The Political Economy of Firm Size Distributions

Evidence from Post-Reform China[1]

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1. Introduction

"As entrepreneurs we are condemned either to being the concubines of state enterprises or the mistresses of multinationals.'

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Wu Kegang, Yunnan Hong Wine[2]

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This quote, from an entrepreneur in the People's Republic of China in 2006, makes clear that the state continues to favor state-owned enterprises and foreign investors, relative to indigenous private enterprise. It could imply that private enterprise is crowded out by the state's policies, or that private enterprise can exist in (uneasy) symbiosis with state owned or foreign enterprises. Indeed, the saga of private enterprise in China is inseparable from that of the evolution of economic policy. It is all the more surprising, therefore, that the industrial organization literature has largely neglected the role of public policy in a central intellectual strand that runs through this field – the study of firm size distributions. The intellectual pedigree runs from Nobel Laureate Herbert Simon's early reflections (Ijiri and Simons, 1977; Simons & Bonini, 1958) through Joe Bain (1956),, and on to modern industrial organization theorists like John Sutton (1991, 1998). Yet this literature has almost exclusively focused on technological primitives as the primary, if not the

[2] Challenging Change: Why an even fiercer battle hinders China's march to the market, *Financial Times*, February 28, 2006, page 11

exclusive, determinant of industrial structure. A recent effort by Cabral and Mata (2003) hypothesizes that evolution of firm size distribution is consistent with a story of the evolution of capital market constraints. But nowhere does political economy enter the picture.

In this paper, we argue that this neglect is of first-order importance. The importance of political economy measures is of the same order of magnitude as that of technological primitives and often much larger than that of capital market constraints, at least in our data set comprised of several million observations for a range of organizational forms in two years, 1999 and 2003, a period of massive growth in China.

Why is China a sensible research site for studying political economy? China has been a laboratory for social science experiments in the last few decades. The fingerprints of policy decentralization, and of limited convergence, are visible in the considerable intra-China variation which we exploit for identification purposes. We are particularly interested in studying the effects of China's uneven march to the market on firms of different ownership, namely state-owned enterprises, collectively owned enterprises, foreign invested enterprises, and private firms.

The love-hate relationship with private enterprise will be recognizable to any student of China (or any reader of the *Financial Times* for that matter). It has evolved from thriving private enterprise in the Song dynasty to the first Company Law (*Gongsilu*) produced by the Qing court in 1904 in the wake of that regime's embarrassment at China being shown to be economically lagging the west (Kirby 1995), to suspension by Mao Zedong of private enterprise because he was enamored of socialism (1949-1978), and to Deng Xiaoping's pragmatic re-embrace of any form of capitalism (1978 onwards). Even so, private property rights remain suspect and were only given constitutional legitimacy in 2004. Successful entrepreneurs still have to manage the visibility of their success and remain close to the party. Apparently, several on a 'rich list' produced by a British journalist have had to leave China or have been jailed.[3] The multiple modifications have demonstrated the fallacy of the belief that the 'Western model would be the essential vehicle for *private* Chinese economic development' (Kirby, 1995, p. 44; italics in original).

Our results show that massive liberalization in China has encouraged the growth of foreign-invested enterprises and, to a lesser extent, collective enterprises (including Township and Village Enterprises), but they have never encouraged genuinely private firms. The best thing that can be

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[3] Ruper Hoogewerf's list, reported in Face Value: China's uneasy billionaire, *The Economist*, February 4, 2006, p.60.

said for private enterprise in China is that foreign direct investment, a centerpiece of the China reform model that we review in the next section, appears to spur the entry of small firms. Surprisingly, price flexibility, an important form of liberalization, does not help private firms, though it does help large foreign firms and large collectives become even larger. We are also able to distinguish between government interference directed at provincial insiders (incumbents, if you will) and that directed at potential provincial outsiders (potential entrants, if you will) and show that the effects on the size distribution are opposite. The results are consistent with local governments, in an attempt to protect the autonomy granted them by the center during the reform process, 'hitting back' at central government efforts to contain them, perhaps in order to encourage their own local (provincial) firms.

This paper contributes to the literature by unpacking the idea of liberalization. Several of the unpacked dimensions do not affect the first moment of the distribution (means and medians), but do affect other parts of the distribution. That is the firm size distribution shifts. Further, the effects we identify, aided by the size of our data set, are precisely estimated and economically large. Politico-economic considerations affect the firm size distribution as much, and often more, than capital market constraints.

2. Literature Review

A. China

We first provide an overview of relevant characteristics of China's reform initiated by Deng Xiaoping in 1978 and continuing through the present time. This review reveals that most, if not all, of the institutional constraints believed to be important in understanding China's growth in this period are neglected by the literature on size distribution of firms. The latter has mostly focused on technological primitives and, to a smaller extent, on variation in the availability of well functioning financial markets.

China provides an interesting experimental setting for exploring political economy's effects on the size distribution of firms because extensive policy experimentation after 1978 has led to big variation across the provinces. Several dimensions of this variation are of interest, notably the extent to which China has attracted foreign direct investment, and the manner and extent to which

it has liberalized in different provinces. Also of interest is the view that, despite massive inflows of capital into China via FDI, there has been minimal improvement in productive efficiency in recent years (Young, 2000). Understanding the interaction between the different policy instruments used in China and the effects on firms can help shed light on why this has been so.

Liberalized environment

Several of our measures seek to capture the extent to which particular provinces have been liberalized. We unpack the idea of 'liberalization' in our analysis. The first dimension of liberalization concerns the extent to which prices are set by market forces, as opposed to by planning authorities. The origins of market-based pricing in modern China go back to the advent of the Household Responsibility System (HRS; Lin, 1991) introduced soon after Deng's reforms began in 1978. They were introduced, at first, primarily in the rural areas, where incentives had been especially stifled following Mao's Great Leap Forward and Cultural Revolution (1966-76). Under Mao, private activity had been wiped out, replaced entirely by nationalization and collectivization of all organizations, beginning with the "interim regulations on private enterprises" decree of 1950. HRS introduced market based pricing on the margin. That is, there was a dual track system under which farmers could source inputs and sell outputs on the market, as long as they fulfilled their commitment to the planned levels of output. Lau et al. (2001) argue that the process of reform can be understood as a way of achieving efficiency while compensating losers so that the latter are 'bribed' to not oppose the reform process (see also Qian and Laffont, 1999).[4]

But liberalization can take forms other than market based pricing. In China, part of liberalization was a form of getting the center away from micromanaging enterprise. This decentralization occurred through giving local governments more autonomy, and through providing local officials with the incentives to support business. Support for local enterprise occurred through the fostering of collectives. In China, these were referred to as Township and Village Enterprises (TVE) (Che & Qian, 1998). Property rights were given to the collective unit, rather than the individual, and local officials ran their collective enterprise rather like diversified

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[4] In the so-called dual track system, enterprises continued to be governed by plan quotas on inputs and outputs, but once these planned inputs were used and planned outputs provided, both at state-determined prices, any surplus transactions were carried out at market prices. Those participating in market-mediated transactions were, by definition, better off, and those under the plan no worse off than they were before. The maintenance of the plan track was an implicit transfer – efficient, since it amounted to an inframarginal transfer independent of the efforts of the economic agents involved – to potential losers from reform.

corporations (Oi, 1992; Walder 1995). TVEs thrived more than did purely private enterprises when the local market was less developed, a situation generally correlated with prevailing 'antimarket ideology' and with a greater presence of (centrally owned) SOEs (Jin & Qian, 1998). TVEs contributed greatly to the local coffers, and their importance grew through the early 1990s.

Local authorities had strong incentives to participate in enhancing local economic output, since they were assured of keeping a portion of the incremental pie (Qian, Jin & Weingast, 2005). The incentives were enhanced because local growth improved the career prospects of the Party members in charge of the local area (Maskin, Qian, and Xu, 2000; Li & Zhou, 2005). And the fiscal incentives under which they operated were reasonably strong (Jin, Qian and Weingast, 2005). The provincial budget constraint was credible in part because competition between Chinese provinces amidst at least some factor mobility raised the opportunity cost of center-led bailouts (Qian and Roland, 1998). Oi (1992) points out that the percentage of local revenues that were not subject to oversight under what she calls this system of 'local state corporatism' by a higher authority rose from 1-2% to being as high as 50% post-reform (p. 105).

Note that virtually all entrepreneurial activity in China was happening under the umbrella of the local government officials. The first company law in the PRC did not come into effect until 1994 and the legal status of private entrepreneurs has remained in limbo until very recently. The rising percentage of private activity in national accounts was driven by organizations that did not have limited liability and, unsurprisingly, did not thrive (Kirby 1995; Huang, 2003). By the late 1990s and after, it can be argued that government involvement manifested itself as meddling. We capture this with our data on what local entrepreneurs interpret as unnecessary intervention on the part of the government.

Backlash to Liberalization

But these reforms were not without side-effects. For example, local officials had an incentive to protect local enterprises even if this were not in the national interest. As an example, many provinces might seek to each have an automobile industry, even though this would result in overproduction relative to any sensible social optimum.[5] This manifested itself in the form of local protectionism where firms from particular provinces found it difficult to 'export' into or do

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[5] Huang 1996 studies a version of this inter-province negative externality in his study of how inflation arose through overheating from excessive investment in China.

business in other provinces. Young (2000) says that the reform process exacerbated this tendency over time. We capture this with measures of provincial protectionism.

A unique feature of our data is that we have measures from incumbents, provincial insiders, about the extent to which the provincial government interferes with their business – think of this as non-price meddling (e.g. filling of quotas, permits, fees etc.) – as well as measures from potential entrants, those not within the province, about the extent to which the provincial government prevents them from entering and doing business.

<u>Foreign Direct Investment</u>

At least in the west, the China story is very much equated with success in attracting unprecedented quantities of foreign direct investment, more than $50 billion annually for each of the past few years. Opening up to FDI is, of course, opening up to global markets for capital and talent and is therefore another form of liberalization to complement that based on market based price setting, eschewing non-price based interference, removal of inter-province trade barriers.

As with other elements of liberalization, there is variation in the extent to which FDI was embraced. Deng also instituted a series of policy experiments in select urban areas. Initially, Special Economic Zones (SEZ) were set up in Shenzhen, Zhuhai and Shantou in Guangdong Province, close to Hong Kong, and Xiamen in Fujian Province, close to Taiwan, and the entire province of Hainan was designated a SEZ.[6] That is, Deng capitalized on proximity of these initial locations to pre-existing trading and financial centers. By the mid 1980s, it had become apparent that the SEZ experiment was a success, and Deng rapidly scaled up by opening many more SEZs.[78] The coastal provinces were generally subject to substantial deregulation – that is they could import and export, collaborate with foreign companies, hire and fire workers, in exchange for not expecting state subsidies in times of distress (Démurger et al. 2002). Other than the initial incidence of liberalization, other factors affect the realization of FDI inflows – e.g. local corruption

[6] Taiwan of course is where Chiang Kai-Shek fled after his defeat by the Communists. Therefore provinces close to Taiwan were ignored by Mao, and subsequently especially re-energized by Deng.
[7] Fourteen coastal cities were open to overseas investment by this time: Dalian, Qinhuangdao, Tianjin, Yantai, Qingdao, Lianyungang, Nantong, Shanghai, Ningbo, Wenzhou, Fuzhou, Guangzhou, Zhanjiang and Beihai.
[8] Subsequent work might exploit endowment effects that go farther back in history. Classic references on the particular composition of urban areas in China can be related to their propensity to support market-based activity. See, for example, Skinner, G William, ed. 1977 The city in later imperial china (Stanford University Press) and Chi Chao-Ting 1936. Key economic areas in Chinese history (London: Allen and Unwin).

(Wei, 2000) and implementation by each province (and city) of laws, even those governing property rights, price controls, etc. that are enacted nationally.

What about the effects of FDI? These have received less attention than the incidence of FDI itself. A corollary of Young's (2000) critique of unproductive expansion of the use of inputs is that FDI was not being used efficiently. Huang (2003) suggests that FDI was directed to sectors (with low intangible assets) exactly in ways that do not make sense from the standpoint of efficiency enhancement. Huang and Di (2004) suggest that FDI crowds out local enterprise. We speak to this issue with our analyses as well.

<u>Exogeneity</u>

Provincial variation drives our analyses. It is important to note that this variation is sensibly viewed as exogenous. It is the result of Deng's sequence of experimentation, which, in turn, was optimally located given the endowment effect of China's history under Mao. That is, Mao, in building up the People's Republic of China, had certain strongholds where he naturally concentrated his time, staying away from the forces of his Nationalist foe in the civil war of the time, Generalissimo Chiang-Kai Shek. China's northeast, closer to the border of what was then the Soviet Union, was the site of much Communist party intervention. In contrast, provinces to the south were deemed unsafe, since those corresponded to Nationalist strongholds (Tsai, 2002). Indeed, provinces like Fujian (near Taiwan today) grew very slowly in the pre-Deng period, reflecting the lack of attention during Mao's time. The importance of this is that the northeast was characterized by much heavier state intervention, initiated during Mao's era, and therefore much less market-oriented reform in the Deng Xiaoping era that followed Mao, than was the southeast. As an example, in 1989, officials in the northern province of Heilongjiang (bordering Russia today) pursued Project 383, an attempt to control the prices of a basket of goods used to calculate the local price index, in contrast to the southern province of Guangdong which freed all the same prices. The net result was that Guangdong's prices ended up being far lower and Project 383 was abandoned (Montinola, Qian and Weingast, 1995).

<u>Persistence of Institutional Variation</u>

While decentralized policy experimentation caused considerable intra-country variation, the period that we study, changes in policy between 1999 and 2003, represent a catching up of the provinces that were originally left behind on the long march to the market. In part, this catching up

is necessitated by competition from more market-driven provinces. An early example is the artificial attempt to curtail hog prices in Jiangxi in 1985. This policy was derailed by the free and higher hog prices in neighboring Guangdong and Fujian, because hog farmers in Jiangxi simply evaded controls and 'exported' hogs to the neighboring policies (Montinola, et al 1995). We think of the policy experiments that we observe in our data as reasonably exogenous because they undo to some extent the variation in policy observed in the early reform years.

Summary of China Literature Review

We are thus able to measure four different aspects of the liberalization process: market-based pricing, openness to competition from other provinces, freedom from non-price intervention by the local government, and the openness to foreign capital and talent. We show that the effects of this anatomy of liberalization are significant and of first-order magnitude, over and above the effect of technological primitives and that induced by capital constraints.[9]

B. Firm Size Distribution

The literature on the firm size distribution in industrial organization is massive. For our purposes, the main contours of analysis over the past several decades are sufficient to recount, for it will be clear that policy variation has received scant, if any, attention in this literature; yet we show in this paper that it is of first order importance. The literature begins with Gibrat's Inegalités Economiques, 1931, positing the Law of Proportional Effect that stated, simply, that the growth rate of firms was proportional to their size. Subsequent work, recently reviewed by Sutton (1997) and Caves (1998), includes decades of basic investigation of the correlation suggested by Gibrat and modified by Simon and his coauthors (Simon and Bonnini, 1958; Ijiri and Simon, 1977), and refinements that controlled for sample selection, offered game-theoretic models (which suggested that there was no general reason for assuming that growth was correlated with size) and modeled entry and exit of firms over industry life-cycles (Klepper and Graddy, 1990; Klepper and Simons 1993). The net result was to show that firms' proportional growth rates diminishes with size (Hall, 1987), consistent with a model posited by Jovanovic (1982).

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[9] Of course, each of the dimensions of liberalization themselves may relax capital constraints. We control directly for capital availability since much of the literature is concerned with this, and study the effects of liberalization thereafter.

The latest theoretical literature suggests a bounds approach to firm size – pointing out a minimum bound above which industry concentration ratios are predicted by theory to lie (Sutton, 1995, 2000). Cabral and Mata (2003) offer one of the first systematic analyses of the evolution of firm size distributions, showing that the log of firm size of a given cohort of firms evolves to a symmetric distribution and the overall distribution of firm size is quite stable and skewed to the right. The evolution of the distribution of a cohort, in turn, is consistent with a model that focuses on financial constraints, disproportionately affecting the prospects of smaller firms.

It is worth noting that there is very little literature on the size distribution outside the United States and Canada. Work by Roberts and Tybout (1996) on entry and exit in some developing countries, and by Cabral and Mata (2003) using Portuguese data are exceptions. Caves' (1998) conclusion, that the processes by which markets work appear similar in different countries, is perhaps premature, or at least true in only a rather abstract sense.

2. Data

Our data for the size of organizations comes from the China Statistical Yearbook, an official publication that is published annually by the National Bureau of Statistics of China. We use the data for 1999 and 2003 in our analyses. In 1999, we observe 3.24 million organizations. This number increases to 5.30 million by 2003. The yearbook provides a repeated cross section of data. There are no company identifiers; we cannot follow an organization over time. For each company, the yearbook lists the number of employees, the organizations' registered capital, and the firm's province. We also have detailed data on types of ownership and the firm's industry. The industrial classification system is China's own. It provides detailed information on manufacturing activities and a much coarser classification of services. In our analyses, we use 3-digit industry codes. At this level, we distinguish, for instance, the precious metal smelting industry, the general metal smelting industry and the non-ferrous metal alloy industry. In our empirical analyses, we use a random 1% sample of the yearbook data.

We supplement the information in the yearbook with data from NERI, a Chinese nonprofit organization that publishes an annual "Marketization Index." This index is designed to measure the relative importance of the market economy in each province. The index consists of 23 sub-

indices, which range from the fraction of prices that are set by provincial authorities to data on the origination of bank loans.

Much of this information is taken from official published sources. Two of NERI's subindices, the level of provincial protectionism and the extent of local government interference with business affairs, come from a survey among Chinese entrepreneurs. This survey is administered by the China Entrepreneur Survey System (CESS), a survey organization founded by the State Council's Development and Research Center and other governmental organizations. Summary statistics for all variables used in this study are given in Table 1.

3. Empirical Strategy

To link technological factors, financing constraints and policy variables to China's firm size distribution, we estimate models of the following general form:

(1) $e_{it} = \mathbf{X_i}\beta + Z_{\mathbf{pt}}\varphi + \gamma L_{pt} + t + \mu_p + v + \varepsilon_{it}$.

e_{it} is the log of employment at company i in year t. X_i is a vector of ownership indicators, Z_{pt} is a vector of province-level policy variables, L_{pt} represents a measure of financing constraints, t is a year effect, μ_p is a province fixed effect and v is an industry indicator. In this specification, we ask how employment at companies in a particular province changes in response to changes in the policy variable in this province. The industry fixed effects are meant to control for the influence of technology on firm size. We use the fraction of short-term loans obtained by the nonpublic sector to proxy for financing constraints L_{pt}. In many of our models, we want to know if the effects of a change in policy vary with the form of ownership. For instance, we are interested in studying if levels of employment in private enterprises change disproportionately if provinces pursue a more liberal policy. To measure these effects, we interact Z_{pt} with the ownership indicator variables. As we are interested in the effects of policy on the entire distribution of firms, we will estimate (1) not only as ordinary least squares but also as simultaneous-quantile regression models. The latter weigh the residuals of a median regression. For example, if we want to estimate the 75th percentile, we start with a regression that predicts the median size of firms in a 3-digit industry and then weigh the negative residuals by 0.50 and the positive residuals by 1.50 to predict the 75th percentile.

4. Results

The premise for our study is that China's provinces have served as laboratories of economic reform. Variation in province-level policy over time thus allows us to study the effect of these policies on the firm size distribution. Figure 1 shows such distributions, by ownership type, for the entire country, for Beijing and Zhejiang in 2003. Clearly, the distribution of firm size varies dramatically from province to province. The changes are particularly dramatic for foreign firms. The results in Table 2 confirm this impression. The third column in this table reports the size of province fixed effects from a regression with 3-digit industry fixed effects and a year effect. The dependent variable is the log of employment. We order the effects by size, creating a ranking of the effect of provinces on firm size. Not unexpectedly, some of the economically more successful provinces such as Guangdong and Shanghai appear high on this ranking, indicating the average company in these places is smaller than companies in Anhui, the omitted province. In columns 4 and 5 report the NERI Marketization index and the Démurger & Sachs (2002) preferential policy index. The latter measures deregulation at the provincial level.[10] There appears to be some correlation between the size of the fixed effects and the scores – more open provincial economies are typically ranked more highly – but there are many exceptions. In Table 2, Pearson correlations are 0.33 for the fixed effects and the NERI measure, 0.39 for the fixed effects and Démurger & Sachs, and 0.61 for NERI and Démurger & Sachs.

We start exploring the link between provincial policy and firm size more directly in Table 3. As in the remainder of our analyses, these models include 97 3-digit industry fixed effects and province fixed effects. That is, we are asking how policy changes in a province affect its firm size distribution. In Table 3, we first study how forms of ownership influence the size of firms. We find that private and collective firms are significantly smaller than state-owned companies, the omitted category. Foreign firms are larger. The difference between state-owned companies and other organizations has not changed in the period from 1999 to 2003 (specification 2).

We also report the results of quantile regressions in Table 3. The impact of ownership on firm size varies significantly across different points in the distribution. For example, the difference

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[10] Deregulation consists of four principal measures: the ability to import duty-free for re-export; to collaborate with foreign companies in investment projects; to hire and fire workers at will; and to escape confiscatory taxation (Démurger et al., 2000).

between state-owned and private firms is larger for larger companies. Conversely, the size advantage of foreign firms relative to state-owned companies increases in size.

In Table 4, we report the results for our baseline model in equation (1). Controlling for technology (industry fixed effects), we ask if financing constraints, measured as the fraction of short-term loans that is extended to nonpublic firms, influence the size of companies. The answer, from specification (1) in Table 4, is affirmative. Provinces with greater availability of private-sector loans have smaller companies. This effect varies by ownership type. Improved financing boosts the size of foreign firms and collectives, relative to state-owned enterprises. There appears to be no effect on private companies.

In specification (3) of Table 4, we add the NERI Marketization score to the base model, asking if liberalization policies influence the firm size distribution over and above the influence of technology and financing. We find that the average firm is smaller in more market-friendly provinces. But as with financing, foreign and collective enterprises grow larger in more market-friendly provinces. In contrast, the difference between private and state-owned companies does not change in provinces that pursued more liberal policies in the 1999 to 2003 period.

The quantile regressions in Table 4 show some interesting differences to the OLS results. The size advantage of foreign firms that is due to more market-friendly policies is much smaller for small foreign companies. The reverse is true for private companies. In sum, the results in Table 4 are our first evidence that public policy has an effect on the distribution of firm size over and above the factors commonly studied in the literature. In particular, the types of liberalization policies pursued in China appear to have fostered the growth of foreign firms and collective enterprises. Perhaps surprisingly, we find that these policies did not affect the difference in size between private and state-owned firms.

The NERI marketization score provides a summary statistic for a multitude of market-friendly policies. As a result, the estimates are difficult to interpret. In Table 5, we look at two specific policies believed to be at the core of China's program to develop a market economy: the liberalization of prices and the opening of the economy to foreign direct investment. Taken by themselves, these policies do not appear to have shifted the firm size distribution in any significant way. However, these average effects mask important variation. In specification (2), where we interact the policy variables with forms of ownership, we find that increased price flexibility

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increases the size advantage that foreign firms have relative to state-owned enterprises. There is no such effect for private and collective companies. Similarly, greater openness to FDI fosters the growth of foreign firms and decreases the size of private and collective companies. This latter observation is consistent with Huang and Di (2004) in that a reliance on foreign investors appears to crowd out domestic entrepreneurship. However, the negative effect of FDI on the size of private companies could also reflect the entry of many small firms. We find some evidence for this latter interpretation in our data. In specification (3) of Table 5, we relate FDI to the fraction of private firms and find a significant and positive effect. In China's case, FDI and small-scale entrepreneurship appear to be complements.

Columns (4) through (6) in Table 5 report quantile regression results. Increases in price flexibility tend to have a more positive effect on the size of larger firms for all forms of ownership. But even at the 75th percentile, price flexibility mostly benefits foreign firms and collective enterprises and not private companies. The effect of FDI, on the other hand, appears to be fairly uniform across firm sizes.

In Table 6, we turn to the effects of two policies which obstruct the functioning of markets: provincial protectionism and government interference with business. To measure protectionism in, say, Guizhou, managers in other provinces are asked how difficult it is to export goods and services to Guizhou. Thus, protectionism is the assessment of outsiders. In contrast, government interference is measured as the fraction of working time that managers spend dealing with government agents in their own province. Interference is the view of insiders. We find that protectionism reduces the size of the average company, but government interference bears a positive relationship to firm size. The effect of protectionism is particularly negative for foreign firms, perhaps because protectionism is mostly directed at foreign firms or because these companies lack the political connections to secure access to provincial markets. In specification (3) of Table 6, we show that these estimates reflect entry decisions. The fraction of private firms increases in more protectionist provinces and it decreases with more heavy-handed government interference.

As in the previous tables, we explore the effects of protectionism and government interference for companies of different size. Most coefficients are fairly similar in the three quantile regressions in Table 6. An interesting exception is the effect of protectionism on private companies. The

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difference between state-owned enterprises and private firms is smaller for smaller firms in more protectionist provinces. Protectionism encourages private entry and it keeps private firms small, although this latter effect is less pronounced for small private companies.

How important are the policy effects in our data? A natural comparison is with technology and financing constraints, the two factors most often studied in the previous literature. Table 7 compares the size of the median industry fixed effect (technology) and a one standard-deviation increase in the fraction of short-term loans available to private companies with one-standard deviation increases in our policy variables. Overall marketization and protectionism are the most important policy factors. For example, a one-standard deviation increase in protectionism is 5.17 times as important as a one-standard deviation increase in the availability of financing. Price flexibility is the least important of the policy variables that we study in this paper.

5. Conclusion

Political economy variables have first-order effects on the size distribution of firms. Even after controlling for technological primitives (through industry fixed effects) and for capital constraints, we showed that different aspects of liberalization matter, and do so differently for different types of firms. Reforms have generally promoted the growth of foreign firms and collectives and have done relatively little for truly private firms. One way to present this is to note that even the extensive liberalization that China has undergone has proven insufficient to override its bias against private enterprise. Amazingly, price flexibility in particular does not appear to help small firms. It helps large firms get larger. The best thing that can be said for private firms is that their entry is supported by the presence of foreign direct investment. FDI does not entirely appear to crowd out small private firms.

Provincial government interference has opposing effects on insiders and outsiders. Outsiders, especially foreign firms, suffer the most, presumably because they do not quite know how to deal with the interference. Insiders are protected. But interference directed against incumbent enterprises within each province is correlated with the existence of large firms. It appears that one needs to of a certain size to combat interference.

A corollary of these results regarding the differential effects of different dimensions of liberalization is that aggregate indices (such as those provided by Démurger et al 2002) should be

used with caution. We also find that the means of the distributions often remain unaffected by particular policy variables, but firms at other points in the distribution are affected quite differently. That is, there are indeed distributional consequences of these policy experiments beyond the effect on first moments.

We should note some limitations of our analyses. As yet, census type data, where one can track the identity of particular firms over time, are not easily available in developing countries like China. This precludes analyses regarding whether or not small firms should be thought of reflections of welfare-enhancing net entry, or as symptoms of welfare-reducing stagnant growth. Nonetheless, the policy experiments have sufficiently intriguing effects that it is probably premature to conclude, as Caves (1998) bravely does, that market forces play out similarly everywhere. That may take a really long run view, and Keynes had something to say about that a while back!

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TABLE 1 – SUMMARY STATISTICS

Variable	Definition	Obs	Mean	Std. Dev	Min	Max
# employees		76204	120.9338	990.3056	1	78000
Private firm		76204	0.570534	0.495003	0	1
% private companies	Ratio of private firms in 3-digit industry to all firms in this industry in the province	5283	.4453813	.2302744	0	1
Foreign firm		76204	0.038384	0.192122	0	1
Collective enterprise		76204	0.199675	0.399758	0	1
Other Enterprise		76204	0.014409	0.119169	0	1
Financing constraint	Index of (short-term loans to nonpublic sector)/(all short-term loans in province)	76204	4.432419	2.976541	0	10
NERI Marketization Score		76204	7.076896	1.406928	2.89	9.18
Price flexibility	Index of % prices not set by provincial bureaus	76204	8.516438	1.407282	0	10.08
FDI	Index of provincial FDI / Provincial GDP	76204	3.72978	2.903954	0	10
Protectionism	Survey measure, see text	76204	8.42953	1.972582	0	10.33
Government Interference	Survey measure, see text	76204	7.537411	3.85066	0	15.78
Year		76204	2001.521	1.93094	1999	2003

TABLE 2 – PROVINCE FIXED EFFECTS

Rank	Province	Fixed Effect	NERI Score	Sachs Indicator
1	Xizang	-0.4	7.14	1
2	Hainan	-0.399	8	3
3	Guangdong	-0.291	8.51	3
4	Ningxia	-0.271	3.49	1
5	Fujian	-0.265	8.39	3
6	Jiangsu	-0.265	9.18	2
7	Sichuan	-0.252	6.69	2
8	Zhejiang	-0.252	8.54	2
9	Heilongjiang	-0.248	4.99	2
10	Liaoning	-0.215	5.86	2
11	Shanghai	-0.209	8.31	3
12	Xinjiang	-0.196	4.4	2
13	Yunnan	-0.173	5.9	2
14	Qinghai	-0.169	3.33	1
15	Guangxi	-0.16	7.85	2
16	Beijing	-0.152	6.81	2
17	Tianjin	-0.109	6.12	2
18	Inner Mongolia	-0.079	4.36	2
19	Shaanxi	-0.078	6.26	1
20	Gansu	-0.006	4.66	1
21	Jiangxi	0.017	5.82	1
22	Chongqing	0.032	6.69	
23	Hubei	0.041	6.43	2
24	Hunan	0.063	6.31	1
25	Guizhou	0.101	4.92	1
26	Shandong	0.116	7	2
27	Hebei	0.119	7.56	2
28	Shanxi	0.12	4.33	1
29	Henan	0.244	6.16	1
30	Jilin	0.381	4.69	2

Notes: The omitted province is Anhui. Fixed effects are estimates from a model with size of employment as the dependent variable and province and 3-digit industry fixed effects.

TABLE 3 – FIRM SIZE AND OWNERSHIP

	(1) log size	(2) log size	(3) log size 10% quantile	(4) log size 25% quantile	(5) log size 75% quantile
Private Firm	-0.683	-0.656	-0.322	-0.421	-0.902
	(0.014)**	(0.020)**	(0.011)**	(0.012)**	(0.040)**
Foreign Firm	0.277	0.295	0.155	0.314	0.304
	(0.027)**	(0.041)**	(0.063)*	(0.025)**	(0.005)**
Collective Enterprise	-0.421	-0.441	-0.084	-0.165	-0.584
	(0.016)**	(0.022)**	(0.007)**	(0.011)**	(0.056)**
Other Enterprise	-0.245	-0.247	-0.253	-0.236	-0.235
	(0.039)**	(0.039)**	(0.062)**	(0.013)**	(0.017)**
2003 × private		-0.043			
		(0.024)			
2003 × foreign		-0.032			
		(0.051)			
2003 × collective		0.037			
		(0.029)			
Year = 2003	-0.039	-0.023	-0.034	-0.025	-0.047
	(0.009)**	(0.021)	(0.002)**	(0.000)**	(0.020)*
Province fixed effects?	Yes	Yes	Yes	Yes	Yes
3-digit industry fixed effects? (97 indicators)	Yes	Yes	Yes	Yes	Yes
Observations	76204	76204	76204	76204	76204
R-squared	0.25	0.25			

TABLE 4 – FIRM SIZE, FINANCING AND LIBERALIZATION POLICIES

	(1) log size	(2) log size	(3) log size	(4) log size	(5) log size 10% quantile	(6) log size 25% quantile	(7) log size 75% quantile
Short-term loans to nonpublic sector	-0.009 (0.003)**	-0.017 (0.005)**	-0.009 (0.003)**	-0.009 (0.003)**	-0.008 (0.004)*	-0.006 (0.004)	-0.008 (0.007)
NERI Marketization Score			-0.042 (0.013)**	-0.064 (0.014)**	-0.024 (0.013)	-0.022 (0.006)**	-0.035 (0.013)**
Private company	-0.683 (0.014)**	-0.678 (0.021)**	-0.684 (0.014)**	-0.790 (0.059)**	-0.589 (0.007)**	-0.612 (0.074)**	-0.982 (0.003)**
Foreign Company	0.276 (0.027)**	0.042 (0.048)	0.276 (0.027)**	-1.210 (0.157)**	-0.747 (0.140)**	-1.162 (0.226)**	-1.423 (0.040)**
Collective enterprise	-0.422 (0.016)**	-0.519 (0.025)**	-0.422 (0.016)**	-0.670 (0.074)**	-0.084 (0.103)	-0.122 (0.038)**	-0.892 (0.160)**
Other companies	-0.246 (0.039)**	-0.237 (0.040)**	-0.246 (0.039)**	-0.225 (0.040)**	-0.241 (0.037)**	-0.257 (0.003)**	-0.222 (0.015)**
Loans × private		0.000 (0.004)					
Loans × foreign		0.049 (0.009)**					
Loans × collective		0.024 (0.005)**					
Marketization × private				0.016 (0.008)	0.040 (0.002)**	0.027 (0.009)**	0.012 (0.001)**
Marketization × foreign				0.202 (0.021)**	0.128 (0.013)**	0.204 (0.024)**	0.228 (0.002)**
Marketization × collective				0.036 (0.010)**	0.002 (0.015)	-0.005 (0.005)	0.044 (0.022)*
Year 2003	-0.022 (0.011)	-0.023 (0.011)*	-0.007 (0.012)	-0.009 (0.012)	-0.019 (0.012)	-0.017 (0.003)**	-0.033 (0.013)**
Province fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3-digit industry fixed effects? (97 indicators)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	76204	76204	76204	76204	76204	76204	76204
R-squared	0.25	0.25	0.25	0.25			

Standard errors in parentheses
* significant at 5%; ** significant at 1%

TABLE 5 – FIRM SIZE, PRICE FLEXIBILITY AND FDI
(% prices not set by provincial bureaus; Provincial FDI / Provincial GDP)

	(1) log size	(2) log size	(3) # private companies	(4) log size 10% quantile	(5) log size 25% quantile	(6) log size 75% quantile
Price flexibility	-0.001	-0.018	14.135	-0.009	-0.014	-0.029
	(0.007)	(0.009)*	(48.097)	(0.003)**	(0.007)*	(0.015)
FDI	-0.010	-0.003	163.294	0.001	0.010	0.003
	(0.006)	(0.007)	(57.688)**	(0.020)	(0.003)**	(0.005)
Short-term loans to	-0.011	-0.011	180.892	-0.008	-0.002	-0.004
nonpublic sector	(0.004)**	(0.004)**	(34.047)**	(0.003)**	(0.002)	(0.007)
Private company	-0.683	-0.758		-0.287	-0.243	-0.940
	(0.014)**	(0.068)**		(0.018)**	(0.074)**	(0.044)**
Foreign Company	0.276	-0.327		-0.409	-0.168	-0.549
	(0.027)**	(0.200)		(0.394)	(0.026)**	(0.078)**
Collective enterprise	-0.422	-0.703		-0.248	-0.274	-1.052
	(0.016)**	(0.083)**		(0.110)*	(0.049)**	(0.093)**
Other companies	-0.245	-0.244		-0.239	-0.245	-0.227
	(0.039)**	(0.039)**		(0.083)**	(0.072)**	(0.088)**
Flexibility × private		0.018		0.001	-0.015	0.009
		(0.009)*		(0.007)	(0.010)	(0.004)*
Flexibility × foreign		0.055		0.056	0.042	0.078
		(0.023)*		(0.049)	(0.010)**	(0.002)**
Flexibility × collective		0.031		0.018	0.016	0.056
		(0.011)**		(0.003)**	(0.005)**	(0.010)**
FDI × private		-0.020		-0.012	-0.014	-0.010
		(0.005)**		(0.011)	(0.004)**	(0.003)**
FDI × foreign		0.021		0.012	0.022	0.028
		(0.009)*		(0.016)	(0.016)	(0.004)**
FDI × collective		0.005		0.002	-0.008	-0.003
		(0.005)		(0.017)	(0.000)**	(0.005)
Year 2003	-0.017	-0.019	116.883	-0.011	-0.014	-0.039
	(0.012)	(0.012)	(22.687)**	(0.015)	(0.003)**	(0.006)**
Province fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes
3-digit industry fixed effects? (97 indicators)	Yes	Yes	Yes	Yes	Yes	Yes
Observations	76204	76204	5283	76204	76204	76204
(Pseudo) R-squared	0.25	0.25	0.11			

Standard errors in parentheses
* significant at 5%; ** significant at 1%

TABLE 6 – FIRM SIZE, PROVINCIAL PROTECTIONISM AND LOCAL GOVERNMENT INTERFERENCE

(Protectionism measure from NERI survey; interference measure from survey of Entrepreneurship Association)

	(1) log size	(2) log size	(3) % private companies	(4) log size 10% quantile	(5) log size 25% quantile	(6) log size 75% quantile
Protectionism	-0.077	-0.081	0.016	-0.068	-0.075	-0.040
	(0.017)**	(0.017)**	(0.006)**	(0.023)**	(0.007)**	(0.022)
Government interference	0.009	0.009	-0.004	0.001	0.001	0.006
	(0.003)**	(0.004)*	(0.001)**	(0.000)**	(0.009)	(0.005)
Short-term loans to nonpublic sector	-0.010	-0.010	0.002	-0.011	-0.011	-0.008
	(0.003)**	(0.003)**	(0.002)	(0.003)**	(0.001)**	(0.002)**
Private company	-0.683	-0.570		-0.166	-0.252	-0.804
	(0.014)**	(0.059)**		(0.098)	(0.049)**	(0.043)**
Foreign Company	0.275	-0.889		-0.948	-0.883	-0.843
	(0.027)**	(0.122)**		(0.330)**	(0.105)**	(0.187)**
Collective enterprise	-0.421	-0.353		0.061	0.075	-0.477
	(0.016)**	(0.070)**		(0.029)*	(0.004)**	(0.014)**
Other companies	-0.246	-0.247		-0.260	-0.273	-0.224
	(0.039)**	(0.040)**		(0.007)**	(0.017)**	(0.108)*
Protectionism × private		0.011		0.025	0.021	0.011
		(0.007)		(0.011)*	(0.001)**	(0.013)
Protectionism × foreign		-0.110		-0.115	-0.128	-0.102
		(0.013)**		(0.043)**	(0.001)**	(0.038)**
Protectionism × collective		0.010		0.013	0.020	0.016
		(0.008)		(0.005)**	(0.003)**	(0.010)
Interference × private		0.003		-0.005	-0.000	-0.000
		(0.003)		(0.002)*	(0.006)	(0.003)
Interference × foreign		-0.024		-0.018	-0.013	-0.028
		(0.007)**		(0.003)**	(0.010)	(0.010)**
Interference × collective		-0.003		0.006	0.011	-0.003
		(0.004)		(0.006)	(0.005)*	(0.007)
Year 2003	-0.067	-0.068	0.034	-0.043	-0.051	-0.052
	(0.014)**	(0.014)**	(0.001)**	(0.021)*	(0.004)**	(0.005)**
Province fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes
3-digit industry fixed effects? (97 indicators)	Yes	Yes	Yes	Yes	Yes	Yes
Observations	76204	76204	76204	76204	76204	76204
R-squared	0.25	0.25				

Standard errors in parentheses

* significant at 5%; ** significant at 1%

TABLE 7 – SIZE OF ESTIMATED EFFECTS

	% median industry FE	% one standard-deviation increase in availability of short-term loans to nonpublic sector
% median industry FE	100	1523.73
One std. dev. increase in marketization	15.05	229.30
One std. dev. increase in financing	6.56	100.00
One std. dev. increase in price flexibility	0.35	5.48
One std. dev. increase in FDI	7.42	84.88
One std. dev. increase in protectionism	38.14	517.10
One std. dev. increase in govt interference	8.88	120.46

GRAPH 1 – FIRM SIZE DISTRIBUTIONS

Chinese Firms in 2003
kernel density estimate

Firms in Beijing 2003
kernel density estimate

Firms in Zhejiang 2003
kernel density estimate