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## Institutional regimes and profitability transitions

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## **Institutional Regimes and Profitability Transitions: The Case of Indian Manufacturing Firms**

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# Institutional Regimes and Profitability Transitions: The Case of Indian Manufacturing Firms

## Abstract

### *Purpose*

Literature, spanning industrial organization and strategic management disciplines, uses variance decomposition to understand the relative importance of firm, industry and business group effects in shaping profitability variations. Some literature analyses firm profitability under transition to liberalization. Previous research has taken a static before-and-after view on institutional change. We focus on the dynamic process of liberalization in India, analyzing how different institutional regime changes alter firm behavior leading to changes in profitability patterns.

### *Approach*

Based on a panel dataset of several thousand Indian firms, spanning the twenty-six year period between 1980-81 and 2005-06, we determine the relative importance of firm, industry and business group effects in explaining manufacturing firms' profitability variances across different institutional phases. We evaluate three propositions that help assess transition dynamics between phases. We determine the quantum of catch-up or falling behind by firms.

### *Findings and Implications*

Different industries emerge as profitability leaders, as the economy progresses through different liberalization phases. Business groups that have been more effective in resource appropriation, rent-seeking, politician management and non-market activities in a controlled regime are replaced as profit leaders by those that, in a free-market economy, can be capable of intra-business resource allocation tasks and leveraging corporate capabilities.

### *Originality*

Our approach demonstrates how to analyze the underlying detailed structure of firm level data, and performance outcomes; to derive nuanced interpretation of factors giving rise to the effects that explain profitability variances; and how to assess the way these effects behave over time. The dynamic evidence-based approach highlights what factors matter, where, when and why, in influencing profitability variances, which are a key dimension of industrial and economic performance.

*Key words:* firm, industry and group effects; institutional change; Indian industry; inter-temporal dynamics; liberalization; policy regimes; profitability variance analysis; transition patterns.

## 1. Introduction

Since independence, Indian economic growth has been much faster than in the colonial period, with progressive industrialization occurring. The French historian Fernand Braudel had written that: *“What is interesting is that the economy is taking off. After Japan, and not far behind China, India is becoming one of Asia’s great industrial powers”* (1993: 250). Yet, there has been intermittent stagnation of industrial performance in India (Raj, 1994). Two striking features of the industrial growth experiences were sharp declines in the rate of growth of industrial output and the existence of large unutilized manufacturing capacities. India’s institutional transformation, described in popular parlance as liberalization, however, took place in 1991. On 24<sup>th</sup> July, 1991 India’s business environment was radically changed.

In this article, we evaluate performance outcomes for a large number of Indian manufacturing firms, over a sustainably-long period of time. We study, in detail, profitability transitions over multiple regimes of institutional change, as they have unfolded in the Indian economy. Our approach is based on firm-level data analysis from 1980-81 to 2005-06. The broad facts, about industrial production growth, have indicated a reawakening of the industrial spirit, with which is associated a restoration of an upward trajectory in industrial performance and growth numbers, from around 1991. We take a distinctly-dynamic focus on the unfolding processes of liberalization by analyzing the effects of transitions across different institutional regimes on firm behavior, and how these institutional transitions have influenced firm profitability. Our analysis moves substantially beyond a simplistic before-and-after view of the 1991 liberalization.

Some reasons had been specified for earlier inattention to industry and manufacturing. Profits were not well thought of in Asia as a whole, and particularly in India (Lal, 1999). To seek them was to be selfish. To make profits the primary planning goal was to subordinate people’s necessities to the haggling of markets (Zinkin, 1963). Lloyd Rudolph and Susanne Rudolph had written that: *“Until the mid-seventies, modern capitalists in India had to contend with preindustrial cultural prejudices and postindustrial ideological doctrines that picture them, on the one hand, as heartless moneylenders and, on the other, as antisocial profiteers”* (1987: 26). Nevertheless, profits are an important item for industrial performance analysis. They are an expression of the difference between the real resources required to produce any particular thing and the real resources people are prepared to pay in order to get it. Yet, India’s economy has been, for the main part, in the iron grip of a performance-hindering pervasive *License Raj*. Indian industry simply may not have had the motivation to engender exertion so as to make profits and contribute to industrial growth.

The presence of *License Raj* pathologies is not new. An excellent example of the phenomenon was related by John Beames.<sup>1</sup> Salt tax was an important source of government revenue. In the 1800s, the manufacture, distribution and taxation of salt in 19<sup>th</sup> century Bengal and

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<sup>1</sup> John Beames was an ICS officer who had served in India from 1858 to 1893, principally in Bihar and Bengal, but also for a very short time in Punjab and in Orissa, as Collector and District Magistrate of Balasore and Puri districts, and then Commissioner of Orissa. He subsequently became Commissioner of the Chittagong and Burdwan divisions. He later was a Member, Board of Revenue for the then-combined province of Bengal, Bihar and Orissa. A land revenue and general administration expert, he had written about the salt trade in his memoirs.

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3 Orissa had been a government activity. The expensive and inefficient system<sup>2</sup> was replaced. The  
4 government gave up making salt on its own account, and a variety of enterprising contractors  
5 embarked on this venture.<sup>3</sup> Nevertheless, the government could not let the salt contractors alone.  
6 There was a *License Raj* for the 19<sup>th</sup> century salt business, which then invited an equal and opposite  
7 reaction from entrepreneurs (Beames, 1984). John Beames had written that: *“Every step in the*  
8 *manufacture and sale of salt is surrounded with the most minute precautions on the part of Government, and there is a*  
9 *distinct and separate kind of fraud practiced at each stage. As each fresh precaution is evolved by the Board of*  
10 *Revenue, the Board of Smugglers invents a means of circumventing it* (1984: 208).”

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13 Economic regulation is necessary, though its consequences are unexpected. The issue is not  
14 whether regulation and state intervention should exist, but of what kind and when (Evans, 1995).  
15 Design and sequencing of regulations and state interventions is important. Otherwise, outcomes can  
16 be perverse (Hirschman, 1991), and quite the opposite of original intentions, as with the *License Raj*.  
17 Since independence, the Indian economy has witnessed transition through a large variety of  
18 institutional regimes. All of these regimes would have impacted firms’ performance differently, since  
19 institutional mechanisms by which regulations influence firms’ decisions to alter behavior and  
20 performance would have differed in their logics, and such institutional logics would have influenced  
21 decision-making via perception effects. Altered institutional logics would lead to changing  
22 interpretations of contingencies and approaches to resource deployments, and result in profitability  
23 variations across time.  
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27 Given the conceptual and institutional backdrop, the big picture on Indian industry has been  
28 positive. It is evocative of an economy no longer just on a taxi-roll, but one that has taken off. In the  
29 last several decades, there has been take-off in industrial growth and entrepreneurship. Numerous  
30 institutional transitions have occurred. Indian grassroots capitalism is substantial. Individuals have  
31 set up numerous new ventures, based on diverse business models. Yet, to what end? Important  
32 questions relate to institutional regimes in transition economies, and their influences on firm  
33 behavior and profitability outcomes.  
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36 In our analyses, we focus in detail on variance decompositions to tease out the relative  
37 importance of firm, industry, time and business group effects, on firms’ profitability, as the economy  
38 has moved through different institutional regimes. Each institutional regime would have its specific  
39 logic (Majumdar, 2016). We control for macroeconomic shocks and cycles using time effects, via the  
40 year variable. Firm-level performance is analyzed to evaluate inter-temporal performance transitions  
41 patterns in the aggregate.  
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44 These dataset inter-temporal characteristics permit deeply-nuanced assessments of observed  
45 profitability transition patterns, and allow for speculation on the mechanisms by which firms may  
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48 <sup>2</sup> A large staff of highly-paid officials supervised the work of salt duty collection. The Salt Agent to  
49 Government, who lived in a huge palace at Contai, on the Bengal coast, was a very senior ICS man  
50 and received an extremely large salary of Rupees 48,000 per annum in the mid-1800s. Fraud was rife.  
51 Smuggling was carried out on a large scale (Beames, 1984).  
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54 <sup>3</sup> These persons secured leases of land ten to fifteen square miles in area, in the salt-bearing region  
55 which was a narrow strip of low land running along the Orissa coast, and applied for contracts to  
56 make salt (Beames, 1984).  
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3 have moved from lower to higher performance, or vice-versa. Such inter-temporal performance  
4 analyses highlight how firms, industries and business groups are propelled into high performance  
5 subsequent to reforms, thus catching-up; or slip into a low performance trajectory, and fall behind  
6 through various phases of institutional transition in India.  
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### 8 9 *1.1 Framing Our Contribution in the Context of the Literature*

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11 Beginning with Schmalensee (1985) and Rumelt (1991), a literature has focused on the  
12 decomposition of firms' profitability variances, to understand the magnitude of firms versus industry  
13 effects on such variances. In emerging and controlled economies, business groups are important  
14 (Leff, 1978). In the profitability variance decomposition-based literature, Chang and Hong (2002)  
15 and Majumdar and Bhattacharjee (2013) have incorporated business group effects.<sup>4</sup> The role of  
16 political factors is important (de Figueiredo, 2002; Hillman and Keim, 1995), with the role of  
17 political factors in influencing firms' adaptation enhanced and magnified in emerging markets (Diaz  
18 Hermelo and Vassolo, 2010; Kumaraswamy et al., 2012; Mudambi et al., 2002), and government  
19 agencies use institutional rules to interfere in firms' activities (Bhagwati, 1993).  
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23 Four recent studies (Makino et al., 2004; Brito and Vasconcelos, 2006; McGahan and Victor,  
24 2010; Diaz Hermelo and Vassolo, 2012) stratify the data to parse out different factors to explain the  
25 findings. These studies evaluate profitability variances across countries and differing institutional  
26 contexts. They advance the literature in highlighting what factors matter, where, when and why in  
27 influencing profitability variances. Data stratification is an evidence-based approach permitting  
28 nuanced interpretation of factors giving rise to effects.  
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31 The stratification-based literature (Makino et al., 2004; Brito and Vasconcelos, 2006;  
32 McGahan and Victor, 2010; Diaz Hermelo and Vassolo, 2012; Majumdar and Bhattacharjee, 2013)<sup>5</sup>  
33 advances our understanding of the sources of firm profitability variances, especially for firms in  
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36 <sup>4</sup> Conflicting findings of positive (Khanna and Rivkin, 2001) and negative outcomes (Chacar and  
37 Vissa, 2005) to group affiliation exist for India.  
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40 <sup>5</sup> Makino et al. (2004) decompose the profitability variances of multinational firms to evaluate  
41 strength of country effects, which are as strong as industry effects. Their findings indicate that the  
42 type of effects: corporate and affiliate effects, or country and industry effects, are more important  
43 depending on whether it is a developed or developing country. Brito and Vasconcelos (2006) analyze  
44 country effects for firms in seventy-eight countries, finding that differences in industry type matter.  
45 In trade and agriculture based sectors, country effects are larger than industry effects, while in the  
46 manufacturing and financial services sectors the industry effect is larger than country effect. Diaz  
47 Hermelo and Vassolo (2012) evaluate firms from seven Latin American countries, stratifying firms  
48 by performance. Their results indicate that firm effects are the most important; in some sub-  
49 samples, industry effects are larger than country effects; for superior performing firms, external  
50 effects such as country, industry and country-industry effects are more important than endogenous  
51 firm effects; for inferior performing firms, firm effects are the most important, compared to overall  
52 external effects and to firm effects in other sub-samples. McGahan and Victor (2010) stratify firms  
53 by degrees of multi-nationality to assess the importance of country, industry, and firm effects on  
54 profitability. Country and industry effects are more important to domestic firms than multinationals.  
55 However, country influences are important even for firms with high degrees of multi-nationality.  
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3 emerging economies. There remains, however, much to be analyzed so as to understand the  
4 changing nature of profitability variances, and implicitly activities, of firms. To advance analyses, it is  
5 important to understand the dynamic patterns of transition for each of the effects that explain  
6 profitability variances, and to suggest factors giving rise to the observed patterns of changes in each  
7 effect over time. Such analyses involve digging deeply into the data.  
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10 Beyond the findings of the stratification and profitability variance decomposition literatures,  
11 there are important questions relating to institutional regimes in transition economies and their  
12 influence on firm behavior and profitability. On this score, the literature is limited in its scope of  
13 coverage and comprehensiveness. Chari and Henry (2004) have analyzed the effect of liberalization  
14 on firm valuation across eleven different countries including India, but based on a small number of  
15 firms. Ghemawat and Khanna (1998) and Chacar and Vissa (2005), among others, have studied  
16 diversified business groups in India, particularly the impact of liberalization on resource  
17 misallocation with adverse outcomes for profitability. Hsieh and Klenow (2009) also examine total  
18 factor productivity and resource misallocation using enterprise level data from two transition  
19 economies, China and India, in comparison with the United States of America. Comprehensive  
20 analyses of industrial performance dynamics for a specific-country context are few in the literature.  
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## 23 **2. Article Scope and Theoretical Framework**

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26 Using standard statistical inference techniques, recent research (Majumdar and Bhattacharjee,  
27 2013) has assessed absolute magnitudes, relative importance and inter-temporal differences in firm,  
28 industry and business group effects in explaining profitability variances for Indian manufacturing  
29 firms, over a twenty-six year period from 1980-81 to 2005-06. In emerging economies, government  
30 policies influence the strength of firm, industry, business group and political effects. Specifications  
31 of business conduct rules leads firm behavior to be oriented towards rent-seeking (Bhagwati, 1993)  
32 and politician management (Das, 2002). The impact of such policies is analyzed. The data are  
33 stratified by institutional phases, placing emphasis on the role of institutional changes in an emerging  
34 economy, as a regime of command and control transitioned to partial liberalization, between 1985  
35 and 1991, to an open competitive market economy after 1991, and with phases of financial reforms  
36 and legal reforms following thereafter.  
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40 Economic liberalization has significantly altered the relative importance of firm, industry and  
41 group effects, as stratified data show. Firm effects are always important, whether in a control regime,  
42 with benefits accruing from political rent seeking, or in liberalized periods where dynamic  
43 efficiencies are valued. Industry effects are significant in the control regime, when mandatory sector  
44 placement endows firms in industries with superior profits, and in the liberalized period when the  
45 choice of the industry segment to operate in is open to firms. Thereafter, industry effects dissipate.  
46 Business groups matter in explaining profitability variances. Group effects magnitudes, however, do  
47 not change significantly over time.  
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50 In this article we highlight a novel approach that extends the standard profitability variance  
51 analysis. The use of a panel data set, with an extensive cross section of firms for a lengthy time  
52 period, permits in-depth analyses of the composition of profitability variances. The inter-temporal  
53 characteristics of the dataset are used to analyze and observe patterns of profitability transitions, and  
54 we speculate on the mechanisms by which firms have moved from lower to higher performance, or  
55 vice-versa, over time. Firm-level performance is analyzed to evaluate inter-temporal performance  
56 transitions patterns in the aggregate.  
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Such analyses of inter-temporal performance patterns highlight how firms, industries and business groups are propelled into high performance subsequent to reforms, therefore catching-up; or they slip into a low performance trajectory, subsequent to reforms, and hence fall behind, through the phases of institutional transition in India. The catching-up phenomenon (Mathews, 2002) is relevant. That literature deals with issues of inter-temporal dynamics of industrialization through aggregate economy-wide analyses or case study analyses. Our analyses depict the distinct, dramatic and dynamic nature of performance catching-up, or falling behind, by firms and industries within an economy, and across a variety of policy regimes. Empirically, the article demonstrates an important and detailed approach to analyze the catching-up phenomenon.

Based on an initial decomposition of profitability variances for Indian manufacturing firms, we report the outcomes of an examination of inter-temporal patterns in firms,' industries' and groups' profit performance, and assess sector-oriented sub-stratified variances in profitability. The current analysis extends the work by Majumdar and Bhattacharjee (2013), based on an extensive dataset on Indian firms, consisting of 37,642 firm-year observations, evaluating the importance of firm versus industry versus group effects in explaining profitability variances for manufacturing firms from the 1980s to the 2000s. That analysis covers the twenty-six-year period from 1980-81 to 2005-06. The overall period has been stratified into five unequal time phases, each phase having a unique institutional characteristic:

- [i] of command and control, from 1980-81 to 1984-85;
- [ii] of transition, from 1985-86 to 1990-91;
- [iii] of liberalization, from 1991-92 to 1995-96;
- [iv] of financial sector reforms, from 1996-97 to 2000-01; and
- [v] of legal reforms, from 2001-02 to 2005-06.

The industrial reforms were put through between 1991-92 and 1995-96. Thereafter, financial sector and tariff reforms followed between 1996-97 and 2000-01 (Panagariya, 2004). After 2001-02, reforms were implemented in property rights, foreign exchange rules, competition policies, and by way of many industry-specific regulations such as in the telecommunications sector (Majumdar and Bhattacharjee 2013; Nayyar, 2017; Panagariya, 2008). The same data set and time phases, as in past research, are used.

Based on initial derivation of profitability variances of Indian manufacturing firms between 1980-81 and 2005-06, the predicted values for firm, industry and group effects, based on best linear unbiased predictions (Bates and Pinheiro, 1998), are used to analyze the data inter-temporally to assess:

- [i] patterns of firms' transitions from positions of high profit performance to low profit performance, and vice-versa;
- [ii] industry transitions, as to which industries generate positive effects, and which ones generate negative effects, in respect of overall profitability variances in the different phases studied; and
- [iii] transitions of business groups over different phases of time to superior profit performance positions. These analyses permit assessment of firms, industries and groups catching-up or falling behind in profit performance over the five institutional phases.

These analyses lead us to drawing inferences as to the heterogeneous nature of industrial responses to policy transitions in India over time.

## 2.1 Historical Background

The pre- and post-transition year is generally taken as 1991. We go back to 1980-81, and forward to 2005-06, in our profitability patterns analyses. Hence, the historical background has to be described. Driving India's regulation and control processes had been a post-independence need to exercise power for the common good. Power was derived from control over key sectors of the economy (Earle, 1997). Later, the command necessity turned into a command desire and a command need. For several decades, the exercise of economic power became a hard-to-break habit. Control over the economy permitted exercise of direct and material power by government over the lives of people (Earle, 1997).

A key conceptual lapse in 20<sup>th</sup> century *License Raj* design had been use of physical versus financial controls. These physical controls, of manufacturing capacity, continued longer than necessary. Negatively-oriented physical control instruments barred investment in specific areas and drove investments underground (Bhagwati, 1993). It created an administrative Frankenstein. The Directorate-General of Technical Development, popularly known as the DGTD, an agency meant for the technical upgrading of India's industrial capabilities, became the final arbiter of import, investment and expansion decisions for India's industry (Majumdar, 2012).

Establishment of large-scale facilities had been ordained, since 1956, to be the province of state-owned enterprises. If private sector enterprises wanted to scale up production, they had to go through an involved process with the DGTD, which would evaluate all the technical parameters. The DGTD was a technical agency, fully staffed by engineers, and not an economic agency, with economists who might understand markets. Thus, approval was rarely given. Since it became known that approval was rare, and if it did come would be attached to a string of near-impossible conditions, firms lost motivation to expand capabilities. This led to a self-displacing prophecy loop (Schelling, 1978), as businessmen generically shared this negative motivation.

Since everybody expected the same behavior from DGTD, they collectively curtailed their DGTD dealings (Majumdar, 2012). Nobody wanted to deal with the bureaucrats, popularly referred to as *babus*, of Udyog Bhavan, an important office building in New Delhi where the DGTD was based.<sup>6</sup> By not wanting to deal with the bureaucrats, industrialists reduced the average level of capabilities, firm and plant size in Indian industry. Indian firms lost numerous opportunities to enhance profitability.

It had been noted that the Europeans went into Asia with a spirit of determination to succeed which was stronger than the will of the Asian people to resist, and this accounted for European successes (Sansom, 1950). India's businessmen could be determined. Yet, possession of a strong spirit would not deliver results if resources were absent through DGTD fiat and control (Majumdar, 2012). Control over resources, and the specific parameters of their utilization, provided

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<sup>6</sup> The word *babu* has been used to describe the mentality of junior members of government departments who process paperwork, and were popularly held to be the key impediments to human progress. John Masters had remarked that: "*The babu is not a person but an outlook....many blinkered men of his type....make references and cross references, check and recheck, refer and confer, and willingly spend their human energy in inhuman exactitude.*" (1956: 296).

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3 the mechanisms for Government in India to amass power. Because the economy was essential to  
4 human survival, command over autonomous economic activities yielded control over lives. All  
5 economic questions became political questions.  
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8 The human factor was of importance. The will to make progress existed among the people.  
9 But, it was dampened and needed re-activating (Nair, 1961). There was little entrepreneurship in  
10 India in the period prior to 1991 because *“the ability to fight one’s own battles depends on the will to succeed”*  
11 (Shrinagesh, 2007: 18), and placing limits on entrepreneurs’ aspirations had debilitating  
12 consequences on human will. At the margin, businessmen would not engage in advantageous  
13 activities, because the institutional norms placed great psychological barriers (Nair, 1961). *License Raj*  
14 rigidity, with businessmen unable to shape firms’ destinies, led to the decline of India’s industrial  
15 performance (Majumdar, 2012).  
16

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18 An unfavourable financial and economic situation arose at the beginning of 1991 (Jalan,  
19 2005). It culminated in a now well-known shipment of India’s gold to London. It also promoted an  
20 evaluation of all aspects of India’s economic policy. Soon after taking over as the Prime Minister,  
21 the late Mr. P. V. Narasimha Rao realized the presence of an opportunity to comprehensively alter  
22 policies. The Principal Secretary to the Prime Minister was the late Mr. A. N. Verma, who had  
23 previously been the Industry Secretary. Between A. N. Verma and Mr. L. Mansingh, the then Joint  
24 Secretary in charge of the Secretariat of Industrial Approvals (SIA), the division of the Ministry of  
25 Industrial Development engaged in industrial licensing tasks, a decision to delicense industrial entry  
26 was taken. On 24<sup>th</sup> July 1991, a notification was issued, under Mr. Mansingh’s signature, opening up  
27 entry, other than in the standard strategic areas of atomic energy, defense and railways, to any firm  
28 wanting to invest and set up business in India.<sup>7</sup>  
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32 The institutional change of 24<sup>th</sup> July 1991 achieved the removal of a pathological process,  
33 and industrialists regained their autonomy. An open and competitive market-based economic system  
34 allowed expression for individual freedom, on the assumption that multiplier effects would create  
35 further economic opportunities elsewhere (Patel, 2002). The institutional discontinuity permitted  
36 entrepreneurship democratization in India. A democratic society permitted initiatives and enterprise  
37 to rise to the fore rather than be controlled and guided by a machine bureaucracy aggregating  
38 preferences and mobilizing choices (Patel, 2005).  
39

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41 Political democracy permitted moral incentives to thrive; similarly, economic democracy  
42 permitted material incentives to thrive. In an environment with democratized entrepreneurship, the  
43 burden of strategic choice would be on businessmen. The laying at a businessman’s door of the  
44 cause-effect relationship in business transactions would engender rationality. Now, businessmen  
45 could not blame others, like the DGTD, for mediocre performance outcomes. Economic freedom  
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50 <sup>7</sup> Our views on the institutional setting has been conditioned by detailed communications and  
51 discussions with several civil servants who were closely associated with the making of India’s  
52 economic policy. Gratitude is expressed to Mr. L. Mansingh, IAS (Retd.), for several long  
53 conversations on the topic. He was responsible for the 24<sup>th</sup> July 1991 notification, and his insights  
54 on the process of industrial licensing in India have been important. We are also grateful to Mr. S.  
55 Rajgopal, IAS (Retd.), the late Mr. N. Raghunathan, IAS (Retd.) and the late Dr. N. K. Sengupta,  
56 IAS (Retd.), for several conversations on this topic.  
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permitted agency; but, it brought responsibilities for action. These factors would encourage developing robust business models to enhance success.

Dr. Nitish Sengupta, a former civil servant and politician, had written that: *“In the end nothing is more important than creating an environment in which the entrepreneurs, whether in the private sector or in the public sector, can take managerial decisions, based on his own assessment, judgment and intuition within the parameters and rules of the game laid down by the government rather than under the compulsions of administrative diktats from sources far removed from the reality of the shop floor”* (Sengupta, 1992: 55).

## 2.2 The Framework and Some Hypothesized Expectations

We use ideas from the [i] profitability persistence, [ii] resource-based view, [iii] institutional theory and [iv] Asian business groups’ literatures. Based on these literatures, we develop propositions to guide our empirical assessment of profitability transition patterns. These propositions help us evaluate how different effects explaining profitability variances behave over time periods.

*Firms’ Profitability Transitions:* The profitability variance literature in strategic management<sup>8</sup> has dealt with enhancing understanding of how, and why, these variances are explained by various effects. Relatively little material deals with the dynamics, and the transition patterns, of these effects. A related stream, the persistence of profitability literature (Mueller, 1986), emerging at the same time as the profitability variance literature, has dealt with analyses of the time-series properties of basic profitability ratios.<sup>9</sup> This literature evaluates profitability dynamics, but does not consider the composition of the underlying effects driving profitability ratios. We merge ideas from the two streams of profitability analyses in deriving an expectation that we evaluate to assess dynamic patterns of transition in the routes firms take in becoming more, or less, profitable. By evaluating transitions of firms in different performance strata (Diaz Hermelo and Vassolo, 2012) we can understand how firm effects underlying profitability variances behave over periods of time.

The persistence of profitability literature, founded on the principles of the Harvard school of structural analysis (Bain, 1956; Mason, 1957) takes as its core idea that market power, industry concentration and favourable demand conditions (Sutton, 1991) are the primary factor explaining high profits. As markets become competitive, with greater incidents of entry and exit occurring, profitability levels are no longer stable but are driven down. Over time, there is decline in firms’ average profitability with the advent of competition (Mueller, 1986). This is a major finding from the dynamic analysis in the persistence of profits literature.

The alternative Chicago school of process analysis (Stigler, 1968; Demsetz, 1973; Mancke, 1974) has stated high profitability arises because some firms are more efficient. Firms’ unique efficiency patterns constitute the reason for profitability differences between firms, while the distribution of efficiencies and industry life cycle together determine market structure (Jovanovic, 1982). The postulates of this view have led to the development of the resource-based theory of the

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<sup>8</sup> See Bou and Satorra (2007) and Wiggins and Ruefli (2002).

<sup>9</sup> Glen et al. (2003), McGahan and Porter (1999) and Waring (1996) are some studies in this genre.

1  
2  
3 firm (Wernerfelt, 1984), in which endogenous competencies lead firms to be efficient (Prahalad and  
4 Hamel, 1990; Nelson, 1991).  
5

6  
7 The possession of endogenous competencies leads to uniqueness of firm attributes.  
8 Heterogeneity and idiosyncrasy, of competencies, behavior and performance, is an important  
9 component of the Chicago school (Lippman and Rumelt, 1982) as well as of the resource-based  
10 view (Barney, 1991). As institutional changes occur, firms react differently to the changes. If the  
11 forces of competition tend to drive profits down, with the occurrence of competition-inducing  
12 institutional change, firms are motivated to invest in resources and capabilities to enhance their  
13 efficiencies (Leibenstein, 1987).  
14

15  
16 Because of firms' uniqueness, idiosyncrasy and heterogeneity, the reactions of firms to  
17 institutional change will differ substantially, across periods of time. Not all firms can be equally-  
18 successful in enhancing capabilities. In fact, for many firms, quality levels of capabilities may decline.  
19 The interpretations of policy changes by such firms can induce under-investment or a predilection  
20 for inefficiencies in resource utilization. Hence, across periods of time, clusters of high-performing  
21 firms become low performers, and clusters of low-performing firms become high performers. As  
22 varieties of institutional changes unfold, the sizes of the low-performing and high-performing  
23 clusters also change. This is the dynamic capabilities logic (Teece et al., 1997) at play.  
24

25  
26 As more firms are induced by the environment to make changes to their resource profiles,  
27 with corresponding performance impact noted in subsequent periods, because of heterogeneity in  
28 how institutional changes are handled there will be inter-temporal variations in the proportion of  
29 firms experiencing performance changes. The first proposition to be empirically evaluated is:  
30

31  
32 *Proposition 1 - As institutional changes unfold in the Indian economy, numerous high performing firms in*  
33 *one period will subsequently transition to the low performance category, and the relative proportions of such*  
34 *performance-changing firms will change with the institutional changes that keep occurring in different policy areas over*  
35 *time.*  
36

37  
38 *Industries' Profitability Transition Patterns:* We use institutional theory ideas to state our ideas as  
39 to how industry performance trajectories may alter with institutional change. As Scott (1995: 33) has  
40 suggested, institutions comprise of "cultural-cognitive, normative and regulative elements that, together with  
41 associated activities and resources, provide stability and meaning to social life." The behavior of organizations is  
42 anchored in rule systems defining the relational features of interaction influencing material items.  
43 Industries are fields of organizations that have, in the aggregate, a well-recognized set of  
44 suppliers, resource providers, customers, regulatory agencies and other service organizations in  
45 symbiotic relationship with firms that make up an industry (DiMaggio and Powell, 1983). Firms'  
46 activities and their dynamics of behavior are embedded in an organizational field situated in a  
47 national polity (Schneiberg and Clemens, 2006).  
48

49  
50 Changes in an organizational field occur because of politics (Powell, 1991), social  
51 movements (Rao and Sivakumar, 1999) and the interplay of social and economic processes (Dacin,  
52 1997). These lead to institutional changes. Such institutional changes are often major  
53 transformations (Scott, 1995) redefining the rules of the game for industries, or organizational fields,  
54 and need the re-configuration of resources and capabilities. These institutional changes alter the  
55 nature of assumptions driving business activity within an industry (Hoffman, 1999), and change the  
56 nature of the business model in use.  
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4 When institutional changes occur, the basic characteristics of a population of firms in an  
5 industry change (Carroll and Hannan, 2000). The contingent nature of environmental changes, such  
6 as those involving changes in institutional arrangements, motivates adaptation (Lewin et al., 1999).  
7 Firms unable to strategically adapt themselves to institutional changes fall behind in performance.  
8 This process of non-adaptation cumulatively brings industries' performance down. As the  
9 institutional logic of organizational fields change, a phenomenon is the decline of performance in  
10 the industries where the nature of business activity assumptions, business models and rules of the  
11 game change across institutional regimes. Conversely, other industries will begin to display positive  
12 profits as they become more adjusted, through strategic adaptations, to conducting operations in a  
13 fully-changed business environment. The second proposition to be empirically evaluated is:

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16  
17 *Proposition 2 - As institutional changes unfold in the Indian economy, industries that have generated high*  
18 *positive profit effects in regulated and controlled regimes firms in one period will no longer generate the high positive*  
19 *profit effects in a market economy. With transition to a market economy, instead, different industries will generate the*  
20 *highest positive profit effects.*

21  
22 *Business Groups' Profitability Transitions:* Business groups are not legal firms or industries with  
23 circumscribed boundaries. They are confederations of legally independent firms, playing a role in  
24 Western (Whitley, 1992) and emerging economies (Goto, 1982; Leff, 1978) such as India  
25 (Damodaran, 2008). They are an archetype example of a merchant organizational form (Carney and  
26 Gedajlovic, 2002). Groups permit allow affiliated firms to overcome obstacles caused by missing  
27 markets and inadequate institutions (Leff, 1978). The organizing principle of an archetype is the  
28 conduct of a set of activities conditioned by a unique temporal or geographic contingency (Carney  
29 and Gedajlovic, 2002; Miller, 1982). Time and place, thus, matter. Where there is fundamental  
30 change in the logic for an organizational archetype, in a given temporal and spatial setting, then a  
31 large change can be faced by the group (Miller, 1982). A large change invalidates the positive  
32 performance consequences of business group membership for affected firms.  
33  
34

35  
36 The nature of activities that business groups undertake in a controlled economic regime  
37 revolve around the mobilization and appropriation of scarce resources (Granovetter, 2005),  
38 including financial resources (Chang and Hong, 2002; Majumdar and Sen, 2007). The activities of  
39 groups, that influence positively the performance of affiliated firms, are based on special  
40 entrepreneurial skills, connections, family ties and the capabilities for making alliances. Often, the  
41 possession of such capabilities is crucial to the formation of an organizational archetype, such as a  
42 business group (Whitley, 1992). These capabilities help in navigating specific institutional  
43 circumstances.  
44

45  
46 With changes in institutional circumstances, say, because of the introduction of competition,  
47 the need for once-useful activities disappears. As the logic of a particular archetype becomes less  
48 relevant, the positive impact of such an archetype on firm performance dissipates. The changing  
49 institutional circumstances denote the need for a new logic, and many business groups face a  
50 quantum change which they cannot adapt to (Carney and Gedajlovic, 2002). There are other  
51 confederations of legally independent but affiliated firms possessing the now-crucial capabilities to  
52 succeed in the changing environments. The nature of activities required is different, say, in managing  
53 global operations, versus those for managing government relations (Majumdar and Bhattacharjee,  
54 2013). Hence, firms belonging within a business group where these new-age skills for growth exist  
55 will experience positive performance impacts. The identity of the various business groups, however,  
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generating positive profit impacts will have changed as a consequence of the institutional changes occurring. The third proposition to be empirically evaluated is:

*Proposition 3 - As institutional changes unfold in the Indian economy, business groups that generated high positive profit effects in regulated and controlled regimes firms will not generate the high positive profit effects in a market economy. With transition to a market economy, instead, different business groups will now account for the highest positive profit effects.*

### 3. Analysis Details

#### 3.1 Data and Variables Details

Reserve Bank of India data from 1980-81 to 2005-06 are used. Data on business groups are collected from the Centre for Monitoring the Indian Economy. Firms belonging to 61 major business groups are identified, and 384 group firms are classified by respective business groups, covering 8 percent of sample firms and 12 percent of firm-year observations. Sample firms do not change business group affiliation over periods, and firm effects are nested in group effects. Time effects capture business cycle, credit, fiscal policy, interest and exchange rates effects. There are 37,642 firm-year observations. These comprise of:

- [1] 6,462 observations for the 1980-81 to 1984-85 phase;
- [2] 9,034 observations for the 1985-86 to 1990-91 phase;
- [3] 7,076 observations for the 1991-92 to 1995-96 phase;
- [4] 7,119 observations for the 1996-97 to 2000-01 phase; and
- [5] 7,951 observations for the 2001-02 to 2005-06 phase.

The data are classified into 28 manufacturing industries. Return on assets (ROA) is the profitability measure, defined as the ratio of net profits to total assets, and expressed in percentage terms.<sup>10</sup>

#### 3.2 Profitability Distribution Patterns

The dataset on Indian firms, consisting of 37,642 firm-year observations, is initially used to calculate the industry-specific average profitability for each industry, for the beginning of the time period, 1980-81, the mid-point of the time period after which reforms took place, 1990-91 and the end point of the time period, 2005-06. The descriptive statistics and profitability dispersion over time highlight inter-industry profitability differences in each time period. Over time periods, the variance in industry profits, and changes in their direction, show considerable within-industry heterogeneity in performance patterns. The profitability data are in table 1.

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<sup>10</sup> Transitions in ROA can arise from changes in the capital structures of firms. This does not materially affect our analysis because capital structures of public limited companies are relatively stable over time and therefore subsumed within firm effects. Over the short periods, under analysis within each regime, capital structure of the included firms to not change substantially. In addition, there is a clearly-accepted idea in the corporate finance literature that capital structure is an endogenous construct, since the questions of whether to have debt, how much of it, and in what form, are all questions that are uniquely firm-specific. The firm variable in our analyses capture numerous firm-specific effects, including the decisions related to capital structure.

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4 \*\*\*\*\* INSERT TABLE 1 HERE \*\*\*\*\*  
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7 Table 1 displays the mean, standard deviation, coefficient of variation and skewness for each  
8 industry for the years 1980-81, 1990-91 and 2005-06. First, the average profitability of all industries,  
9 as shown in the last row of table 1, was 3.83 percent in 1980-81, dropped to 1.86 percent in 1990-91  
10 and has increased to 4 percent by 2005-06. If, in spite of competitive forces being unleashed,  
11 because of reforms, over time profits rise then such a finding is an indicator that competition has  
12 spurred firms to acquire capabilities and enhance efficiencies so that enhanced market-  
13 competitiveness does not erode profitability.<sup>11</sup> Indian firms have been motivated to adapt to  
14 circumstances (Kumaraswamy et al., 2012). This finding is in consonance with the Chicago-based  
15 process school (Demsetz, 1973), or the resource-based view (Barney, 1991). Such a finding,  
16 invalidating the market power and profitability hypothesis, is established by Glen et al. (2003) for  
17 other emerging economies.  
18  
19

20 An indicator, however, of changing patterns of profitability distribution over time is the  
21 nature of change in skewness, between the three periods. The type of skewness change that occurs  
22 for each industry is recorded in the last column of table 1. Take the first industry in table 1, the sugar  
23 industry. For the sugar industry, skewness is negative in 1980-81, and again in 1990-91, when it has  
24 increased. By 2005-06, skewness has increased further but it is positive. Increase in skewness is a  
25 first-order indication of increasing asymmetry of the profitability distribution. Negative skewness  
26 indicates more observations for that industry with less-than average profitability. Conversely,  
27 positive skewness implies more observations for that industry with higher-than average  
28 profitability.<sup>12</sup>  
29  
30

31 In the sugar industry, average profits have been 4.34 percent in 1980-81, but then dropped  
32 to 0.42 percent in 1990-91, and increased to 7.96 percent by 2005-06. It is an industry that has  
33 become, on average, more profitable over time. An increase in negative skewness till 1990-91  
34 indicates more firm-level occurrences of below-average profitability, but by 2005-06 the transition to  
35 positive skewness indicates more occurrences of firm-level above-average profitability. Table 1  
36 highlights substantial intra- and inter-industry profitability dispersions. It indicates considerable  
37 heterogeneity in the distribution of profits, as well shifts in the nature of such dispersion. Table 2  
38 summarizes observed patterns.  
39  
40

41 \*\*\*\*\* INSERT TABLE 2 HERE \*\*\*\*\*  
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47 <sup>11</sup> Further investigation is required to fully explore this issue by including explicitly measures of  
48 competition in the analysis; this is retained for future work. In our modelling framework, any  
49 transition in competitiveness is subsumed within a combination of industry and year effects, and our  
50 results are robust to inclusion of industry x year interaction effects. We thank a referee for bringing  
51 this issue to our attention.  
52

53 <sup>12</sup> The literature in empirical industrial organization has emphasized the important connection  
54 between skewness of the cross-section distribution across firms and transition dynamics; see for  
55 example, Higson et al. (2002).  
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*Types of Skewness Changes:* Table 2 lists five types of skewness pattern changes observed over time. Type 1 is when left-tailed and negative skewness in 1980-81 changes over time to right-tailed and positive skewness by 2005-06, indicating a larger number of observations for that industry beginning to enjoy above-average profitability. There are ten industries in this type 1 category. Their names are listed in the last column of Table 2. Type 2 is when right-tailed and positive skewness in 1980-81 changes over time to left-tailed and negative skewness by 2005-06, indicating a larger number of observations for that industry beginning to experience below-average profitability. There are two industries in this category. Type 3 is when it is left-tailed and negative skewness throughout, indicating a consistent pattern of a larger number of observations for that industry experiencing below-average profitability. There are twelve industries in this category. This is the most common change in skewness type. Rather, there has been no change in the type of skewness.

Type 4 indicates when skewness is initially left-tailed and negative in 1980-81, then right-tailed and positive skewness in 1990-91, and then left-tailed and negative in 2005-06. The pattern indicates a larger number of observations for that industry experience below-average profitability, then a larger number of observations for that industry begin to experience above-average profitability, but thereafter a larger number of observations for that industry begin re-experiencing below-average profitability. There is one industry in this category. Type 5 indicates a larger number of observations for that industry experience above-average profitability, then a larger number of observations for that industry experience below-average profitability; thereafter, a larger number of observations for that industry begin re-experiencing above-average profitability. There are three industries in this category. These results show, inter-temporally, substantial inter- and intra-industry profitability variances, hence warranting a deeper examination of profitability change patterns.

### 3.3 Analysis of Profitability Variances

We use variance decomposition analysis, and nested data models (Majumdar and Bhattacharjee, 2013), to assess what explain profitability variances. For firms belonging to a group, the firm effects are modeled hierarchically, as nested in the group effects. Firms not in a group are nested in the non-group firms' category. We base our analysis on the following hierarchical linear model of profitability  $r$  of company  $c$  in group  $g$  and industry  $i$  at time  $t$ :

$$r_{gcit} = \mu + \alpha_g + \beta_{cg} + \gamma_i + \delta_t + \varepsilon_{gcit}, \quad (1)$$

where  $\mu$  is the overall mean, and  $\alpha$ 's,  $\beta$ 's,  $\gamma$ 's,  $\delta$ 's and  $\varepsilon$ 's are the group effects, firm effects nested within groups, industry effects, time effects and random errors respectively.

To infer the importance of the different effects, a random effects assumption, of independence between the different effects, and between the error and the effects, is made. We test assumption validity using the Hausman (1978) tests, comparing random effects estimates for each effect with corresponding fixed effects estimates. The null hypothesis, that the random effects assumption is valid for each effect, is not rejected at the 5 percent level. Specifically, over the 5 regimes under analysis, the p-values of the test are 0.498, 0.479, 0.686, 0.849, and 0.138, respectively. We estimate a hierarchical mixed effects model, where fixed effects in the base model can be combined with random effects decomposition for the composite error (Searle et al., 1992).

The variance of  $r_{gcit}$ , denoted  $\sigma_r^2$ , is represented as:

$$\sigma_r^2 = \sigma_\alpha^2 + \sigma_{\beta\alpha}^2 + \sigma_\gamma^2 + \sigma_\delta^2 + \sigma_\varepsilon^2 \quad (2).$$

This linear split of the variance of  $r_{gcit}$ ,  $\sigma_r^2$ , into components corresponding to different

sources of variation enables assessment of the importance of various effects in explaining overall variability in  $r_{gciit}$ . The restricted maximum likelihood (REML) approach (Majumdar and Bhattacharjee, 2013) is used. We estimate the contribution of each factor to the overall variation in profitability, variance components, in absolute ( $\sigma_\alpha^2$ ,  $\sigma_\beta^2$ ,  $\sigma_\gamma^2$ ,  $\sigma_\delta^2$  and  $\sigma_\varepsilon^2$ ) and relative terms (e.g.,  $\sigma_\alpha^2 / \sigma_r^2$  or  $\sigma_\alpha^2 / (\sigma_r^2 - \sigma_\varepsilon^2)$ ); see Majumdar and Bhattacharjee (2013) for further details of the methodology and references to the relevant methodological literature.

In Table 3, we report the variance components as percentages of the total variance in return on assets. In the 26-year period, 1980-81 to 2005-06, firm effects account for 42.4 percent of the profitability variance, while industry effects account for 1.0 percent. Group effects and year effects account for 1.1 and 2.0 percent of such variance. The unexplained variance is 53.6 percent. In the 5-year command and control period, firm effects explain 47.6 percent of the variance, industry effects explain 4.8 percent of such variance, while group and year effects explain 1.6 and 4.1 percent of the variance. The unexplained variance is 41.9 percent. In the 6-year transition period, firm effects explain 54.3 percent of the variance, industry effects explain 1.8 percent, and group and year effects explain 1.1 and 0.7 percent. The unexplained variance portion is 42.1 percent.

\*\*\*\*\* INSERT TABLE 3 HERE \*\*\*\*\*

In the 5-year liberalized period, firm effects explain 53.5 percent of the profitability variance, industry effects explain 3.1 percent, and group and year effects explain 0.6 and 0.6 percent. The unexplained variance is 42.2 percent. In the 5-year financial reforms period, firm effects explain 51.8 percent of the profitability variance, industry effects explain 1.6 percent of the variance, and group and year effects explain 1.2 and 0.9 percent of the profitability variance. The unexplained variance is 44.5 percent. In the 5-year legal reforms period, firm effects explain 42.7 percent of the profitability variance, industry effects explain 1.2 percent of the profitability variance, and group and year effects explain 0.8 and 1.2 percent of the profitability variance. The unexplained variance is 54.1 percent.

#### 4. Evaluating Inter-Temporal Changes in Firm, Industry and Group Effects

The analysis generates profitability variances. Using the predicted values for the firm, industry and group effects, we assess:

- [i] firms' transition patterns from positions of high performance to low performance, and vice-versa, over the different institutional time phases;
- [ii] industry transition patterns, as to which industries generate positive effects, and which ones generate negative effects, in the different institutional time phases studied; and
- [iii] transition patterns of business groups over the institutional time phases to superior performance positions.

##### 4.1 Assessment of Firm Level Profit Transitions

The data consists of an unbalanced panel for all years, and separate unbalanced panels of 6,462 observations for the command and control phase, 9,034 observations for the transition phase, 7,076 observations for the liberalized phase, 7,119 observations for the financial reforms phase and 7,951 observations for the legal reforms phase. Because the panel is unbalanced, there is not always inter-period data contiguity for all observations.

We generate performance strata (Diaz Hermelo and Vassolo, 2010). Between one phase and another:

[A] we identify observations present in the top performance quartile of the first phase and also present in the data set for the next phase; see row 1 of table 4;

[B] observations present in the bottom performance quartile of the first phase and present in the data set for the next phase; see row 2 of table 4;

[C] observations present in the top performance quartile of the first phase and in the top performance quartile in the next phase; see row 3 of table 4;

[D] observations present in the bottom performance quartile of the first phase and in the bottom performance quartile in the next phase; see row 4 of table 4;

[E] observations present in the bottom performance quartile of the first phase and in the top performance quartile in the next phase; see row 5 of table 4; and

[F] observations present in the top performance quartile of the first phase and in the bottom performance quartile in the next phase; see row 6 of table 4.

\*\*\*\*\* INSERT TABLE 4 HERE \*\*\*\*\*

*Summary Data:* The summary data are reported in Table 5. Column (A) of panel (A), reporting the data in row 4 of table 4 being divided by row 1 data of the same table, shows that 54 percent of observations in the bottom performance quartile in the command and control phase remained in the bottom quartile in the transition phase; 52.7 percent of observations in the bottom performance quartile in the transition phase remained in the same quartile in the liberalized phase; 49.5 percent of observations in the bottom performance quartile in the liberalized phase remained in the bottom performance quartile in the financial reforms phase; and 50.7 percent of observations in the bottom performance quartile in the financial reforms phase remained in the bottom quartile in the legal reforms phase data.

Column (B) of panel (A), based on data in row 3 of Table 5 being divided by data in row 2, shows that 46.3 percent of observations in the top performance quartile in the command and control phase are also in the top quartile in the transition phase; 44.2 percent of observations in the top performance quartile in the transition phase remain in the top performance quartile in the liberalized phase; 46.8 percent of observations in the top performance quartile in the liberalized phase remain in the top performance quartile for the financial reforms phase; and 52.2 percent of observations in the top performance quartile in the financial reforms phase are in the top quartile in the legal reforms phase.

These data denote the inter-temporal transitions of firms from the top and bottom performance quartiles across different time phases. As expected, the degree of performance movement is substantial. No doubt, about half the sampled firms stay put in the same performance quartiles; but, equally, half of the firms move into a different performance quartile. These results establish considerable heterogeneity in firm performance, conditioned by unique idiosyncratic behavior that characterize firms, and support our first set of expectations on firms' performance transitions.

\*\*\*\*\* INSERT TABLE 5 HERE \*\*\*\*\*

*Catching-Up:* Based on data in row 5 of table 5 being divided by the data in row 1, in column (C), we note that 10.4 percent of observations in the bottom performance quartile in the command



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3 and control phase are in the top performance quartile in the transition phase. Similarly, 17.7 percent  
4 of observations in the bottom performance quartile in the transition phase are in the top  
5 performance quartile in the liberalized phase; 10.4 percent of observations in the bottom  
6 performance quartile in the liberalized phase are in the top performance quartile in the financial  
7 reforms phase; and, 19.6 percent of observations in the bottom performance quartile in the financial  
8 reforms phase are in the top performance quartile in the legal reforms phase. A tenth to a fifth of  
9 firms make a transition from the lowest to the highest performance categories. A large proportion of  
10 firms catch up in performance. These results highlight the catch up phenomenon in operation, as  
11 well further support the notion of heterogeneity.  
12  
13

14  
15 *Falling Behind:* We analyze profit drops, as given in column (D). Based on the data in row 6 of  
16 table 5 being divided by the data in row 2, we find that 9.8 percent of observations in the top  
17 performance quartile in the command and control phase are in the bottom performance quartile in  
18 the transition phase. Similarly, 11.2 percent of observations in the top performance quartile in the  
19 transition phase are in the bottom performance quartile in the liberalized phase, 8.8 percent of  
20 observations in the top performance quartile in the liberalized phase are in the bottom performance  
21 quartile in the financial reforms phase, and 9 percent of observations in the top performance quartile  
22 in the financial reforms phase are in the bottom performance quartile in the legal reforms phase.  
23 After institutional changes, a tenth of the firms also race to the bottom in performance. While there  
24 is catch up, there is also falling behind, because of firms' inability to adapt.  
25  
26

27 *Tests of Significance of Transition Patterns:* Panel (B) of table 5 displays results of statistical testing  
28 as to whether the inter-temporal observed performance transitions are statistically significant. The  $p$   
29 values of the tests of second-order inter-temporal transitions of performance changes between one  
30 institutional regime and another institutional regime are given in the cells.  
31  
32

33 The second-order inter-temporal transitions are:

34 [a] between the command and control phase to the transition phase, and the transition to  
35 liberalized phase;

36 [b] between the transition to liberalized phase, and the liberalized to financial reforms phase;  
37 and

38 [c] between the liberalized to financial reforms phase, and the financial reforms to the legal  
39 reforms phase.  
40

41 As per column (A), we find no significant differences in the movement of firms in the  
42 bottom performance quartile in one period and remaining in the bottom quartile in the next period.  
43 This is for all inter-period transitions. As per column (B), we find a significant difference in  
44 percentage of observations in the top performance quartile in one period and the next between the  
45 liberalized to financial reforms phase and the financial reforms to the legal reforms phase (row 3).  
46 As per column (C), for firms that are in the bottom performance quartile in one period and the top  
47 performance quartile the next, all of their inter-period transitions are statistically significant. These  
48 transitions include a sharp drop in the percentage of firms, moving from the bottom performance  
49 quartile to the top performance quartile, between the liberalized and financial reforms phases, and  
50 then a substantial rise in the percentage of such firms, moving from the bottom performance  
51 quartile to the top performance quartile, in the financial reforms to legal reforms phases.  
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54  
55 As per column (D), we note that for observations in the top performance quartile in a period  
56 and in the bottom quartile in the next period, there is a significant drop in the percentage of such  
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firms between the transition to liberalized phases, and the liberalized to financial reforms phases. These results reflect a considerable amount of churning in the profitability of Indian firms after liberalization, with significant performance quartile changes by firms being recorded. This overall conclusion from these overall results are also supported by the evidence displayed in Table 2, which denotes that there has been change in the pattern of skewness, indicating transitions in the distribution of profitability, for 16 of the 28 industries that we study.

Since each institutional phase will have similar impact, and industry effects will affect firms in specific industries similarly, the results provide evidence that internal organizational restructuring and strategic experiments are underway, in Indian firms, with firms reconfiguring resources and dynamic capabilities to cater to emergent market challenges. These results indicate a catch-up process, and an element of falling behind by some firms in relative profitability. They denote the existence of substantial heterogeneities in the performance of the Indian manufacturing sector, at the firm level. Overall, the results support the first proposition articulated.

#### *4.2 Assessment of Specific Industry Performance Transitions*

Our data analysis takes account of the effects of 28 industries in assessing profitability variances. In our initial estimation of firm, group, industry and time effects we generate industry-specific effects, either positive or negative. The estimated effects for each industry, for each phase, are given in Table 6. These effects are listed for the sake of understanding the dynamics of industry transitions.

\*\*\*\*\* INSERT TABLE 6 HERE \*\*\*\*\*

Based on the estimated industry effects, in Table 7 we list the names of the 5 industries with the largest positive effects, and those of the 5 industries with the largest negative effects in each phase. The row below denotes the percentage of firms contributed by that industry to the overall number of firm-year observations in that time period. These facts enable us to track the different industry trajectories, and review importance of industries in different institutional regimes.

\*\*\*\*\* INSERT TABLE 7 HERE \*\*\*\*\*

Panel (A) of Table 7 provides the names of industries with the largest positive and negative effects, ranked in decreasing order, for each of the phases we study. In the command and control regime, the tobacco, brewing, pharmaceuticals, cement and machine tools industries have generated the largest positive effects. Collectively, these industries contribute almost 20 percent of the sample observations in that time period. Over time, their contributions have changed. The pharmaceuticals industry is a consistently positive industry effect generator, in all five phases, highlighting its importance for the Indian economy. The importance of the tobacco industry, used for excise tax revenue collection by the Government of India, disappears after liberalization. Social movements, against tobacco, has changed the organizational field and made the industry less relevant as a profit contributor in the later phases of our analyses.

After liberalization, in the financial and legal reforms phases, industries like industrial chemicals, automobile and ancillaries, and fertilizers and pesticides emerge as contributors of positive industry effects. The presence of these industries displays the overall transition of Indian industry from low value-added agricultural commodities processing to higher value-added

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2  
3 manufacturing and knowledge-based industries. By the legal reforms phase, the top five large  
4 positive effects industries contribute 31 percent of the sample observations we have studied for that  
5 time period. From an institutional theory perspective, the rise of these industries is explained by a  
6 need to develop industries that contribute to national development, and the emergence of industrial  
7 chemicals, automobile and ancillaries, and fertilizers and pesticides industries as key economic  
8 growth contributors support a national industrial development agenda.  
9

10  
11 Panel (B) of Table 7 provides the names of industries with the largest negative effects,  
12 ranked in decreasing order, for each of the phases we study. Collectively, the top 5 negative-effects-  
13 industries contribute 24 percent of the sample observations in the command and control time  
14 period. By the legal reforms time period, the industries contribute 16 percent of the sample  
15 observations in that time period. Over time, different industries' contributions change. We note that  
16 some interesting transitions occur. The leather industry, which had a top-five negative profit effect  
17 in the command and control and transition phases, has emerged to generate a positive profit effect,  
18 putting it in the top-five, by the liberalized phase. India possesses one of the largest global leather-  
19 goods industries. After liberalization, the leather industry is a major profitable exporter.  
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22 Conversely, based on the processing of agricultural items, the brewing and distilling industry  
23 has generated positive industry effects during the command and control and transition regimes. By  
24 the legal reforms regime, it has become a negative industry effects generator. This does not, in any  
25 way, occur because the Indian public has consumed less brewed and distilled products in per-capita  
26 terms, but because of the entry of numerous domestic and global competitors into a vibrant  
27 consumer products industry has made the industry more competitive. Hence, extreme market  
28 contestability, after liberalization, has led the brewing and distilling sector to generate large negative  
29 effects.  
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32 A market structure argument applies to the cement industry. It is an old-established industry  
33 in India. In the command and control phase, the industry is a top-5 positive profit effect generator.  
34 Cement has been a commodity in short supply, and the cement industry had several institutional and  
35 economic entry barriers erected around it. These would have led to the generation of almost-  
36 guaranteed profits and led to very positive profit effects. After liberalization, there has been a spate  
37 of entry in the sector, and the cement industry has generated negative industry effects in the  
38 transition and financial reforms phases, leading it to being in the top-5 negative industry effects  
39 generating category. Investment in capabilities ought to have negated the negative consequences of  
40 enhanced competition, but Indian cement firms have stuck to old technologies and experienced  
41 performance compromises. More recently, most domestic firms have been taken over by foreign  
42 purchasers and such a contingency might lead to the spillover of capabilities from foreign  
43 investment. This could lead to the re-emergence of positive profit effects, but that issue could be  
44 evaluated with more recent data.  
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48 Overall, these results support an institutional theory explanation for the changing nature of  
49 how different industries generate positive and negative profitability effects over phases of time, and  
50 the evidence generated highlight the emergence of the industries associated with a growing and  
51 rapidly-developing economy. They support the second stated proposition.  
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#### 54 *4.3 Assessment of Specific Business Group Performance Transitions*

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We carry out similar analysis for business groups, highlighting which ones remain consistently successful and ones which drop out of reckoning. We identify 61 business groups to classify our observations by. For these business groups, we estimate group effects. The specific group effects are calculated by subtracting the predicted random effect for non-group firms from the predicted random effects for each group firm. The details of random effects for each group firm, the non-group firms and the predicted group effects are given in table 8.

\*\*\*\*\* INSERT TABLE 8 HERE \*\*\*\*\*

Panel (A) of Table 9 lists the top 5 high performing groups in each phase. Other than in the transition period, the *TVS* group has been in a top performance position as a positive group effect generator. Panel (B) lists which groups have durable presence as positive group effects generators. These have been the *TVS* group, present in all 5 phases, the *Ramco* group, present in 4 phases, the *Bajaj* and *Tata* groups present in 3 phases, the *Aditya Birla* and *Wadia* groups present in 2 phases, and others business groups have appeared in one institutional phase each as a positive group effect generator.

The groups appearing in early phases, as beneficiaries of the command and control regime, have been the *Hinduja* and *K. K. Birla* groups. They disappear as profit contributors, since there has been a quantum change in the nature of business group activity after liberalization. The need to acquire scarce resources, based on managing government relationships has abated. The archetype of a merchant organizational form no longer defines what a business group does in India. Rather, the contemporary business group archetype is akin to that of a conglomerate with a central headquarters engaged in capabilities leverage tasks (Amsden, 1989). The groups to emerge as profit contributors after liberalization are the *Kalyani* and *Mahindra* groups, both with major automotive sector presences. Both have substantial global presences, and the *Kalyani* group companies include *Bharat Forge*, the world's largest manufacturers of automotive castings. The need to develop comprehensive global growth strategies, and manage complex global operations, now figures as key tasks for these emergent groups.

Some of the groups are very old. The *Wadia* group has been in business since the mid-18<sup>th</sup> century, as shipbuilders, including building frigates for the Royal Navy, and then as textile manufacturers, owning *Bombay Dyeing*. It now runs a foods business, *Britannia Biscuits*, an airline, *Go Air*, and an upscale property development business, *Bombay Realty*. Unlike other older business groups, the *Wadia* group has been able to orchestrate a quantum change in its logic for existence, as times and assumptions about business activities, have changed in India. Its archetype has changed from that of a merchant organizational form to that of a contemporary conglomerate. Overall, major transitions in their contributions to profitability performance, across Indian industry, have occurred among the various Indian business groups.

\*\*\*\*\* INSERT TABLE 9 HERE \*\*\*\*\*

*Depicting Group Dynamics:* A final analysis depicts the changing nature of group effects in India. We take 49 business groups for which data are present in the command and control and the legal reforms phases. For each of these, in figure 1, we depict the relative size of its group effect in the command and control and the legal reforms phases. The figure shows considerable gap in the group effects in the two phases evaluated. The continuous line shows the relative group effects for the command and control phase. The values range from 2.25 to 3.9. The dotted line shows the

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3 relative group effects for the legal reforms period. Now, the values range from 0.89 to 2.6. In the  
4 final legal reforms phase, estimated group effects are considerably smaller, as the vertical distance  
5 between the two data plots shows. Groups comprise of firms. As the institutional environment  
6 changes, these changes impact the behavior of firms as well as that of the group, since groups are an  
7 organizational form with social components, if not legal ones.  
8  
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10 Our findings also tie in with the literature highlighting resource misallocation in Indian  
11 industry (Hsieh and Klenow, 2009). Particularly for business groups, excess capacity is a reason for  
12 such misallocation, and liberalization has then resulted in a lowering of profitability for such groups  
13 (Ghemawat and Khanna, 1998; Chacar and Vissa, 2005).<sup>13</sup> The substantial difference in estimated  
14 group effects, over time, highlights changing aspects of firm and group behavior, in India, and in the  
15 transition dynamics of effects that explain profitability variances. These data also support the third  
16 proposition.  
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19 \*\*\*\*\* INSERT FIGURE 1 HERE \*\*\*\*\*  
20

## 21 5. Discussion

22

23 This research is a sequel to prior work (Majumdar and Bhattacharjee, 2013). We analyze  
24 firms' profitability variances given the presence of inter-temporal institutional changes. We analyse  
25 the data deeper to understand transition patterns in the behavior of the various effects that influence  
26 profitability. The approach we have used has hitherto been not demonstrated. We considerably  
27 augment the profitability variance analysis literature in demonstrating additional ways to tease out  
28 insights on the dynamics of firm behavior and industry evolution. The approach permits assessment  
29 of the dynamic catching-up and falling-behind phenomenon of firms as industries evolve.  
30  
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32 Inter-temporally, we find firm effects' influence rising, falling and rising again, in their  
33 economic significance as explanatory factors of profitability variances, as institutional forces change  
34 economic conditions. The analyses of firms' profit transitions show movement of firms from low to  
35 high performance categories, and vice-versa. There is greater movement from the low to high  
36 performance category, suggesting catch-up in profitability performance by firms. As markets  
37 dominate resource allocation, the role of endogenous competencies, as captured by the firm effects,  
38 drive profitability variance transitions, permitting firms to catch-up in performance. The  
39 simultaneous occurrence of falling-behind by other firms denotes the existence of substantial  
40 heterogeneity in firms' endogenous capability distribution.  
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43 From analyses we have carried out of specific industries, we observe heterogeneity in the  
44 performance dynamics of specific industries. Generically, industry effects may matter, but which  
45 industries matter more, and when, are important questions to assess. These issues have so far  
46 remained relatively unexplored in the analysis of profitability variances literature. The fine-grained  
47 analyses of specific industries show that once highly-positive profit-impacting industries no longer  
48 remain so after institutional transition has occurred. Other industries emerge to have a highly-  
49 positive profit impact after the institutional changes occur. Our specific tracking of industries  
50 provides a template for researchers to delve into the black box of how exactly firm, industry and  
51 other effects' influence profitability variances. Thereby, interpretations of movements in the key  
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56 <sup>13</sup> We are grateful to a referee for highlighting this important implication to us.  
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3 effects explaining profitability variances over time can be developed. This will permit advance in our  
4 systematic understanding of the structure of real economies.  
5

6  
7 Business group effects also matter in explaining the profitability variances of firms. Again,  
8 generically, while group effects matter, which groups matter more, and when, are important  
9 questions shedding light on entrepreneurial dynamics in India, and elsewhere. In India, business  
10 group formation has occurred because of close political ties of business leaders with politicians. The  
11 groups phenomenon in India reflect their emergence in a control era for not handling economic  
12 problems, per-se, but for mobilizing resources via entrepreneurs' abilities to exploit ties and alliances  
13 (Das, 2002). The transition of specific groups, from a highly-positive profit-impacting category to  
14 having no impact, reflects the dissipation of control regime capabilities of resource appropriation,  
15 rent-seeking and politician management.  
16

17  
18 Conversely, the appearance of new groups in the highly-positive profit-impacting category  
19 reflects a change in the nature of Indian business groups. The tasks of business group offices, in a  
20 free-market economy, such as intra-business resource allocation, and the leverage of corporate  
21 capabilities, is reflected in a highly-positive profit-impact for the business group variable. The  
22 carrying out of such tasks at the group level will also have led to the emergence of many subsidiaries  
23 of these business groups, such as *Kalyani* and *Mahindra*, as globally-important business entities, and  
24 the disappearance of control economy business groups such as *Hinduja* and *K. K. Birla*. Again, the  
25 specific tracking by groups, as shown by evaluating inter-group variability in effects over time,  
26 provides a means for researchers to dig deeper to understand their changing nature, and how  
27 business group structures affect profitability variance transition dynamics. These analyses enable  
28 nuanced interpretations of the sources of profitability variances.  
29  
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## 31 **6. Conclusion**

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33  
34 Based on a large dataset of Indian firms, aggregating to 37,462 observations, and spanning  
35 the twenty-six year period between 1980-81 and 2005-06, we first determine the relative magnitudes  
36 of the firm, industry and business group effects in explaining manufacturing firms' profitability  
37 variances across different institutional phases. Then, we use these results to conduct in-depth  
38 analyses, of transition dynamics between phases, to understand the nature of firm profitability  
39 changes and determine the quantum of performance catch-up or falling behind by firms. We  
40 establish that different industries emerge as profitability leaders, as the economy progresses through  
41 different liberalization phases. We establish that business groups more effective in resource  
42 appropriation, rent-seeking, politician management and non-market activities in a controlled regime  
43 have been replaced as profit leaders by those that, in a competitive free-market economy, can be  
44 capable of intra-business resource allocation tasks and the leveraging of corporate capabilities.  
45  
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47  
48 The results help in an understanding, in a considerably deeper manner, of how institutional  
49 changes lead to industrial transformation in emerging economies. The evidence-based approach  
50 demonstrated takes the profitability variance analysis literature forward by highlighting the nature  
51 and patterns of transitions in industrial performance, for firms, industries and business groups, and  
52 in suggesting what factors matter, when and why, in influencing organizational performance. Our  
53 analysis leads to questions relating to the nature of the effect of competition on firm behavior, and  
54 also to the precise micro firm, industry and group characteristics that may affect intertemporal  
55 profitability transitions. Subsequent investigations of these issues are retained for future research.  
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Table 1: Statistics of Profitability Distribution in Various Industries

Industry	1980-81				1990-91				2005-06				Type of Skewness Change
	Mean	Standard deviation	Coefficient of Variation	Skewness	Mean	Standard deviation	Coefficient of Variation	Skewness	Mean	Standard deviation	Coefficient of Variation	Skewness	
Sugar	4.34	12.96	2.99	-0.44	0.42	5.94	14.26	-1.04	7.96	6.79	0.85	1.12	1
Food, oils, fats	3.95	6.79	1.72	1.12	1.47	14.87	10.14	-4.04	3.28	21.94	6.69	0.81	5
Tobacco	19.03	32.79	1.72	2.00	12.76	6.69	0.52	-0.22	5.92	4.28	0.72	0.07	5
Cotton Textiles	3.79	8.21	2.17	-1.46	3.92	12.80	3.27	-0.43	5.28	21.30	4.03	1.98	1
Rayon and silk	4.95	5.24	1.06	1.06	5.01	15.16	3.02	4.01	0.95	20.33	21.47	-0.84	2
Jute Textiles	3.97	11.76	2.96	-0.92	-6.05	17.40	-2.87	-1.25	3.84	3.59	0.93	1.19	1
Mixed Textiles	-1.83	14.02	-7.65	-2.28	0.41	16.37	40.24	-1.88	3.33	18.03	5.42	1.09	1
Leather	-2.22	2.59	-1.17	-0.14	5.85	16.71	2.86	-0.35	1.30	12.45	9.56	-1.01	3
Brewing and Distilling	3.80	5.90	1.55	-0.54	1.66	4.88	2.94	-0.47	0.88	32.53	37.06	-0.51	3
Metals	-0.79	8.35	-10.59	-1.59	-6.83	21.32	-3.12	-1.86	4.78	14.71	3.08	-0.82	3
Metal products	3.85	12.90	3.35	-1.39	0.34	13.40	39.85	-0.27	6.84	18.81	2.75	2.48	1
Automobiles	4.50	9.28	2.06	-3.19	0.85	13.24	15.56	-2.93	7.94	10.96	1.38	6.39	1
Transport Equipment	7.22	19.24	2.66	2.73	5.55	4.34	0.78	0.67	4.60	10.34	2.25	-1.14	2
Electrical goods	4.75	8.57	1.80	-2.95	0.50	11.77	23.46	-1.90	3.76	18.53	4.93	-0.89	1
Machine tools	3.74	8.23	2.20	-0.91	3.51	7.85	2.24	-2.87	5.82	20.43	3.51	-1.36	3
Fertilizers and Pesticides	4.14	6.27	1.51	-0.59	3.45	7.48	2.17	-0.17	4.97	8.16	1.64	-1.08	3
Pharmaceuticals	2.71	8.68	3.21	-2.35	4.70	9.27	1.97	-0.15	4.57	16.53	3.62	-0.86	3
Dyes	2.79	8.21	2.94	-1.17	3.25	5.54	1.70	-0.88	-6.85	27.89	-4.07	-2.96	3
Paints	2.38	2.91	1.22	0.00	0.16	8.83	56.11	-2.83	-2.29	31.92	-13.92	-2.46	3
Plastic	1.86	5.68	3.06	-1.26	3.17	7.71	2.43	-0.28	6.97	19.27	2.77	3.92	1
Industrial Chemicals	4.60	8.31	1.81	-1.34	2.17	13.49	6.21	-2.26	5.35	15.47	2.89	0.77	1
Cement	1.17	8.25	7.07	-0.90	-0.05	13.32	-249.13	-1.29	1.23	18.90	15.41	-3.92	3
Glass, Ceramics	4.64	15.15	3.27	-2.46	-2.44	16.29	-6.67	-1.98	-2.55	26.41	-10.36	-2.82	3
Rubber products	3.15	12.47	3.96	-1.73	3.50	5.72	1.63	1.37	2.09	13.95	6.68	-0.92	4

Industry	1980-81				1990-91				2005-06				Type of Skewness Change
	Mean	Standard deviation	Coefficient of Variation	Skewness	Mean	Standard deviation	Coefficient of Variation	Skewness	Mean	Standard deviation	Coefficient of Variation	Skewness	
Plastic Products	3.94	8.85	2.25	-2.37	0.26	11.65	44.02	-1.43	-1.06	18.71	-17.69	-0.64	3
Paper and Pulp	3.04	8.49	2.79	-1.57	1.83	11.64	6.35	-2.10	4.17	9.41	2.26	2.16	1
Wood Products	0.98	6.54	6.66	-1.00	1.46	5.92	4.05	-0.48	2.35	3.47	1.47	-0.42	3
Diverse	6.71	3.45	0.51	0.41	3.33	4.48	1.35	-1.45	5.44	4.20	0.77	0.95	5
All Industries	3.83	10.42	2.72	-0.53	1.86	12.47	6.71	-1.41	4.00	18.09	4.52	-0.49	3



Table 2: Summary of Profitability Dispersion Patterns for the Various Industries

Type of Change in Skewness	Pattern of Change of Type of Skewness	Number of Industries	Names of Industries
1	From left-tailed and negative skewness in 1980-81 and 1990-91 to right-tailed and positive skewness by 2005-06	10	Sugar; cotton textiles; jute textiles; mixed textiles; metal products; automobiles; electrical goods; plastic; industrial chemicals; paper and pulp
2	From right-tailed and positive skewness in 1980-81 and 1990-91 to left-tailed and negative skewness by 2005-06	2	Rayon and silk; transport equipment
3	Left-tailed and negative skewness throughout	12	Leather; brewing and distilling; metals; machine tools; fertilizers and pesticides; pharmaceuticals; dyes; paints; cement; glass and ceramics; plastic products; wood products
4	From left-tailed and negative skewness in 1980-81 to right-tailed and positive skewness in 1990-91 and back to left-tailed and negative skewness in 2005-06	1	Rubber products
5	From right-tailed and positive skewness in 1980-81 to left-tailed and negative skewness in 1990-91 and to right-tailed and positive skewness in 2005-06	3	Foods, oils and fats; tobacco; diverse
3	Left-tailed and negative skewness throughout	28	Overall for all industries

**Table 3: Share of Profitability Variance Explained by Each Effect for all 37,642 Firm-Year Observations**

<b>Share of Variance Explained by each Component Expressed as Percentage of Total Variance</b>						
<b>Regime:</b>	<i>By Firm Effects</i>	<i>By Industry Effects</i>	<i>By Group Effects</i>	<i>By Year Effects</i>	<i>Unexplained Variance</i>	<i>Total Variance</i>
<b>Overall Period:</b>						
1980-81 to 2005-06	42.4	1.0	1.1	2.0	53.5	100
<b>Command and Control</b>						
1980-81 to 1984-85	47.6	4.8	1.6	4.1	41.9	100
<b>Transition</b>						
1985-86 to 1990-91	54.3	1.8	1.1	0.7	42.1	100
<b>Liberalized</b>						
1991-92 to 1995-96	53.5	3.1	0.6	0.6	42.2	100
<b>Financial Reforms</b>						
1996-97 to 2000-2001	51.8	1.6	1.2	0.9	44.5	100
<b>Legal Reforms</b>						
2001-02 to 2005-06	42.7	1.2	0.8	1.2	54.1	100

**Table 4: Details of Number of Firms and Patterns of Changes of Firm Profit Performance between Different Institutional Regimes**

<b>Part (I): Institutional Phase</b>		<b>Total number of firm-year observations</b>			
	<i>Command and Control</i>	6,462			
	<i>Transition</i>	9,034			
	<i>Liberalized</i>	7,076			
	<i>Financial Reforms</i>	7,119			
	<i>Legal Reforms</i>	7,951			
<b>Part (II): Data Type on Firm Level Performance Changes between Differing Institutional Regimes</b>					
<b>Row</b>	<b>Category</b>	Column	Column	Column	Column
		(A)	(B)	(C)	(D)
		<i>Command and Control Institutional Regime to Transition Institutional Regime</i>	<i>Transition Institutional Regime to Liberalized Institutional Regime</i>	<i>Liberalized Institutional Regime to Financial Reforms Institutional Regime</i>	<i>Financial Reforms Institutional Regime to Legal Reforms Institutional Regime</i>
1	Number of observations in the top performance quartile in one period and present in the data in the next period	1,214	1,133	1,139	999
2	Number of observations in the bottom performance quartile in one period and present in the data in the next period	1,796	1,765	1,471	1,428
3	Number of observations in the data in the top performance quartile in one period and present in the top performance quartile in the next period	832	780	689	746
4	Number of observations in the data in the bottom performance quartile in one period and present in the bottom performance quartile in the next period	656	597	564	506
5	Number of observations in the data in the bottom performance quartile in one period and present in the top performance quartile in the next period	126	201	119	196

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6	Number of observations in the data in the top performance quartile in one period and present in the bottom performance quartile in the next period	176	198	129	128
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**Table 5: Details of Statistics Showing Patterns of Changes of Firm Profit Performance between Different Institutional Regimes**

		Column (A)	Column (B)	Column (C)	Column (D)
<b>Panel (A): Regimes and Firm Performance Change Patterns</b>					
Row	Regime Transition	<i>Percentage of Observations in Bottom Performance Quartile in One Period as well as in the Next Period</i>	<i>Percentage of Observations in Top Performance Quartile in One Period as well as in the Next Period</i>	<i>Percentage of Observations in Bottom Performance Quartile in Next Period</i>	<i>Percentage of Observations in Top Performance Quartile in One Period and Bottom Performance Quartile in Next Period</i>
1	Command and Control to Transition Phases	54.0	46.3	10.4	9.8
2	Transition to Liberalized Phases	52.7	44.2	17.7	11.2
3	Liberalized to Financial Reforms Phases	49.5	46.8	10.4	8.8
4	Financial to Legal Reforms Phases	50.7	52.2	19.6	9.0
<b>Panel (B): <math>p</math> Values of Statistical Tests of Second Order Inter-Temporal Transitions of Performance Changes between One Institutional Regime and Another Institutional Regime</b>					
1	Between Command and Control Phases to Transition and Transition to Liberalized Phases	0.514	0.201	0.000***	0.168
2	Between Transition to Liberalized Phases and Liberalized to Financial Reforms Phases	0.130	0.132	0.000***	0.020***
3	Between Liberalized to Financial Reforms Phases and Financial Reforms to Legal Reforms Phases	0.601	0.004***	0.000***	0.854

\*\*\* Significant at  $p < 0.05$



**Table 6: Industry Effects by Industry for each Institutional Regime**

<i>Industry</i>	<b>Period</b>				
	<i>Command and Control</i>	<i>Transition</i>	<i>Liberalized</i>	<i>Financial Reforms</i>	<i>Legal Reforms</i>
Sugar	-0.840	1.461	-0.258	-0.157	0.741
Foods and Oils	0.659	0.565	0.915	0.621	0.642
Tobacco	5.194	1.510	1.848	0.851	1.203
Cotton Textiles	-2.850	-0.547	-3.358	-4.294	-1.595
Rayon and Silk	0.082	0.403	-0.076	-2.099	-2.873
Jute Textiles	-4.957	-3.601	-5.283	0.350	-0.292
Mixed Textiles	-3.635	0.200	0.314	-0.953	-1.113
Leather	-5.088	-1.717	1.723	-0.380	0.289
Brewing and Distilling	3.178	1.332	-0.521	0.541	-1.682
Metals	-1.349	-0.800	1.555	-0.561	0.299
Metal Products	0.479	-0.003	-1.305	-1.323	0.527
Automobiles and Ancillaries	1.141	0.513	0.550	1.635	2.694
Transport Equipment	0.570	0.671	0.525	0.421	0.538
Electric Goods	1.101	-0.109	0.212	0.081	0.460
Machine Tools	1.708	1.000	1.308	1.398	1.670
Fertilizers and Pesticides	1.308	0.627	-2.402	1.089	1.348
Pharmaceuticals	2.299	2.367	2.378	2.857	1.320
Dyes	-1.960	-0.478	-0.778	-0.892	-1.324
Paints	0.246	-0.150	0.887	0.818	-0.854
Plastic	-0.991	0.220	0.513	0.964	0.282
Industrial Chemicals	0.895	0.913	2.020	1.523	1.659
Cement	1.852	-1.949	-0.405	-1.989	-0.827
Glass and Ceramics	1.013	-0.884	-0.643	-0.172	-1.073
Rubber Products	0.896	1.120	-0.149	0.443	0.244
Plastic Products	1.487	-0.724	-1.075	-1.883	-2.279
Paper and Pulp	-2.119	-1.799	0.575	-0.349	0.081
Wood Products	-0.318	-0.141	0.744	0.609	-0.351
Diverse	0.000	0.000	0.188	0.848	0.265

**Table 7: Details Showing Changes in Importance of Different Industries with Positive and Negative Industry Effects Across Different Institutional Regimes**

<b>Panel (A): Name of Industries with Positive Industry Effects Ranked in Decreasing Order</b>						
	<b>Rank</b>					
	<b>First</b>	<b>Second</b>	<b>Third</b>	<b>Fourth</b>	<b>Fifth</b>	<b>Percentage of Total Observations</b>
<b>Command and Control Regime</b>	<i>Tobacco</i>	<i>Brewing and Distilling</i>	<i>Pharmaceuticals</i>	<i>Cement</i>	<i>Machine Tools</i>	19.77
<b>Transition Regime</b>	<i>Pharmaceuticals</i>	<i>Tobacco</i>	<i>Sugar</i>	<i>Brewing and Distilling</i>	<i>Rubber Products</i>	11.24
<b>Liberalized Regime</b>	<i>Pharmaceuticals</i>	<i>Industrial Chemicals</i>	<i>Tobacco</i>	<i>Leather</i>	<i>Metals</i>	18.08
<b>Financial Reforms Regime</b>	<i>Pharmaceuticals</i>	<i>Automobiles and Ancillaries</i>	<i>Industrial Chemicals</i>	<i>Machine Tools</i>	<i>Fertilizers and Pesticides</i>	31.13
<b>Legal Reforms Regime</b>	<i>Automobiles and Ancillaries</i>	<i>Machine Tools</i>	<i>Industrial Chemicals</i>	<i>Fertilizers and Pesticides</i>	<i>Pharmaceuticals</i>	30.84
<b>Panel (B): Name of Industries with Negative Industry Effects Ranked in Decreasing Order</b>						
<b>Command and Control Regime</b>	<i>Paper and Pulp</i>	<i>Cotton Textiles</i>	<i>Mixed Textiles</i>	<i>Jute Textiles</i>	<i>Leather</i>	24.23
<b>Transition Regime</b>	<i>Glass and Ceramics</i>	<i>Leather</i>	<i>Paper and Pulp</i>	<i>Cement</i>	<i>Jute Textiles</i>	11.59
<b>Liberalized Regime</b>	<i>Plastic Products</i>	<i>Metal Products</i>	<i>Fertilizers and Pesticides</i>	<i>Cotton Textiles</i>	<i>Jute Textiles</i>	26.26
<b>Financial Reforms Regime</b>	<i>Metal Products</i>	<i>Plastic Products</i>	<i>Cement</i>	<i>Rayon and Silk</i>	<i>Cotton Textiles</i>	26.14
<b>Legal Reforms Regime</b>	<i>Dyes</i>	<i>Cotton Textiles</i>	<i>Brewing and Distilling</i>	<i>Plastic Products</i>	<i>Rayon and Silk</i>	15.99

Table 8: Predicted Random Effects and Specific Effects for each Group during each Institutional Regime

	Command and Control		Transition		Liberalized		Financial Reforms		Legal Reforms	
	Group Effects	Random Effects	Group Effects	Random Effects	Group Effects	Random Effects	Group Effects	Random Effects	Group Effects	Random Effects
<i>Apollo</i>	2.249	-0.749	1.747	-0.366	0.820	-0.397	2.673	0.013	1.725	0.027
<i>Amalgamations</i>	2.985	-0.012	2.355	0.242	1.391	0.174	2.910	0.250	0.894	-0.804
<i>Bajaj</i>	3.599	0.602	2.420	0.307	1.447	0.230	3.021	0.361	1.812	0.114
<i>Bhilwara</i>	3.213	0.215	2.192	0.079	1.330	0.113	2.870	0.210	1.772	0.074
<i>Birla, C. K.</i>	3.203	0.206	2.216	0.103	1.177	-0.040	2.490	-0.170	1.587	-0.112
<i>Birla, K. K.</i>	3.248	0.250	2.424	0.311	1.334	0.117	2.645	-0.015	1.422	-0.276
<i>Birla, Aditya</i>	3.304	0.307	2.078	-0.035	1.227	0.010	3.371	0.711	1.998	0.300
<i>Birla, M. P.</i>	3.024	0.026	2.204	0.091	1.284	0.067	2.692	0.032	1.660	-0.039
<i>Birla, S. K.</i>	3.089	0.092	2.094	-0.020	1.152	-0.065	2.435	-0.225	1.519	-0.180
<i>BPL</i>			2.041	-0.072	0.980	-0.237	2.606	-0.053	1.327	-0.371
<i>Chhabria</i>	2.370	-0.627	1.803	-0.310	1.121	-0.096	2.560	-0.099	2.015	0.317
<i>Chidambaram</i>	3.281	0.284	2.198	0.085	1.187	-0.030	2.572	-0.088	1.644	-0.054
<i>Dalmia</i>	2.985	-0.013	2.084	-0.029	1.266	0.050	2.728	0.068	1.724	0.026
<i>Doshi, V.</i>	3.069	0.071	2.105	-0.008	1.087	-0.130	2.673	0.013	1.732	0.034
<i>Dr. Reddy's</i>			2.112	-0.001			2.700	0.041	1.745	0.047
<i>Escorts</i>	3.282	0.284	2.310	0.197	1.318	0.101	2.930	0.270	1.448	-0.251
<i>Essar</i>					1.238	0.021	2.582	-0.078	1.637	-0.061
<i>Finolex</i>	3.042	0.044	2.372	0.259	1.316	0.099	2.833	0.173	1.802	0.104
<i>Godrej</i>	3.052	0.054	2.118	0.005	1.223	0.006	2.647	-0.013	2.049	0.351
<i>Goenka, G. P.</i>	2.721	-0.277	2.082	-0.031	1.187	-0.030	2.065	-0.595	1.624	-0.074
<i>Goenka, R. P.</i>	2.699	-0.299	1.741	-0.372	1.015	-0.202	2.999	0.339	1.235	-0.463
<i>Hero</i>	3.445	0.447	2.375	0.262	1.446	0.229	3.196	0.536	2.306	0.608
<i>Hindustia</i>	3.414	0.417	2.126	0.013	1.231	0.015	2.764	0.104	1.824	0.125
<i>Indo Rama</i>									1.761	0.063
<i>Ispat</i>	2.812	-0.185	2.126	0.013	1.271	0.054	2.572	-0.088	1.592	-0.106
<i>Jaypee</i>	2.468	-0.530			1.247	0.030	2.684	0.024		
<i>Jindal, O. P.</i>	2.974	-0.023	2.253	0.140	1.205	-0.012	2.677	0.017	1.690	-0.008
<i>Kalyani</i>	3.129	0.132	2.267	0.154	1.148	-0.069	2.831	0.171	1.909	0.211

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3	<i>Kirloskar</i>	2.761	-0.237	2.234	0.121	1.109	-0.108	2.288	-0.372	1.654	-0.044
4	<i>Lalbbhai</i>	3.436	0.438	2.241	0.128	1.305	0.088	2.476	-0.184	1.812	0.114
5	<i>Lloyds</i>			2.127	0.014	1.231	0.014	2.535	-0.125	1.602	-0.097
6	<i>Mafatlal</i>	2.839	-0.159	1.746	-0.367	1.288	0.071	2.602	-0.058	1.484	-0.214
7	<i>Mahindra</i>	2.987	-0.010	2.190	0.077	1.138	-0.079	3.095	0.436	1.862	0.163
8	<i>Modern</i>	3.094	0.096	2.049	-0.064	1.319	0.102	1.900	-0.760	1.842	0.143
9	<i>Modi, V. K.</i>	2.784	-0.213	1.430	-0.683	0.978	-0.239	2.451	-0.208	1.933	0.235
10	<i>Murugappa</i>	3.034	0.037	2.213	0.100	1.244	0.027	2.761	0.101	1.919	0.220
11	<i>Nagarjuna</i>			1.941	-0.172	1.291	0.074	2.695	0.035		
12	<i>Nabar</i>	2.986	-0.011	2.401	0.288	1.359	0.142	2.585	-0.075	1.735	0.037
13	<i>Oswal Agro</i>			2.213	0.100	1.193	-0.024	2.587	-0.073	1.549	-0.149
14	<i>Piramal, Ajay</i>	3.078	0.081	2.420	0.307	1.335	0.118	2.741	0.081	1.581	-0.117
15	<i>Ramco</i>	3.512	0.515	2.790	0.677	1.489	0.272	3.223	0.563	1.854	0.156
16	<i>Ranbaxy</i>	3.023	0.026	2.109	-0.004	1.253	0.036	2.726	0.067	1.804	0.106
17	<i>Reliance</i>	3.200	0.203	2.163	0.050	1.240	0.023	2.730	0.070	1.758	0.060
18	<i>Ruchi Shabara</i>			2.181	0.068	1.260	0.043	2.666	0.006	1.615	-0.084
19	<i>Shriram, Lala</i>	2.670	-0.327	2.073	-0.040	1.026	-0.191	2.222	-0.438	1.950	0.252
20	<i>Singhania, H.</i>	2.875	-0.122	1.468	-0.645	1.159	-0.058	2.638	-0.022	1.653	-0.045
21	<i>Singhania, V.</i>	3.197	0.199	2.186	0.073	1.225	0.008	2.779	0.119	1.791	0.093
22	<i>SRF</i>	2.950	-0.048	1.541	-0.572	1.040	-0.177	2.500	-0.160	1.601	-0.097
23	<i>Tata</i>	2.967	-0.031	2.975	0.862	1.403	0.187	2.738	0.078	2.226	0.528
24	<i>Thapar, L. M.</i>	2.646	-0.352	2.122	0.009	1.318	0.101	2.569	-0.091	1.788	0.090
25	<i>Thapar, M. M.</i>	3.147	0.150	2.064	-0.049	1.218	0.001	2.467	-0.193	1.253	-0.445
26	<i>Torrent</i>	2.979	-0.019	1.927	-0.186	1.217	0.000	2.548	-0.112	2.000	0.302
27	<i>TVS</i>	3.889	0.892	2.528	0.415	1.708	0.491	3.839	1.179	2.642	0.943
28	<i>Mallya</i>	3.117	0.119	1.989	-0.124	1.096	-0.121	2.844	0.185	1.538	-0.161
29	<i>Usba Rai</i>	3.113	0.116	2.141	0.028	1.269	0.052	2.735	0.075		
30	<i>Usba Martin</i>	2.997	0.000	2.107	-0.006	1.257	0.040	2.663	0.003	1.679	-0.019
31	<i>Vardhaman</i>	3.340	0.342	2.399	0.286	1.378	0.161	3.147	0.487	1.810	0.112
32	<i>Videocon</i>							2.658	-0.002	1.699	0.001
33	<i>Wadia</i>	3.338	0.341	2.493	0.380	1.390	0.173	2.803	0.144	2.014	0.316
34	<i>Wipro</i>	3.232	0.234	2.244	0.131	1.233	0.016	2.709	0.049		
35	<i>Khaitan</i>	3.019	0.021	2.009	-0.104	1.182	-0.035	2.606	-0.054	1.397	-0.302
36	<i>Non-group firms</i>	0.000	-2.997	0.000	-2.113	0.000	-1.217	0.000	-2.660	0.000	-1.698
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**Table 9: Details Showing Changes in Importance of Different Business Groups between Different Institutional Regimes**

<b>Panel (A): Names of Groups Occupying the First Five Positions in Each Regime</b>					
	<b>Command and Control</b>	<b>Transition</b>	<b>Liberalized</b>	<b>Financial Reforms</b>	<b>Legal Reforms</b>
First Position	<i>TVS</i>	<i>Tata</i>	<i>TVS</i>	<i>TVS</i>	<i>TVS</i>
Second Position	<i>Bajaj</i>	<i>Ramco</i>	<i>Ramco</i>	<i>Aditya Birla</i>	<i>Tata</i>
Third Position	<i>Ramco</i>	<i>TVS</i>	<i>Bajaj</i>	<i>Ramco</i>	<i>Wadia</i>
Fourth Position	<i>Lalbbhai</i>	<i>Wadia</i>	<i>Tata</i>	<i>Mahindra</i>	<i>Aditya Birla</i>
Fifth Position	<i>Hinduja</i>	<i>K. K. Birla</i>	<i>Amalgamations</i>	<i>Bajaj</i>	<i>Kalyani</i>
<b>Panel (B): Stability of Appearance in Each Regime</b>					
Appears in all 5 Regimes	<i>TVS</i>				
Appears in 4 out of 5 Regimes	<i>Ramco</i>				
Appears in 3 out of 5 Regimes	<i>Bajaj; Tata</i>				
Appears in 2 out of 5 Regimes	<i>Aditya Birla; Wadia</i>				
Appears in 1 out of 5 Regimes	<i>Amalgamations; K. K. Birla; Hinduja; Kalyani; Lalbbhai; Mahindra</i>				



