once development gains momentum, rather than a reduced role in general, and suggest that some governments are better at this than others. For example, autocratic governments might assign a higher degree of importance to SCEs and over time they become the capture of entrenched elites associated with the State and turn into grabbing hands that hinder growth (Shleifer and Vishny, 1997). This would imply a value to liberal democracy as a country graduates to a stage of development where growth through creative destruction becomes important, as in Aghion et al (2005)

To explore this further, we partition the sample into countries with democratic versus autocratic governments. To do this, we use *polity*, the well-know *polity2* autocracy-democracy score from the Polity IV Project of Maryland's *Center for International Development and Conflict Management* and George Mason University's *Center for Global Policy*.[35] This twenty-one point scale rates factors like how the executive is chosen, how executive powers are checked, and the strength of political competition. To mitigate subsample selection endogeneity, we partition using *polity2* for 1950 or the first available year thereafter. We define *democracies* as countries with *polity2* scores above 6 and call other countries *autocracies*. Our sample of autocracies therefore also includes those defined as "partially democratic" in the Polity IV database.[36] Subsample regressions (not shown) analogous to Table 6 link the survival of large private sector firms to slow growth more strongly in democracies than in autocracies. The survival of sometime SCEs, in contrast, retards growth more clearly in autocratic states.

A detailed investigation into our 1975 and 1996 lists of top companies helps explain these results. First, in both 1975 and 1996, democracies see fewer SCEs among top businesses than autocracies. In 1975, about 33% of the top ten non-financial domestic businesses are one-time SCEs in democracies versus about 60% in autocracies. Second, many SCEs in democracies are infrastructure providers (roads

[35] See www.cidcm.umd.edu/polity.

and utilities); whereas many in autocracies are industrial conglomerates or groups. Thus, one interpretation of our regression results is that democracy onetime SCEs, whether they fade away or not, do not significantly impede growth; but that long-lived onetime SCEs in autocratic countries do hinder growth.

Because barriers to entry constitute a common concern throughout our discussions of government, financial development, and openness; we consider subsamples of countries with contestable versus noncontestable markets. A country's markets are contestable if its government permits new businesses to arise freely, and is well-captured by variables like "the time required to register a new business", from Table 4. Since that variable is not available for earlier years, we partition our sample at the median 1980 *quality of a country's bureaucracy*, from Business Environment Risk Intelligence data. We say markets are contestable if bureaucratic quality is better than the sample median, and noncontestable otherwise.[37] Regressions (not shown) analogous to Table 6 link slow growth to the persistence of large private sector firms where markets are contestable, but to the survival of sometime SCEs where they are not.

These findings suggest investigating how the determinants of growth, or the lack thereof, differ for countries with different initial conditions. 'Stages of development' is an old idea, but our findings suggest new possibilities. For example, Rostow (1971) suggests large SCEs might coordinate "catch up" growth across sectors. We find no evidence of such an effect in our data, but rather that a stable SCE sector correlates with low growth. Our findings suggest that, if SCEs have such a role at all, it must at an earlier stage than those our sample represents. Our findings better accord with less charitable views of SCEs – that they "crowd out" entrepreneurial investment (Kornai, 1986; Murphy et al. 1991, 1993), scorn innovation (Marshall, 1907; Shleifer and Vishny, 1994a, 1994b; and Shleifer, 1996), or manipulate public policy to stifle upstarts and entrench the *status quo* (Krueger, 1974; Helpman and Grossman, 2002; Rajan

[36] Other reasonable partitions, for example negative versus positive *polit2y* scores, yield qualitatively similar results. We are grateful to an anonymous referee for suggesting democracy-autocracy and market contestability partitions.
[37] Partitioning at the median value of "the time required to register a new business", from Table 4, generates qualitatively similar results.

and Zingales, 2003; Roe, 2003; Morck et al. 2005; Acemoglu et al. 2005).

Another intriguing' stages of development' theory, due to Khanna and Palepu (2000) and others, posits that large stable corporations or corporate groups controlled by prominent families play key roles in developing low-income economies. This is because these huge hierarchical structures circumvent such countries' corrupt or otherwise dysfunctional product, labor, and capital markets and arm's-length institutions. Again, our findings do not accord with these arguments. But like Rostov (1971), this theory may well describe earlier stages of development, and certainly might pertain to specific countries or other circumstances. Fully exploring these issues lies beyond the scope of this study, but we are pursuing them elsewhere.

6. Conclusions

Countries whose rosters of big businesses change less from 1975 through 1996 exhibit slower economic growth and total factor productivity growth in the 1990s. This finding is most evident in higher income countries, where stable lists of leading businesses also correlate with reduced capital accumulation in the 1990s. This finding reflects old giants waning and all but disappearing, not just being eclipsed as new ones wax large.

In high-income countries, big business stability is associated with a larger government sector, a Civil Code legal system, and higher barriers to entry; as well as a larger banking system and weaker legal protection for outside shareholders. Openness to the global economy correlates with reduced big business stability. Thus, the link from big business stability to growth seems effected via institutional factors in these countries.

In low-income countries, institutional factors do not capture the link from big business stability to growth. However, slow growth in low income countries is linked to the persistent dominance of a cadre of SCEs or onetime SCEs, which leads us to speculate about a lingering drag on growth due to state intervention.

Without addressing causality directly, we can make inferences about economic growth. Our results, especially our linking growth to the demise of old big businesses, not merely the rise of new ones, support Schumpeter's (1912) thesis that sustained long run growth entails new corporate giants arising and undermining old leviathans. They also validate efforts to formalize and extend Schumpeter (1912), such as Aghion and Howitt (1997). While we cannot speak to other time periods or specific industry or country settings, growth due to innovation by large established businesses, as in Schumpeter (1942), appears less generally important in recent decades.

Our findings raise the concern that big business in some economies might be excessively stable, and that this might retard their growth. Further work to clarify the directions of causation in the economic processes underlying these results would be useful. We welcome alternative interpretations of our findings and additional theoretical or empirical work that might cast light upon these issues.

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Table 1 Panel A: Stability Indexes Using Maximally and Minimally Inclusive Lists of Top Ten Businesses

Maximally inclusive lists include all available enterprises. Minimally inclusive lists exclude financial, foreign controlled, and state controlled enterprises. Stability indexes are fractions of top ten 1975 firms still in the 1996 top ten *or* having grown at least as fast as total GDP, weighted by 1975 employees, Ω_{L75}^{GDP}, or equally, Ω_{E}^{GDP}.

	Maximally Inclusive Top 10 List (I)		Minimally Inclusive Top 10 List (V)	
	Ω_{L75}^{GDP}	Ω_{E}^{GDP}	Ω_{L75}^{GDP}	Ω_{E}^{GDP}
Argentina	0.31173	0.2	0.39277	0.3
Australia	0.66851	0.6	0.73239	0.6
Austria	0.83342	0.5	0.22772	0.2
Belgium	0.40802	0.3	0.53091	0.5
Bolivia	0.74855	0.3	0.27430	0.3
Brazil	0.47057	0.5	0.29455	0.3
Canada	0.40118	0.4	0.57342	0.4
Chile	0.43968	0.4	0.27919	0.3
Colombia	0.28799	0.2	0.60121	0.5
Denmark	0.56300	0.4	0.72525	0.4
Finland	0.78035	0.7	0.57816	0.5
France	0.56400	0.4	0.55802	0.4
Germany	0.76277	0.7	0.73497	0.7
Greece	0.38197	0.3	0.07193	0.1
Hong Kong	0.60582	0.3	0.60582	0.3
India	0.12107	0.1	0.56486	0.4
Indonesia	0.31485	0.3	0.39913	0.3
Ireland	0.45014	0.3	0.39698	0.2
Israel	0.59483	0.6	0.74440	0.4
Italy	0.76126	0.4	0.78853	0.3
Japan	0.72527	0.7	0.59077	0.6
Korea	0.45119	0.5	0.34111	0.4
Malaysia	0.07326	0.1	0.12253	0.1
Mexico	0.76431	0.5	0.62523	0.5
Netherlands	0.83944	0.6	0.84228	0.6
New Zealand	0.20476	0.2	0.24253	0.3
Norway	0.30084	0.3	0.12190	0.1
Pakistan	0.22827	0.2	0.45168	0.4
Peru	0.45936	0.5	0.26775	0.2
Philippines	0.25999	0.2	0.07253	0.1
Portugal	0.34266	0.2	0.08388	0.1
Singapore	0.56019	0.4	0.06400	0.1
South Africa	0.57996	0.5	0.66960	0.6
Spain	0.46344	0.3	0.30168	0.3
Sri Lanka	0.07093	0.1	0.24317	0.2
Sweden	0.78482	0.5	0.78337	0.4
Switzerland	0.83344	0.7	0.83344	0.7
Taiwan	0.39190	0.2	0.62445	0.3
Thailand	0.74212	0.6	0.60927	0.5
Turkey	0.20833	0.1	0.38338	0.2
United Kingdom	0.23128	0.2	0.53862	0.4
United States	0.53122	0.5	0.53122	0.5
Uruguay	0.49031	0.3	0.40564	0.2
Venezuela	0.77755	0.5	0.40070	0.4

Table 2: Main Variables
Panel A: Univariate Statistics

Variable		Mean	Standard Deviation	Minimum	Maximum
Based on Maximally Inclusive List (I) of Top Ten Firms					
Continued importance index using total GDP growth as benchmark, labor weighted.	Ω_{L75}^{GDP}	0.495	0.223	.0709	0.839
Continued importance index using total GDP growth as benchmark, equally weighted.	Ω_{E}^{GDP}	0.381	0.179	0.100	0.727
Based on Minimally Inclusive List (V) of Top Ten Firms					
Continued importance using total GDP growth as benchmark, labor weighted.	Ω_{L75}^{GDP}	0.460	0.227	.0640	0.842
Continued importance using total GDP growth as benchmark, equally weighted.	Ω_{E}^{GDP}	0.354	0.166	.0909	0.700
Growth Measures					
Growth in per capita GDP in US dollars at PPP, 1990 to 2000	$\Delta\ln(y)$	0.223	0.137	-.0827	0.624
Total factor productivity growth, 1990 to 2000	$\Delta\mathrm{TFP}$	0.144	0.100	-.0415	0.467
Capital accumulation rate, 1990 to 2000	$\Delta\ln(k)$	0.263	0.207	-0.217	0.674
Control Variables					
1990 per capita GDP in thousands of US Dollars at PPP	y	12.9	7.59	1.68	26.5
Average years of total education for adults (age > 25, as of 1990)	h	7.24	2.40	2.29	12.0
1990 per capita capital assets in millions of US Dollars at PPP	k	31.4	22.1	1.93	79.1
1990 total GDP in trillions of US Dollars at PPP	Y	0.542	1.08	.0161	6.62

Sample is the 44 countries listed in Table 1.

Table 2 (Continued)
Panel B: Pearson Correlation Coefficients Between Stability Indexes and Growth Variables.

Index of …		Maximally Inclusive Top 10 List (I)		Minimally Inclusive Top 10 List (V)	
		Ω_{L75}^{GDP}	Ω_{E}^{GDP}	Ω_{L75}^{GDP}	Ω_{E}^{GDP}
Growth Measures					
Per capita GDP growth, '90 to '00	$\Delta\ln(y)$	**-0.365** **(.02)**	**-0.302** **(.05)**	**-0.266** **(.08)**	**-0.382** **(.01)**
Total TFP growth, '90 to '00	$\Delta\mathrm{TFP}$	**-0.309** **(.04)**	**-0.250** **(.10)**	**-0.290** **(.06)**	**-0.391** **(.01)**
Capital accumulation, '90 to '00	$\Delta\ln(k)$	**-0.305** **(.04)**	**-0.262** **(.09)**	-0.120 (.44)	-0.211 (.17)
Control Variables					
log of '90 per capita GDP	$\ln(y)$	**0.471** **(.00)**	**0.482** **(.00)**	**0.340** **(.02)**	**0.272** **(.07)**
log of '90 per capita capital	$\ln(k)$	**0.500** **(.00)**	**0.541** **(.00)**	**0.271** **(.08)**	0.235 (.12)
Log of over 25 pop. av. years of schooling	$\ln(h)$	**0.327** **(.03)**	**0.415** **(.01)**	**0.260** **(.09)**	0.238 (.12)
Log of '90 total GDP	$\ln(Y)$	.0907 (.56)	0.244 (.11)	**0.382** **(.01)**	**0.467** **(.00)**

Samples are countries listed in Table 1. Numbers in parentheses are probability levels for rejecting the null hypothesis of zero correlations coefficients

Table 3: Regressions of Growth on Corporate Sector Stability Indexes

OLS regressions of growth on stability and controls. Growth is 1990 to 2000 *per capita* GDP growth, $\Delta\ln(y)$, total factor productivity growth, ΔTFP, or per capita capital accumulation, $\Delta\ln(k)$. ΔTFP is $\Delta\ln(y) - 0.3\Delta\ln(k)$. Stability indexes, Ω, measure the proportion of '75 top ten firms still in the top ten in '96 or growing no slower than GDP from '75 to '96. Control variables are the log of '90 *per capita* GDP, $\ln(y)$, log of '90 capital assets *per capita*, $\ln(k)$, and log average years of education for adults, $\ln(h)$. All financial variables are in '96 US dollars at purchasing power parity. Probability values are based on heteroskedasticity-consistent standard errors.

Panel A: Regression with Typical Control Coefficients and Regression Statistics

Stability index is equal-weighted and based on lists of top ten domestic private sector firms.

		$\Delta\ln(y)$	ΔTFP	$\Delta\ln(k)$
Constant		0.408 (.25)	**0.442 (.09)**	-0.113 (.80)
Continued Importance, equal-weighted.	Ω_E^{GDP}	**-0.349 (.01)**	**-0.249 (.01)**	**-0.333 (.10)**
Log of per capita GDP, 1990	$\ln(y)$	0.0888 (.49)	-0.0507 (.60)	**0.465 (.01)**
Log of average years of education	$\ln(h)$	**0.192 (.05)**	**0.166 (.02)**	0.0863 (.50)
Log of per capita capital assets, 1990	$\ln(k)$	-0.125 (.20)	-0.00612 (.93)	**-0.397 (.01)**
F-Statistic	F	**2.45 (.06)**	**3.07 (.03)**	**2.80 (.04)**
Adjusted R-Squared	R^2	0.197	0.224	0.152
Sample	N	44	44	44

Panel B: Regression Coefficients of Corporate Stability

Only coefficient estimates on corporate stability are shown. Probability values are based on heteroskedasticity-consistent standard errors. List I includes all available firms; List II includes all firms from List I except financial firms; List III is List I less financial and foreign controlled firms; List IV is List I excluding financial and state controlled firms; List V is List I excluding financial, foreign controlled and state controlled firms.

List of Top Ten Firms and Definition of Stability			$\Delta\ln(y)$ Coef.	$\Delta\ln(y)$ p-val.	ΔTFP Coef.	ΔTFP p-val.	$\Delta\ln(k)$ Coef.	$\Delta\ln(k)$ p-val.
I	Maximally Inclusive	Ω_{L75}^{GDP}	**-0.222**	**(.02)**	**-0.154**	**(.01)**	-0.227	(.15)
		Ω_E^{GDP}	**-0.253**	**(.05)**	**-0.204**	**(.03)**	-0.161	(.48)
II	No Financial Firms	Ω_{L75}^{GDP}	**-0.248**	**(.01)**	**-0.159**	**(.02)**	**-0.295**	**(.03)**
		Ω_E^{GDP}	**-0.267**	**(.06)**	**-0.197**	**(.06)**	-0.235	(.30)
III	No Financial or Foreign Controlled Firms	Ω_{L75}^{GDP}	**-0.273**	**(.01)**	**-0.173**	**(.01)**	**-0.334**	**(.04)**
		Ω_E^{GDP}	**-0.377**	**(.00)**	**-0.257**	**(.00)**	-0.401	(.12)
IV	No Financial or State Controlled Firms	Ω_{L75}^{GDP}	**-0.199**	**(.03)**	**-0.144**	**(.03)**	-0.184	(.18)
		Ω_E^{GDP}	**-0.330**	**(.01)**	**-0.254**	**(.01)**	-0.253	(.15)
V	No Financial, State, or Foreign Controlled Firms	Ω_{L75}^{GDP}	**-0.199**	**(.04)**	**-0.133**	**(.04)**	-0.220	(.14)
		Ω_E^{GDP}	**-0.349**	**(.01)**	**-0.249**	**(.01)**	**-0.333**	**(.10)**

Sample is countries listed in Table 1. Numbers in parentheses are probability levels for rejecting the null hypothesis of zero coefficients.

Table 4: Determinants of Stability

Regressions are of the form: stability index = β_0 + β_1*stability determinant + β_2*ln(*y*) + β_3*ln(*h*) + β_4*ln(*k*) + ε. Dependent variables are labor or equal-weighted measures of the proportion of top ten '75 firms that either remain in the top ten list for '96 or grew no slower than GDP from '75 to '96. Control variables are the logs of '75 *per capita* GDP, capital assets, and average years of education for adults. All financial variables are in 1996 US dollars at purchasing power parity. Only coefficient estimates on political economy variables are shown. Probability values are based on heteroskedasticity-consistent standard errors. List I includes all available firms; List II includes all firms from List I except financial firms; List III is List I less financial and foreign controlled firms; List IV is List I excluding financial and state controlled firms; List V is List I excluding financial, foreign controlled and state controlled firms.

Panel A: Political Economy Variables as Determinants of Stability

Political economy variables include government size (total final government consumption over GDP in '75), inequality ('75 GINI coefficient), a Common Law legal origin dummy, and red tape (days to obtain legal status as a new business in 1999).

Continued importance List			Government size		Inequality		Common Law		Red tape	
			Coef.	p-val.	Coef.	p-val.	Coef.	p-val.	Coef.	p-val.
I	Maximally Inclusive	Ω_{L75}^{GDP}	-0.00172	(.69)	-.0014	(.75)	**-0.109**	**(.07)**	**0.0928**	**(.02)**
		Ω_{E}^{GDP}	0.00119	(.76)	-.0024	(.38)	-.0522	(.29)	0.0511	(.14)
II	No Financial Firms	Ω_{L75}^{GDP}	-0.00311	(.44)	.00045	(.91)	**-0.131**	**(.02)**	**0.0874**	**(.04)**
		Ω_{E}^{GDP}	-0.00245	(.46)	-.0023	(.33)	-.0672	(.16)	0.0413	(.25)
III	No Financial or Foreign Controlled Firms	Ω_{L75}^{GDP}	-0.00328	(.38)	.0021	(.60)	**-0.112**	**(.06)**	**0.0881**	**(.02)**
		Ω_{E}^{GDP}	-0.00292	(.35)	.00027	(.99)	-.0407	(.45)	0.0410	(.19)
IV	No Financial or State Controlled Firms	Ω_{L75}^{GDP}	**0.0118**	**(.03)**	**-.0071**	**(.07)**	.0259	(.70)	-.0186	(.67)
		Ω_{E}^{GDP}	0.00178	(.65)	-.0030	(.31)	.0229	(.65)	-.0204	(.57)
V	No Financial, State, or Foreign Controlled Firms	Ω_{L75}^{GDP}	**0.0113**	**(.04)**	-.0059	(.21)	.0276	(.71)	-.0075	(.85)
		Ω_{E}^{GDP}	0.00102	(.79)	-.0025	(.49)	.0122	(.83)	.00023	(.99)

Samples are as listed in Table 1 less Taiwan for government size. Numbers in parentheses are probability levels for rejecting the null hypothesis of zero coefficients.

Panel B: Financial Development Variables as Determinants of Stability

Financial development variables include banking system (financial credit to private sector over GDP in 1975), stock market (total market capitalization over GDP in 1978), creditor rights, and shareholder rights, the latter two from La Porta et al. (1998).

Continued importance List			Banking system size		Stock market size		Creditor rights		Shareholder rights	
			Coef.	p-val.	Coef.	p-val.	Coef.	p-val.	Coef.	p-val.
I	Maximally Inclusive	Ω_{L75}^{GDP}	**0.00215**	**(.07)**	-.0338	(.47)	-.00419	(.85)	**-.0570**	**(.02)**
		Ω_{E}^{GDP}	**0.00269**	**(.01)**	-.0172	(.64)	-.00689	(.72)	-.0321	(.13)
II	No Financial Firms	Ω_{L75}^{GDP}	0.00159	(.16)	-.0467	(.28)	-.0141	(.49)	**-.0534**	**(.02)**
		Ω_{E}^{GDP}	**0.00279**	**(.00)**	-.0173	(.60)	-.00964	(.55)	-.0210	(.26)
III	No Financial or Foreign Controlled Firms	Ω_{L75}^{GDP}	0.00130	(.24)	-.0381	(.43)	-.0117	(.58)	**-.0547**	**(.01)**
		Ω_{E}^{GDP}	**0.00257**	**(.01)**	-.00279	(.96)	-.00714	(.69)	-.0213	(.28)
IV	No Financial or State Controlled Firms	Ω_{L75}^{GDP}	**0.00224**	**(.10)**	-.0332	(.65)	0.0283	(.27)	-.0204	(.37)
		Ω_{E}^{GDP}	**0.00257**	**(.01)**	.0103	(.85)	.00790	(.67)	-.00107	(.95)
V	No Financial, State, or Foreign Controlled Firms	Ω_{L75}^{GDP}	0.00146	(.25)	-0.110	(.23)	0.0159	(.61)	-.0266	(.26)
		Ω_{E}^{GDP}	**0.00174**	**(.09)**	-.0592	(.40)	.000543	(.98)	-.0151	(.43)

Samples are as listed in Table 1 less Hong Kong and Taiwan for banking system size, those in Table 1 less Ireland and New Zealand for stock market size, those in Table 1 less Bolivia and Venezuela for creditor rights, and those in Table 1 less Bolivia for shareholder rights. Numbers in parentheses are probability levels for rejecting the null hypothesis of zero coefficients.

Panel C: Openness Variables as Determinants of Stability

Openness variables include foreign direct investment (FDI inflows as a fraction of GDP in 1975) and trade openness (imports plus exports as fraction of GDP in 1975).

Continued importance List			FDI Openness		Trade Openness	
			Coef.	p-val.	Coef.	p-val.
I	Maximally Inclusive	Ω_{L75}^{GDP}	-0.0177	(.60)	.0000513	(.90)
		Ω_{E}^{GDP}	**-0.0283**	**(.10)**	-.000390	(.20)
II	No Financial Firms	Ω_{L75}^{GDP}	-0.0152	(.65)	-.000131	(.71)
		Ω_{E}^{GDP}	-0.0279	(.11)	-.000490	(.13)
III	No Financial or Foreign Controlled Firms	Ω_{L75}^{GDP}	-0.0103	(.76)	-.000088	(.81)
		Ω_{E}^{GDP}	-0.0164	(.40)	-.000393	(.17)
IV	No Financial or State Controlled Firms	Ω_{L75}^{GDP}	**-0.0598**	**(.00)**	-.000430	(.40)
		Ω_{E}^{GDP}	**-0.0338**	**(.04)**	**-.000554**	**(.10)**
V	No Financial, State, or Foreign Controlled Firms	Ω_{L75}^{GDP}	**-0.0806**	**(.00)**	**-.00107**	**(.07)**
		Ω_{E}^{GDP}	**-0.0539**	**(.00)**	**-.00101**	**(.00)**

Samples are as listed in Table 1 less Hong Kong, Switzerland and Taiwan for foreign direct investment, and those in Table 1 less Taiwan for trade openness. Numbers in parentheses are probability levels for rejecting the null hypothesis of zero coefficients

Table 5: Regressions of Growth on Corporate Sector Stability Indexes and Institutional Environment Variables

OLS regressions of growth on stability, institutional environment, and controls. Growth is 1990 to 2000 *per capita* GDP growth, $\Delta\ln(y)$, total factor productivity growth, ΔTFP, or per capita capital accumulation, $\Delta\ln(k)$. ΔTFP is $\Delta\ln(y) - 0.3\Delta\ln(k)$. Stability indexes, Ω, measure the proportion of '75 top ten firms still in the top ten in '96 or growing no slower than GDP from '75 to '96. Panel A uses stability based on List I, which includes all available firms. Panel B uses stability based on List V, which is List I excluding financial, foreign controlled and state controlled firms. Institution variables include a Common Law legal origin dummy, red tape (days to obtain legal status as a new business in 1999), government size (total final government consumption over GDP in '75), banking system (financial credit to private sector over GDP in 1975), and trade openness (imports plus exports as fraction of GDP in 1975). Control variables are the log of '90 *per capita* GDP, $\ln(y)$, log of '90 capital assets *per capita*, $\ln(k)$, and log average years of education for adults, $\ln(h)$. All financial variables are in '96 US dollars at purchasing power parity. Probability values are based on heteroskedasticity-consistent standard errors.

Panel A. Stability based on List I – Maximally inclusive top ten lists of leading businesses – including financial, foreign controlled, and sometime state controlled firms

	Per capita GDP growth, $\Delta\ln(y)$						Productivity growth, ΔTFP						Capital accumulation, $\Delta\ln(k)$					
stability, value-wtd	**-.204** **(.05)**	**-.260** **(.01)**	**-.222** **(.03)**	**-.196** **(.05)**	**-.212** **(.04)**	**-.223** **(.05)**	**-.141** **(.03)**	**-.172** **(.01)**	**-.154** **(.02)**	**-.131** **(.04)**	**-.148** **(.02)**	**-.146** **(.03)**	-.211 (.26)	-.294 (.12)	-.226 (.16)	-.218 (.18)	-.213 (.19)	-.260 (.20)
common law	.027 (.60)					.068 (.32)	.019 (.56)					.043 (.39)	.024 (.78)					.085 (.46)
red tape		.030 (.21)				**.066** **(.05)**		.014 (.36)				.039 (.17)		.053 (.16)				**.092** **(.01)**
gov't size			.000 (.96)			-.002 (.60)			.000 (.83)			-.001 (.84)			-.002 (.74)			-.003 (.40)
banking dev.				.001 (.18)		-.002 (.20)				-.001 (.10)		-.001 (.13)				-.001 (.74)		-.001 (.71)
trade openness					**.001** **(.01)**	.000 (.30)					**.000** **(.09)**	.000 (.54)					**.001** **(.00)**	.001 (.15)

	Per capita GDP growth, $\Delta\ln(y)$						Productivity growth, ΔTFP						Capital accumulation, $\Delta\ln(k)$					
stability, equal wtd.	**-.238** **(.07)**	**-.266** **(.04)**	**-.256** **(.06)**	-.203 (.13)	-.216 (.11)	-.190 (.18)	**-.194** **(.03)**	**-.210** **(.02)**	**-.209** **(.02)**	**-.162** **(.07)**	**-.185** **(.05)**	**-.159** **(.09)**	-.146 (.54)	-.188 (.43)	-.154 (.52)	-.138 (.56)	-.104 (.66)	-.103 (.69)
common law	.041 (.38)					.082 (.22)	.028 (.37)					.051 (.29)	.043 (.58)					.101 (.35)
red tape		.017 (.43)				**.058** **(.07)**		.007 (.66)				.034 (.22)		.035 (.25)				**.080** **(.02)**
gov't size			.001 (.78)			-.001 (.71)			.001 (.58)			.000 (.94)			-.001 (.80)			-.003 (.44)
banking dev.				-.001 (.23)		-.001 (.25)				-.001 (.15)		-.001 (.18)				-.001 (.70)		-.001 (.67)
trade openness					**.001** **(.03)**	.000 (.46)					.000 (.19)	.000 (.73)					**.001** **(.00)**	.001 (.18)

Table 5: Regressions of Growth on Corporate Sector Stability Indexes and Institutional Environment Variables (continued)

Panel B. Stability based on List V – Minimally inclusive top ten lists – including only private sector non-financial domestically controlled businesses.

	Per capita GDP growth, $\Delta\ln(y)$						Productivity growth, ΔTFP						Capital accumulation, $\Delta\ln(k)$					
stability, value-wtd	**-.201** **(.03)**	**-.198** **(.05)**	**-.216** **(.04)**	**-.186** **(.05)**	**-.163** **(.07)**	**-.174** **(.07)**	**-.134** **(.03)**	**-.133** **(.05)**	**-.148** **(.04)**	**-.121** **(.05)**	**-.113** **(.05)**	**-.123** **(.06)**	-.223 (.12)	-.218 (.15)	-.225 (.16)	-.215 (.15)	-.167 (.27)	-.167 (.28)
common law	.051 (.26)					.088 (.19)	.036 (.24)					.056 (.25)	.049 (.50)					.107 (.31)
red tape		.008 (.70)				**.055** **(.10)**		-.001 (.97)				.031 (.26)		.028 (.30)				**.079** **(.03)**
gov't size			.002 (.37)			-.000 (.99)			.002 (.37)			.000 (.87)			.001 (.92)			-.002 (.69)
banking dev.				**-.002** **(.10)**		-.002 (.14)				**-.001** **(.06)**		**-.001** **(.10)**				-.001 (.62)		-.001 (.62)
trade openness					**.001** **(.02)**	.000 (.69)					.000 (.18)	.000 (.95)					**.001** **(.01)**	.001 (.28)

	Per capita GDP growth, $\Delta\ln(y)$						Productivity growth, ΔTFP						Capital accumulation, $\Delta\ln(k)$					
stability, equal wtd.	**-.353** **(.00)**	**-.348** **(.01)**	**-.351** **(.01)**	**-.321** **(.01)**	**-.308** **(.02)**	**-.304** **(.01)**	**-.252** **(.00)**	**-.250** **(.01)**	**-.252** **(.01)**	**-.224** **(.01)**	**-.230** **(.01)**	**-.225** **(.01)**	**-.336** **(.10)**	-.327 (.11)	-.330 (.12)	-.324 (.11)	-.259 (.24)	-.263 (.20)
common law	.052 (.22)					.097 (.13)	.037 (.20)					.063 (.19)	.050 (.47)					.114 (.26)
red tape		.006 (.77)				**.054** **(.08)**		-.002 (.88)				.031 (.24)		.026 (.32)				**.078** **(.03)**
gov't size			.001 (.79)			-.001 (.68)			.001 (.67)			-.000 (.90)			-.001 (.82)			-.003 (.42)
banking dev.				-.001 (.20)		-.001 (.21)				**-.001** **(.10)**		-.001 (.13)				-.000 (.80)		-.001 (.71)
trade openness					**.0005** **(.10)**	.000 (.91)					.000 (.40)	-.000 (.84)					**.001** **(.03)**	.000 (.40)

Table 6: High and Low Income Countries

OLS regressions of growth on stability and controls. Growth is 1990 to 2000 *per capita* GDP growth, $\Delta\ln(y)$, total factor productivity growth, ΔTFP, or per capita capital accumulation, $\Delta\ln(k)$. ΔTFP is $\Delta\ln(y) - 0.3\Delta\ln(k)$. Stability indexes, Ω, measure the proportion of '75 top ten firms still in the top ten in '96 or growing no slower than GDP from '75 to '96. Control variables are the log of '90 *per capita* GDP, $\ln(y)$, log of '90 capital assets *per capita*, $\ln(k)$, and log average years of education for adults, $\ln(h)$. All financial variables are in '96 US dollars at purchasing power parity. Only coefficient estimates on corporate stability are shown. Probability values are based on heteroskedasticity-consistent standard errors. List I includes all available firms; List II includes all firms from List I except financial firms; List III is List I less financial and foreign controlled firms; List IV is List I excluding financial and state controlled firms; List V is List I excluding financial, foreign controlled and state controlled firms.

Panel A: Coefficients on Corporate Stability Indexes in High Income Countries

List of Top Ten Firms and Definition of Stability			$\Delta\ln(y)$ Coef.	$\Delta\ln(y)$ p-val.	ΔTFP Coef.	ΔTFP p-val.	$\Delta\ln(k)$ Coef.	$\Delta\ln(k)$ p-val.
I	Maximally Inclusive	Ω_{L75}^{GDP}	-0.088	(.47)	-0.073	(.48)	-0.049	(.70)
		Ω_{E}^{GDP}	-0.107	(.43)	-0.108	(.39)	0.003	(.99)
II	No Financial Firms	Ω_{L75}^{GDP}	-0.084	(.48)	-0.062	(.53)	-0.075	(.52)
		Ω_{E}^{GDP}	-0.093	(.47)	-0.071	(.54)	-0.072	(.63)
III	No Financial or Foreign Controlled Firms	Ω_{L75}^{GDP}	-0.127	(.37)	-0.095	(.41)	-0.106	(.46)
		Ω_{E}^{GDP}	-0.162	(.22)	-0.127	(.32)	-0.116	(.53)
IV	No Financial or State Controlled Firms	Ω_{L75}^{GDP}	**-0.192**	**(.07)**	-0.154	(.11)	-0.127	(.22)
		Ω_{E}^{GDP}	**-0.229**	**(.07)**	**-0.199**	**(.08)**	-0.102	(.35)
V	No Financial, State, or Foreign Controlled Firms	Ω_{L75}^{GDP}	**-0.207**	**(.05)**	**-0.163**	**(.08)**	-0.146	(.16)
		Ω_{E}^{GDP}	**-0.305**	**(.02)**	**-0.261**	**(.03)**	-0.149	(.25)

Sample includes 22 high-income countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Singapore, Spain, Sweden, Switzerland, United Kingdom, and United States. Numbers in parentheses are probability levels for rejecting the null hypothesis of zero coefficients.

Panel B: Coefficients on Corporate Stability in Low-Income Countries

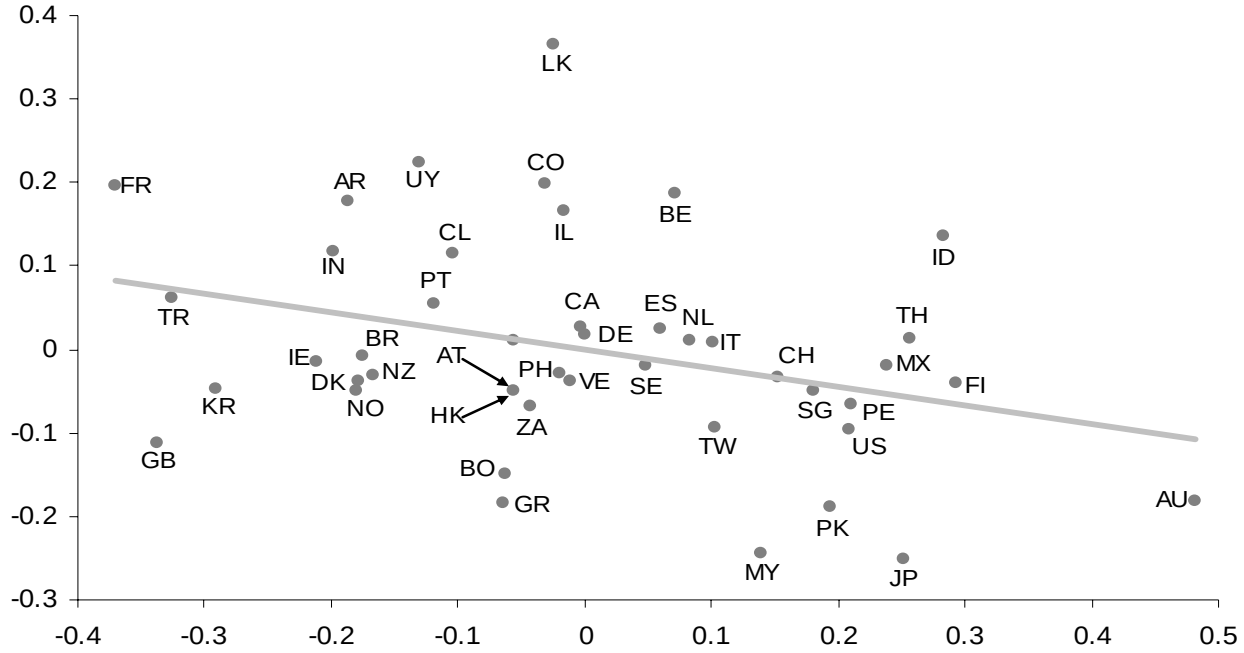
List of Top Ten Firms and Definition of Stability			$\Delta\ln(y)$ Coef.	$\Delta\ln(y)$ p-val.	ΔTFP Coef.	ΔTFP p-val.	$\Delta\ln(k)$ Coef.	$\Delta\ln(k)$ p-val.
I	Maximally Inclusive	Ω_{L75}^{GDP}	**-0.306**	**(.04)**	**-0.197**	**(.03)**	-0.364	(.21)
		Ω_{E}^{GDP}	-0.245	(.35)	-0.186	(.20)	-0.196	(.73)
II	No Financial Firms	Ω_{L75}^{GDP}	**-0.393**	**(.00)**	**-0.238**	**(.01)**	**-0.516**	**(.02)**
		Ω_{E}^{GDP}	-0.301	(.32)	-0.210	(.23)	-0.304	(.65)
III	No Financial or Foreign Controlled Firms	Ω_{L75}^{GDP}	**-0.361**	**(.01)**	**-0.214**	**(.01)**	**-0.490**	**(.05)**
		Ω_{E}^{GDP}	**-0.396**	**(.04)**	**-0.245**	**(.04)**	-0.503	(.31)
IV	No Financial or State Controlled Firms	Ω_{L75}^{GDP}	-0.028	(.90)	0.002	(.99)	-0.099	(.83)
		Ω_{E}^{GDP}	-0.197	(.54)	-0.129	(.37)	-0.226	(.75)
V	No Financial, State, or Foreign Controlled Firms	Ω_{L75}^{GDP}	-0.050	(.81)	0.007	(.95)	-0.191	(.63)
		Ω_{E}^{GDP}	-0.199	(.45)	-0.091	(.47)	-0.358	(.50)

Sample includes 22 low-income countries: Argentina, Bolivia, Brazil, Chile, Colombia, Greece, India, Indonesia, South Korea, Malaysia, Mexico, Pakistan, Peru, Philippines, Portugal, South Africa, Sri Lanka, Taiwan, Thailand, Turkey, Uruguay, and Venezuela. Numbers in parentheses are probability levels for rejecting the null hypothesis of zero coefficients.

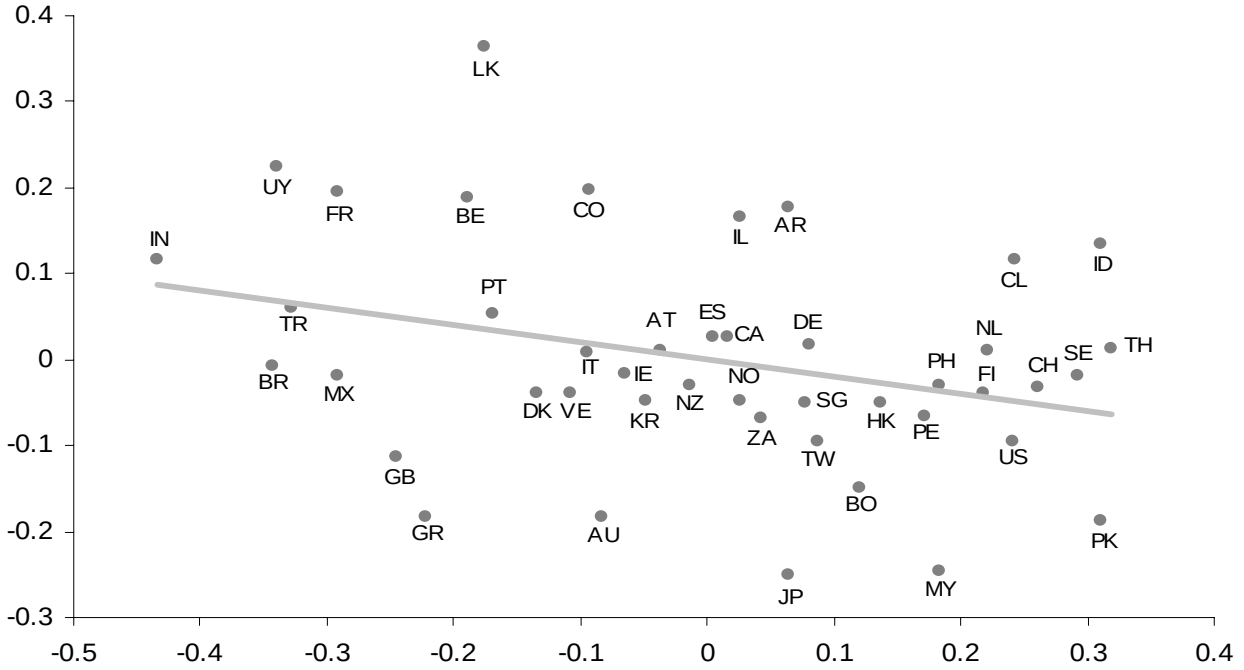
Figure 2: Growth versus big business stability

Residuals of economic growth and big business stability, after regressing each on logs of initial real per capita GDP, real per capita capital stock, and education, are on the vertical and horizontal axes respectively. Maximally and minimally inclusive mean all big firms and domestically controlled non-financial big firms with no episode of state control, respectively.

Panel A1. Residual per capita GDP growth v. residual maximally inclusive stability



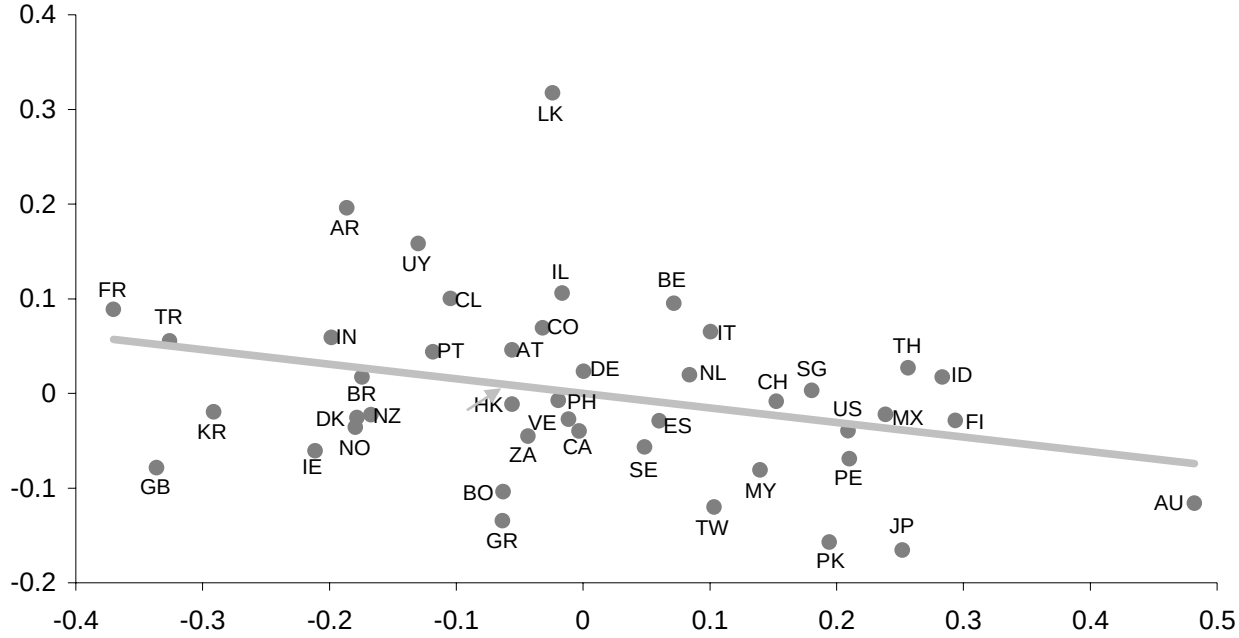
Panel A2. Residual per capita GDP growth v. residual minimally inclusive stability



Countries are: Argentina (AR), Australia (AU), Austria (AT), Belgium (BE), Bolivia (BO), Brazil (BR), Canada (CA), Chile (CL), Colombia (CO), Denmark (DK), Finland (FI), France (FR), Germany (DE), Greece (GR), Hong Kong (HK), India (IN), Indonesia (ID), Ireland (IE), Israel (IL), Italy (IT), Japan (JP), Malaysia (MY), Mexico (MX), Netherlands (NL), New Zealand (NZ), Norway (NO), Pakistan (PK), Peru (PE), Philippines (PH), Portugal (PT), Singapore (SG), South Africa (ZA), South Korea (KR), Spain (ES), Sri Lanka (LK), Sweden (SE), Switzerland (CH), Taiwan (TW), Thailand (TH), Turkey (TR), United Kingdom (GB), United States (US), Uruguay (UY), and Venezuela (VE).

Figure 1 (Continued)

Panel B1. Residual TFP growth v. residual maximally inclusive stability



Panel B2 Residual TFP growth v. residual minimally inclusive stability

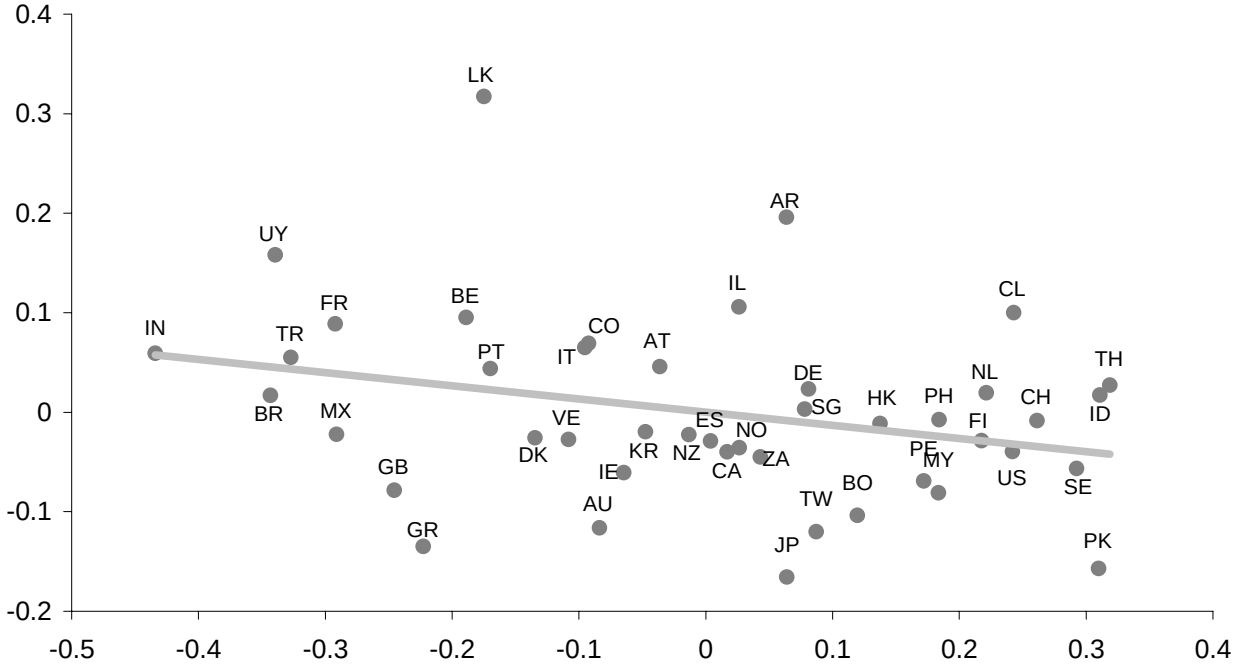
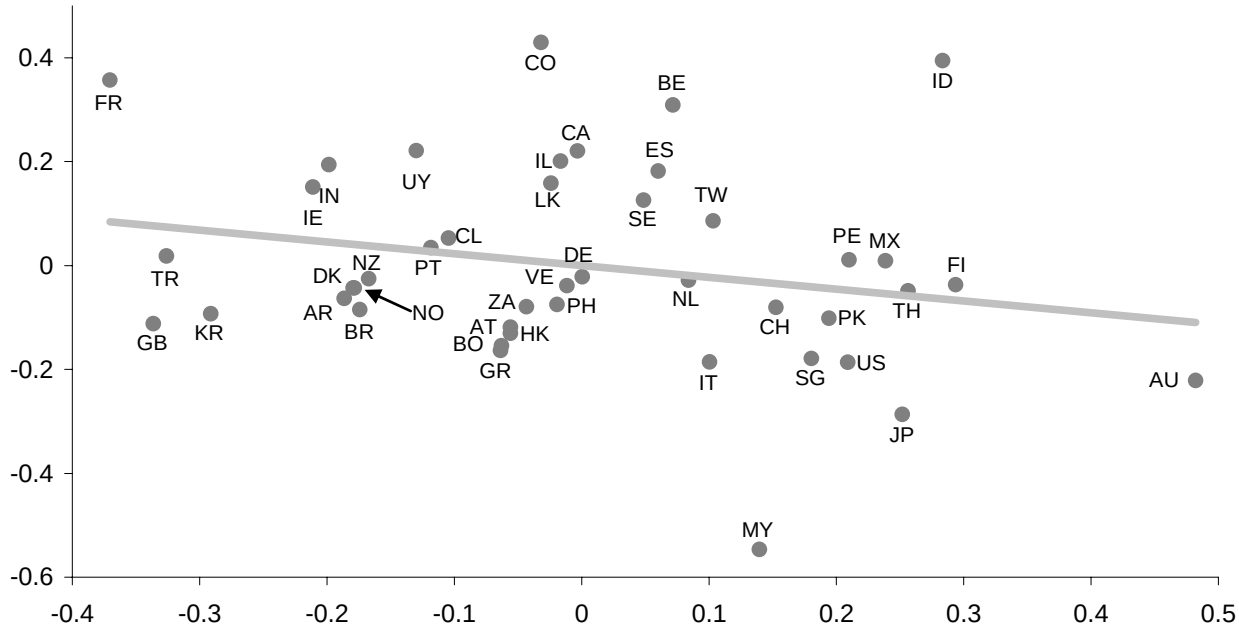


Figure 1 (Continued)

Panel C1. Residual capital accumualtion v. residual maximally inclusive stability



Panel C2 Residual capital accumulation v. residual minimally inclusive stability

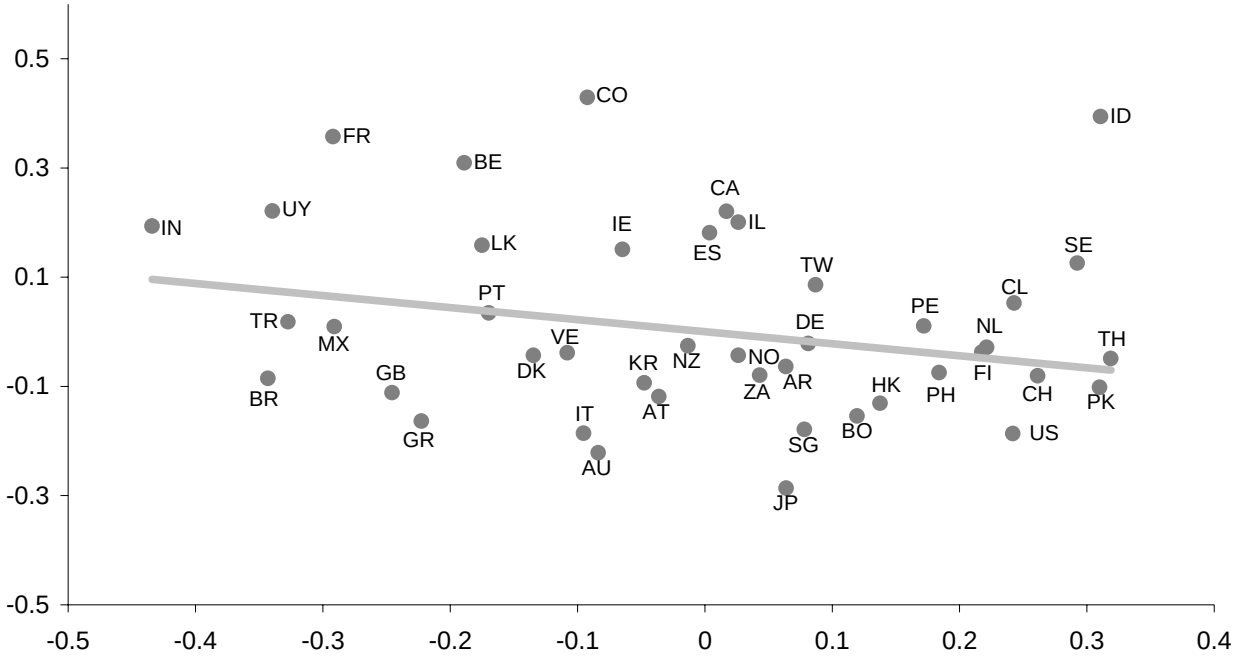
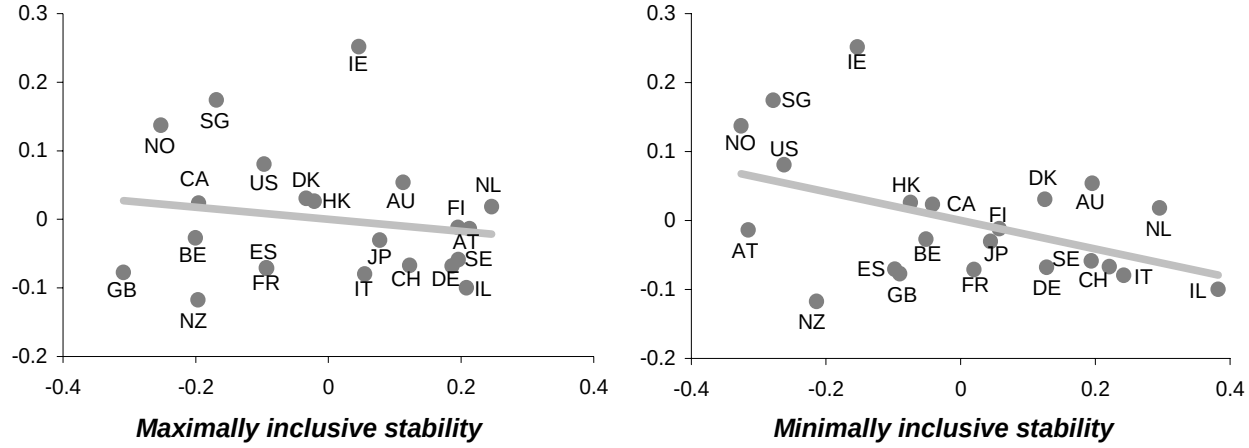


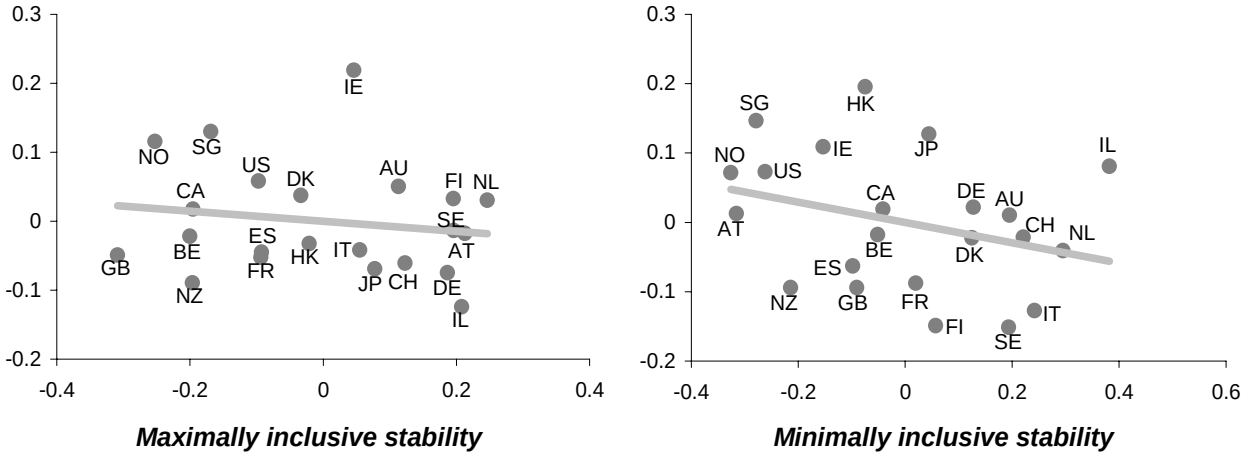
Figure 2: Growth versus big business stability in high-income countries

Residuals of economic growth and big business stability, after regressing each on logs of initial real per capita GDP, real per capita capital stock, and education, are on the vertical and horizontal axes respectively. Maximally and minimally inclusive mean all big firms and domestically controlled non-financial big firms with no episode of state control, respectively.

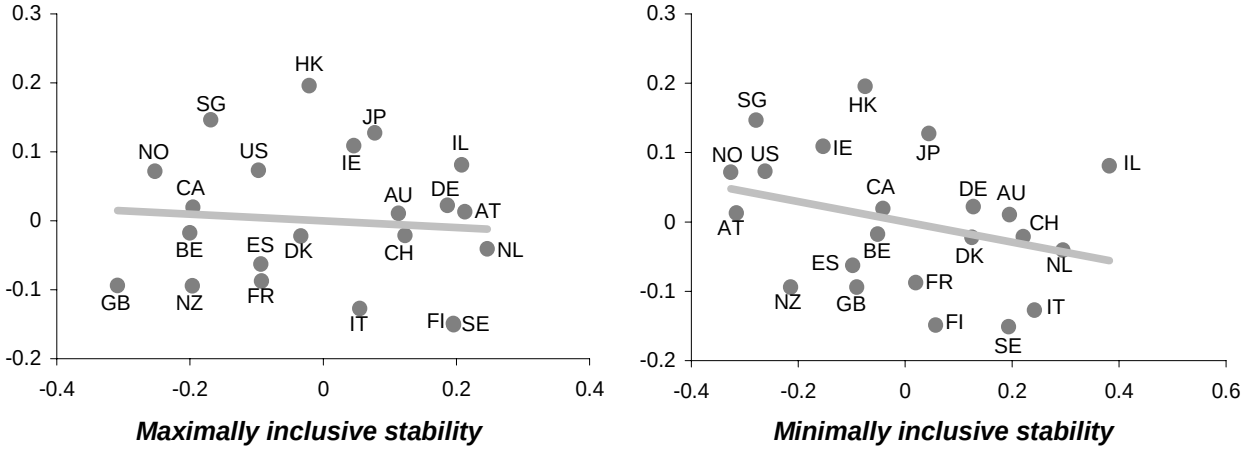
Panel A. Residual per capita GDP growth v. residual stability



Panel B. Residual TFP growth v. residual stability



Panel C. Residual capital accumulation v. residual stability

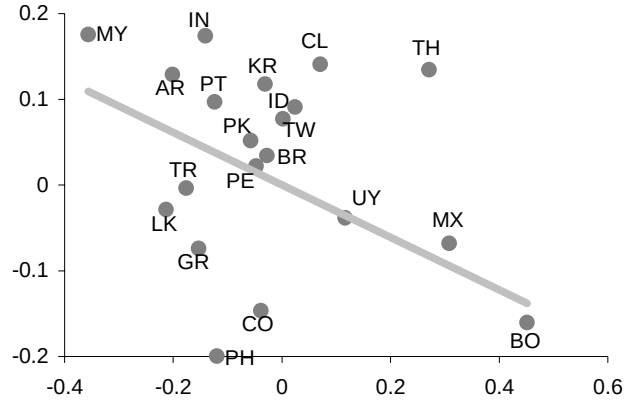


High-income countries are: Austria (AT), Australia (AU), Belgium (BE), Canada (CA), Switzerland (CH), Germany (DE), Denmark (DK), Spain (ES), Finland (FI), France (FR), United Kingdom (GB), Hong Kong (HK), Ireland (IE), Israel (IL), Italy (IT), Japan (JP), Netherlands (NL), Norway (NO), New Zealand (NZ), Sweden (SE), Singapore (SG), and the United States (US).

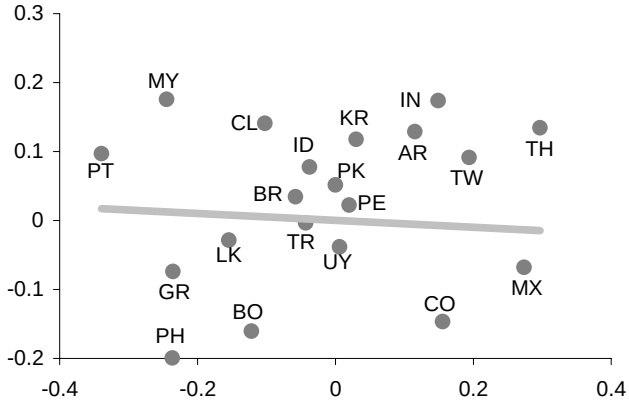
Figure 3: Growth versus big business stability in low-income countries

Residuals of economic growth and big business stability, after regressing each on logs of initial real per capita GDP, real per capita capital stock, and education, are on the vertical and horizontal axes respectively. Maximally and minimally inclusive mean all big firms and domestically controlled non-financial big firms with no episode of state control, respectively.

Panel A. Residual per capita GDP growth v. residual stability

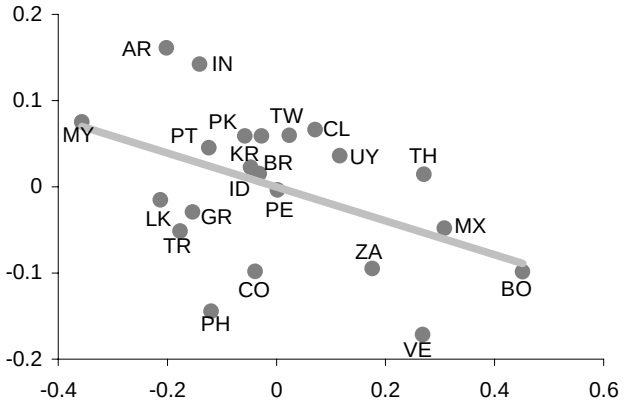


Maximally inclusive stability

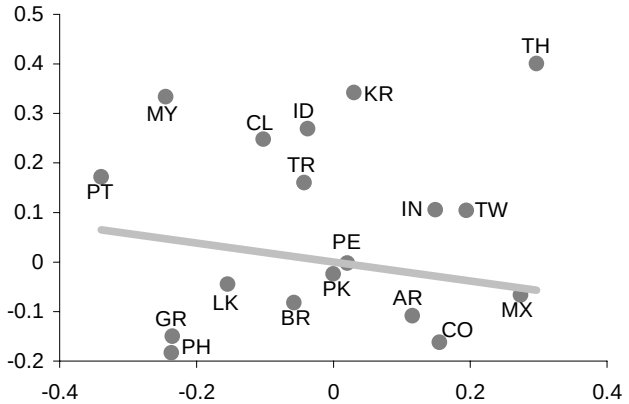


Minimally inclusive stability

Panel B. Residual TFP growth v. residual stability

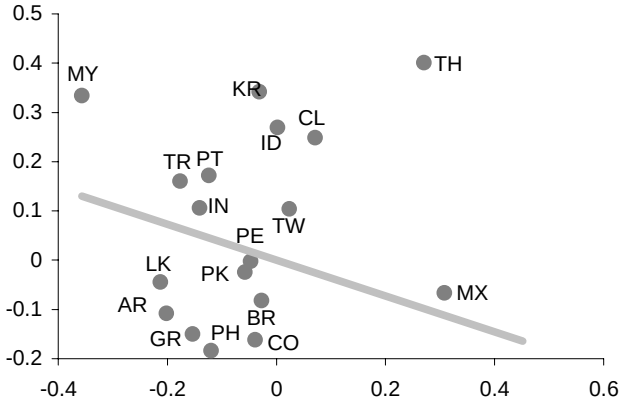


Maximally inclusive stability

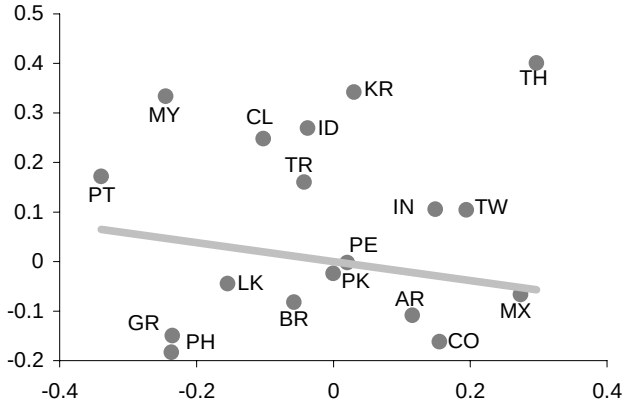


Minimally inclusive stability

Panel C. Residual capital accumulation v. residual stability



Maximally inclusive stability



Minimally inclusive stability

Low-income countries are: Argentina (AR), Bolivia (BO), Brazil (BR), Chile (CL), Colombia (CO), Greece (GR), Indonesia (ID), India (IN), South Korea (KR), Sri Lanka (LK), Mexico (MX), Malaysia (MY), Peru (PE), Philippines (PH), Pakistan (PK), Portugal (PT), Thailand (TH), Turkey (TR), Taiwan (TW), Uruguay (UY), Venezuela (VE), and South Africa (ZA).