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ABSTRACT

Liberalisation, Concentration and Diversification: Business Groups in India, 2000-2020*

We analyse changes in market structure in India between 2000 and 2020 using a rich dataset at high levels of disaggregation. We examine the extent to which business groups – notably family-owned groups – have maintained dominant market positions in the Indian economy. We focus on two key dimensions. The first is the extent of concentration in markets and market shares by industry. The second concerns the dynamics and the extent to which business groups have focussed on consolidating their position in specific, narrow sectors or, rather, entered new sectors and diversified. We find that while market concentration has been falling, a bloc of high concentration sectors remains. Further, diversification has been actively pursued across sectors by most business groups. While this points to greater competition among business groups, the ratio of revenues to variable costs – a measure of the markup – has shifted upwards, particularly after 2013. The weight and persistence of these large business groups in the economy, as measured by the ratio of their revenues to GDP, has also increased. Finally, we discuss possible policy options.

JEL Classification: D22, L1, L11, O14, O25

Keywords: market concentration, India, business groups, Hirschman Herfindahl Indices, diversification

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1. Introduction

There has been a growing interest in the extent of market concentration and the attenuation of competition in the advanced economies, notably the USA (Blair and Sokol, 2015, Philippon, 2019; De Loecker, Eeckhout, & Unger, 2020). This is being echoed in emerging markets where concerns about market power have come to challenge earlier views about the desirability of scale in driving the development process (Tybout, 2000; De Loecker & Eeckhout, 2018). Indeed, many of the sources of concentration in Asia have flowed from explicit policy choices as well as market failures (Commander and Estrin, 2023). There is, however, a feature of Asia, including India – the subject of this paper – that makes it different from the advanced economies. That is the presence and persistence of large business groups, many of which are family owned (Khanna & Palepu, 2000; Carney, 2008; Bhaumik, Estrin & Mickiewicz, 2017). These business groups are mostly formed of multiple companies operating across a variety of sectors with, however, interconnected governance structures designed to facilitate family control through concentration in ownership (Bertrand, Mehta & Mullainathan, 2002; Morck, Wolfenzon & Yeung, 2005). The consequences have also included significant degrees of concentration in specific markets, as well as at the level of the economy (Khanna & Yafeh, 2007; Colpan, Hikino & Lincoln, 2010). One indicator of the weight of business groups in the aggregate economy can be gauged by the share of the largest companies' revenues in national output. Across Asia, the top 5 and top 10 companies have recently accounted for between 10-40% of GDP. In India these shares have been around 10% and 15% respectively (Commander and Estrin, 2022)[2]. These are certainly large shares when compared with most advanced economies where comparable shares are around 3-5%. Perhaps not surprisingly, some present-day critics argue that large business groups' family owners have accumulated excessive market power and have effectively formed a new oligarchy[3]. The perception that some sectors are dominated by a very small number of companies led India's Competition Commission (CCI) to launch an investigation of seven sectors including pharmaceuticals, telecommunications, airports and ports in 2021.

Although scale and concentration were initially viewed as an integral feature of India's development strategy, concern over concentration in markets and the potential for abuse of market power emerged several decades ago. That concern was initially prompted by the rapid expansion of public enterprises and the preferences granted to specific privately held business groups from the 1950s onwards. A series of Government of India Commissions in the 1960s looked in detail at the impact on competition and led, among other consequences, to the introduction of legislation to address monopoly[4]. Implementation was however very limited. However, since then – as we summarise in Section 3 - the policy regime has shifted sharply in the direction of promoting market liberalisation (Chhibber and Soz (2021), Kapur (2020), Aghion, Burgess, Redding &

[2] These shares include state-owned companies but privately held businesses are a significant component
[3] For example, Ghosh (2023)
[4] The Monopolies and Restrictive Trade Practices Act (MRTP). For the Commissions, there were, inter alia, the Mahalanobis Committee (1964) and the Hazari Committee (1966)

Zilibotti, (2008)). Even so, the tension between promoting pro-business and pro-market policies has remained. For example, the Modi governments since 2014 have explicitly lauded the role of large business groups in the implementation of major infrastructure and other projects.

Our paper charts the dynamics of market competition in India between 2000 and 2020. In addition, it analyses the extent to which business groups – particularly family-owned groups – have continued to stake out dominant positions in the Indian economy. We focus on two key dimensions. The first is the extent of concentration in markets and market shares by industry. The second concerns the dynamics and the extent to which business groups have focussed on consolidating their position in specific, narrow sectors or, rather, entered new sectors and diversified. Our analysis therefore focusses on the behaviour and persistence of these large business organisations in India between 2000-2020[5]. In the paper, we use a rich dataset to explore these issues in depth and at high levels of disaggregation.

To understand fully the dimensions of market power it is normal to look not only at the degree of concentration but also pricing and profits over time (De Loecker, Eeckhout, & Unger, 2020). Although we can observe profits, data on pricing have major shortcomings or are not available[6]. As a result, our focus is mainly on the extent of concentration and diversification as observed at two and three-digit levels with the principal unit of analysis being the family business group. To help our understanding of some of the welfare effects, we then look at the evolution of markups, measured as the ratio of sales to variable costs in the reference period, whilst also identifying the weight of the business groups in the aggregate economy.

The paper is organised as follows. Section 2 provides a literature survey. Section 3 summarises the changes in the policy regime, particularly measures aimed at promoting greater liberalisation, that have occurred either before or during our reference period. Section 4 then describes the dataset that we use, how it has been assembled along with its strengths and limitations. Given our focus on business groups we indicate how these are measured. Section 5 examines concentration in aggregate using both concentration ratios and Hirschmann-Herfindahl Indices (HHI). The focus is largely on 2 and 3-digit industry levels. Section 6 then looks at the extent to which business groups are diversified along with the evolution and type of diversification since 2000. It then examines how diversification has been associated with market shares, as measured by revenues. Section 7 analyses whether the reference period has seen any movement in the ratio of sales to variable costs for the business groups. Section 8 turns to the weight of business groups in the aggregate economy as well as that accounted for by the top five groups. A concluding

[5] Analysis in the spirit of Sutton (2007). See also Kato & Honjo (2009).
[6] They also do not permit an analysis at a regional level, a serious deficiency since in many sectors the Indian market is not fully integrated. This may mean that our data understate the true extent of market concentration as felt by consumers

section discusses the main results and outlines some of the policy changes that are required to address the entrenchment of business groups.

2. Literature review

Business groups have been a central feature of the Indian economy for decades and remain so to this day. With their presence has come both concentration in ownership and concentration in markets, although the variation over time, particularly in the latter, has not been well measured.

There are several competing explanations for such concentration in India (and more generally in Asia). One approach has been to emphasise the ties that link business with politicians and political parties (Commander and Estrin, 2022). Preferential, discretionary ties have, inter alia, delivered protection, finance, access to resources and assets thereby diluting competition, either by reducing the incentives of incumbents and/or by explicitly excluding challengers.

Another view is that the rationale for business groups is driven by market imperfections or failures, whether it be in managerial or capital markets (Khanna & Palepu, 2000; 2004). Business groups allow resources to be pooled and allocated across the group at the discretion of the owners drawing on internal resources. At the same time, the format can facilitate tunnelling of resources and lack of transparency (Bertrand et al., 2002). A very recent example concerns how the Adani group has raised and allocated capital[7].

Yet, as economies reach higher income levels and install better institutions, this might be expected to reduce the need for capital market internalisation and other business group features (Khanna and Yafeh, 2007). The available evidence suggests that despite considerable income growth and marked institutional improvements in recent decades, there is little or no evidence of any significant retreat from the business group format, whether in India or indeed elsewhere in Asia. Part of the reason may be the continuing power of political connections, but it could also be true that the governance properties of business groups (Morck, Wolfenzon, & Yeung, 2005) continue to be the driving force behind this choice of business format.

Further, although the political connections and market imperfections arguments can in principle jointly explain the presence of business groups, they have different implications for competition. The connections argument suggests that business groups will exploit advantageous treatment to gather rents and hence hold down competition. However, business groups may compete robustly against each other while the dispensation of political favours may not necessarily be narrow. Indeed, the evidence presented later in this paper shows that Indian business groups rarely act as monopolists and most markets

[7] A New York hedge fund – Hindenburg Research - produced a report in January 2023 on the Adani group alleging, inter alia, corporate fraud and equity price manipulation. Subsequently, further allegations about opaque funding and governance in the group emerged.

are characterised by multiple players. Even so, the accumulated weight of the business groups may ensure that entry by others is deterred. Although arguments based on market gaps or failures can in principle help explain concentration in ownership, they do not shed much light on why concentration in markets may result nor how market structure will evolve over time (Carney, Van Essen, Estrin & Shapiro, 2018).

There is an additional, significant feature of many business groups in India (and indeed throughout Asia) which is their degree of diversification by sector and activity. Although the textbook model of the firm suggests that there are few or no reasons to diversify, pervasive market failures may promote diversification strategies. Khanna and Palepu (2000) argue that business group structures can reduce the costs of diversification as they deploy their internal capital markets to launch new ventures. As to the form of diversification, Resource-Based Theory (RBT) (see Mahoney & Pandian, 1992) posits that shifting into related industries that share resources can improve the performance of firms when compared to a strategy of specialising within an industry or diversifying to unrelated industries (Wan et al., 2011).

As regards empirical analysis of concentration, market power and business groups, an early analysis - Hazari (1966) - found that by 1958 nearly 20% of the gross capital stock of all non-state-owned public companies was held by just two, family business groups (FBGs) - Tata and Birla. Even so, he observed that the main business groups were highly diversified and were, as a result, not normally monopolists in particular industries[8]. Consequently, he and the Government of India did not give priority to anti-trust policies. Subsequently, in 1990/91 Piramal (2003) found that Tata and Birla were still the top ranked business groups and nine business groups that had been ranked in the top 20 in 1951 were still in the same category. Ten years later their share of the gross capital stock was still around 30% pointing to strong persistence.

Since the 1990s there have been significant changes in policy orientation (see Section 3 below) and these have had implications for concentration. A recent paper (Acharya, 2023) finds that while overall concentration in India - as measured by the share of assets held by the largest companies - fell in the 1990s, this was mainly due to the share of state-owned firms declining rapidly due to explicit attempts to downsize the public sector. At the same time, the share of the largest private firms rose although not by quite as much as the state sector declined. Despite some flattening of the process between 2010 and 2015, asset concentration subsequently rose again after 2016. On Acharya's measure, the market share for assets of the top five private business groups surpassed 18% by 2021 from just over 10% in 1991[9].

[8] Hazari (1966) pp305ff

[9] Those groups being Ambani (Mukesh); Adani, Tata, Birla (Aditya) and Bharti Telecom

In short, the strong presence and persistence of business groups – mostly family controlled - in India was facilitated by explicit public policy between the 1950s and 1980s. Even when the policy tide subsequently shifted towards greater liberalisation, the business groups appear to have demonstrated a robust capacity for entrenching themselves.

3. Policy context

India's policy framework for business has had several distinct phases over the past 75 years. Between 1950-1980, industrial policy gave priority to the state sector while also giving favourable treatment to a limited number of business groups within the context of the state's overall direction of economic development (Dreze and Sen, 1996). This was achieved by granting licenses on preferential terms to businesses with close connections to politicians. This so-called 'Licence Raj' curbed competition in that big businesses were largely shielded from domestic and foreign competitors (Ahluwalia, 2016; Bhattacharjea, 2010). Although, initially, economic growth was driven by high levels of public investment, as inefficiencies mounted, growth continued at a far slower pace.

Following the failure of the industrial policies of 1950-1980 to achieve the twin objectives of industrialisation and rapid economic growth, there was a shift to a more pro-business approach from the 1980s (Aghion, Burgess, Redding and Zilibotti, 2008). There was a relaxation in the threshold value of assets at which firms were required to take approvals for mergers and acquisitions as well as for licencing of investment and the import of intermediate and capital goods. Despite most measures benefiting incumbent business groups, the Monopolies and Restrictive Trade Practices Act (MRTP) was also amended so that the market share at which a firm was regarded as dominant in an industry fell from 33% to 25%. Although the performance of the economy improved from the mid-1980s (Balakrishnan 2017), a balance of payments crisis triggered by the 1990 Gulf War prompted a switch to more pro-market policies in an attempt at raising efficiency and growth.

The reforms unveiled after 1991 included the de-licensing of most industries; only four remained under the compulsory licencing regime by 2020 (DPIIT, 2019). All restrictions on mergers and acquisitions by big business houses were lifted and the MRTP was repealed entirely in 2009 with a new Competition Act enacted in 2002. Reserved industries for the public sector were radically reduced in 1991 from 17 to 8 and by 2016, this list had only atomic energy and railways (PIB, March 2016). By 2015, reservation of certain sectors for small-scale industry were also completely abolished. Other liberalising measures included allowing the private sector access to equity markets without the approvals that were needed earlier. Removal or relaxation of price ceilings on most commodities, except pharmaceuticals, also occurred (Bhattacharjea, 2022). Amendments to employment-protection regulations by state governments were put in place and the Insolvency and Bankruptcy Code (IBC) was enacted in 2016. In addition, there were major reforms to the trade and investment regime. Quantitative restrictions on all capital and

intermediate goods were removed in 1991 as they were on all imports, except for a modest negative list, by 2001. There was a gradual reduction in import tariffs and restrictions on FDI were eased considerably post-1991. By 2020 FDI was allowed without clearance in all except nine sectors.

Some of these liberalising reforms, notably for trade, were resisted initially by major Indian businesses who argued that Indian industry was unprepared to face competition from external markets and lobbied for a made-in-India policy towards the end of the 1990s. Ahluwalia (2016) argues that Indian industry had adequate time to adjust to the new economic realities as most import and FDI restrictions were only removed by 2002. Corporate failures – notably of the Future and UB groups – only came later after the Global Financial Crisis led to higher debt-servicing costs and a slowdown in growth. Set against this, however, several high profile – and politically connected - business groups continued to expand rapidly throughout the period in both existing as well as new activities and sectors.

4. Data description

We use panel data from the stand-alone financial statements provided by CMIE's Prowess database. The database is the largest and most comprehensive source of information on the financial performance of Indian business entities with over 3300 data fields for the entities covered. A unique advantage of this database is that it provides subsidiary-level information as well as details of business group ownership[10]. For the period we analyse – 2000 to 2020 - we have nearly 500,000 observations.

The dataset, however, requires substantial cleaning for an analysis at the 2008 National Industrial Classification (NIC) two-digit level or higher. For example, 5025 firms are assigned to 20 non-existent or incorrect NIC-3 codes. This requires reclassifying these companies to their correct NIC-3 codes using the companies' financial statements, product-level revenue data for companies provided by Prowess which is used to identify the primary goods produced and an online source (Zauba Corp) which provides details for companies based on records from the Indian Ministry of Corporate Affairs[11].

Our paper focusses primarily on the top 25 family business groups (FBGs) using total income of the business groups in 2019-20 as the ranking criteria[12]. Total income is gross of indirect taxes, rebates and discounts and net of income capitalised and transferred to

[10] This contrasts with the Annual Survey of Industries (ASI) which only provides anonymous plant-level information

[11] For robustness, we check the correlation of CR5 (concentration ratios of the top five businesses in an industry) and CR10 (concentration ratios of the top ten businesses in an industry) measures for the Prowess database and the ASI for NIC-2 level for each year and find that the correlation is generally high for the manufacturing sector considering that Prowess data is at the level of the firm and ASI at plant level. We restrict ourselves to manufacturing as this is the primary coverage of the ASI. The correlation coefficients are available on request

[12] In Prowess, total income has four components: income from sales, income from financial services, other income, and prior period and extraordinary income

deferred revenues. The database reports total income at the subsidiary-level which is then aggregated up to the Family Business Group (FBG) level, our main unit of analysis. This is done in two steps. The first requires aggregating the subsidiary-level data for each business group at the NIC-3 level based on the group ID and name provided in the database. This step creates two types of business entities: Stand-alone Businesses (SBs) and Business Groups (BGs). The second involves aggregating branches to create the FBG entity. We do this based on the group IDs reported in sequence for family businesses. In this exercise, we choose to consolidate businesses which are offshoots of the same broad family business and where the principals are close relatives. This means that Reliance Group is composed of two components; the Birla Group is made up of eight branches while the Piramal Group is composed of four branches[13]. By this means, we have a dataset where the total income of all firms is aggregated from the NIC-3 level and consolidated at the level of FBGs. This gives three types of business entities: SBs, BGs and FBGs. The list of the top 25 FBGs and top 25BGs based on total income in 2019-20 can be found in Appendix 1. There is relatively little difference between the two categories with only three non-FBGs (Larsen and Toubro; Infosys and ITC) in the top 25 BG list. Compared to 2000/1, although there is some turnover – eight FBGs present in 2000/1 are no longer found in the top 25 by 2010/11 – the list remained largely unchanged between 2010/11 and 2019/20. Moreover, the FBGs occupying the top 5 and top 10 remained unchanged with few shifts in ranking. In sum, there is a very striking degree of persistence.

5. Concentration in India

We first consider the evolution of market concentration in India. To do this, we calculate concentration ratios (CRs) based on shares of revenue. These are relevant indicators for an evaluation of market power. We also use another standard measure, the Hirschman-Herfindahl Index (HHI)[14]. Starting at an aggregate level, we proceed to analyse the evolution of concentration in a more disaggregated way by focussing on industry at the NIC-2 and NIC-3 levels, both of which conform more closely to the relevant markets for an analysis of concentration and market power. Our results confirm a sharply declining trend in concentration during the early 2000s, although less marked than reported by others[15]. The changes are in part driven by a declining state share but also by entry at the sectoral level. Later, we argue that some of this entry represents expansion by existing family business groups into new sectors.

5.1 Overall concentration

We start our analysis with data at the industry level for all firms, including state firms. Table 1 reports the HHI for all industries over the period 2000 to 2020. It is evident that there is a large decline in this measure of concentration from 0.123 in 2000/1 to 0.037 in

[13] Reliance (2) - Anil and Mukesh Ambani; Birla (8) – Aditya, Ashok, BK, CK, KK, MP, SK and Yash Birla; Piramal (4) – Ajay, Ashok, Dilip and Mohanlal

[14] The HHI is calculated by squaring the revenue share of each firm (or group) in a market and summing the resulting numbers. In a range of 0-1, a value for the HHI >0.25 is commonly considered to indicate high concentration

[15] Our estimates are lower than those of Acharya (2023) who uses more aggregate evidence

2019/20, with most of the change occurring by 2014/15. The table also reports the HHI when excluding the state sector. Although the trend is similar, the values are very significantly lower as is the size of decline from 0.015 in 2000/1 to 0.009 in 2019/20. *Figure 1* also plots the evolution of the HHI for all industries for each 1-digit sector over the full period. These confirm across-the-board declines, many of which are significant.

Turning to concentration ratios, the upper part of Figure 2 gives the evolution of three values - the concentration ratios for the top 5, 10 and 25 firms - between 2001-2020. For each of these concentration ratios (CR) there is a sharp, indeed exponential, decline. The CR5 falls from 47.8 to 31.7 whilst the CR10 value drops from 54.6 to 38.4. The lower part of Figure 2 reports the shares of revenues for the leading FBGs (as ranked in 2019-20). This shows a different trajectory. Between 2001-2010 the respective CRs increase before falling back slightly in the subsequent decade. By 2020, the three CRs still lie at – or in the case of the top 25 slightly below - those in 2001. In short, much of the action has been driven by changes to the state sector and its policy-driven downsizing.

Table 1: Overall concentration as measured by HHI (with and without state sector) 2001-2020

	All	***Without State***
Year	Mean	Mean
2001	0.123	0.015
2002	0.114	0.013
2003	0.118	0.012
2004	0.107	0.012
2005	0.102	0.013
2006	0.098	0.012
2007	0.091	0.013
2008	0.078	0.012
2009	0.081	0.012
2010	0.066	0.013
2011	0.061	0.012
2012	0.061	0.012
2013	0.055	0.011
2014	0.052	0.009
2015	0.043	0.008
2016	0.037	0.007
2017	0.037	0.007
2018	0.038	0.008
2019	0.041	0.009
2020	0.037	0.009

Figure 1 HHI by broad sector 2000-2020

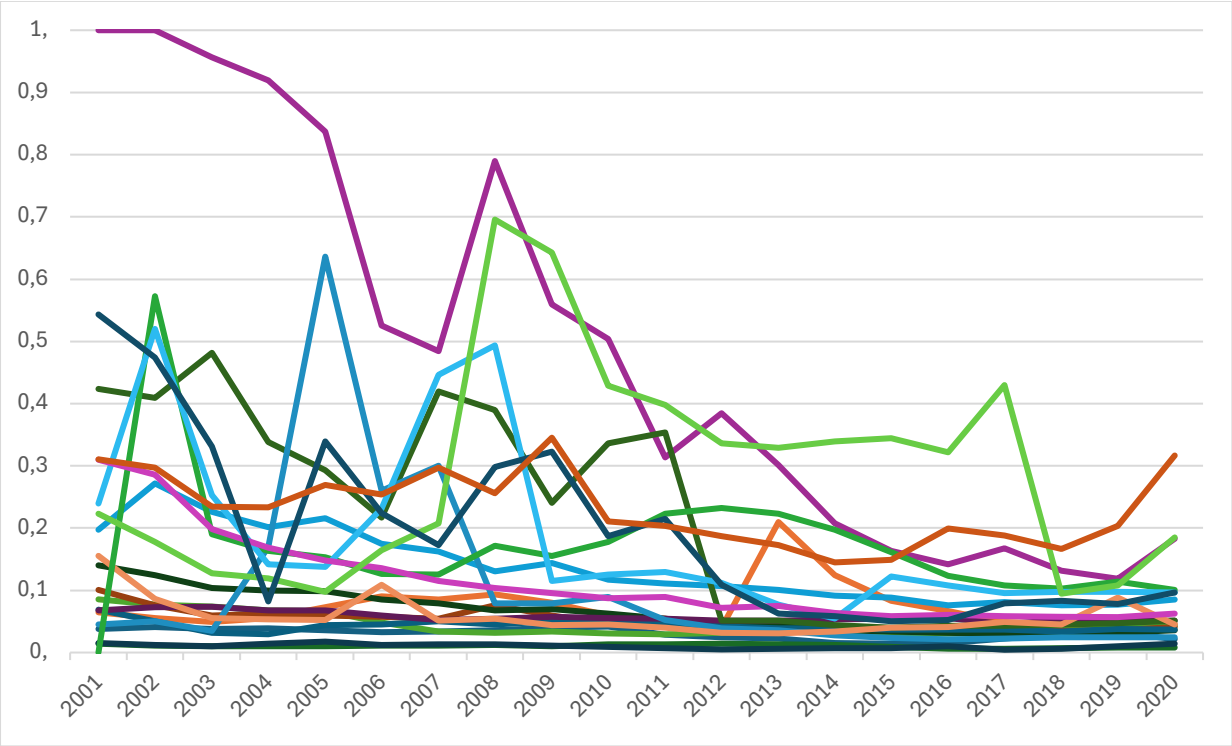
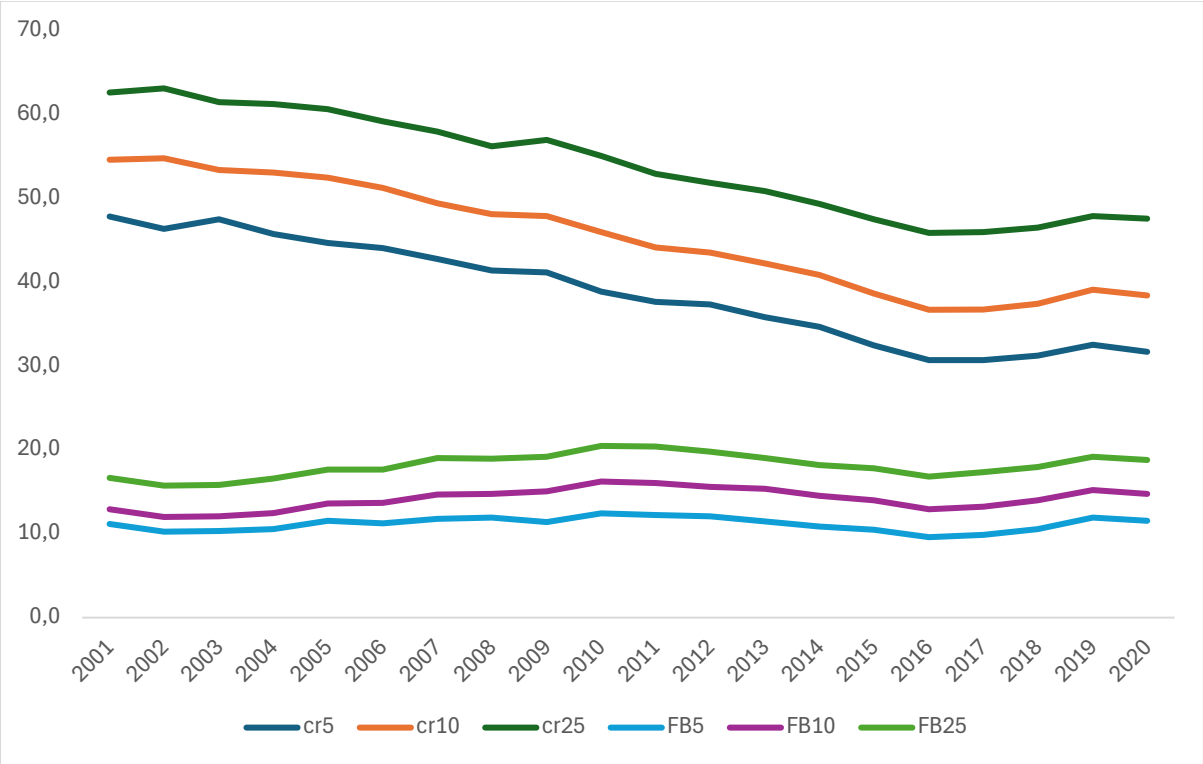


Figure 2: Concentration ratios for business groups and family business groups, 2000-2020

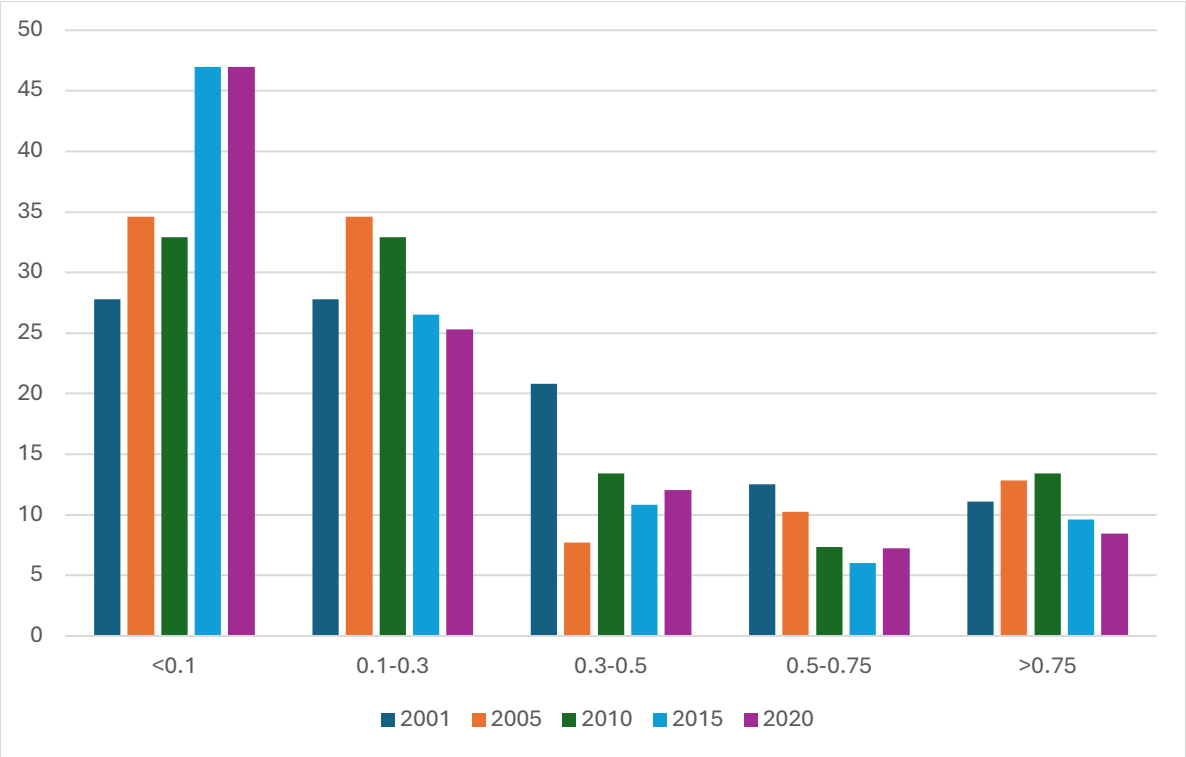


5.2 Concentration at NIC-2 level

Set against these findings at aggregate level, we can now consider the changes to industry-level concentration starting with information from 85 NIC-2 sectors. Between 2001 and 2020, more than 85% of 2-digit industries saw a decline in concentration as measured by the HHI, while only 6-7% saw an increase. Some of the changes are substantial – for example, in food and beverages the HHI went from 0.87 to 0.34 while in employment activities it fell from 0.51 to 0.11.

To explore further whether the predominantly downward shift in concentration occurred in all sectors or was concentrated in the more competitive sectors at the start of the period, we categorise NIC-2 industries by their level of HHI into five brackets - <0.1, 0.1-0.3, 0.3-0.5, 0.5-0.75 and > 0.75 - and then report the proportion of NIC-2 industries within each bracket for five-year intervals. Figure 3 summarises the findings showing that the shift in HHI noted above has been most striking in the bracket of those industries with low HHIs (<0.1), in other words, more competitive industries. Between 2001-2020 this bracket went from nearly 28% to 47% of all NIC-2 industries. Most of the matching decline in group shares (12 of the 19 percentage points) occurred in the two medium concentration categories (0.1-0.5) where concentration fell by 3 and 9 percentage points respectively. The most concentrated group (HHI>0.75) also saw some decline, particularly after 2010, falling from just over 11% to 8.4% of all NIC-2 industries.

Figure 3: Proportion of NIC-2 industries by HHI bracket (including state sector)



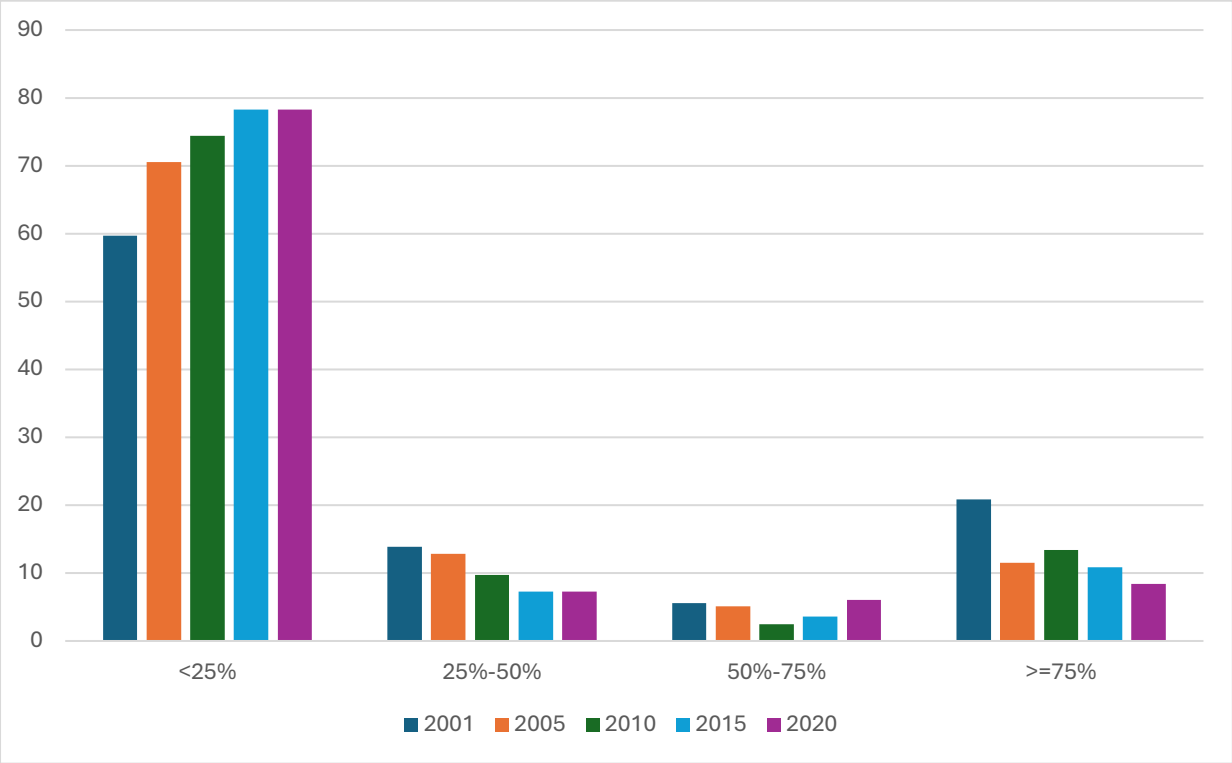
The decline in concentration as measured by the HHI across NIC-2 sectors has thus involved moderately competitive sectors becoming more competitive, while the proportion of industries that displayed an HHI >0.5 fell more modestly from 24% to 16%. Nevertheless, it is important to note that most of the sectors that were highly concentrated in 2001 remained so in 2020.

The broad decline in concentration appears much sharper when focussing only on the largest firms, rather than the entire firm size distribution as we have done using the HHI. The findings using CR5 as a measure of concentration are summarised in Figure 4. Using this measure, most NIC-2 sectors are highly competitive, with 78% of industries having a CR5 less than 25% in 2015 and 2020 up from 60% in 2001. Most of this change is accounted for by the decline in the share of the least competitive sectors (CR5>75%) which went from 21% to only 8%.

In sum, between 2000 and 2020 the share of NIC-2 industries with low concentration ratios increased significantly. An increase in the share of competitive industries is also indicated when using the HHI, albeit alongside a fairly stable bloc of high concentration sectors[16].

[16] Note that when doing the same exercise without the state sector for both NIC-2 and NIC-3, the differences are not that substantial. The results are available from the authors

Figure 4: Proportion of NIC-2 industries by CR5 brackets, 2001-2020 (with state sector)



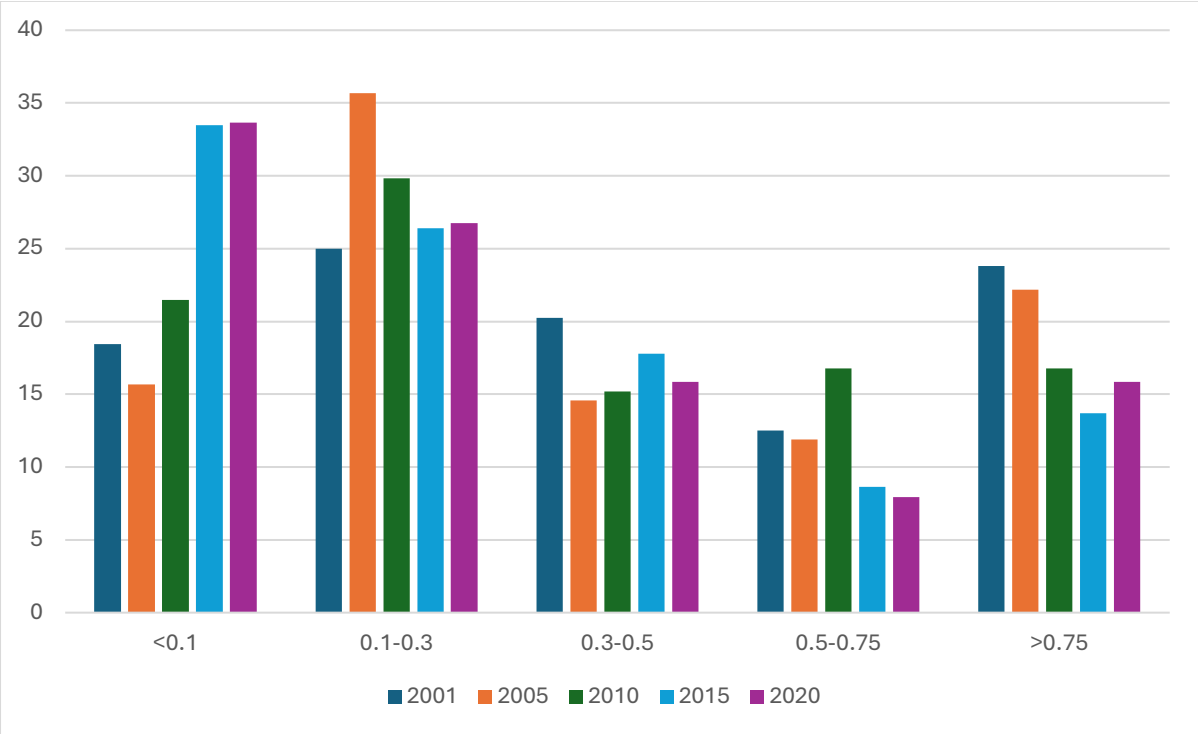
5.3 Concentration at NIC-3 level

We now shift our analysis to NIC-3 industries of which there are 208 in our dataset. As would be expected for this level of disaggregation, market shares will typically be greater. At the same time, the declines over the period are less marked. Thus, a smaller proportion of sectors displayed a decline in the HHI between 2001 and 2020 compared with the NIC-2 classification: 69% as against 80%. Further, most of the sectors which reported a decline saw a relatively small decrease. In addition, nearly 26% of sectors experienced increasing concentration over the period[17].

As with the analysis at the NIC-2 level, we initially group the HHI into five brackets (viz., HHI = <0.1; 0.1-0.29; 0.3-0.49; 0.5-0.75 and 0.75) and report in Figure 5 the shares for each five-year interval. The results bear some similarity with NIC-2 although concentration is more pronounced, and the changes are less significant. For example, the proportion of NIC-3 industries in the most concentrated category (HHI>0.75) declined relatively modestly from about 24% in 2001 to 16% in 2020, whilst the least concentrated (HHI<0.1) rose from around 18% to 34%.

[17] Data for each NIC-3 industry are available on request

Figure 5: Proportion of NIC-3 industries by HHI bracket, 2001-2020 (with state sector)



Switching to concentration ratios and in particular the CR5, Figure 6 reports the proportion of NIC-3 industries in each CR5 bracket for the same five-year intervals. At the start of the period, 44% of sectors had a CR5 ratio of 25% with nearly a third having very high (>75%) CR5s. By 2020, the former had jumped to just shy of two thirds of sectors whilst the highest concentration bracket had slipped back to just over 20%. In short, at NIC-3 level the share of more low concentration NIC-3 industries rose significantly between 2000-2020 and there was also a marked decline in the share of high concentration sectors.

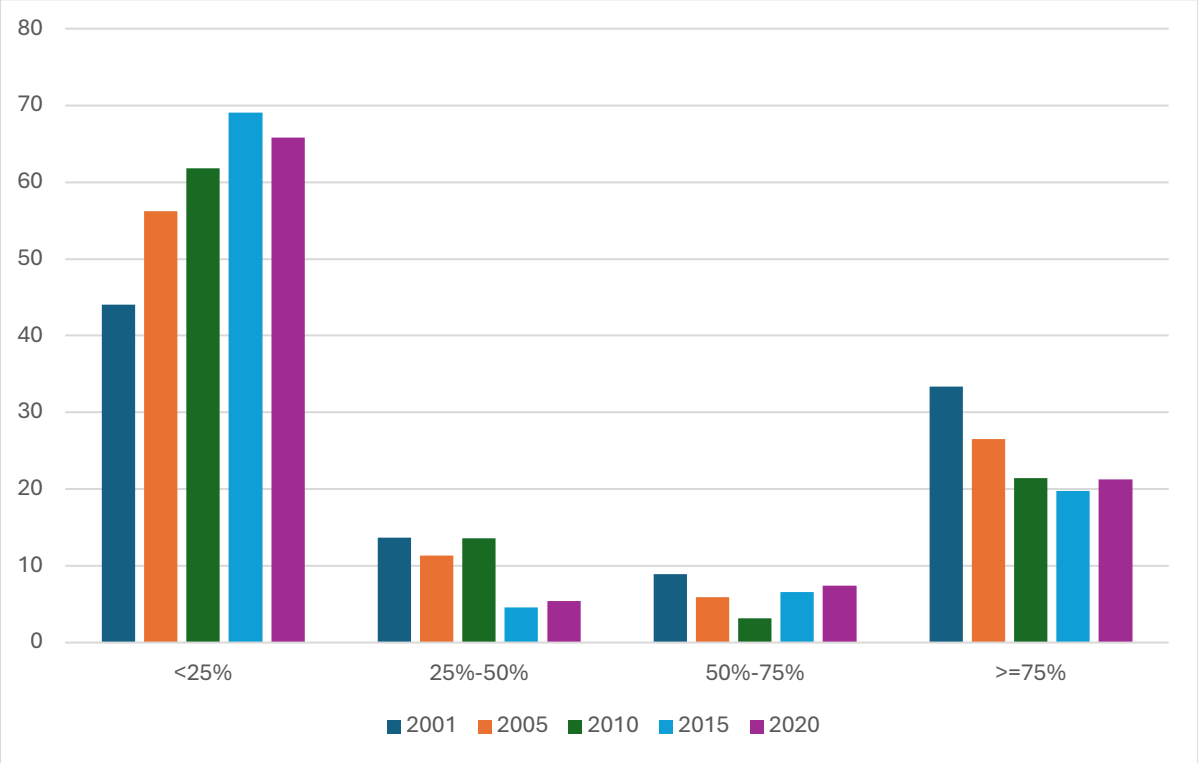
5.4 Contributions to concentration

As already noted, Acharya (2023) has suggested that much of the decline in concentration has been associated with liberalising policies implemented after 1991 and especially the reduction in the size and weight of the state sector. To explore this further, we now decompose the contribution to the HHI of state, top 25 FBGs and other private (viz., non-top 25 FBGs) using NIC-2 level data for three years - 2001, 2010 and 2020[18]. Part of the results are presented in Table 2. The non-FBG private sector contribution remains small (0.5-2%) throughout. However, the contribution of the top 25 FBGs jumps from just over 3% to 10% in the same period. There are striking changes in a range of sectors. For example, in metals mining, food products, basic metals, air transport, telecommunications and insurance, the contribution of the top FBGs increased very substantially. Regarding the state sector's contribution, in about a quarter of NIC-3

[18] For this exercise we use information on 99 NIC-2 sectors for 2000/1, 2009/10 and 2019/20t

sectors there was an unambiguous decline with just over 50% of sectors reporting little or no change.

Figure 6: Proportion of NIC 3 industries by CR5 bracket, 2001-2020 (with state sector)



We also decompose the change in the HHI over the full period from 2000 to 2020, again distinguishing between the contribution of the top 25 FBGs, other private and state. There is considerable heterogeneity for the respective contributions, as also the total effect by sector[19]. For all NIC-3 sectors the total change was -0.856 with almost all the change accounted for by the state sector with very small positive contributions from the top 25 FBGs and other private.

Table 2: Contribution of FBGs, Other Private & State Sector to HHI at NIC-2 level for 2001, 2010 and 2020

	Other private	Top 25 FBGs	State
2000/2001	0.5	3.2	96
2009/2010	1	7	92
2019/2020	2	10	88

[19] Detailed sector-by-sector results are available on request

In short, the decompositions pick out the role played by a declining state sector. However, it is also clear that the largest FBGs have been contributing more significantly to the change in HHI at NIC-2 level over the past couple of decades.

5.5 Summary

Our analysis suggests that the period from 2001 to 2020 was one of declining concentration in India. However, when looking at the data in terms of revenues, rather than assets[20], and especially when looking at concentration at more disaggregated levels, the story has its nuances. Although the HHI has declined in many industries, since 2001 only around a third of NIC-3 industries could be regarded as highly competitive (HHI<0.1) and by 2020 almost one quarter were still highly concentrated (HHI>0.5). Using concentration ratios (CR) and focussing concentrating on NIC-3 sectors, the share with a low CR5 went from 44% to 66% while those with high and very high shares fell from 42% to 29% between 2001 and 2020. Even so, in 2020 over 20% of NIC-3 sectors still had a CR5 greater than 75%. Expressed differently, the largest five firms controlled more than half of revenues in around 15% of NIC-3 industries in 2020.

6. Family Business Groups and Diversification

Our analysis so far makes clear that concentration has declined since 2000 although the extent depends on the level of disaggregation. In addition, there is the question of diversification. Concentration and diversification are often treated as substitutes. However, this assumption may be unwarranted in the Indian context where many business groups have long been highly diversified, while also holding significant market shares across a variety of sectors.

The current and elevated extent of diversification is brought home in Table 3 which lists the number of NIC-3 sectors in which the top 25 FBGs operate at five points in time between 2000-2020. The first thing to note is that the total number of sectors of operation for all 25 FBGs jumped from 332 in 2000/1 to 635 in 2009/10 before reaching 664 by 2019/20. The average number of NIC-3 sectors of operation for the largest FBGs jumped from 13 in 2000 to 25 in 2010 and 26 in 2020. Between 2000-2020 sectors in which more than three FBGs were operating nearly doubled while that for more than six FBGs increased even more to account in 2020 for nearly a quarter of all sectors. Over 60% of NIC-3 sectors experienced entry of between 1-5 FBGs while 10% saw more than 5 FBG entrants. Most of that entry clearly occurred between 2001-2010 when gross annual entry rates exceeded 10%. The largest increases in entry were in sectors where FBGs were already present but where their market shares were low. This timing can be linked to the corporate credit-fuelled boom that occurred between 2003-2008. The slower pace of diversification post-2010 has in turn been linked to credit tightening which, among other things, led to the failure of a couple of over-leveraged FBGs.

[20] Acharya (2023) reports his results using assets.

What is also striking is that long established incumbents, such as Tata and Birla, not only started the period operating in many sectors but have subsequently continued to expand sharply. Further, relative newcomers, such as Adani or Reliance, have expanded into new sectors at an even more rapid pace. In 2000, Adani was operating in only 5 sectors, by 2020 the number had increased by 750%. In the same period, the number of sectors in which the Reliance Group was operating increased by nearly four times.

6.1 Diversification – across or within sectors?

While Table 3 shows that almost all the top 25 Indian FBs have diversified, has this been across or within industries? To address this issue, we use a more formal measure of diversification that accounts for the number of industries that firms diversify to and the incomes generated from them. Commonly, the two most used measures for business diversification are the HHI and entropy measures. Here, we use the entropy measure for analysing the nature of diversification since the HHI-based measure cannot be decomposed into additive elements for within and across industry diversification (Jacquemin & Berry, 1979).

Table 3: Presence of Top 25 FBGs (2019-20 ranking)

in NIC-3 Industries

Name of FBG	2000-01	2004-05	2009-10	2014-15	2019-20
Adani Group	5	12	27	32	38
Bajaj Group	15	21	27	28	28
Bharti Telecom Group	9	10	12	13	12
Birla Group	44	56	68	68	65
Essar (Ruia) Group	12	16	25	21	16
Future Group	2	9	26	28	29
Godrej Group	15	18	19	16	17
HCL Group	4	8	12	10	13
Hero (Munjals) Group	6	10	14	16	19
Hinduja (Ashok Leyland) Group	12	21	29	23	23
Mahindra & Mahindra Group	18	27	37	45	47
Murugappa Chettiar Group	15	19	22	21	22
Om Prakash Jindal Group	9	13	30	38	37
Piramal Group	16	17	20	20	22
Rajesh Exports Ltd.	1	1	1	1	1
RPG Enterprises Group	23	34	33	35	29
Reliance Group	17	33	55	63	63
Ruchi Group	5	6	6	11	11
Shapoorji Pallonji Group	15	20	28	26	26
Sun Pharmaceutical Group	5	7	9	10	10
T.V.S. Iyengar Group	22	26	31	36	36
Tata Group	43	50	67	70	69
UB Group	11	18	15	10	9
Vedanta Group	7	8	15	14	15
WIPRO Group	1	7	7	7	7

Source: Authors' calculations based on CMIE PROWESS Data

The entropy measure of business diversification is given by;

$$Entropy = \sum_{i=1}^{n} \ln\left(\frac{1}{S_i}\right) S_i$$

where S_i is the market share of the ith firm or industry and n is the number of firms of industries. The entropy measure allows decomposing the diversification of a FBG at the NIC-3 industry level into diversification across industries at the NIC-2 level and diversification within the NIC-2 level (Jacquemin & Berry, 1979). Assuming that there are n NIC-3 industries and m NIC-2 industries ($n \geq m$), $Entropy_{NIC3}$ is the measure calculated for diversification across the NIC-3 level and $Entropy_{NIC2}$ diversification across the NIC-2 level.

$$Entropy_{NIC3} = \sum_{i=1}^{n} \ln\left(\frac{1}{S_i}\right) S_i$$

For a firm, S_i is the share of the income from the ith NIC-3 industry.

$$Entropy_{NIC2} = \sum_{j=1}^{m} \ln\left(\frac{1}{S_j}\right) S_j$$

For the same firm, S_j is the share of the income that comes from the jth NIC-2 industry. Jacquemin & Berry(1979) show that $Entropy_{NIC3}$ and $Entropy_{NIC2}$ are related as follows:

$$Entropy_{NIC3} = Entropy_{NIC2} + \sum_{j=1}^{m} S_j \, WEntropy_j$$

$WEntropy_j$ measures the NIC-3 diversification of the firm within the jth NIC-2 industry,

$$WEntropy_j = \sum_{i \in j} \frac{S_i}{S_j} \ln\left(\frac{S_j}{S_i}\right)$$

Table 4: Diversification of the Top 25 FBGs (ranked in 2019-20)

Measure of Diversification	2000-01			2009-10			2019-20		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Entropy at NIC-3	1.24	0	2.58	1.3	0	2.72	1.25	0	2.64
Across NIC-2 Entropy	1.09	0	2.31	1.17	0	2.53	1.11	0	2.43
Weighted Within NIC2 Entropy $(\sum_{j=1}^{m} S_i\, WEntropy_{NIC2})$	0.14	0	1	0.11	0.	0.64	0.11	0	0.5

Source: Authors' calculations based on CMIE PROWESS Data

Table 4 provides the entropy measure at NIC-3 level and within and across industry entropy at the NIC-2 level. At the NIC-3 level, most of the top 25 Indian FBGs are highly diversified. However, the decomposition of the entropy measure reveals that Indian FBGs are far more diversified *across* rather than within NIC-2 industries. On average, NIC-2 diversification accounts for 88 per cent of NIC-3 level diversification in 2000-01, 90 per cent in 2009-10 and 89 per cent in 2019-20.

A closer look at the diversification of the leading FBGs provides some additional insights. Table 5 gives the entropy measure of diversification for the Top 25 FBGs at the NIC-3 level. It shows that over 50 per cent of the Top 25 FBGs are highly diversified (Entropy>1) for each year. Diversification peaks in 2010, then declines somewhat until 2014-15 before recovering by 2019-20. Looking at the intensity of diversification between 2000-2010 and 2011-2020, 60% of the Top 25 FBGs became more diversified in the first decade as against 48% in the second decade. This indicates that diversification has been a feature irrespective of the wider macroeconomic context.

An additional inference concerns the persistence of high levels of diversification. The five most diversified FBGs in 2019-20 were already highly diversified in 2000-01. Insurgent FBGs – notably Adani and Reliance – started out with relatively low degrees of diversification but in the space of twenty years have diversified hugely. In contrast, just under a quarter of the top FBGs became less diversified or remained undiversified throughout this period. In addition, a small number – such as UB, Future and Ruchi groups – either failed or deleveraged significantly in the face of tighter credit markets and slowing growth post 2011.

Table 5: Entropy Measure of Diversification at NIC-3 Industry Level for the Top 25 FBGs (ranked in 2019-20)

Name of FBG	2000-01	2004-05	2009-10	2014-15	2019-20
Tata Group	2.47	2.42	2.72	2.68	2.64
Birla Group	2.58	2.61	2.56	2.5	2.60
T.V.S. Iyengar Group	1.96	1.89	2.11	2.12	2.02
RPG Enterprises Group	2.10	1.07	2.14	1.24	1.98
Murugappa Chettiar Group	1.79	1.84	1.84	1.86	1.95
Adani Group	0.84	1.00	1.53	1.92	1.93
Bajaj Group	1.14	1.25	1.56	1.8	1.82
Godrej Group	1.97	1.74	1.77	1.71	1.80
Mahindra & Mahindra Group	1.40	1.58	1.69	1.68	1.78
Piramal Group	2.22	1.82	1.69	1.54	1.67
Reliance Group	0.74	2.22	1.22	2.11	1.52
Hinduja (Ashok Leyland) Group	1.37	1.13	1.52	1.48	1.43
Shapoorji Pallonji Group	1.83	1.28	1.48	1.71	1.17
Hero (Munjals) Group	0.73	0.64	0.71	0.93	1.13
Future Group	0.63	0.53	1.43	1.24	1.09
HCL Group	0.70	1.03	0.89	0.76	0.98
Om Prakash Jindal Group	1.11	0.61	0.95	0.94	0.95
Vedanta Group	0.79	0.57	0.83	0.84	0.88
WIPRO Group	0.00	0.68	0.21	0.51	0.60
Bharti Telecom Group	0.91	0.27	0.22	0.34	0.46
Essar (Ruia) Group	0.98	1.69	1.08	0.87	0.43
Ruchi Group	1.13	1.48	1.15	0.88	0.27
Sun Pharmaceutical Group	0.42	0.31	0.39	0.21	0.12
UB Group	1.11	0.97	0.89	0.45	0.09
Rajesh Exports Ltd	0.00	0.00	0.00	0.00	0.00
% of Highly Diversified Groups in list (Entropy>1)	56	60	64	56	60

Source: Authors' calculations based on CMIE PROWESS Data

In short, not only were the top 25 FBGs in India mostly highly diversified at the start of the period but their diversification has subsequently been extended. The leading Indian FBGs have mostly engaged in across-industry diversification. It seems likely that they have done this by leveraging business group governance and financing structures, as well as exploiting political connections[21].

6.2 Diversification and market shares

If it is evident that diversification has been a feature of most FBGs' business strategies, an obvious question concerns the subsequent path for revenues and market share after entry. Table 6 documents the range of revenue shares for NIC-3 sectors conditional on a FBG being present in 2001 and then in 2020. The market share is measured relative to total revenues in a NIC-3 sector for both years. In 2001, in 40% of cases FBGs had a revenue share below 10% rising to over 50% by 2020. Further, the largest increase in NIC-3 sectors where FBGs are operating was for those where the revenue share was relatively low (viz., <10%). The number of sectors where FBGs had a revenue share in excess of 10% actually declined between 2001 and 2020.

Table 6: FBG shares of total revenues for NIC-3 sectors, 2001 and 2020

Revenue share	*2001*	*2020*	*Change in number*
<3%	21 (22%)	35 (25%)	+66%
3-10%	19 (19%)	36 (26%)	+89%
10-25%	27 (28%)	34 (24%)	+26%
25-50%	17 (17%)	21 (15%)	+23%
>50%	14 (14%)	14 (10%)	+/-

Source: Authors' calculations from CMIE-Prowess

Do the market shares of competitors deter entry? To test this, for industries at NIC-2 and NIC-3 levels, we estimated a simple regression of the form:

$$Change\ in\ firm\ numbers = \alpha + \beta \times initial\ HHI + \in$$

The change in firm numbers measures the change in FBGs at the NIC-2/NIC-3 levels between 2000-2020. The initial HHI is for 2000-1 at the NIC2/NIC3 industry level and $\in$ is the error term. The estimates are provided in Table 7.

[21] See Khanna and Palepu (2000) and Commander and Estrin (2022)

Table 7: Change in Number of FBGs and Initial Concentration (HHI) 2001-2020

Dependent Variable: Change in Number of FBGs 2000-2020	*NIC2*	*NIC3*
Initial HHI (2001)	-635.73*** (192.34)	-260.35*** (42.04)
N	72	168

* p<0.10, ** p<0.05, *** p<0.01
Standard errors are reported in brackets.

The negative coefficients indicate that new entry has indeed been less likely in sectors where the market power of incumbents measured by the HHI was greater. As expected, the negative association between concentration and new firm entry is slightly more pronounced at the NIC-2 level than NIC-3 level given the higher aggregation for the former.

6.3 Dynamics of market shares

We now examine the association between entry into new sectors and the market shares that FBGs acquire post-entry and over time. To do this, we look at the path of the revenue shares relative to total revenues of a NIC-3 sector for those FBGs that enter a new sector. Specifically, to capture some of the dynamics we focus on shares at two points in time - 5 and 10 years respectively after the initial entry[22]. We find that no obvious trend. In 35% of cases the revenue share increased but the average size of increase was quite small at just over 2%. Moreover, in 55% of cases the revenue share post-entry actually declined between the fifth and tenth years of operation with this decline being over 4% on average[23].

Even though entry by FBGs does not on average lead to large growth in revenue shares, is this different for those FBGs whose operations have expanded most rapidly in recent decades and who are perceived as having especially close connections to government? An obvious example is Reliance. For both, the data show a strong preponderance of small revenue shares at entry but also – for the most part - five years after entry. In Reliance's case, five years after entry, it had achieved a large revenue share (with a range of 35-96%) in four sectors but a small share in thirteen other sectors. Having said that, the contribution of those four sectors' revenues to aggregate group performance was very significant. Adani displays a similar pattern.

[22] Although we have only twenty data points, the fact that most entry occurs in the first ten is helpful for the exercise

[23] Out of 174 NIC-3 sectors, in 62 cases there was an increase in revenue share that was on average 2.1% (5.5 std dev). In 95 cases there was a decline whose average was -4.3% (9.7 std dev)

As for the two long-standing and highly diversified FBGs – Birla and Tata – although the former had significant (>20%) revenue shares for nearly the same number (n=5-6) of sectors in both years, the composition had changed. Only two sectors with over 20% shares in 2001 were in that position in 2020. The remaining six sectors had seen a mix of gradual or, in two instances, rapid expansion. By the same token, two sectors that had a substantial presence in 2001 saw that largely evaporate. In Tata's case, there are some similarities. Although the number of sectors where Tata had a major (>20%) share of total revenues was larger than Birla in 2001 it had fallen back to below Birla in 2020. Moreover, the number of sectors where both BGs had a small revenue share (<3%) roughly doubled in the period. As is the case more widely, these two groups have pursued diversification into new sectors rather than focussing on deepening their existing revenue shares.

In short, FBGs have entered a significant number of new sectors, especially between 2001-2010. In the great majority of instances, the market shares, as measured by revenues, that they have built have remained small. For cases where substantial revenue shares have been achieved, applying a 40% revenue share cut-off, there were 15 cases which satisfied this condition by 2020 and only 10 in which entry had occurred between 2001-2020.

7. FBG financial performance and markups

Given the evolution of concentration and market shares, what has happened to the financial performance of FBGs in the reference period? The evidence that is publicly available suggests significant heterogeneity across the business groups. Some have reported large increases in net profits. For example, Tata Sons' net profit grew at over 27% annually between 2014-2024. Interestingly, this rise in profits was mainly channelled into new ventures and diversification, rather than the payment of dividends to shareholders[24]. However, even though the Prowess dataset contains information on post-tax profits, given the governance of Indian business groups and the resulting opacity in accounting that can result, we prefer not to use this variable and instead construct an alternative measure to answer this question.

Consequently, we focus on a measure of markup and then look at whether the markup and our HHI measure are related. To do this, we employ an accounting or demand-based measure of markup for our analysis (see De Loecker et al., 2020). The markup is defined as:

$$Markup \equiv \frac{Price}{Marginal\ Cost} = \frac{Price \times Ouput}{Marginal\ Cost \times Ouput} = \frac{Sales\ Revenue}{Variable\ Cost}$$

Variable cost comprises cost items that vary with output. For our construction of variable cost, we sum seven components: raw materials, stores and spares; packaging and packing expenses; power, fuel and water charges; compensation to employees; outsourced

[24] Kant (2024)

manufacturing jobs, selling and distribution expenses as well as indirect taxes. Clearly, the level of markup will be sensitive to the definition of variable cost. As such, our analysis focuses on the change rather than the level itself.

Using our dataset, we compute the difference between sales and variable costs in each year for the top 25 FBGs. This measure can be considered as a reasonable approximation of the markup that firms can generate. Figure 7 reports the results for the top 25FBGs. This shows that after remaining broadly constant between 2001-2013, the ratio of sales to variable costs then unambiguously shifts upwards for the rest of the period. Between the trough in 2013 and the peak in 2020 this amounts to a 16% increase and a 13% increase overall between 2001 and 2020.

We then look at the relationship between the sales/variable cost ratio and the HHI measure. We regress the ratio against the HHI at NIC-3 levels for the full period as well as for 2012-2020. The results are contained in Table 8. The coefficient on the HHI measure in all instances is strongly and significantly positive indicating that the size of the markup, as measured by the sales/variable costs measure, is correlated with the extent of concentration at NIC-3 level. This association is maintained when we also control for the number of FBGs or number of groups operating in a NIC-3 sector. As would be predicted, the signs on the latter variables are negative, although in no instance are they significant.

Our findings find some resonance in Acharya (2023) who estimates that aggregate sales-weighted and assets-weighted markups fell up to 2013 before rising between 2013 and 2020/21 by 14-20%. In sum, despite falling concentration, using NIC-3 level data underlines the continuing presence of market power that has had a positive impact on our broad measure of markup, particularly after 2013.

8. FBGs in the Indian economy

Our analysis so far has shown that when analysing two important measures of market power - concentration and profitability – it appears that, contrary to some widely-held views, business groups have not been increasing their market power over the past two decades. Even so, although our evidence strongly points to a fall in concentration, there is no doubt that business groups – and particularly FBGs – retain a powerful position in the aggregate economy. To get a sense of that, Figure 8 gives the path of FBG gross revenues relative to national income (GDP) for the top 5, 10 and 25 FBGs respectively between 2001 and 2020. In each instance, the shape is that of an inverted-U with the shares rising significantly between 2003-2012 before falling away somewhat thereafter. What is most striking, of course, is the scale of these FBGs' activities. At the peak in 2012, the top 25 FBGs' revenues amounted to 20% of India's GDP with the top 5 and 10 accounting for 12% and 16%, respectively. Despite some subsequent decline, between the start of the period and the end, the top 25 FBGs' revenue went from around 11% to 15% of GDP with the top 5 and 10 increasing their shares by between 2-3 percentage points. As already noted, these shares are very significantly larger than customarily found in the advanced

economies, although they are not dissimilar (and in some cases are smaller) than in other Asian economies.

Figure 7: Sales/Variable Cost for FBGs, 2001-20

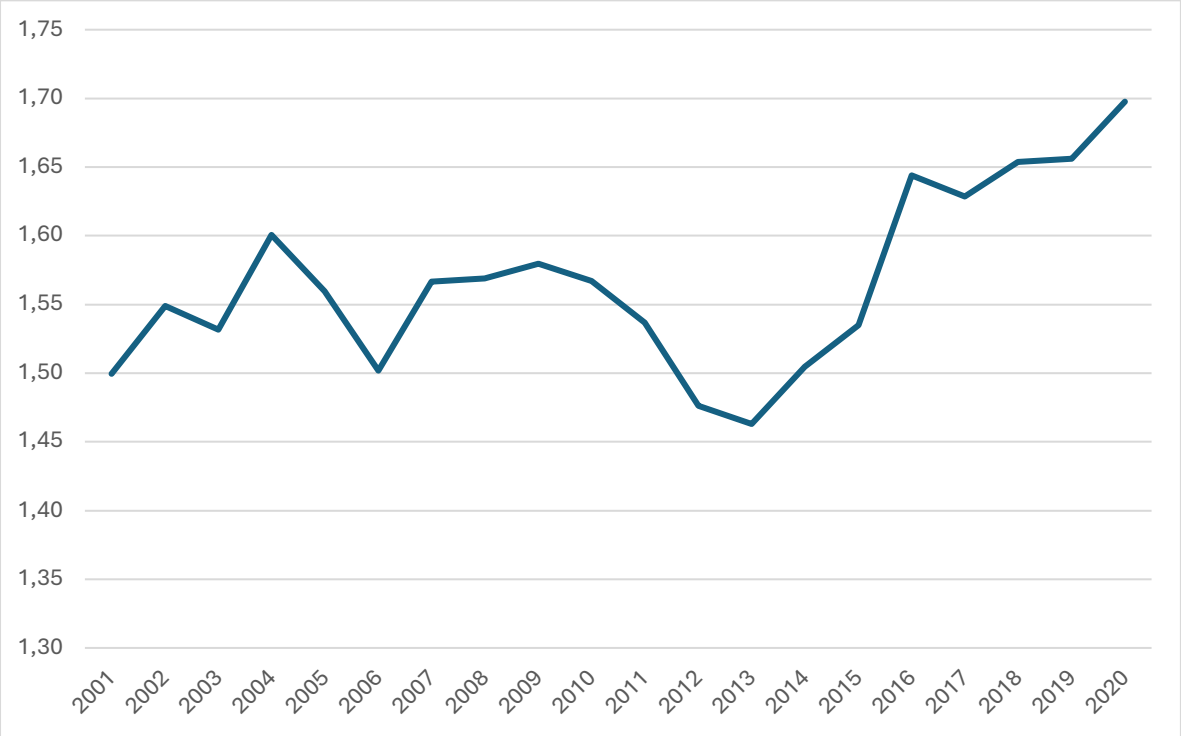
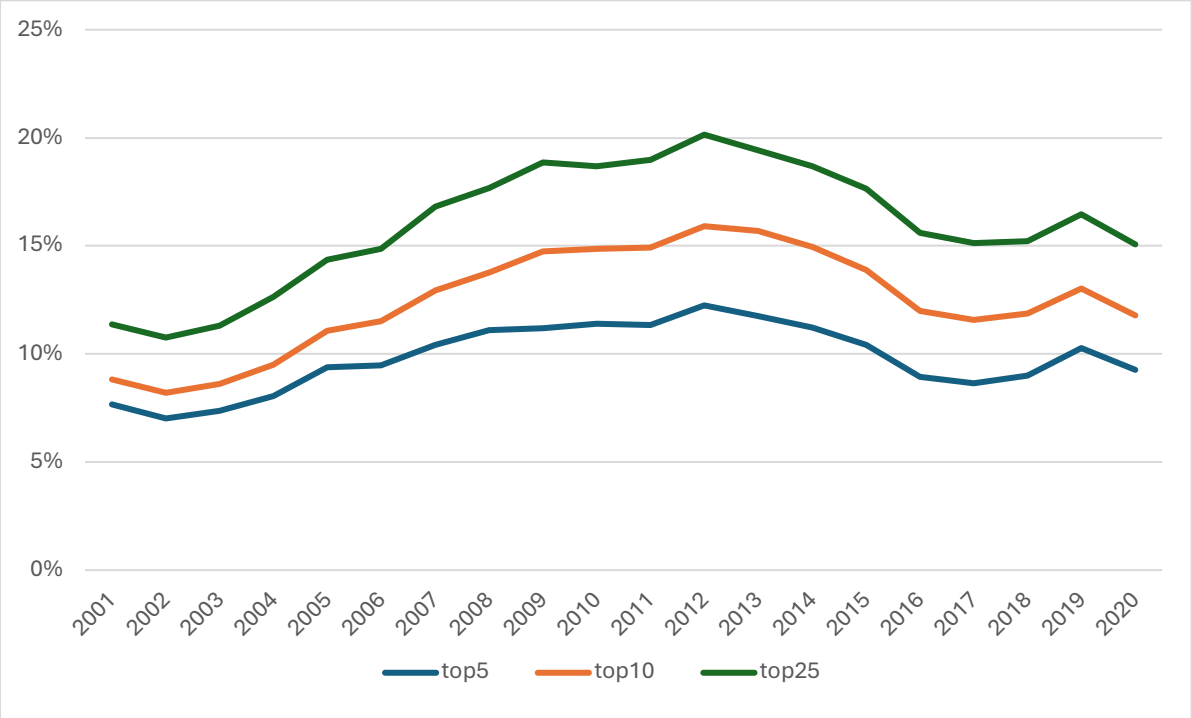


Table 8: Fixed Effect Model: Markup over Marginal Costs vs Concentration

	2012-2020			2000-2020		
Dependent Variable: Markup over Marginal Costs	(1)	(2)	(3)	(4)	(5)	(6)
HHI	7.04**	7.42**	7.33**	14.45*	14.46*	14.43*
	(3.18)	(3.22)	(3.19)	(8.75)	(8.76)	(8.66)
Number of Groups		-.019	-.018		-.0003	-.00004
		(.014)	(0.14)		(.0012)	(.00144)
Number of FBGs			-.47			-.056
			(0.38)			(.18)
N	1,580	1,580	1,580	3,723	3,723	3,723

* p<0.10, ** p<0.05, *** p<0.01
Standard errors are reported in brackets.
Model selection is based on the Hausman Test.

Figure 8: FBG income to GDP ratio (Top 5, 10, and 25 FBGs)



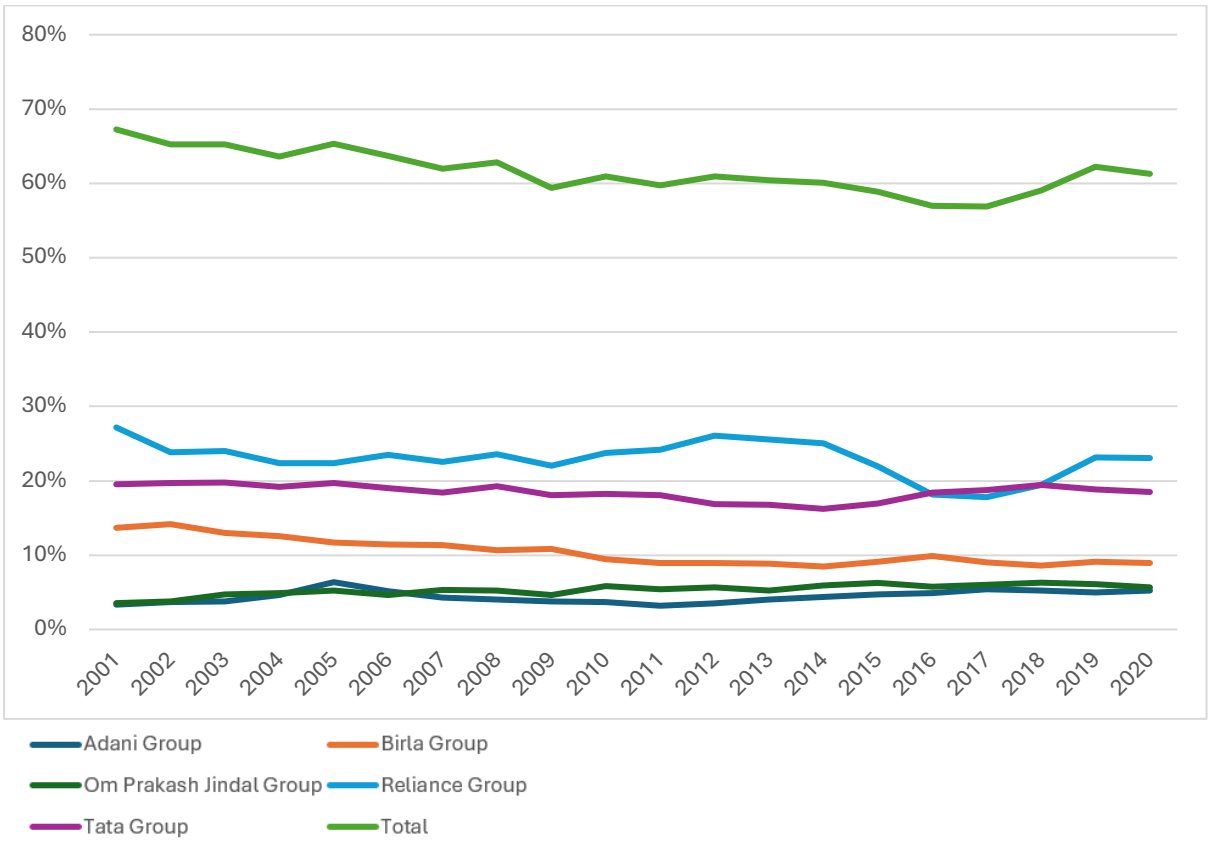
To what extent has this upwards drift in the gross revenue/GDP share been driven by the top FBGs? Figure 9 is consistent with our earlier analysis in showing that the share of the top 5 FBGs – Adani, Birla, Jindal, Reliance and Tata – has actually moved slightly downwards over the reference period. The individual shares for the top 5 have also remained rather stable. Nevertheless, the top 5 still account for over 60% of the top 25 FBGs' revenues at the end of the period.

9. Conclusion

An enduring feature of the Indian economy has been the prominence of business groups, notably family-owned business groups. Explicitly encouraged and favoured by public policy over much of the past 75 years, these groups have very successfully entrenched themselves. It is notable that several of the largest FBGs in the late 1950s are still the largest today. More recently, since 2010 the ranks of the top 25 BGs and FBGs have remained largely unchanged. Even more striking are their revenues expressed as a share of national income. At a recent peak in 2012, the top 25 FBGs' revenues accounted for 20% of India's GDP and although this share has subsequently fallen, it has remained above 15% in 2020, some four percentage points higher than in 2001. These numbers might suggest that market power remains a major issue in the Indian context. Indeed, there is a widely held view in India that these FBGs are throttling competition. Prominent FBGs are seen as actively leveraging their close connections to politicians, exploiting opportunities provided by the policy regime and its loopholes[25]. Recent revelations about how the Adani Group functions have fed this perception.

[25] Some recent examples are given in Rajagopalan and Narla (2024)

Figure 9: Top 5 FBG / Top 25 FBG income shares



Our paper has taken a close look using a rich dataset at the evolution of market power and the role of business groups in the two decades since 2000. Contrary to what is widely believed, we find that market concentration in India has been declining at both higher and lower levels of concentration. Much of that decline has been driven by the policy-induced shrinking of the public sector. But concentration, whether measured by the HHI or concentration ratios, has also been falling for the private sector and for the FBGs. Focussing our analysis at 2- and 3-digit levels, we find that the share of low concentration industries rose significantly between 2000-2020. Even so, a bloc of high concentration sectors has remained in place. At NIC-3 level in 2020 over a fifth of industries remained very highly concentrated whilst the largest five firms controlled more than half of revenues in around 15% of industries.

As concentration has been falling, diversification – a long run feature of most Indian FBGs – has been increasing rapidly, most especially between 2000-2010. Our analysis shows that most of this diversification by FBGs has been across, rather than within, sectors. However, this process – which is, of course, still unfolding – has mostly not been associated with the accumulation of large market shares. This may simply reflect the limited amount of time that has passed but it could also point to strategies that give priority to diversification and experimentation. Part of this may, of course, be related to unfolding structural changes in the Indian economy and the emergence of new sectors and activities.

Regarding the evolution of FBGs' mark-ups - measured as the ratio of sales to variable costs – this measure was broadly stable between 2000-2013 before rising quite sharply after that. Further, it is evident that increases in this ratio have been strongly positively correlated with the level of concentration at NIC-3 sector level. This highlights the continuing presence of market power despite lower concentration. Further, the revenues of the top 25 FBGs still continue to account for a large share of GDP. The overt preference displayed by the Government of India for certain business groups as 'national champions' indicates a wider indifference to the implications of this for competition. The persistence of FBGs has also been sustained by tariff protection, preferential access to finance and other resources and an ability to leverage the policy environment.

To address these powerful incumbency advantages, policy needs to address more effectively the incentives for businesses to operate as business groups[26]. Although the 2013 Companies Act began to limit the numbers of levels and subsidiaries, as well as crossholdings, the scope of these limits has been too circumscribed while enforcement has been weak. Moreover, experience throughout Asia suggests that although prohibitions and taxation can help rein in FBGs, they mostly tend to be ineffectual. The exception has been the strict implementation of high inheritance or successor taxes; a policy that was started in Japan and, more recently, introduced in South Korea. Such policies significantly lower the incentives for maintaining family business group structures.

Finally, although there is clear scope for competition policy to be used to address market power in individual sectors, the FBGs are likely to be robust and effective adversaries. At the same time, such policies will do relatively little to address the level of overall concentration in the Indian economy. A more radical approach that sets specific limits to the maximum market share that a business group can hold should be considered. Once that specified level is reached, existing firms will have to be broken up sector by sector to ensure that the thresholds are not exceeded. Needless to say, this will require some reversal of the strong preference for FBGs and concentrated interests that has marked Indian public policy for many decades.

[26] The policy options are discussed in more detail in Commander and Estrin (2022) pp262-273

Appendix 1

Table 1A: Top 25 Family Business Groups and Business Groups in 2019-20

S.no	*Family Business Groups*	*Business Groups*
1	Reliance Group	Reliance Group [Mukesh Ambani]
2	Tata Group	Tata Group
3	Birla Group	Birla Aditya Group
4	Om Prakash Jindal Group	Om Prakash Jindal Group
5	Adani Group	Larsen & Toubro Group
6	Mahindra & Mahindra Group	Adani Group
7	Essar (Ruia) Group	Mahindra & Mahindra Group
8	Bharti Telecom Group	Essar (Ruia) Group
9	Vedanta Group	Bharti Telecom Group
10	Bajaj Group	INFOSYS LTD.
11	Hinduja (Ashok Leyland) Group	Vedanta Group
12	WIPRO Group	Bajaj Group
13	HCL Group	Hinduja (Ashok Leyland) Group
14	T.V.S. Iyengar Group	WIPRO Group
15	RAJESH EXPORTS LTD.	HCL Group
16	Hero (Munjals) Group	T.V.S. Iyengar Group
17	UB Group	RAJESH EXPORTS LTD.
18	RPG Enterprises Group	I.T.C. (F) Group
19	Murugappa Chettiar Group	Hero (Munjals) Group
20	Future Group	Reliance Group [Anil Ambani]
21	Shapoorji Pallonji Group	UB Group
22	Ruchi Group	RPG Enterprises Group
23	Godrej Group	Murugappa Chettiar Group
24	Piramal Group	Future Group
25	Sun Pharmaceutical Group	Shapoorji Pallonji Group

Appendix 2: Concentration Ratios & Herfindahl-Hirschman Indices

The following is the methodology adopted for generating concentration ratios and Herfindahl–Hirschman indices:

- Concentration Ratio and Herfindahl–Hirschman indices for a year: The data is collapsed so that all activities of a business are aggregated for each year. To calculate the CR5, businesses are ranked yearly based on their total income. The share of income of the top 5 businesses is then calculated each year. The Herfindahl–Hirschman is calculated using the following formula:

$$HHI_t = \sum_{i=n}^{n} s_{it}^2$$

Here, s_{it} is the share of the i^{th} business in the aggregate income of year t, assuming that there are n businesses.

- Concentration Ratio and Herfindahl–Hirschman indices at NIC-2 level: The data is collapsed so that all activities of a business are aggregated at the NIC-2 level. The businesses are then ranked for each year within each NIC-2 level. The share of the total income of the top 5 businesses is calculated for each NIC-2 level to generate the concentration ratio. Using the same data, the Herfindahl–Hirschman index is calculated separately for each NIC-2 level.
- Concentration Ratio and Herfindahl–Hirschman indices at NIC-3 level: The business concentration ratios are calculated so that they are ranked for each year within each NIC-3 level. The share of the total income of the top 5 businesses is calculated for each NIC-3 level to generate the concentration ratio. The Herfindahl–Hirschman index is calculated separately for each NIC-3 level.

We also calculate the total income shares of the top 5, top 10 and top 25 Family businesses based on the same methodology. The only difference is that instead of generating income ranks for all businesses, we do this only for our list of top 25 Family businesses.

Appendix 3: HHI Decomposition

HHI_{total} is the Herfindahl–Hirschman index for the entire economy:

$$HHI_{total} = \sum_i \sum_j \left(\frac{I_{ij}}{\sum_i \sum_j I_{ij}} \right)^2$$

$I_{ij}$is the income of firm j in sector i.

$$HHI_{i=} \sum_j \left(\frac{I_{ij}}{\sum_j I_{ij}} \right)^2$$

HHI_i is the Herfindahl–Hirschman index for sector i.

$$HHI_{total} = \sum_i \sum_j \left(\frac{I_{ij}}{\sum_i \sum_j I_{ij}} \right)^2$$

$$HHI_{total} = \sum_i \sum_j \left(\frac{\sum_j I_{ij}}{\sum_i \sum_j I_{ij}} \right)^2 \left(\frac{I_{ij}}{\sum_j I_{ij}} \right)^2$$

$w_i = \frac{\sum_j I_{ij}}{\sum_i \sum_j I_{ij}}$ is the share of sector i's income in the income of the entire economy.

$$HHI_{total} = \sum_i \sum_j (w_i)^2 \left(\frac{I_{ij}}{\sum_j I_{ij}} \right)^2$$

$$HHI_{total} = \sum_i w_i^2 \sum_j \left(\frac{I_{ij}}{\sum_j I_{ij}} \right)^2$$

$$HHI_{total} = \sum_i w_i^2 \, HHI_i$$

$$HHI_{total} \equiv HHI_T$$

$$\Delta HHI_{Tt} = HHI_{Tt+1} - HHI_{Tt}$$

$$\Delta HHI_{Tt} = \sum_i w_{it+1}^2 \, HHI_{it+1} - \sum_i w_{it}^2 \, HHI_{it}$$

$$= \sum_i (w_{it+1}^2 HHI_{it+1} - w_{it}^2 HHI_{it})$$

$$= \sum_i (w_{it+1}^2 HHI_{it+1} + w_{it}^2 HHI_{it+1} - w_{it}^2 HHI_{it+1} - w_{it}^2 HHI_{it})$$

$$= \sum_i [(w_{it+1}^2 - w_{it}^2) HHI_{it+1} + w_{it}^2 (HHI_{it+1} - HHI_{it})]$$

$$= \sum_i [(w_{it+1} + w_{it}) \Delta w_{it} HHI_{it+1} + w_{it}^2 \Delta HHI_{it}]$$

- ΔHHI_{it} is the change in sectoral HHI for sector i.
- Δw_{it} is the change in the weight of sector i in the economy.

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