

**Working with Your Hands: Essays on Craft
Occupations in India**

by

Aruna Ranganathan

B.Comm., University of British Columbia (2006)

M.S., Cornell University (2008)

S.M., Massachusetts Institute of Technology (2013)

Submitted to the Sloan School of Management
in partial fulfillment of the requirements for the degree of

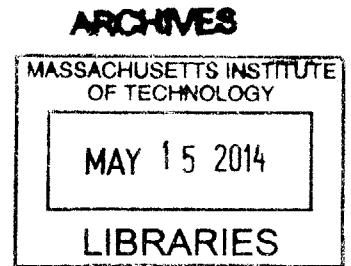
Doctor of Philosophy

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

June 2014

© Massachusetts Institute of Technology 2014. All rights reserved.



Signature redacted

Author Sloan School of Management

Signature redacted June 6, 2014

Certified by Paul Osterman
NTU Professor of Management

Signature redacted Thesis Co-Supervisor

Certified by ... Ezra Zuckerman
Professor of Strategic Management

Signature redacted Thesis Co-Supervisor

Accepted by .. Ezra Zuckerman
Chairman, Sloan PhD Committee

Working with Your Hands: Essays on Craft Occupations in India

by

Aruna Ranganathan

Submitted to the Sloan School of Management
on June 6, 2014, in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

Abstract

Essay 1 : Professionalization And Market Closure : The Case Of Plumbing In India

Professionalization has long been understood as a process of establishing market closure and monopoly control over work; however, in this article I present a case in which professionalization erodes rather than establishes occupational closure. I demonstrate how the Indian Plumbing Association (IPA), a newly formed organization of internationally trained plumbing contractors and consultants, has used the rhetoric and structures of professionalization to threaten pre-existing ethnicity-based closure enjoyed by traditional plumbers from the eastern state of Orissa. By employing a discourse of professionalism and by instituting codes, training, and certification programs, professionalization in this case has undermined Orissan plumbers by changing the basis of plumbing knowledge and opening entry to outsiders. I conclude by suggesting that professionalization is a modern trope that does not necessarily imply monopoly benefits and higher job quality for all members of an occupational group.

Essay 2 : The Price is Right? Ethnographic and Field-Experimental Evidence of Price-Setting from the Sale of Handicraft Products in Southern India

Scholars of economic sociology have shown that sellers often vary prices among different buyers for short-term monetary gains or long-term relational gains, but they have failed to consider how sellers' relationship with their products can affect their price-setting behavior even in the absence of such gains. This paper, by studying how artisans and traders in a wood and lacquerware cluster in India vary prices across buyers, demonstrates the importance of product attachment in understanding price discrimination. Drawing on a field audit study where trained buyers purchase identical products from artisans and traders, the paper documents that artisans often charge significantly lower prices to discerning buyers who are likely to care for

their products beyond the point of sale, even if these buyers are wealthy, in contrast to traders who price in accordance with buyers' willingness-to-pay. These findings are consistent with ethnographic evidence documenting artisans' and traders' varying attachment to their products as indicated by their investment in the products, meaning ascribed to the products and internal standards for the products. By introducing the idea of product attachment, this paper contributes to our understanding of price-setting and economic decision-making more broadly, while also offering a unique methodological model that combines experimental and ethnographic research.

Essay 3 : Export-Oriented Industrialization and Technological Frames of Government Officials, Workers and Capitalists: Evidence from a Mechanization Project in India

Export-oriented industrialization (EOI) is a common strategy for economic development in developing economies that can be achieved by increasing exports in large manufacturing sectors or smaller-scale, cluster-based industries. A key component of the EOI strategy, whether in the context of large- or small-scale production, is technological upgrading of manufacturing practices to facilitate exports and boost worker earnings. While the literature has recognized the salience of technological upgrading, it has focused predominantly on successful cases, thus overlooking problems in the implementation and adoption of such technology that could impede exports. In this paper, I draw on an ineffective export-driven mechanization initiative in a handicraft cluster in southern India to illustrate how key stakeholders might adopt incompatible "technological frames" in making sense of new technology, thus hindering the expansion of exports. I describe how government officials in this case viewed the technology brought into the sector through the frame of "status," workers perceived the technology using a "creative control" frame, whereas capitalists saw the same technology as being a source of "profits." These mismatched frames led to discordant actions by the stakeholders, resulting in limited adoption of the technology, weak exports and little improvements in worker earnings. By highlighting a key condition under which export-driven technology projects might fail, namely when key stakeholders' technological frames are misaligned, this paper draws important implications for the many developing economies using EOI as their primary industrialization strategy.

Thesis Committee

Paul Osterman, *NTU Professor of Management*

Susan Silbey, *Leon and Anne Goldberg Professor of Humanities, Sociology and Anthropology and Professor of Behavioral and Policy Sciences*

Tavneet Suri, *Maurice F. Strong Career Development Associate Professor*

Ezra Zuckerman, *Professor of Strategic Management*

Acknowledgments

I had the best dissertation committee that one could ask for! Without a doubt, this thesis is the product of my committee's significant investment in me. Each one of my committee members has been so generous with their time and has always been so prompt in responding to my emails. I have never had to wait more than a day or two to meet with any of my advisors to get feedback on work-in-progress and in fact, every time I emailed my committee, I heard back from all four of my advisors within a few hours! Even when I was conducting fieldwork in India, I received detailed responses to my memos via email, phone and Skype, and never did I feel unsupported or far away from MIT. There have also been times when I've been pushed in different directions (I particularly remember feeling completely lost after my first committee meeting in the Fall of 2011) but looking back, I honestly believe that my dissertation has benefited as much from dissenting opinions as from their agreement.

Susan Silbey, in addition to being an incredible advisor, made me feel like I had a home away from home. As an advisor, Susan pushed me to be creative and think "big" when I was studying for generals, she meticulously noted every single comment that was made when I presented for the first time at IWER, she taught me to focus on concrete examples in doing qualitative fieldwork (a technique I'm trying to apply to writing these acknowledgments as well!) and she patiently supported me through more than ten grant proposals until we finally got funding from MISTI for my dissertation. Susan has looked out for me, in a way that I didn't know was possible in academic settings. When I ran out of funding, Susan reshuffled her own accounts to make sure that I was financially supported. When Susan didn't see me in E62 for over a week, she emailed me, worried, to make sure that I was alright. Just recently, Susan read a book that she thought I would enjoy and a few days later, she had purchased a copy of the book for me. Susan has advised me on all matters from research design to what I should wear when I'm on the job market to navigating difficult social situations. She has invited me to her home on many occasions and welcomed me into her family. In fact, one of my favorite memories in all my 6 years at MIT is playing

charades with Susan and her family at Thanksgiving. Thank you, Susan, for your professional and personal support that has helped me grow as a person and a scholar through this Phd program.

I thank Paul Osterman for supporting my fledgling research ideas, during my early years as a Phd student, when I was unsure of myself. While several people were quick to point out that the study of low-income, informal sector occupations had no place in a business school, Paul encouraged me to follow my interests and was always willing to give me feedback on memos and talk about my research questions. Had I not received this kind of unwavering support, I might have been swayed into research domains that I find less interesting than the questions that this thesis explores. Paul has also been instrumental in building my confidence as a scholar over the years. When I presented for the very first time to the MIT community at the ESWG, I distinctly remember Paul making a joke a few minutes into my presentation to lighten the mood and ease my nerves. A couple of years later, when Paul and I attended the ILRR conference together in Ithaca, after I presented my plumbing paper, Paul sent me three separate emails, all in the span of two minutes, commending me on my presentation. I still remember beaming with joy when I saw those emails. Over the years, I have learned to be comfortable in my own skin, and I owe this to Paul.

Ezra Zuckerman is, first and foremost, a fantastic teacher. When I first came to MIT, I was convinced that I would be drawing on economic theory to pursue my research questions and so, I busied myself in taking microeconomics and econometrics. However, taking Organizations and Environments, and later, Sociology of Strategy, with Ezra forced me to reconsider my original plan. Ezra has the unique ability of making connections between seemingly unrelated papers in a way that always left me with fresh insights at the end of each class and eventually put me on an “econ soc” track. I am particularly grateful to Ezra for helping me write (and rewrite) my job market paper. Ezra met with me, week after week, for almost a year as I wrote each section of my paper. We spent almost two months on the introduction alone, which drastically improved the paper but also helped me learn different rhetorical tools that can be used in writing. Ezra was so invested in me and the paper, that when it got

rejected by a journal, he was just as (if not more!) upset as me. I remember thinking, as Ezra and I had lunch together the next day going over the reviewers' comments, whether I would ever be such a compassionate advisor that my student's loss would feel like my own. Ezra was also incredibly proactive through the job market process, making introductions to professors at several schools, so that my schedules at ASA and AoM were packed with meetings – I know that some of these meetings translated into job talk invitations and finally, offers, and for this, I am extremely grateful.

The final member of my committee is Tavneet Suri. Tavneet rocks! Her open door policy was very refreshing and I often found myself in her office on evenings and weekends asking what, to her, were probably “dumb” questions. From the time that Roberto Fernandez first introduced me to Tavneet in my third year, she has been nothing but supportive. Tavneet brought me up to speed on several field experiment basics like power calculations, randomization code and balance checks. She was also instrumental in helping me get and maintain COUHES approval for my project. When I was doing fieldwork for my dissertation, Tavneet was supportive through the early months when I proposed a new research project every couple of weeks, and after I narrowed down a particular phenomenon to study, Tavneet quickly got to work in helping me plan the logistics of my experiment. I could never have done the experiment without her – I had no clue about how much to pay my field staff, how to design the survey, where to do the pilot and many, many other details that Tavneet patiently walked me through. Once I was back with my data, Tavneet introduced me to L^AT_EX(thank you!) and also taught me how to put together (beautiful) tables and figures that would, on their own, be able to convey the entire story of my paper. I will especially cherish Tavneet's email to me in the midst of the AOM meetings in Orlando, offering her cell phone number in case I wanted to vent about any of my interviews.

Beyond my committee, there are many professors at MIT who have been just as supportive through these six years. I've often told new admits into our program that it's difficult to put together a formal committee at MIT because so many faculty members are involved in your work! In particular, I would like to thank Emilio Castilla

for the opportunity to work with him – it’s been a wonderful learning experience! I would also like to thank Roberto Fernandez, Tom Kochan, Kate Kellogg, Evan Apfelbaum, Ray Reagans, Ofer Sharone, Cat Turco, Lotte Bailyn, Joanne Yates and Bob McKersie. Additionally, I am deeply grateful to Hillary Ross for helping me to keep track of various deadlines, for organizing Fridays at 4, and most importantly, for being warm and kind!

Apart from faculty support, peer support is a key asset of our Phd program. I am even more appreciative of our strong student community after visiting other schools during the job market and realizing that what we have is, in fact, quite rare. Mabel and Julia, I am SO glad that I went through the program at the same time as both of you! We have supported each other emotionally and professionally through the years and I hope this never goes away. Over the last few years, Sloan has acquired a fantastic group of female graduate students and it’s been a blast hanging out with all of you – thank you Maite, Ceci, Christine, Ozge, Maja, Sam, Rebecca, Hye Jin and Yuly! I’ve had great officemates through the years – thank you Ben, Helen, Stella, Santiago, Dan and Matt. And I was lucky to be able to tap into the wisdom of several senior graduate students who were honest in their advice – thank you JP, Ruthanne, Seth, Michael, Alan and Hiram.

But most of all, I will forever be grateful to the Sloan Phd program for introducing me to my partner, Abhishek. Years 4 through 6 of my Phd were significantly more fun than Years 1 through 3, thanks to him! I vividly remember Abhishek patiently listening to me describe the craft of block printing in Rajasthan as we walked along the Charles late one night in July 2011. It must have been our third or fourth date, and I had just returned from my first round of fieldwork in the handicrafts sector. Little did we know that this would turn into a successful dissertation project at the time, but it’s been special to share every stage of the process, both the victories and the failures, with someone who intimately understands the nature of research. I know that I have learned much more from our daily conversations than I can describe in words. Thank you for being patient when I had to travel to India and for visiting me in the midst of my fieldwork. This dissertation has benefited tremendously from the

conversation that we had after dinner one night in Bangalore about what the thesis and Phd meant to me – I remember saying that the most important thing, for me, was to be personally satisfied with my thesis and today, thanks to your unconditional love and support, I can say that I am indeed proud of this dissertation!

Outside of Sloan, several friends kept me sane and grounded. Anna, thank you for taking care of me during generals and for the awesome shopping trips! Anuja, you were my first friend (and roommate) at MIT and have constantly reminded me that there is light at the end of the tunnel. Murali, I'll never forget the Calvin and Hobbes book that you gifted me when we fought about something I can't even remember now. Sinker, Karthik and Krupa, thanks for home-made food! AT and Poorna, thank you for those long nights playing Puerto Rico and Settlers of Catan!

Finally, I would not have been at MIT without the constant encouragement of my parents. I remember the day when I first told them that I was going to apply to a Phd program at MIT – not once did they question my decision or dissuade me from this career path. On the contrary, they believed in me and my abilities even when I had my doubts. Despite being so far away, my parents have been beside me through every step of the journey and I thank them for that. They constantly reminded me to do my best and forgo attachment to external rewards. I especially enjoyed my dissertation fieldwork because it meant that I got to spend more time at home than I have in the past 10 years. Having my brother and sister-in-law close by in Stamford, CT also made my years at MIT more comfortable as I could escape Boston easily whenever I needed a break.

While all of these wonderful people have contributed to the manuscript you have in front of you, I dedicate this thesis to Zuko, my adorable 6-month year old nephew, who has brought us all much joy.

Contents

1 Professionalization And Market Closure:

The Case Of Plumbing In India	15
1.1 Introduction	16
1.2 Theory	19
1.3 Research Methods	23
1.4 Data	26
1.4.1 Orissan Plumbers	26
1.4.2 Modern Plumbing Sector	30
1.4.3 Indian Plumbing Association (IPA) and Professionalization . .	34
1.4.4 Distinguishing the Traditional and Modern Plumbing Sectors	40
1.5 Findings	42
1.5.1 Professionalization Erodes Closure	42
1.5.2 Mechanisms	44
1.5.3 Conditions for Success of Professionalization	47
1.6 Discussion	48
1.6.1 Contributions of This Study	48
1.6.2 Limitation: Evaluating Quality of Plumbing	50
1.6.3 Implications for Policy	51
1.7 Figures and Tables	53

2 The Price is Right?

Ethnographic and Field-Experimental Evidence of Price-Setting from

the Sale of Handicraft Products in Southern India	61
2.1 Introduction	62
2.2 Literature Review	64
2.2.1 Reverse Price Discrimination	64
2.2.2 Seller-Product Relationships	66
2.3 Setting	67
2.4 Methods	69
2.5 Product Attachment among Artisans and Traders	72
2.5.1 Indicators of Product Attachment	73
2.5.2 Product Attachment and Price-Setting	79
2.6 Field Experiment: Design	81
2.7 Field Experiment: Results	86
2.7.1 Prices	87
2.7.2 Bargaining Rounds and Transaction Length	91
2.7.3 Involvement in Work Processes	92
2.8 Discussion	94
2.8.1 Product Attachment and Reverse Price Discrimination	94
2.8.2 Product Attachment and Other Economic Outcomes	95
2.9 Figures and Tables	98
2.10 Appendix A : Robustness Checks	108
3 Export-Oriented Industrialization and Technological Frames of Government Officials, Workers and Capitalists: Evidence from a Mechanization Project in India	117
3.1 Introduction	118
3.2 Literature Review: Technological Frames	123
3.3 Research Methods	125
3.4 Setting: Channapatna Handicraft Cluster	128
3.5 Key Actors and Their Technological Frames	130
3.5.1 Government Officials: “Status” Frame	131

3.5.2	Artisans: “Creative Control” Frame	139
3.5.3	Traders: “Profits” Frame	147
3.6	Outcomes	155
3.6.1	Exports from Channapatna	156
3.6.2	Artisanal Welfare	158
3.7	Discussion	160
3.7.1	Alternative Explanations	161
3.7.2	Contributions of this Study	163
3.8	Figures and Tables	165

Chapter 1

Professionalization And Market

Closure:

The Case Of Plumbing In India

Abstract

Professionalization has long been understood as a process of establishing market closure and monopoly control over work; however, in this article the author presents a case in which professionalization erodes rather than establishes occupational closure. She demonstrates how the Indian Plumbing Association (IPA), a newly formed organization of internationally trained plumbing contractors and consultants, has used the rhetoric and structures of professionalization to threaten pre-existing ethnicity-based closure enjoyed by traditional plumbers from the eastern state of Orissa. By employing a discourse of professionalism and by instituting codes, training, and certification programs, professionalization in this case has undermined Orissan plumbers by changing the basis of plumbing knowledge and opening entry to outsiders. The author concludes by suggesting that professionalization is a modern trope that does not necessarily imply monopoly benefits and higher job quality for all the members of a given occupational group.

1.1 Introduction

Occupational change and restructuring is taking many forms today. Some occupations are experiencing a decrease in autonomy due to a rise in organizational employment (Van Maanen and Barley, 1984); some are seeing increased insecurity as a result of outsourcing, temporary employment, and employers' pursuit of flexibility (Cappelli, 1999); others are being rendered redundant due to technological advancements and routinization (Autor et al., 2003); while still others are being upgraded through increased education and skills (DiPrete, 1988). Professionalization, through the introduction of training and certification, is one of the prominent ways in which actors formally institute occupational change and is seen as an important tool in improving the economic position of a wide range of occupations in the developing world. Professionalization is known to establish "occupational closure." that is, monopoly control over work, leading to increased income, higher status, and greater power (Freidson, 1970; Larson, 1977; Weeden, 2002). The canonical example is that of medicine. The collective organization of medical practitioners into the American Medical Association (AMA) and the institutionalization of a system of standardized educational licensing supervised by the AMA eliminated other medical sects, asserted authority over other health-related occupations, and established medicine as an independent, high-

paying profession in U.S. society (Starr, 1984). Similarly, the profession of accounting identified a unique knowledge base and demanded licensing through the Chartered Accountant (CA) qualification, and as a consequence realized higher income, respect, and credibility (MacDonald, 1995).

A wide array of occupations not traditionally considered professions, such as hair stylists and interior designers, also claim benefits from the process of professionalization. Notwithstanding the fact that these occupations may lack the authority of abstract theoretical knowledge that grounds doctors' and accountants' authority, the expected benefits of professionalization have led these occupations to employ structures and rhetoric characteristic of the traditional professions. Members of these occupations now pay fees, take classes, pass exams, acquire licenses, and consequently seek the benefits of professional market closure. Locksmiths in the state of Oklahoma, for instance, now submit a criminal background check, pay fees of up to \$350 a year, and pass a 50-question exam to obtain a license to practice their trade. Many such attempts at increased professionalization by occupations not traditionally considered professions have yielded positive results. Reports indicate that licensed workers in the United States earn, on average, 15% more than their unlicensed counterparts (Kleiner and Krueger, 2008). This explains why several occupations, including rather unusual ones such as cat groomers and tattoo artists, are now seeking the stamp of professionalization through licensing (Simon, 2011).

Given the numerous instances in which occupations have successfully increased income and status in the Western world through professionalization, the temptation has been to replicate similar strategies for upgrading labor and position in less-developed economies. National occupational associations in developing countries are adopting structures of professionalization in mid- to low-skilled occupations. For instance, the Philippine Welding Society, an association of construction, manufacturing, and inspection companies, has been working to upgrade the practice of welding in the country through training and licensing (Mori, 2005). In Ghana, hair care product companies along with the Ghana Hairdressers and Beauticians Association (GHABA) have spearheaded the licensing of hairdressing through formal training programs at

vocational institutes and through the introduction of trade testing and certification (Essah, 2008). All these examples illustrate how the instrument of professionalization has been used to establish market closure to benefit the members of various occupations.

In this article, however, I analyze the case of a semiskilled occupation in a developing economy in which attempts at professionalization have faced resistance. I study the Indian Plumbing Association (IPA), which has initiated a process of professionalization by employing structures characteristic of professionalization projects in the West. They have instituted a national Uniform Plumbing Code (UPC), rolled out a Plumbing Education to Employment Program (PEEP), and introduced certification of plumbing practitioners in India, while promoting a discourse of professional expertise. Despite these measures, existing plumbers are disenchanted with the project and are beginning to switch to other occupations. The discourse and structures of professionalization – including codes, training, and certification programs – are in place and yet, surprisingly, traditional members of the occupation seem dissatisfied.

My research investigates under what circumstances professionalization might be resisted by the existing members of an occupation. While scholars have suggested that closure through professionalization is a “prize sought by virtually all occupational groups” (Freidson, 1970, p.368), I explore when and why professionalization might not be desired by an occupation. By focusing for the first time on a case for which the onset of professionalization has faced significant resistance, I advance our understanding of the subtle interplay between professionalization and the social institutions that circumscribe its implementation. I show that before predicting the success of professionalization projects we need to first, consider the possibility of pre-existing closure in the occupation of interest and second, pay careful attention to the identity of the actors behind the professionalization process. In this case, plumbers in India traditionally originated from the state of Orissa and had enjoyed ethnicity-based closure, but were threatened by professionalization being driven by a newly formed Indian Plumbing Association (IPA) consisting of internationally trained plumbing contractors and consultants. I also uncover two mechanisms through which the structures

of professionalization could engender dissent among incumbent members of an occupation. I find that by *changing the basis of knowledge* and by *allowing entry to outsiders*, the IPA-driven licensing and professionalization is undermining rather than reinforcing the ethnically defined closure enjoyed by Orissan plumbers, which is leading to resistance. Finally, I discuss the implications of these findings for our general understanding of professionalization, especially in light of its increased prominence as a potential tool to improve the economic conditions of semiskilled occupations in developing economies.

1.2 Theory

Scholars have long contended that professionalization confers control in the economic marketplace by establishing occupational closure (Larson, 1977). By instituting structures such as licensing, educational requirements, restricted training, and ethics codes, professions are able to protect their jurisdiction from outsiders. In this way, the profession gains control over their supply of workers and the services it provides. In addition, sheltered from competitive market forces, professions acquire the freedom to set their own terms of compensation (Freidson, 1970; Johnson, 1972). Further, professionalization-based closure bestows credibility with the public, personal status, and social mobility (Abbott, 1988; Bledstein, 1976). In this way, closure through professionalization is viewed as offering “continuously independent life chances” (Abbott, 1988, p.324) because it allows occupations to construct and defend social or legal boundaries that, in turn, affect the rewards of their members and restricts access to resources and opportunities to a limited circle of eligibles (Weeden, 2002). While not all occupations have the required abstract knowledge to become “professions,” almost all occupations have the potential to acquire the structures of professionalization by lobbying the government and acquiring state-sponsored mandates on licensing, educational credentialing, voluntary certification, association representation, or unionization and to thereby enjoy closure. When successful, professionalization is thus a legally anchored and enforced process that by establishing occupational closure

creates a protective economic niche.

The existing literature on professionalization provides little insight into why India's plumbing professionalization project is facing such resistance. By focusing predominantly on straightforward cases of professionalization primarily in the United States and Europe (Heinz and Laumann, 1994; Starr, 1984; Abbott, 1988), the literature has treated professionalization as a universal process, leaving little room in the general model for the national and cultural context in which the process of professionalization plays out. Several reasons, however, come to mind as to why the social conditions under which such efforts are instituted might matter. First, while professionalization improves the position of its practitioners by limiting access to practice, that is, by establishing market closure among a group of otherwise disconnected workers, many occupations in the developing world already enjoy such closure by means of ethnic and geographic ties. Carpentry in India is dominated by the Marwari community from Rajasthan while the Kathiawaris from Gujarat are known for their skill in cutting and polishing diamonds (Munshi, 2007). These communities enjoy the benefits of market closure even without the existence of formal professionalization structures. Therefore, in addition to closure through professionalization, closure based on ascriptive attributes like ethnicity and nationality protects valuable and rare resources that reside in scripts, local knowledge, and interpersonal ties. To be sure, while closure through professionalization relies on explicit structures such as licensing and educational credentials, closure often also operates through these informal mechanisms.

Since (Weber, 1968) [1925], scholars have identified a parallel set of attributes that form a basis for closure including social background, language, religion, nationality, race, ethnicity, and gender (Manza, 1992). These ascriptive attributes bestow closure by nature of birth, with the help of beliefs and practices to sustain their control. These attributes can regulate access to resources and entry into an occupation by categorically defining the source of supply of new recruits. (Tilly, 1999) documents the example of Italian immigrants in Westchester, New York, from Roccasecca near Rome who concentrated themselves in Westchester's gardening industry, gaining col-

lective advantages by monopolizing access to jobs and firms. Along the same lines, retailing niches are often quasi-monopolized by one national group or another; examples include Indian newsstands and Korean groceries in New York, and Macedonian fast-food restaurants and Italian barbershops in Toronto.

Similarly, the literature on ethnic entrepreneurship notes that entrepreneurs often rely on their group's local social capital to establish and retain their businesses within their ethnic community (Portes and Zhou, 1992; Light and Gold, 2000). The examples of Gujarati entrepreneurs in the U.S. lodging industry (Kalnins and Wilbur, 2006) and Hispanic entrepreneurs in the New York garment industry (Waldinger, 1999) show how frequent interaction in a highly concentrated ethnic niche promotes a sense of group identity and keeps jobs, information about clients, and skills within the community. (Waldinger, 1999) stressed that once established, these niches easily reproduce themselves because of their reliance on ethnically defined relationships that facilitate internal communication and collaboration, and by delivering superior results to customers. This literature thus documents the prominence and persistence of ethnic niches, both job-centered and entrepreneurial in various ethnic categories.

Despite this, scholars have focused mostly on the role of professionalization in establishing occupational closure. Further, while we have established that both professionalization and ascriptive social attributes could lead to closure, the interaction between the two has received little attention. In particular, what is the role of professionalization when bases for closure like religion or ethnicity might pre-exist in a given occupation? By challenging the predominant, singular understanding of professionalization I show that the interaction between pre-existing closure established through social identity and the formal structures of professionalization can often have harmful unintended consequences for the members of an occupation. Specifically, the possibility that formal rules and procedures undermine benefits accorded through interpersonal ties and local knowledge cannot be ruled out.

Second, in developing economies, the move toward professionalization often arises not from within the occupation, as in the case of doctors and lawyers in the Western world, nor from related occupations waging jurisdictional battles on the basis of

abstract knowledge (Abbott, 1988), but from interested, often entrepreneurial actors pushing for occupational change by enforcing normative control over workers. These entrepreneurial actors, in the name of professionalism, incorporate rational-legal forms of decision making, hierarchical structures of authority, standardization of work practices, accountability, target setting, and performance reviews (Evetts, 2006). These occupational changes are often seen as nothing more than increased bureaucratization (for example, more paper work) and additional responsibilities with no corresponding increase in either collective or individual status or salary for the members of the occupation. For this reason, (McClelland, 1990) distinguished between professionalism as constructed “from within” (by the occupational group itself) rather than “from above” (by the managers in organizations) and emphasized the need to consider who is constructing the discourse and who is benefiting, since professionalism “from above” does not result in occupational control of the work by the workers but rather control by the organizational managers and supervisors.

This phenomenon is prevalent in both developed and developing economies. For example, when hospital administrators in the United States pursued professionalization structures for nursing (mandatory registration and licensing, a stronger theoretical base rooted in higher educational credentials) it resulted in the expansion of the resident nurses’ work to encompass a wider range of nursing tasks including the routine tasks formally delegated to less credentialed workers but provided no corresponding increase in any material benefits from the professionalization (Brannon, 1994). Similarly, the appeal to professionalism as a disciplinary mechanism in novel occupational contexts (like janitorial and clerical positions) is used to inculcate “appropriate” work identities, conducts, and practices (Fournier, 1999). In the context of developing economies, the discourse of professionalism is used among call center workers in India as a mechanism to institute international workplace norms and to enforce managerial control (D’Cruz and Noronha, 2006). Similarly, this discourse is also being adopted by a variety of business and employer-based associations in the developing world in the name of worker training and upgrading labor but often serves private interests of the members of the association instead (Doner and Schneider,

2000).

Therefore, it appears that when the *existence of pre-existing closure* and the *identity of the actors* championing the professionalization process is considered we might be able to enrich our understanding of the professionalization process by analyzing reasons for potential failure in developing countries. Ascriptive attributes have conferred occupational closure for generations in these contexts. Further, a variety of different occupational groups have personal interests at stake in a given trade here, and the drivers of professionalization are frequently not the dominant occupational groups themselves but other marginal organizational actors whose intentions might be orthogonal to other groups impacted by professionalization. This article investigates, for the first time, a case where professionalization faces resistance from the dominant group in the occupation and traces interactions between the structure and discourse of professionalization and ethnicity-based closure.

1.3 Research Methods

This article draws on four months of inductive fieldwork in India. I first gained access to the plumbing industry in August 2009 when I attended the 13th annual Indian Plumbing Conference, organized by the Indian Plumbing Association (IPA), and made several contacts within the industry. Then, from mid-November 2009 to mid-February 2010, I conducted in-depth, face-to-face interviews with 42 actors in the plumbing industry, including the founders of the IPA, Indian representatives of the International Association of Plumbing and Mechanical Officials (IAPMO), modern and traditional plumbing consultants and contractors, labor contractors, supervisors, plumbers (traditional and modern), plumbing manufacturers, builders, building engineers, residents, and plumbing educators. In addition, I had informal conversations with more than 20 current and prospective plumbers in the context of observing their work on construction sites and in IPA training sessions. Obtaining these interviews was relatively straightforward. I enjoyed privileged credibility as a “researcher from America” but, at the same time, was relatively nonthreatening given my status as a

woman in an entirely male industry. For the most part, interviewees seemed to derive importance from being interviewed and were forthcoming when discussing their work and careers. As the president of the IPA stated, “They were thrilled to have caught the eye of academics abroad.”

I used a snowball sampling method, obtaining interviews not just with a pre-set list of persons provided to me by the Indian Plumbing Association and people I had met at the Indian Plumbing Conference but also with others who were suggested to me by the interviewees themselves as persons who might have varying perspectives on the plumbing sector or varying experiences with respect to the ongoing effort to upgrade plumbing in India. I ensured that my sample captured diversity in role within the plumbing sector and encompassed a range of approaches to plumbing. I conducted interviews in Tier 1 cities in India— Calcutta, Chennai, Bangalore, Hyderabad, New Delhi, Mumbai, and Pune – paying attention to regional variation. Nonetheless, all my research was conducted in larger metropolitan cities (with populations greater than 1 million people), and to that extent a large-city bias occurs in my sample.

The interviews lasted an average of one hour each, and I conducted the bulk of them in either Hindi or English. For a very small subset of interviews with plumbers, I needed a fellow plumber to translate from Oriya (the regional language spoken in Orissa) to Hindi. I used a semi-structured interview format, which entails something between the extremes of completely standardized and completely unstandardized interviewing structures (Berg, 1989a). This type of interview involves the preparation of a number of predetermined questions and topics in the form of an interview protocol, formulated in words familiar to the people being interviewed. I informally asked questions from my interview protocol of each interviewee in the course of a conversation, skipping around as per the interview responses. I also probed far beyond the answers to the prepared and standardized questions to elicit respondents’ stories. I began each interview by asking interviewees how they entered the field of plumbing and how their experiences compared with their colleagues in the same field. Following this generic opening, I inquired about how they perceived the evolution of plumbing in India, the problems they experienced in this sector, details on what

their job entailed and how they approached their work, and opinions on the IPA and the professionalization efforts. I collected data inductively with the aim of capturing as much detail as possible on the dynamics between the traditional and the newer sections within plumbing in India.

Each interview was digitally recorded. In addition to taking notes during the interview, I noted my overall impressions of the interviewee, his or her behavior, and the setting at the end of each interview; all but two interviews were conducted at the respondent's worksite. This contextual information proved to be informative during the later interpretation of interview responses. The transcription of all 42 of my interviews, along with my interview notes, serves as the empirical basis of this article. I also relied on field notes from participant observation on construction sites, at training programs and IPA chapter meetings, speeches from the plumbing conferences, press releases of the IPA as well as articles from the IPA's monthly magazine called *Indian Plumbing Today*.

The analysis of the transcripts' content proceeded at first by my reading through a subset of the 42 interviews and identifying themes that distinguished the traditional plumbing sector from the newly emergent modern plumbing sector in India. Based on this initial reading, I identified several themes, which I used to code the remaining interviews. These codes include references to organization of work, physical appearances of plumbing, quality of work, control over work, reputation, work commitment and pride, as well as references to specific roles within the division of labor such as apprentice, subcontractor, or card-holding member of the Indian Plumbing Association. The codes were typed into the computer file of each of the transcribed interviews using Atlas.ti. I was thus able to search efficiently for any reference to these themes as they appeared across the 42 interviews. As a result of this process, some of the original codes were eliminated or collapsed with others, or new codes were added. In this way, my theorizing and analysis of interview data proceeded iteratively as is characteristic of grounded theory.

1.4 Data

The 21st century has seen significant changes in the organization of the plumbing industry in India. For several decades, plumbers from the eastern state of Orissa have controlled the occupation with little interference. More recently, with the growth of the construction industry compounded by the entry of internationally trained plumbing consultants and contractors, an Indian Plumbing Association (IPA) has been formed and newer training and licensing initiatives have been rolled out. The rise of these professional institutions has put the old, ethnicity-based institutions of Orissan plumbers in direct confrontation with the codified and formal institutional processes advocated by the IPA.

1.4.1 Orissan Plumbers

“Everywhere you go, you will find us, Orissan plumbers.”

(Interview with plumber in Bangalore)

Plumbers in India have traditionally come from the eastern state of Orissa. Even more striking is that more than 70% of the plumbers practicing the trade all across India come from not just the same state but from the same cluster of villages from the “block” Pattamundai in the Kendrapada district of Orissa (Ray, 2004; Sahoo et al., 2011). For this reason, Pattamundai is often called “India’s capital of plumbers,” with estimates of more than 20,000 Pattamundai plumbers now practicing across India (Kar and Mishra, 2010). The chief technical consultant with the Directorate of Industries agreed that “plumbing is a significant economic activity in the region, sustaining thousands of families in the Kendrapada district where there is practically no other industry.”

How did the Orissans get into plumbing? In the early decades of the 20th century the first plumbers from Pattamundai began working with British contractors and firms in Calcutta. This account of the origin of Pattamundai as the plumbing capital of India has been corroborated by several Indian academics including (Satpathy

et al., 2002) and (Ray, 2009) along with a large number of my interviewees. In the words of the president of the Indian Plumbing Association, “During the British days [colonial rule], the original capital [of India] was Calcutta, which is close to Orissa. At that time, there was no plumbing in India and an Englishman started the first plumbing contracting business in Calcutta. He picked up all his plumbers from a particular village in Orissa and that just became the trend.” These first plumbers had no knowledge of their future profession but learned on the job from their English employers. What followed was a pattern of migration from the “mother” block to other parts of India, which resulted in Orissan plumbers completely monopolizing the supply of labor in this market. While initially the bulk of the plumbing activity was in Calcutta, as new townships came to be constructed, plumbers from Orissa were taken by English contractors to other cities in India and to places such as Burma (Myanmar) and Afghanistan to help set up plumbing infrastructure. Despite this migration, Orissan plumbers all across India maintained strong ties with their community and village and visited at least once a year for the harvest festivities. This ensured that the migration process continued and the villages of the Pattamundai block and its neighboring areas maintained their status as the epicenter of the plumbing trade in India.

The Orissan plumbers adopted a craft system of work in governing both entry into the trade and training. Boys from the Pattamundai villages typically started working in the city as helpers with a practicing plumber, often a relative, who hailed from the same or a nearby village. The apprentices lived and ate with the experienced plumber and helped with other chores, too. The apprentices learned on the job as they worked and slowly became plumbers as occurs in many other guilds (Roy, 2008). In turn, over time they took on their own helpers in a similar fashion, again from among their kinsmen, as work became more abundant. (Ray, 2004) survey of 413 plumbing households in Pattamundai and 511 plumbing households in Delhi revealed that while most of the plumbers (more than 90%) had received formal schooling in Orissa, hardly any had technical education or training in plumbing at the time of migration. Technical training in plumbing was received only on the job while working

with other plumbers; the focus was on practical, not formal, knowledge. During my fieldwork at a Mumbai-based construction site, a senior Orissan plumber explained this process to me as he initiated an Orissan teenager into the occupation:

“No one teaches plumbing like you think. We all learn by just seeing and observing over time. And we work too, while observing. Whatever the supervisor tells us to do, we have to obey. After doing the work, we get an idea of how to do plumbing. If we think about the work and learn to make sense of it in our heads and then be creative, we learn faster and graduate from being a helper to doing our own plumbing sooner. Yeah, and once we learn, we go back to our village and bring more people into plumbing. That’s the way this works.”

Orissan plumbing has sustained itself in this way because the plumbers share a common heritage having originated from the same cluster of villages in Orissa. Further, they are all from the same scheduled castes, speak the same language – Oriya – and marry within their community. Ethnicity-based closure established in this way affords Orissan plumbers a number of advantages that ultimately result in monopoly control over work. First, Orissan plumbers have successfully controlled their opportunity structure by retaining information about job opportunities, entry into the trade, and training. Through their model of apprentice-based recruitment and training, Orissan plumbers control their work and prevent the entry of others into their occupation. Nearly all Orissan plumbers entered plumbing in the new cities through relatives and friends without pecuniary exchange in securing their first jobs. Second, Orissan plumbers keep their unique expertise within the community. Plumbing knowledge is transferred only through apprenticeships with experienced plumbers and Orissan plumbers retain control over their jobs since courses or other means are not available to acquire the required skills and finesse in this occupation. They take pride in this closure too, as is reflected in this quote by a plumber in Bangalore: “We have a human network [that] helps each other since we are emotional about our roots and for this reason, we don’t teach apprentices not from our community.” Not only do these

networks exist within a particular block or a village but often transcend generations within a family. A Calcutta plumber proudly attests to the power of these family ties in obtaining training: "In those days, my grandfather was known as the super plumber and he was a graduate and we have been doing this for generations... so we know the subject backwards."

So widespread is their reputation and domination of the occupation that, among builders all over India, plumbing is uniquely associated with Orissa. A builder in Mumbai acknowledged that "the best plumbers in India are all from Orissa... they are hard-working boys... they do the job well." The Orissan plumbers, too, have come to believe that they were always "meant" to do this work and that they have a right over it. This sentiment was echoed by one of the plumbers I interviewed: "Actually, now that I think about it, we Orissans are good only at plumbing, nothing else!" Another plumber admitted that, "If offered a different job, I wouldn't accept it because in this one life, I have chosen plumbing and will do this only now." Their importance is not lost on the political class within Orissa either. The chief minister of Orissa acknowledged in a press statement saying, "The plumbers of Kendrapada have made their presence felt throughout the country with their skill and hard work" (Kar and Mishra, 2010).

In this way, ethnicity-based closure has enabled Orissan plumbers to build a reputation, to control entry into the trade, and to monopolize skills, shrouding their invaluable tacit knowledge in secrecy. Such control over work has meant that plumbers in India earn between Rs. 200 and Rs. 250 (\$4 and \$5) a day initially and between Rs. 300 and 350 (\$6 and \$7) after having obtained some experience (Kar and Mishra, 2010). While these are not exorbitant salaries, in a country with extreme poverty, they constitute respectable amounts, which put the plumbers in the 20th to 30th percentile of India's income distribution. That said, the field of plumbing is not without problems. Safety in high-rise buildings and the stigma of dirty work continue to be an issue.

Remarkably though, Orissan plumbers have achieved control over the occupation of plumbing in India without many of the formal structures one would expect. While

the occupation of plumbing is deeply entrenched within the Orissan community, it has become so with practically no codes written down and no formal training programs. This process has been possible because the construction sector has correspondingly not insisted on mandatory plumbing standards and norms typically prevalent in the Western world. While India has a National Building Code (NBC) that devotes one chapter to a code of practice for plumbing installations, this code is based on the British colonial system, is more than six decades old, and is outdated as it does not speak of modern materials or plumbing for high-rise buildings. For example, the industry now uses 10 plastic and 2 copper pipe varieties but the code refers only to GI (galvanized iron) pipes. Further, guidelines outlined in the NBC serve as recommendations only and are not mandatory. No system is in place to ensure that the codes are followed, nor is there any mechanism to penalize those egregiously violating the norms or to bring them into compliance. Moreover, on the supply side, India has never had structures in place to produce formally trained plumbing professionals. In most developed countries, admission to the plumbing trade is through training at a postsecondary institution, such as a community or technical college, followed by an examination, which results in a license to operate as a plumber. However, the situation differs in India. Plumbing courses have existed in India's Industrial Training Institutes (ITIs) but enrollment for these courses is extremely low, and graduates of the programs are known not to receive jobs.

In this way, despite lacking many formal institutions and norms that typically characterize groups that monopolize and control access to occupations, the Orissan plumbers have successfully deployed ethnicity-based ties to achieve occupational closure and monopoly control over work.

1.4.2 Modern Plumbing Sector

In recent times, however, changes in the nature of demand and an influx of internationally trained plumbing practitioners from the Middle East have posed a threat to Orissan dominance in the industry. Since the mid-1970s, more than 500,000 workers from India have migrated to Middle Eastern countries (also called "the Gulf")

including Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE) to work in the construction business (Nayyar, 1994; Amjad, 1989). While the bulk of these migrant construction workers in the Gulf were unskilled laborers on construction sites, about 40% of them were civil engineers with undergraduate degrees who were hired to work as supervisors in various construction trades, including plumbing. Despite their qualifications, most of these workers were employed in “contract jobs,” for which returning to the home country was an essential end-step of the migration process (Prakash, 1998). While in the Gulf, these workers found work with British and American firms that dominated the plumbing industry and executed a majority of the new construction and plumbing projects. These companies followed international plumbing codes and trained migrant workers according to these international standards. Consequently, South Asian civil engineers hired by these companies were exposed to international plumbing codes, standards, and best practices that they would eventually bring back to their home countries.

As this process was unfolding in the Middle East, significant changes were happening in India. In the early 1990s major policy changes at the national level saw the liberalization of India’s economy, leading to speedy urbanization and a concomitant boom in construction. These construction projects contributed to a surge in plumbing activities in India, primarily in cities and urban areas. Also, a newly affluent middle class was demanding expensive and fashionable plumbing products and accessories from the West, and changes in lifestyles necessitated the mushrooming of apartment-style housing, hotels, and resorts, all of which required an increase in the supply of high-end and modern plumbing accessories and products. By the end of 2007, the plumbing industry in India was estimated to have grown to more than \$350 million, a significant chunk of India’s \$14 billion construction industry (Kumar, 2008), and this was only the tip of the iceberg with the impending urbanization of rural areas.

This rise in demand precipitated by a number of market-friendly changes around the period of liberalization meant that the time was ripe for many engineers in the Gulf to return. Plumbing engineers employed in American and British firms in the Middle East were naturally a part of this return migration. Despite being educated

as civil engineers, given their deep familiarity with the modern plumbing process these returnees found it attractive to start their own small businesses as plumbing contractors or consultants, and hence, to capitalize on a burgeoning domestic market. This process eventually sowed the seeds of what has become India's "modern plumbing sector." These new players in the modern plumbing sector had been trained in American or British plumbing codes, and when they returned to India they preferred using these codes instead of imitating Orissan plumbing practices that were the norm even in the newer construction sites. These return migrants also had ample exposure to international practices and methods of doing plumbing and sought to incorporate many of these practices into their plumbing approach in India. This was the first time many of these practices were seen in the Indian market. For example a plumbing contractor said:

"I produce detailed working drawings for plumbing which specify the work in greater detail; we make the material specifications and with these, we decide how to go about executing the work. For 13 years, I worked abroad, and this is the practice followed by contracting companies abroad. People here don't follow this, but this is the way I control quality; I started this culture in India which was followed in [the Middle East] but only the cream of the crop in India follow this."

Today, these newly formed firms occupy a unique place in the Indian plumbing industry. They represent a new way of performing the plumbing trade in India. As one plumbing contractor who returned from Saudi Arabia said, "We are like an institution here in the absence of plumbing education and training. We have to hire people and train them in our plumbing standards." While directly applying methods and practices popular in the West, the newly emerging class of plumbing contractors holds dogmatic views about their modern plumbing practices and considers them to be vastly superior to the Orissan way of plumbing. A Dubai-returned consultant explained to me: "They [Orissan plumbers] have nothing up there. I don't know where they are coming from and how they are dreaming about earning [big money]."

They aren't able to visualize and execute the jobs.”

While returnee migrants from the Middle East form the core of India's newly emergent plumbing industry, they are supported by other international entrants who seek a piece of this market that is poised for explosive growth. These entrants include foreign manufacturers of plumbing equipment and international Project Management Companies (PMC). By 2005, imports of plumbing products in India had risen to around 10% of total demand in terms of value, though these products are largely restricted to the higher end of the market. While no foreign companies have production facilities in India, many operate sales centers in the country and participate in the Indian market in various ways. Products of certain large multinationals such as Jacob Delafon, American Standard, Kohler, Vilroy Boch, and Toto are being imported into India by distributors. Given the rise in demand for luxury products, several foreign manufacturers have also participated in joint ventures or have cooperative agreements with Indian companies. Jaquar, a leading Indian manufacturer of plumbing products, for example, markets products in India that are made by the German bath fittings company Hansgrohe and participates in a manufacturing alliance with Italian ceramics firm Glass Idromassaggio. Given the increasing technical complexity of the modern plumbing business, many Project Management Companies (PMCs) have also sprung up that act as middlemen helping construction companies and consumers better understand their choices.

These new PMCs and foreign manufacturers with returnee plumbing contractors and consultants, are transforming the face of Indian plumbing. The “modern plumbing sector” they seek looks very different from the traditional sector on many counts. They differ in some of their core processes: for example, they adopt a two-pipe core plumbing infrastructure, as done in the West, and hide piping under false ceilings. They are more comfortable experimenting with newer synthetic materials like CPVC, whereas the traditional sector prefers to stick to the tried and tested galvanized iron. These new firms also portray a more professional image and constantly reference their international connections as a source of credibility. Their workers receive formal instruction in plumbing through training programs and adhere rigidly to formal

objects like codes and plumbing drawings. This is in contrast to Orissan plumbers who are trained on the job through informal apprenticeships and who rely instead on their carefully cultivated expertise and years of experience. Table 1.1 illustrates these differences in greater detail.

INSERT TABLE 1.1 ABOUT HERE

Despite these differences, the modern plumbing sector caters to only 10% of the market and their clients are mostly MNCs, builders of international technology parks and high-end hotels, who consciously seek to implement Western plumbing standards. To grow from being niche suppliers of high-end construction projects to firms with a wider mass-market presence, the actors behind the modern plumbing sector have turned to the tools of professionalization. They have organized themselves under the umbrella of the Indian Plumbing Association (IPA) and have instituted a new Uniform Plumbing Code (UPC).

1.4.3 Indian Plumbing Association (IPA) and Professionalization

When returning plumbing contractors and engineers from the Gulf arrived in India, they were immediately attracted by the possibility of applying their plumbing knowledge and exposure to international plumbing standards in the Indian context. They were, however, dismayed to find that the sector was controlled almost exclusively by the Orissan plumbers. Moreover, their deep-rooted views about the “right way to do plumbing” faced opposition at every turn: the Orissan workers shunned formal codes and practices and relied instead on community-based learning and informal training. The difficulty in penetrating the market closure Orissan plumbers enjoyed, combined with the rapidly booming market for plumbing in India, proved to be perfect conditions for the birth of Indian plumbing’s professionalization project.

In 1993, the Indian Plumbing Association (IPA) was born with an initial membership of 15 consultants and contractors. Its objectives were to organize and represent

the interests of India's modern plumbing sector and to push its agenda forward. The early goals claimed by this association were to "rectify the state of plumbing in the country, increase awareness of good plumbing and disseminate technical knowledge" (Interview, VP, IPA). The official goals and objectives of the IPA can be seen in Figure 1-1.

11 FIGURE 1-1 ABOUT HERE

Today, the IPA has 11 chapters in major cities across India and counts more than 1,300 members from all over the nation. Its members represent broad segments of the trade including consulting, manufacturing, contracting, and project management. The initial founding members, who form the National Executive Committee (NEC) of the IPA, are deeply involved in making important decisions within the IPA. In this way, over the past 15 years, the IPA has organized a rag-tag bunch of return migrants under an umbrella organization that has overseen their growth to the present day. Although the modern plumbing sector now controls approximately 10% of India's lucrative plumbing industry, they aspire to increase their share of the pie to 70% (Interview).

Thus, the IPA seems to represent an assortment of interests that are all keen to import global norms and standards into the Indian Plumbing industry and to potentially sidetrack valuable, ethnically closed skills that the Orissan plumbers have cultivated over many decades. As the president of the IPA said, "We want to expand such that there is no regional bias within this industry [referring to the Orissans]. Instead we will focus on education. I can say that all the educated players in the plumbing sector, more or less, they are already in the IPA." This sentiment underlies a series of initiatives the IPA has taken to "professionalize" its work.

First, they have partnered with the International Association of Plumbing and Mechanical Officials (IAPMO), an organization headquartered in California, which is in the business of developing and publishing plumbing and mechanical codes. Together, they have introduced a Uniform Plumbing Code-India (UPC-I), a modified

version of IAPMO's parent document, the Uniform Plumbing Code (UPC), which is ratified by many municipalities in the United States. The approach has been to use a set of codes already developed in the West instead of building from scratch a new set of codes and norms suited to the Indian conditions. The IPA claims that the UPC-I is a comprehensive document covering every aspect of plumbing installations and that it takes into consideration new materials, technology, and the latest installation practices followed in the West. UPC-I with its accompanying publication, the *Illustrated Training Manual*, offers almost 1,000 pages of specifications, drawings, charts, and tables. As the head of the NEC said, "Even simple things, you know like designing a piping system for a toilet, to take an example, each fixture has to have some sort of a weight specifications, which is different in the American, British and Indian systems and we offer a common currency." The management of the IPA holds dogmatic views about their method of plumbing, believing it to be a "science" and therefore universally correct. As the VP of the IPA said, "Note that the codes are embedded in engineering, so it is not subjective. There is a right and wrong." However, like the National Building Code, the UPC-I is recommended not mandated, although the IPA plans to approach government bodies for the ratification of UPC-I so that it can be made legally binding. The goal is for the UPC-I to be revised every three years to keep pace with the latest developments in plumbing technology.

Similarly, in the domain of training the IPA has teamed up with IAPMO to launch a Plumbing Education to Employment Program (PEEP) across the nation to impart Western knowledge of plumbing through formal training programs. PEEP is being implemented in partnership with existing vocational training institutions and polytechnics. IAPMO provides the syllabus and training materials for PEEP and conducts an initial Train the Trainer program for the faculty members of the partnering institutions. PEEP offers three structured courses called Plumbing Systems Design (PSD), Plumbing Construction Management (PCM), and Plumbing Technology for design engineers, construction managers/supervisors and plumbers, respectively. PSD is a one-year course for engineers that teaches design and review of plumbing systems within the building architecture. PCM is a one-year course for contractors, construc-

tion managers, and supervisors of construction sites to understand the basic principles and the code requirements of plumbing systems. Finally, the Plumbing Technology program is a two-year program that teaches installation, repair and maintenance of a variety of piping systems, plumbing fixtures and other equipment associated with water distribution, and wastewater disposal. These PEEP courses are the first accredited courses to be offered for training plumbing engineers, designers, supervisors, and plumbers in India. The president of the IPA said, “There might be good designers and engineers out there, but that’s not enough. The people who actually do the job need to be trained. You might be knowing that Bill Gates is a school dropout, but who will you recruit, [Bill Gates or] a trained person? Training is required, some people are exceptions, but we can’t go on exceptions.”

The IPA’s final initiative is a certification program based on an examination at the end of the training. The VP of the IPA explained to me, “What are the implications of the license? It’s like [in] a pharmacy, a druggist. There should be somebody who knows what they are doing and has obtained a license.” A candidate who undergoes a PEEP training program and passes the exam is designated a Certified Plumbing Systems Engineer, Certified Plumbing Supervisor, Certified Plumber, or Certified Master Plumber and is given an operating license. Alternatively, practitioners already in the field can choose to directly undergo the examination to acquire the certification. The IPA’s end-goal is for certified plumbing professionals to exclusively undertake plumbing work in the country. As the IPA president said, “Our goal . . . is that, like in other parts of the world, we want to see a certificate: a plumber with a certificate. For anybody who comes into the house, I can ask: Do you have a certificate? Then only I will decide that okay, you know plumbing.”

In addition to codes, training, and certification programs, the IPA employs a discourse of professionalism, with an eye to being identified as a profession and for occupational workers to be labeled as professionals. Here the appeal to professionalism is to a myth or an ideology that includes building a professional identity through an emphasis on public service, comparisons with prototypical professions, a client-focused mindset, and building respect for the occupation. This professional discourse

is evident on the IPA's website.

“IPA has succeeded in creating awareness about [the bad quality of Indian plumbing], but we have a long way to go. Our professionals must match their global counterparts in terms of skills and expertise. Professionals in our plumbing industry need exposure to international codes and practices to grow beyond their inherent limitations and be competitive and competent on a global scale.”

(Accessed June 2010)

A critical component of the IPA's discourse is its emphasis on “public service.” While rolling out its professionalization structures, the IPA's discourse stresses heavily that the purpose of the professionalization was to “do good for our society.” In various interviews, press materials, and speeches, IPA members have said, “You know that the IPA is an honorary organization, not a financial or technical organization; we are just trying to do something for our countrymen, something for everybody's interests” and that “once they [the government] realize that there has been an NGO [the IPA] sitting here and doing all this work, things will happen.” The IPA is confident that their altruistic private efforts to upgrade plumbing through the UPC and training programs will be acknowledged, respected, and ratified by the government so that their efforts will not be in vain. Further, the IPA members never fail to advertise how they have invested their own money into the professionalization initiatives such that “each one has donated more than Rs. 1 lakh [\$20,000] for it” (Interview). In this way, they argue that even though “we have been asleep so far, this is our contribution back to the society” (Interview).

Further, the IPA often draws comparisons with prototypical professions to claim legitimacy. In particular, since medicine is a classic case of professionalism being deeply entrenched in an occupation, the IPA often draws comparisons between plumbing and medicine, saying they “believe that plumbers are health workers.” They justify this comparison by creating awareness of the vitally important role of plumbing and the building services industry in promoting health. For example, the treasurer

of the IPA reminded me that “the SARS disease in Hong Kong started from a basic plumbing fixture, the trap. In every bathroom, you have a floor trap and the SARS bacteria or the virus came through that. So, actually that is where it all started.” The IPA also incorporates health as one of its core values and a key goal of the professionalization initiatives. They hope that the IPA “will become one of the powerful tools to bring a focus to health and public safety [through] education about why toilets and good plumbing are important.”

The IPA also places a strong emphasis on being customer-focused and catering to the demands of the new Indian middle class. While these clients pay attention to the aesthetics of their plumbing fixtures they sometimes neglect the technical aspects of plumbing, according to some of my interviewees. Therefore the IPA considers it their responsibility to remind clients to supplement aesthetically pleasing fixtures with technically grounded plumbing. As one plumbing consultant in Bangalore said, “The whole concept is changing in India. Where earlier you know, one corner of the house somewhere will have one bathroom where you can wash your face and all those things, now in most of the houses you can see a good bathroom, people spend a lot of money. What we are saying is when you spend a lot of money on the tiles and fixtures, decorating the whole thing, you must appoint a good plumbing contractor and spend a little more money on proper plumbing.”

In addition, the IPA seeks to eliminate the stigma associated with plumbing. Plumbing was once associated with performing “dirty work,” but this is slowly ceasing to be the case if the IPA’s discourse is to be believed. The president of the IPA said, “There is no more stigma associated with the plumbing trade, earlier there was no value for the profession, no dignity, people thought it was a dirty job... Today, plumbing is a specialty – there are trained, qualified people who look after this work.” The core IPA members seem to believe that “now plumbers are having conferences and so the image will change; this will have impact on the market.” The IPA contends that their professional and polished approach to plumbing will bring the occupation both respect and dignity: “Respect for the profession will come, then respect for [the] industry will come.”

Moreover, the IPA holds monthly chapter meetings in various cities across India, hosts an annual national conference, an annual plumbing product exhibition, publishes a monthly magazine (*Indian Plumbing Today*), and has established an expensive Plumbing Laboratory (for live demonstrations) in Pune, India, as well as a plumbing product certification facility. As a result of the professionalization structure and the discourse around professionalization, the IPA expects that “in no time, in another five years, probably we will see a drastic change in the plumbing industry in India. At least you will have good qualified plumbers like in the US or in other European countries” (Interview).

1.4.4 Distinguishing the Traditional and Modern Plumbing Sectors

Despite achieving initial success, the IPA has created tension in the Indian plumbing industry between themselves and the Orissan plumbers. Fundamental differences in their philosophies over the performance of work and the battle to wrest control of a lucrative market have alienated Orissan plumbers from their occupation’s primary professional body, showing how professionalization can be a double-edge sword depending on the actors responsible for the professionalization. The modern plumbing sector views the traditional sector as an unfair monopoly; is critical of the traditional sector for lacking in formal, theoretical plumbing knowledge; and accuses them of being “stuck in time” and lacking dynamism. This view has allowed the IPA to justify their intervention of professionalization. The president of the IPA stated, “We [the IPA] have to educate them [Orissan plumbers]... we need to be there and we need to [teach] new techniques, new technologies, new materials that are coming to the market. They [Orissans] don’t know where to go and learn, that is the big problem. There is nobody to guide them or educate them. This is where we want to step in and then, automatically they will drift towards this direction.”

The traditional sector expresses repeated cynicism about the objectives of the IPA, suspicious about their motives and skeptical of the effectiveness of their West-

ern professionalization. For example, a plumber in Bangalore said, “The IPA has been formed for commercial reasons. There are certain people who want to rule this area, this sector all over the country wherever you go. ”Further, several Orissan plumbers commented that the Middle East returned plumbing practitioners who constituted the IPA formed a fairly close-knit community, helping each other achieve their commercialization interests. As one supervisor said, “At present all the returnee contractors have good contacts with the consultants. . . they get good margins by recommending each other for projects.” In addition, the Orissan plumbers view the modern sector as lacking in plumbing knowledge relevant to the Indian context. They are skeptical of the applicability of U.S. or British codes in India because of the differences in topography, climate, and availability of natural resources. For example, to conserve water, three-liter or six-liter flushes have traditionally been used in India, instead of the twenty-one-liter flushes typical in the West, but the new code ignores these Indian innovations. The Orissan plumbers also find the style and attitude of the modern plumbers too “gimmicky.” They argue that the modern plumbing sector places needless emphasis on marketing, lavish plumbing conferences, and exhibitions, at the cost of neglecting substantive elements of plumbing. These arguments, as summarized in Table 1.2, form the backdrop against which the present conflict between the modern plumbing sector and the Orissan plumbers is playing out.

INSERT TABLE 1.2 ABOUT HERE

In the past 15 years the IPA has brought in new technology, a better understanding of the global market, and a system of management and organization (including licensing and codified methods of performing work) that was previously not seen in this industry. While traditionally such professionalization initiatives are seen to increase monopoly control over work and worker rents, the incumbent workers in Indian plumbing, the Orissan workers, have strongly resisted these changes. The conditions that surround the establishment of the IPA and their interplay with the traditional ethnicity-based closure enjoyed by the Orissan workers provide clues for why this might be the case.

1.5 Findings

At the start of this article I questioned when and why a professionalization attempt might be resisted. The findings from this research are threefold. First, I demonstrate that despite theoretical predictions of professionalization enforcing closure, in this case evidence is to the contrary. Indeed, professionalization can sometimes erode occupational closure. I show that the modern plumbing sector with its tools of professionalization (such as the UPC-I) is threatening the traditional ethnicity-based closure enjoyed by Orissan plumbers. Second, I uncover two mechanisms that drive this phenomenon. By introducing codes and training, the IPA is changing *the basis of knowledge* in this industry thereby undermining the value of on-the-job experience held by traditional plumbers. In addition, by *allowing entry to outsiders* by way of open licensing the IPA is encouraging workers not affiliated with the Orissan community to participate in the occupation. Third, I propose why in this case professionalization might have had effects contrary to our prior beliefs. I suggest that the interaction between pre-existing closure established by social identity and the formal structures of professionalization, as well as the question of who is doing the professionalization, provide resolutions to this puzzle.

1.5.1 Professionalization Erodes Closure

In my field research I document numerous instances which suggest Orissan plumbers are beginning to lose occupational closure that had thus far allowed them to control entry into the occupation, plumbing knowledge, and standards for the performance of work. My data suggest that Orissan plumbers are slowly ceding such control owing to the modern plumbing sector's professionalization initiatives.

First, plumbing in India is increasingly seeing entry by a wide variety of demographic groups, not just Orissans. One plumbing manufacturer in Delhi provided preliminary evidence saying, "The plumbers used to be heavily migrant workers from Orissa – but that trend is changing now." A builder in Mumbai confirmed, "[While] most plumbing labor used [to be] from Orissa and that had continued over the years,

I know that we have some plumbers from Hyderabad (mostly Muslim) and Kerala too now.” Plumbing is starting to be seen as an occupation in which a wide variety of workers from across India are able to find work, undermining the tight control Orissan plumbers have traditionally had over this occupation.

Second, future generations of Orissan plumbers are looking at alternate careers as a result of challenges posed by professionalization. A plumber, reflecting on this situation shared, “Ever since this training started, some of the children meant to become plumbers are beginning to work in the malls since they are not able to practice their own trade.” Similarly, a prospective teenage plumber whose family has been in the profession for decades agreed, “My father is based in Raipur, the capital of Chhattisgarh. I was hoping to join him there in a year and learn everything from [him]. Now I don’t know what to do.”

Third, Orissan plumbers no longer control the knowledge associated with the occupation of plumbing in India. In the past, they decided “what was right” and passed on such tacit knowledge through informal mechanisms within their community. The onset of professionalization has meant that the knowledge created by Orissan plumbers faces competition. The IPA has encouraged the codification of tacit knowledge through the UPC-I, has imported new knowledge from the West, and has created completely new bases on which such knowledge is to be evaluated. Figure 1-2 shows one typical example in a diagram explaining the installation of water heating equipment. As one plumber complained, “IPA has adopted international standards in India. There is definitely a difference between this code [UPC] and our practices. We are able to sense that difference now but it is hard for us to implement.”

INSERT FIGURE 1-2 ABOUT HERE

In my interviews I also document Orissan plumbers’ anxiety over the expansion of the IPA and the professionalization initiatives, concern about the longevity of their own careers as plumbers, and broad resistance to change. One plumber complaining about the onset of licensing said, “I’d prefer we don’t get a license, that would make

our life difficult. We are illiterate, I know my work but if they won't let me practice my work because I can't get a license that would be bad"; and another said, "I don't have a certificate and I wouldn't want to go through training at this point in my life." A third plumber grieved that "if IPA forms a nexus like this, then they will see to it that those internationally trained people who have membership will get good business and we will languish." Because the Orissan plumbing community is based on thousands of individually crafted ethnic ties, they lack central organization to actively resist such changes, and India has not witnessed any demonstrations or protests. Through my interviews, however, I am able to uncover and give voice to a deeply rooted passive opposition to the professionalization process as reflected in this quote: "I've been in plumbing for 20 years now. I'm happy with my progress. God willing, I hope to do this for 10 more years since there is nothing else I know to do."

1.5.2 Mechanisms

In particular, I find evidence for two major mechanisms that cause professionalization to be resisted in this setting. First, the codes and training programs initiated by the IPA sought to change the basis for knowledge in the plumbing trade. Second, certification and licensing, including an emphasis on standardization and codified knowledge, allowed entry to outsiders.

Changing the Knowledge Base

The IPA-driven professionalization challenges the traditional knowledge base of the Orissan plumbers by codifying a competing knowledge base and giving it legitimacy through professionalization. Two elements about the new knowledge base make it particularly challenging for the Orissan plumbers. First, it is very theoretical, making it inaccessible to the traditional plumbers whose entire system of learning was geared toward a very practical orientation. Second, the knowledge base (founded on IAPMO's codes in the United States) is quintessentially Western and therefore, not entirely applicable to India. The Orissan plumbers' core expertise is specifically

suiting to Indian conditions. This expertise is unique and has developed over generations of practice. Unlike in the West, India's unique geographical and cultural context means that construction activities are not planned to every detail; there is flexibility in plumbing blueprints so that plumbers have room to deal with unexpected contingencies, such as water shortages or monsoons, and the Orissan plumbers have mastered this craft. That approach, however, is now being replaced by a formally codified body of knowledge that Orissan plumbers believe to be potentially inferior and lacking in Indianness. This has the effect of both eroding Orissan plumbers' expertise and replacing their skills with an unfamiliar body of knowledge.

While discussing the excessively theoretical new body of plumbing knowledge being introduced in India, a plumber said, "The code is very theoretical, it will take forever for us to learn this, if at all!" And another plumber said, "Any training has to be theory and practice. Can you be a theoretical doctor? But right now the training offered is all theory, and quite frankly, we know only the practicals though we know that very well." An instructor for the PEEP training program secretly admitted to me that "the new curriculum misses important things like going to the local hardware store down the street and finding out how much different things cost, what materials are durable in reality, what kinds of joints/connections are available, what materials are even out there, etc. This sort of practical knowledge is essential to being a good plumber in India but the UPC and PEEP don't value it and so Orissan plumbers who know this like the back of their hand will lose out."

Similarly, the unfamiliarity of the IPA's Westernized professional codes was explained to me by a plumber in Mumbai: "From what I understand, this code [UPC] is not Indianized and that is a challenge for us since there are lots of things that are not relevant to how we perform Indian plumbing. For example, a floor trap is irrelevant to India since we have wet toilets here and it is going to be particularly challenging for us, who have never used floor traps, to get used to this." Further, because the origins of the IPA are in serving the very high end of the market, their discourse is often out of touch with the realities of most people in India. A plumber described that, "A major section on the last day of training is on how to conduct water audits.

A water audit consists of 4 areas – outside the house, kitchen, laundry, and the toilet. The outside section includes how irrigation is done for landscape greenery, how often a swimming pool is refilled, etc., but these lifestyles depicted and also the assumptions with respect to water consumption are culturally irrelevant and do not reflect the Indian context.”

In this way, the theoretical Western knowledge backed by the IPA is replacing the decades of carefully guarded tacit skills of the Orissan plumbers, thereby threatening their monopoly control over plumbing in India.

Entry to Outsiders

The second tool for erosion of the Orissan plumbers’ closure is provided through PEEP since it enables easy entry into plumbing, whereas earlier, the ropes of the trade could be learned only through informal apprenticeships with existing plumbers in the Pattamundai community. A builder, a silent spectator to all these occurrences, agreed that “now through PEEP, IAPMO is trying to bring nontechnical people into the field. They don’t have the basic background [like the Orissans] and the PEEP course also doesn’t provide adequate training but yet, they will get the new jobs.” Further, the entry of new communities has been accompanied by a gradual withdrawal of traditional Orissan plumbers from the occupation because the newly established conditions are particularly hard for the Orissan plumbers to fulfill despite being steeped in the plumbing occupation.

PEEP, for example, remains extremely inaccessible to the Orissan plumbers for three main reasons: 1) it relies on book-based learning, 2) its classes are taught in English, and 3) the course remains prohibitively expensive. Various plumbers mentioned in interviews, “I can’t read or write,” “See for all that money, there will be a course that we [plumbers] will not understand,” and “They charge Rs.20,000 (\$400) for the course from the students. And then there are examination fees and each student has to pay Rs.4,000 (\$80) for that.” While taking these certification exams is hard for Orissans currently employed in plumbing, the certification process is also discouraging future generations from entering the occupation. A plumber in Bangalore expressed

his concerns, “Well, my son is only 1 right now. First he will study and after that I wanted to teach him plumbing and this is a good job, so why not. But now I’m not so sure anymore,” suggesting that new roadblocks to becoming a plumber have caused his doubt, roadblocks such as taking the PEEP courses and becoming certified. Precisely because of these reasons, the professionalization of plumbing is keeping out the very people who possess the practical skills to pursue the occupations while encouraging the educated, English-speaking, lower middle class to enter.

1.5.3 Conditions for Success of Professionalization

While the literature, by selecting on successful cases of professionalization, has often assumed that professionalization is desirable, this case helps us identify conditions under which such success might be attained. I have been highlighting two conditions in particular under which professionalization might not just be ineffective but also be resisted. First, when closure pre-exists through other means, such as ethnicity or nationality, professionalization can often be harmful. Professionalization in this case is likely to undermine rather than reinforce strong connections and ties that such informal bases of closure provide. Why formal, professionally constructed structures of professionalization should provide a superior way of establishing closure over a given occupation when such closure might have arisen through other more natural and organic processes is unclear. This study, with its unique setting in which professionalization takes place in the presence of pre-existing closure, makes clear this tension and highlights the problems with treating professionalization as the only way to establish market closure in occupations.

Second, when professionalization takes place in the presence of pre-existing closure, the new process appears to be explicitly designed to break such closure rather than reinforce it. In such a case, it becomes important to pay attention to the primary actors who are leading the professionalization effort. While the literature often assumes that the dominant groups in the occupation are the only ones capable of launching professionalization projects, this case study shows that marginal actors seeking legitimacy and the benefits of market closure can also lead the cause. Such

marginal attack is often more likely when incumbents are poorly versed in the language of modern professionalization and marginal groups are more sophisticated. The contribution is that future study of professionalization must seek to understand the relative differences between factions within the occupation of interest and explicitly consider the identity of major actors proposing the professionalization project before making claims about its effectiveness. I show that the identity of the champions of professionalization determines if professionalization projects ultimately help incumbent actors.

1.6 Discussion

In this article I have asked why professionalization might sometimes meet with resistance. The Orissan plumbers in my study have provided us with reasons to believe that our understanding of professionalization is fundamentally incomplete.

1.6.1 Contributions of This Study

My first contribution has been to document the resistance that the professionalization project is facing in India. Using field interviews and participant observation, I describe the occupational change induced in Indian plumbing through the recent professionalization project and show how professionalization initiatives ostensibly aimed at improving the lot of plumbing in India have hurt the incumbent Orissan plumbers who previously dominated the profession of plumbing. My second contribution has been to uncover two primary channels through which professionalization is harming the Orissan plumbers. First, professionalization, through its technically sophisticated discourse, knowledge imported from the West, and an emphasis on English, has changed the primary basis of knowledge of plumbing in India. Second, while traditionally professionalization has prevented outsiders from gaining entry into a profession, in the Indian case professionalization has had the opposite effect. The new processes have made it easy for outsiders to gain entry while the design of these means of entry specifically deter the incumbent Orissan plumbers. Because training

is conducted in English and is expensive, plumbing is becoming an occupation with workers from India's increasingly upwardly mobile middle class, which is replacing incumbent Orissan plumbers.

And third, having established that Orissan plumbers oppose such professionalization initiatives and having suggested mechanisms through which such resistance is fostered, I seek to understand why professionalization might face such resistance. Such resistance is puzzling because the literature suggests that licensing, training programs, and other professionalization structures should unambiguously help actors obtain occupational closure by establishing monopoly control over work and prohibiting entry to outsiders. With its emphasis on successful cases of professionalization, mostly in the United States and Europe, the literature has focused almost exclusively on benefits emerging from such professionally mandated closure. In light of this singular focus, it becomes difficult to explain the empirical facts emerging out of my fieldwork in India.

To explain why attempts to professionalize plumbing in the Indian context have faced difficulties, I advance our understanding of the professionalization process. In particular, I posit and show that understanding the cultural and national context that circumscribe the implementation of the project is necessary before success can be predicted. First, I note that while professionalization has typically been uniquely associated with the establishment of occupational closure, such closure can also be established through other means including geography and ethnicity. When closure pre-exists in this way, I show that attempts to professionalize might weaken rather than reinforce such closure. This observation is a significant departure from our understanding of professionalization and closure, which assumes the former to imply the latter. Second, I show that the identity of the actors doing the professionalization is critical to a complete understanding of the benefits and the impacts of the professionalization process. While the literature has often treated workers in a given occupation as one entity, I distinguish between the dominant incumbent group comprising Orissan plumbers and the newly emergent group of plumbing contractors and consultants returning from the Middle East. While previous studies have assumed that incum-

bent groups choose professionalization structures specifically designed to help them achieve market control, the case of plumbing in India shows that professionalization can prove to be a double-edged sword. In this case, the returnee migrants are using licensing, training programs, and ethics codes precisely to break occupational closure enjoyed by the Orissan plumbers. Thus, professionalization structures cannot unambiguously be associated with the establishment of market closure since they can, in fact, be molded to suit the intentions of the actors behind their implementation.

1.6.2 Limitation: Evaluating Quality of Plumbing

In this article, while I argue that professionalization faces resistance from dominant incumbent groups, given data considerations I am unable to establish the impact of professionalization initiatives on the overall quality of plumbing in India. In particular, my preliminary investigations about the effect of professionalization on quality delivers ambiguous results.

On the one hand, it may be reasonable to expect that the IPA with its focus on adopting standardized training practices and international, environmentally friendly standards should improve the quality of plumbing in India. As a plumbing consultant in Calcutta explained to me, “Every car cannot be a Rolls Royce on its own, in the same way a plumber who is not up to quality can now get there through training.” The IPA’s provisions also actively encourage plumbers to use environmentally friendly materials and more efficient plumbing techniques. A plumbing contractor told me, “Now in place of GI pipes, we are using PPC [poly plastic]. They are environmentally better and cheaper by 20 to 25%.” These quotes provide the supporters of professionalization with reasons to associate the era of modern plumbing in India with higher plumbing quality.

On the other hand, reasons exist to doubt the claim that India’s modern plumbing sector might usher in a wave of increased quality. While it is clear that the IPA is promoting the rapid import of international standards and technologies into the Indian plumbing market, many interviewees express concerns over their suitability to Indian conditions. When asked if the Uniform Plumbing Code was adapted to

Indian conditions one plumber replied, “It’s not fully Indianized. There are lots of things that are not relevant to Indian plumbing, either appliances or systems but also social habits of the population here are very different.” Another plumber analyzed that “a lot of Indian innovations that work brilliantly for our conditions here will be lost... for example, after the monsoons, pipes leading to the drainage often get choked and we have used firelines to clear it up... this will no longer be allowed under the UPC but the monsoons are not going to stop, so not sure how we will deal with the problem.”

Pending further research, reasons exist to support both sides in the debate on professionalization’s impact on the quality of plumbing in India. While the focus of this article is to analyze resistance to professionalization initiatives by Orissan plumbers, the effect of professionalization on plumbing quality remains a question to be addressed in future work.

1.6.3 Implications for Policy

Finally, this article has implications for policy in the area of professionalization and licensing. The most strident critique is against the direct import of international professionalization structures in developing contexts. While the problems faced by a variety of semiskilled, low-income occupations in the developing world are real, these problems might be exacerbated by instituting policies orthogonal to occupational interests. In particular, such arrangements are susceptible to capture by powerful actors who can use them against the very people they were intended to serve. The general lesson is that such professionalization initiatives must be adapted to local conditions and involve incumbent actors right from the beginning. Even though the implications of such professionalization structures on quality are ambiguous, what is clear is that in this case the professionalization project is having particularly malicious effects on Orissan plumbers. Equity considerations and redistributive effects of licensing and professionalization initiatives must be considered by policy. If professionalization is seen as inevitable, one suggestion is to implement re-skilling and training programs so that incumbents are able to participate. That an Indian plumbing community

with decades of experience in local conditions is being systematically excluded from participating in its own professionalization is indeed unfortunate.

In sum, by exploring a novel setting in which professionalization faces opposition, I am able to analyze the effects of institutional and cultural context on its success and uncover new extensions to our understanding of professionalization and occupational change. In the future, a more complete analysis of professionalization needs to consider pre-existing reasons for closure and the identity of the actors behind the establishment of professionalization. Finally, in this article I provide concrete guidelines that inform policy designed around professionalization projects in the developing world.

1.7 Figures and Tables

Table 1.1: Distinguishing the Traditional and Modern Plumbing Sectors.

Variable	Traditional plumbing	Modern plumbing
Market Share	90%	10%
Clientele	Residential and Low-End Commercial Projects “Most builders go directly to the Orissan contractor. There is no quality control or anything, it seems to work on trust.”	MNCs, Five Star Hotels “That’s why when any big hotel project is being done, we see the same 4 to 5 companies everywhere.”
Appearance of plumbing	Two pipe plumbing system, pipes outside building, GI pipes	One pipe plumbing system, pipes hidden behind false ceilings, plastic pipes (PVC/CPVC)
Image	No-Fuss “People think of Orissan plumbers and think of plumbing as associated with bad hair, wearing dhoti [loin cloth] but excellent skills... and hard-working guys, you have to give them that.”	Professional “We are professionals behind the work... Now plumbers are crisply dressed, having conferences in five star hotels.”

Table 1.1 continued.

<p>Primary source of legitimacy</p>	<p>Hereditariness “We are khandani’ [family-based], you know what that means? My father was doing plumbing and I also learned plumbing. We’re the only ones who know the different kinds of materials out there, the difference in quality, and what is best for a particular situation.”</p>	<p>Internationality “Our course content comes from an international association of plumbing [IAPMO] that you must have heard of. IAPMO has invested heavily in India and is responsible for all the training development.”</p>
<p>Mode of learning</p>	<p>Apprenticeship “For example, our Bandhu Patra... he can look at something and within 5 minutes, diagnose the problem. He is from Orissa. There is no training school in Orissa, but they learn both the theory and practical elements of plumbing within 4 to 5 years of experience, by seeing and doing.”</p>	<p>Training programs “During training, you can create virtual models and then study the hydraulics, how it acts and then you know when the trap is not fully vented, what kind of turbulence you can get and what these kinds of things mean, where the trap seal is going out and all these things can be studied.”</p>

Table 1.1 continued.

Knowledge	<p>Tacit knowledge</p> <p>“When trying to find water in the ground, I think asking the Orissan plumber would be more useful than an educated hydrologist or plumbing engineer. From my practical experience, I am telling: I have paid lakhs of Rupees to the hydrologist to find a point of water and then also, what they find for me is insufficient. But the untrained, often who has been a villager, who has field experience, will use his own resources and then come and tell me, Here Sir, here there is water.’ They have intuition.”</p>	<p>Formal knowledge</p> <p>“Theoretical knowledge is important to distinguish between different materials, how the hydraulics, specifically for plumbing, work. For example, if they [plumbers] are designing a system, they will find where there is moisture, they will calculate the run-off, the cross section of the pipes, what is the total sewage that is coming, what is the amount of solid waste... these things are required.”</p>
-----------	--	--

Table 1.1 continued.

Attitude to	Flexibility	Rigid adherence
plumbing drawings	<p>“Usually if we are going to fix up a bathroom of a flat then it is mentioned in the drawing what height customers want their shower head at or at what height they want water pressure. So it totally depends on the drawing given by the consultant. But there are lots of contingencies in India and we [Orissans’ plumbers] use the drawings as guidelines. This way at least we ensure that people are getting some water!”</p>	<p>“While on the site in Shoba, a consultant who was doing the drawings once told me that he wanted to drop some pipes with three 90 degree bends. I told him that this would not be possible. If he wants so many bends, the angles would have to be 50 degrees. Otherwise, I told him that I can do one 90 degree bend. The drawings have to be accurate, otherwise what’s the point.”</p>

Figure 1-1: Aims and Objectives of the Indian Plumbing Association.

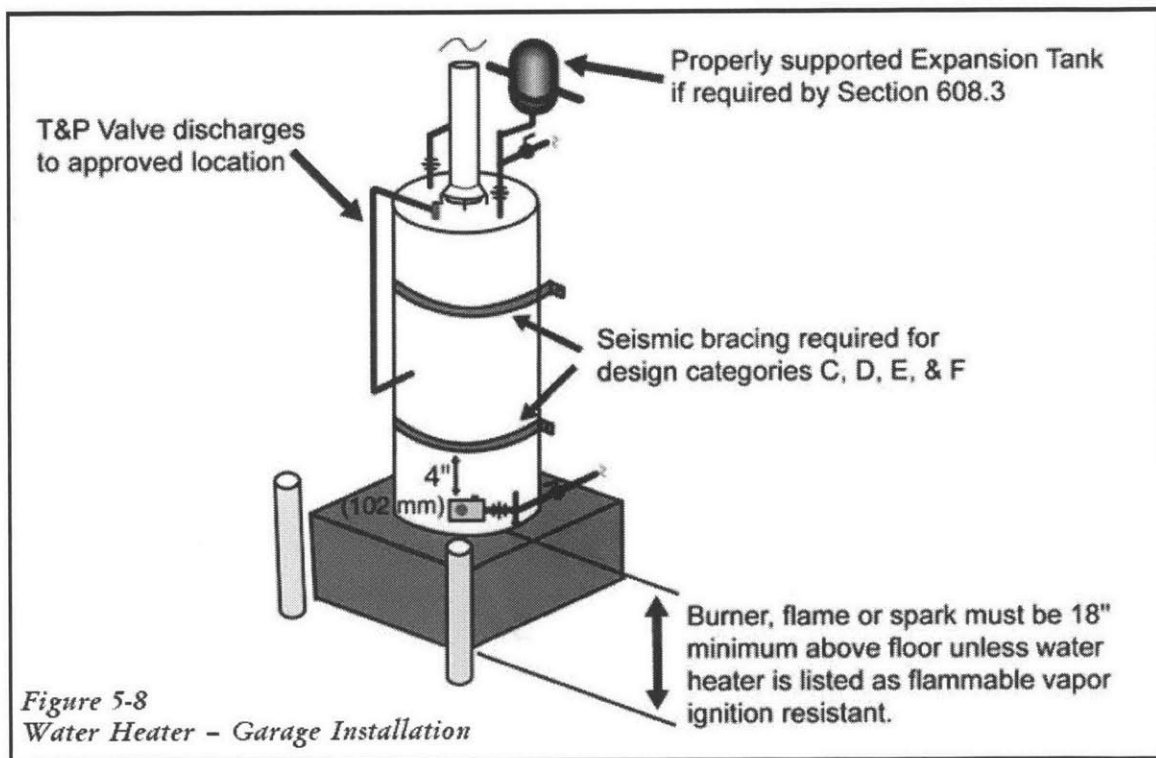
- To promote the advancement of the plumbing and building services industry in the country.
 - To provide a platform for the dissemination and exchange of knowledge on all matters related to the industry and offer advice to all concerned, on the subject.
 - To promote and foster feelings of brotherhood and achieve co-operation and mutual help among professionals in the industry.
 - To encourage its members to achieve high standards of workmanship, adopt correct business practices according to the ethical code of conduct to maintain the dignity of the profession and emphasis on their duties and obligations.
 - To establish means of communication and harmony between the authorities and the plumbing & building services industry, for discussion of problems faced with government, semi-government, municipal, public and private organizations.
 - To make efforts to find solutions to the satisfactions of all concerned and generously contribute to the improvement of working conditions for the benefit of the society at large.
 - To organize conferences, seminars, tours, etc., which may benefit and educate the members of the trade and to promote, support and advance the building services industry.
-

Source: Indian Plumbing Association's Website
<http://www.indianplumbing.org/aimsobjective.htm>

Table 1.2: Tension between the Traditional and Modern Plumbing Sectors.

Variable	Modern sector's opinion of the traditional sector	Traditional sector's opinion of the modern sector
Control over work	<p>Unfair monopoly</p> <p>"I find that they [Orissan plumbers] are being very exclusionary. Only they know where the projects and where the jobs are, [but they] won't tell anyone."</p>	<p>Commercial interests</p> <p>"Everything is money-making. Don't think that these organizations are all doing good. In the front, they speak about public service, but behind the only thing that matters is revenue generation. Even Mr. Nair [part of IPA] said that they would do all this [professionalization] as long as the funds kept pouring in!"</p>
Knowledge	<p>Lack of theoretical knowledge</p> <p>"They have learnt the work down the generations, hands-on. They are sort of an unorganized section. But why they have to fit one thing to another, they don't know; similarly [they don't know] why the pipe has to be of a certain diameter; their theoretical knowledge is very low."</p>	<p>Lack of knowledge relevant to India</p> <p>"With the IPA folks, if the code says that a pipe should be painted black, they will do so. They do not question why [this] should be done or if black is an appropriate color for India and that project. In this way, India-specific needs and plumbing adaptations are not necessarily reflected in the UPC or new training programs."</p>
Approach	<p>Stagnant</p> <p>"Unless they [Orissan plumbers] were to get involved in conferences or technical exhibitions, they wouldn't get updated: what developments are there, what innovations, what new materials; so they would lag behind."</p>	<p>Superficial</p> <p>"He [IPA member] will charge a lot and speak in English but he doesn't know plumbing. He is a good salesman and he talks well but he has no background in this matter. I know I want to be in a technical trade not a sales gimmick."</p>

Figure 1-2: Diagram of Installation of Heater.



Source: Indian Plumbing Today

Chapter 2

The Price is Right?

Ethnographic and

Field-Experimental Evidence of

Price-Setting from the Sale of

Handicraft Products in Southern

India

Abstract

Scholars of economic sociology have shown that sellers often vary prices among different buyers for short-term monetary gains or long-term relational gains, but they have failed to consider how sellers' relationship with their products can affect their price-setting behavior even in the absence of such gains. This paper, by studying how artisans and traders in a wood and lacquerware cluster in India vary prices across buyers, demonstrates the importance of product attachment in understanding price discrimination. Drawing on a field audit study where trained buyers purchase identical products from artisans and traders, the paper documents that artisans often charge significantly lower prices to discerning buyers who are likely to care for their products beyond the point of sale, even if these buyers are wealthy, in contrast to traders who price in accordance with buyers' willingness-to-pay. These findings are consistent with ethnographic evidence documenting artisans' and traders' varying attachment to their products as indicated by their investment in the products, meaning ascribed to the products and internal standards for the products. By introducing the idea of product attachment, this paper contributes to our understanding of price-setting and economic decision-making more broadly, while also offering a unique methodological model that combines experimental and ethnographic research.

2.1 Introduction

Price discrimination, or the practice of sellers charging different prices to different buyers for the same product, is widespread. For example, airlines charge different prices depending on how far in advance buyers book flight tickets, catalog retailers like Staples and Victoria's Secret have been reported to send out catalogs with higher prices to buyers in more free-spending zip codes, and online retailers like Amazon have been reported to charge lower prices for the same products when buyers have previously visited popular price-comparison sites (Turow et al., 2005). In all these examples, sellers vary prices according to their assessment of different buyers' willingness-to-pay for the same products in order to extract the highest possible price and thereby maximize their profits.

In this paper, however, I present a case where sellers offer buyers, with an evidently higher willingness-to-pay, lower prices for a given product. In the wood and lacquerware cluster of Channapatna in southern India, I find that artisans offer foreign buyers, who clearly have a higher willingness-to-pay for handicraft products, signifi-

cant discounts (of upto 50%) for their handicraft products. This practice, henceforth called reverse price discrimination, poses a puzzle to neoclassical theories of price discrimination.

Scholars in economic sociology offer some explanations for such reverse price discrimination. These explanations suggest that sellers might offer discounted prices to buyers with a higher willingness-to-pay when 1) the buyers have pre-existing embedded relationships with the sellers (Uzzi, 1999; Uzzi and Lancaster, 2004; Sorenson and Waguespack, 2006), 2) the buyers provide expectations of future business with the sellers (Zbaracki and Bergen, 2010; Fernandez-Mateo, 2007), or 3) the buyers closely adhere to locally-held norms (Halpern, 1997; Ody-Brasier and Vermeulen, 2014). Each of these explanations is consistent with the idea that sellers might be sacrificing revenue from sales in the short-run in order to preserve their relationship with certain buyers in the long-term.

While the aforementioned economic sociology theories are helpful in understanding reverse price discrimination, they are insufficient in explaining the outcomes that I observe. Artisans in Channapatna engage in predominantly one-time transactions with buyers owing to the handicraft cluster's remote location, and as such, they have no opportunity to develop long-term relationships with buyers. Yet, artisans give discounts to buyers with a higher willingness to pay, thus highlighting the need to add to the existing literature.

I find that, to understand reverse price discrimination, we must additionally consider sellers' relationship with the products that they sell, or what I call "product attachment". In this paper, I uncover three indicators of product attachment: high investment in products, transcendent meaning ascribed to products and exacting internal standards for products. Further, I find that when sellers are attached to their products in this way, they give discounts to discerning buyers, who they believe will take care of their products beyond the point of sale, even when these buyers might have a higher willingness to pay.

In my setting, I find that artisans in Channapatna have high levels of product attachment, hand-crafting the products that they sell from start to finish, which mo-

tivates their discounts to foreign buyers whom they perceive as being discerning and appreciative. This sacrifice in monetary rewards by artisans for the sake of their products is particularly stark given that artisans are poor with no savings or alternative sources of income. The paper rules out alternative explanations for artisans' price-setting behavior by comparing artisans in Channapatna to traders in the area, who sell the same products but are not involved in making them. I find that traders have low product attachment and price discriminate as neoclassical economic theory would predict, where seemingly wealthier buyers are charged premium prices.

This paper draws on multiple methods to investigate the role of product attachment in reverse price discrimination. Using eight months of ethnographic fieldwork, I characterize the concept of product attachment and hypothesize how it affects sellers' prices to different buyers. Then, using a randomized field audit study where six trained buyers belonging to three experimentally-manipulated categories purchase the same product from a group of 52 artisans and 25 traders and negotiate prices based on a bargaining script, I collect detailed data on 450 sales transactions to test the hypothesis that sellers attached to their products give discounts to discerning buyers. By combining ethnographic and experimental methods in this way, this paper offers a unique model of "full-cycle research" (Fine and Elsbach, 2000).

In what follows, I review the relevant literature and describe my research setting and methods. I then discuss my ethnographic and field experimental findings, detailing artisans' and traders' varying degrees of product attachment and their prices offered to different buyers. I end by discussing the implications of product attachment for understanding reverse price discrimination and other economic outcomes.

2.2 Literature Review

2.2.1 Reverse Price Discrimination

Economic sociology offers three explanations for why sellers might reverse price discriminate, or offer wealthy buyers significant discounts in price. First, sellers might

price-discriminate based on the strength of their prior ties with buyers, where embedded relationships are rewarded with more favorable prices than arms-length transactions (Uzzi, 1999). Economic exchange embedded in such pre-existing social relations entails buyers and sellers sharing private information based on trust, thus reducing transaction costs and adding value that might be shared by both the buyer and seller in the form of lower prices (Uzzi and Lancaster, 2004). Even in the absence of additional economic rents from embedded exchange, favorable prices might result simply from a preference to transact with prior exchange partners (Sorenson and Waguespack, 2006).

Apart from embedded relationships, sellers might price-discriminate based on the importance of a buyer to future business. In particular, buyers seen as being valuable in the long-term, because of their stature or business potential in existing and new product domains, might be welcomed with lower prices in the short-run (Zbaracki and Bergen, 2010; Fernandez-Mateo, 2007). Similarly, norms might also guide the prices quoted by sellers to different buyers. For example, social norms around friendship might dictate that sellers quote lower prices to their friends (Halpern, 1997), while customer violations of locally-established norms might be punished by sellers through higher prices (Ody-Brasier and Vermeulen, 2014).

These three explanations are united in their focus on buyer-seller relationships. In each of the cases, sellers seem to sacrifice revenue from sales in the short-run in order to preserve their relationship with certain buyers in the long-term. For example, when sellers share embedded relationships with buyers, they might offer discounts in prices under the assumption of reciprocity, which is a key facet of embeddedness (Uzzi, 1999). The assumption here is that sometime in the future, the seller's exchange partner will grant them similar favors that will be profitable. Similarly, when sellers offer discounted prices to first-time buyers of high stature, they might believe that this deed will grow their business in the long-run. The seller's expectation might be either that the highly reputed buyer will become a regular customer in the future, directly increasing their sales, or else, that interactions with the buyer might give the seller new leads or publicity that will indirectly raise profits in the long-term. Additionally,

when sellers offer discounts to buyers who adhere to category norms, they might be using the tool of pricing to encourage buyers to stick to category norms, thereby reducing risk and uncertainty that could be expensive to the seller in the long run. Thus, in all these cases, variation of prices by sellers to different buyers is consistent with a focus on maintaining lucrative relationships with buyers.

While the economic sociology literature provides important explanations for reverse price discrimination, in order to explain my findings, we must add to this literature. In my study, sellers typically have one-time interactions with buyers owing to the remote location of the setting. Over 90% of sellers report never selling twice to the same direct customer, in a survey that I conducted. Thus, sellers don't have the opportunity to establish long-term relationships with buyers in this context. Yet, they give discounts to buyers with a higher willingness-to-pay. To explain this, I bring an understanding of seller-product relationships into existing explanations of reverse price discrimination.

2.2.2 Seller-Product Relationships

Scholars in the sociology of work have documented that under certain conditions, products might become meaningful to their sellers. Such attachment to products is most prevalent among sellers who make the products that they sell and especially, in cases where the products are non-routine and offer sellers an avenue for creative, individual expression (Caves, 2000). When sellers conceptualize and develop their products from scratch, nurturing their creative output from inception to finish, making several creative decisions along the way pertaining to style or design, they often develop a deep identification with the end product of their labor. Sellers of cultural goods like art (Velthuis, 2005), handicraft products (Wherry, 2008) and music (Faulkner, 1971) experience such a nurturing relationship with their products, arising from careful attention to the aesthetics of their creative output.

Even in the absence of such creative control, when sellers are involved in making more standardized products, they develop attachment to their products simply from making them with their hands. This idea, called the IKEA effect, posits that

labor alone can induce greater liking for the fruits of ones labor (Norton et al., 2011). Thus, factory employees making “homers” from scrap material (Anteby, 2006), artisanal cheesemakers (Paxson, 2012), builders of motorcycles (Crawford, 2009) and snowboards (Shah, 2003), and amateurs assembling IKEA furniture become attached to their end products (Norton et al., 2011).

In these instances, sellers often forgo personal, monetary gains in the production process for the sake of their products. Scholars have documented that hobbyist wine entrepreneurs in California sometimes invest in inefficient inputs, such as paying more to hire winemakers with a French accent, simply because of their perceived authenticity, without any expectation of increased quality of their wine or demand for their product (Scott Morton and Podolny, 2002). Similarly, cooks in upscale restaurants in the Twin Cities metropolitan area have been shown to pay inordinate attention to the bunching of grapes in a perfectly pyramidal shape in their dishes, even if these details are unobservable to their customers and might be detrimental to their profits (Fine, 1992).

As I will show in further detail below, artisans in Channapatna become attached to their products while making them with their hands from start to finish whereas traders, who merely sell the same products, see them as a means to an end. In what follows, I explain how this key difference in product attachment leads artisans to reverse price discriminate by offering discounts to discerning buyers who will take care of their products beyond the point of sale, in a way that traders, focused on monetary gains, do not.

2.3 Setting

The setting for my study is a wood and lacquerware craft cluster in the town of Channapatna in southern India. Channapatna has a three-hundred year long tradition of wood and lacquerware handicrafts and about 10% of Channapatna’s 60,000 people are artisans, producing a range of exquisite wood and lacquerware products by hand that they sell locally from their worksheds (Aziz, 1979). These products include

wooden toys and jewelry. Channapatna is also home to a large number of traders who are not involved in the production process but sell these same products locally as well as in wider markets through retail establishments. This setting, housing two groups of sellers selling the same products where only one group makes the products, was appropriate to study sellers' price discriminating behavior.

Channapatna was also a convenient setting to study pricing behavior. It is a remote market located on a major highway between two large cities (Bangalore and Mysore) and receives local and international tourists, who purchase products from both traders and artisans (see a map in Figure 2-1). These transactions are typical of those in the informal economy: prices vary and are set by bargaining, relationships between buyers and sellers are one-time (devoid of reputational incentives), products are not branded or signed, sellers operate independently and there is no audience for any given sale.

INSERT FIGURE 2-1 ABOUT HERE

What helped additionally is that artisans and traders in Channapatna are similar along several dimensions. Members of both occupations are typically male, married, literate, usually in their mid-forties, belong to what are designated in India as backward castes,¹ have families of about five or six people, have similar levels of market exposure and have been practicing their occupation for about twenty years each, having inherited it from their family. However, traders are slightly more educated as compared to artisans, are more likely to be Hindu rather than Muslim and make about \$160/month as compared to artisans who make \$70/month.² These data come from a survey I conducted and the findings are summarized in Table 2.1.

INSERT TABLE 2.1 ABOUT HERE

¹includes Scheduled Castes (SC), Scheduled Tribes (ST) and Other Backward Castes (OBC) as defined by the Indian Constitution

²While these gaps might be a cause for concern, Figures A.7, A.8 and A.9 establish that the final results are robust to these differences.

In the next section, I explain how I first conducted inductive qualitative research, where I noticed differences in artisans' and traders' attachment to the same products, and developed indicators of product attachment. Based on participant observation, I also developed a hypothesis that sellers with greater product attachment will offer discounts to discerning buyers regardless of their willingness to pay for the items. I then designed a field audit study to rigorously test this hypothesis and rule out alternative explanations, described later in the paper.

2.4 Methods

Ethnographic Fieldwork. After spending two months conducting exploratory research at handicraft clusters across India, I began fieldwork in Channapatna in January 2012. When I arrived in Channapatna, I stayed at a small lodge that offered proximity to both artisanal localities and trading establishments in the town. Both artisans and traders welcomed me into their homes, making access straightforward. Although the locals did not understand what research or academia meant, my interest in studying how handicrafts were made and sold and how work life was organized in Channapatna led them to trust me and, as a single woman in a predominantly male occupation, regard me as “harmless”. While, as a researcher from the US living amongst the artisans, I enjoyed some celebrity status, with a train of children accompanying me wherever I went, being of India origin, I wasn't completely foreign and blended in quite well.

During the day, I would observe artisans and traders at work, paying special attention to their work practices and routines. For example, I would observe an artisan's creative decision-making process including how they chose colors and patterns or a trader's dealings with a large number of buyers of different kinds. In addition, in the evenings and over meals, I would talk with artisans and traders about the day's work and events (Spradley, 1979). Apart from my ability to communicate in Hindi, I also developed a working understanding of Kannada (the state language) that allowed me to speak with a diverse set of local people over time. Artisans, in particular, were

keen for their stories to be told and they seemed to open up to me, even more than to their colleagues or families because, unlike their family members, I asked about their work and took interest in their lives. I decided to carry a visible notebook from the beginning and let artisans and traders see me jotting notes at all times, making them feel important each time I wrote down what they said.

Finally, at the end of each day, I would make sure that I had documented all salient observations. I structured my time so that I was in the field for three days a week and spent the rest of my time in Bangalore typing up field notes, writing memos and making sense of the emerging data. This worked well because the time away from the field helped me identify puzzling observations that would inform the following week of my fieldwork. In this way, fieldwork included intensive participant observation of the artisans' and traders' day-to-day work, including observation of over sixty artisanal worksheds and visits to more than thirty trading establishments in the area.

Interviews and Survey. In addition to participant observation, I conducted twenty-two formal interviews with artisans and traders whom I had met in the course of fieldwork. My interview sample captured diversity in religion and size of establishment (Trost, 1986). I used these interviews to probe deeper into how artisans and traders understand and make sense of their work (Spradley and Baker, 1980). The semi-structured interviews were conducted in Hindi and lasted an average of one hour. Over the course of the interview I would cover most topics ranging from how the sellers had entered their occupation, how they experienced their work, what they liked and disliked about it, their daily routines and practices, the problems that they experienced and views about their family, town, and occupation. Each interview was digitally recorded and after every interview, I recorded my impressions of the interviewee, his house, workplace and family members. Beyond these formal interviews, I also conducted over fifty informal ones in the midst of my participant observation (Barley and Kunda, 2001).

The open-ended data, comprising over 500 pages of fieldnotes and interview tran-

scripts, was analyzed inductively using Atlas.ti. My inductive analysis (Glaser and Strauss, 1967) consisted of multiple readings of field notes and interview transcripts and extensive memo writing to decipher patterns in how artisans' strong connection with their work manifested in their economic behavior. In my coding of the data, I associated passages of text with one or more mnemonic codes, labeling different ways in which artisans and traders talk about and understand their work. Some of these codes referred to uniqueness of products, artistic quality, product variety, creativity, attitude towards money, passion, selling behavior, sincerity towards work, work routines, competition, references to organization of work, control over work, reputation, work commitment and pride. In this way, the theorizing and analysis of the data proceeded iteratively.

In addition to observational and interview data, at the end of my fieldwork in June 2012, I conducted a survey of 52 artisans and 23 traders who would also participate in my field audit study.³ Conducted at the end of my fieldwork, these surveys collected (a) descriptive data including age, family information, household assets, religion, education and leisure activities, (b) workplace data such as tenure in the profession and machinery owned, (c) occupational data regarding work practices and norms such as time spent working, knowledge of other crafts, generational shifts and secondary occupations, (d) financial data about income, prices and expenditure on raw materials and (e) sales data by different customer groups. The nineteen page survey, translated into Kannada, was developed through an iterative process of referring to field notes, relevant literature (Aziz, 1979), and in consultation with handicraft and survey experts. The survey was administered by three trained surveyors who read the questions aloud, elicited responses and filled out the surveys on behalf of the respondents. An individual survey took about 30 minutes to complete and respondents were compensated for their time away from work.

This process of data collection and inductive data analysis revealed that artisans and traders have very different relationships with the products that they sell, and also

³There were 25 traders in the experimental sample but only 23 trader survey responses because one trader owned two shops and one trader refused the survey.

helped to uncover some conditions when sellers might be attached to their products, thereby pricing in ways that prioritizes the welfare of their products over profits. The next section uses the qualitative and survey data to explore this further.

2.5 Product Attachment among Artisans and Traders

Artisans and traders in Channapatna sell the same handicraft products with the key difference that artisans actually make the products in addition to selling them whereas traders only retail these products. My fieldwork revealed that artisans and traders have very different relationships with the products that they sell - while artisans become attached to their products, traders have a more objective, instrumental relationship with the same products. And further, I observed that this key difference in product attachment seems to matter for artisans' and traders' preferences over buyers to transact with, and ultimately, the prices that they charge. In particular, while artisans, attached to their products, care about the future welfare of their products in setting prices for different buyers, traders have a single-minded focus on extracting the highest price possible from each sale. These contrasting quotes make this evident:

“I put my heart and soul into making it [the product] perfect..it’s more than the money.” (Artisan)

“Everything is about money only, no? Why else would we work? People steal also, for money only. Without money, we have nothing. Even the cocks wouldn’t wake up in the morning without money.” (Trader)

This section draws on inductive analysis to articulate some indicators of artisans' deep connection to their products, lacking amongst traders. This contributes to our understanding of price discrimination by laying out signals that sellers might be attached to their products, thereby pricing in ways that depart from a simply focus on willingness-to-pay of buyers. The three indicators are: when sellers significantly invest in their products, when they ascribe transcendent meaning to their products, and when they have exacting internal standards for their products.

2.5.1 Indicators of Product Attachment

Investment in Product. First, artisans and traders vary in their level of investment in the products that they sell. Artisans are deeply involved in the creation of their handicraft products, investing deeply in every stage of the production process, whereas traders, engaging only in selling craftware, invest in their products in a very limited fashion.

Artisans invest significantly in the painstaking production process, a process that combines the artisans' traditional craft knowledge with an avenue for novel creative expression. Among the range of creative objects produced is the "Channapatna bangle," a wooden bracelet ranging in thickness from half inch to two inches in width. Artisans meticulously produce perfectly rounded wooden bangles, evenly coated with natural vegetable dyes in many different colors and polished to obtain a glossy exterior. An example of these bangles is pictured in Figure 2-2. Each bangle is individually produced on a motorized lathe, a device on which a block of wood is turned as an artisan works on it. An artisan crafts the block of wood into a barrel on the lathe much like a potter does clay on a wheel. Once a piece of wood has been given the desired shape, artisans apply layers of lacquer that have previously been dyed using vegetable colors. After a base layer of color has been applied, a bangle is then shaded expertly to obtain a variety of different effects. A locally available leaf having an abrasive texture is finally used to give the bangle its distinctive glossy appearance and smooth exterior. A schematic of the production process is shown in Figure 2-3.

INSERT FIGURE 2-2 ABOUT HERE

INSERT FIGURE 2-3 ABOUT HERE

Artisans similarly invest in the storage of their products. They spend over 20% of the total production time on post production practices meant to keep the product safe and out of harm's way. In particular, artisans will shuttle products to their houses multiple times a day, preferring to store them in the safety of their homes, rather

than in the chaos of the workshed. This practice is common, even though a couple of artisans I observed demonstrated that stacking and storing finished items in bulk, in the workshed itself, at the end of the day, was quite sufficient to keep the bangles safe.

Thus, artisans are deeply involved in every process along the value chain, beginning with acquisition of the raw wood, to crafting it on a lathe machine, to polishing painting and storing it, to selling the finished product to a customer. By investing deeply in this production process that entails painstaking application of technical principles as well as creative expression, artisans get attached to their products. An artisan, talking about crafting and molding the products with his own hands, said:

“You get that satisfaction when you see your product transform from the raw wood to the final shape, like them taking the first footsteps, then getting shapes, then making their initial forays into the market, and finally, you have to sell them. It’s like holding their hands through this whole process and then giving them away.”

Traders, on the other hand, merely sell handicraft products without investing in the production of the products that they sell. Even though both artisans and traders retail the same craft products to the customer, the key difference of physical and creative investment in the production process results in different levels of attachment to the products. Traders don’t experience this transformation of the product from its raw, crude form to its final, refined state and so, they do not care about their products beyond what is required to complete the sale. For example when traders are faced with broken products, they do not bother to fix them, instead taking pride in being able to sell these broken pieces. As one trader said:

Everyone can sell a good product. But us traders, we take pride in the ability to sell even a broken product. For that you need intelligence. You have money but no brain..I have brains but no money..who will do better? Me.

Similarly, when traders are faced with old products, once again they do not feel compelled to paint or polish these products to restore their original finish. The traders are instead focused on the goal of being able to sell these products despite their flaws. In the words of a trader:

You have to just repackage the old designs as new designs. Each one is a different price. We just need the intelligence to make sales.

Meaning Ascribed to Product. Similarly, artisans and traders ascribe very different meanings to the products that they make. Artisans see their work as being sacred, and as such, they deify the work process and their products and worship their implements by offering flowers, lighting incense sticks and rigorously cleaning their machines. As some artisans said:

“Work is god for us. This is my work. I get a lot of satisfaction...It’s not like other work, where you work for money or some other material thing.”

“People carry that kind of devoted attitude towards work. They clean their machinery daily. People treat their machinery as god. I see people cleaning their machines in the morning and evening, twice a day just like we pray twice a day.”

For this reason, artisans in Channapatna typically work without footwear despite the workplace being filled with sharp wood chips and sawdust, citing Indian custom where it is inappropriate to wear footwear in a place of worship like a temple or a mosque. The consequence of this is that there was not one workshop that I visited where I did not see an artisan with cuts and cracks on his feet from the sawdust and splinters of his workshop floor. When asked why they don’t wear footwear despite the safety implications, the idea seemed nonsensical to one artisan - “Do you wear *chappals*[footwear] inside the house of god?” he replied.

The sanctity of the work process means that artisans treat the fruits of their labor as also being special, loving them and treating them with care. In particular, artisans

see their products as their own babies, part of their embodied selves. Artisans seem to express deep affection towards their products that mirrors a parent's love for his or her child. As one artisan said:

“When I make a piece, I get attached to it. I [develop] affection for it..it's like bringing up a child when you are an artisan.”

In fact, artisans sometimes become so emotionally attached to their “babies” that they don't have the heart to sell them at all. This becomes most apparent when artisans create innovative products or introduce new designs. In such cases, the first piece of the new type is often treasured by the artisan and kept as a memento. This is a widespread practice, as evidenced by the fact that on my first visit to any given artisan's home, he invariably fetched a handful (or more) of unique self-made artifacts from a closed cupboard in his bedroom for my viewing, as a testament to his skill and imagination. During one such interaction, an artisan said:

These are my babies..we like to do our own pieces, create them with new designs, new colors and keep samples for our memory..we don't want to become operators in a factory.

Traders, on the other hand, see the handicraft products that they sell as simply a means to an end. For them, the work of selling is purely a way to make ends meet and support their family. Thus, they do not harbor any affection towards the products that they sell or concern for the quality of the product, focusing solely on its economic value. As one trader articulated:

We work for money. Even my wife understands this. My wife asks [me] for money and if I don't give her enough, then she asks “what is the point [of] your work?”. So ultimately I work for money.

Internal Standards for Products. Finally artisans and traders have very different internal quality standards for the products that they sell. Artisans aspire to make their products “as good as they can be,” going to great lengths to achieve this goal.

Traders, on the other hand, hold lower internal standards for their products and just hope to sell these products at the best possible price.

Since artisans perceive their products to be so dear to them, they have high internal quality standards for these products. Artisans will often go to extreme lengths and undergo personal hardship to preserve these internal standards, even making decisions that are at odds with profit-maximization for the sake of their products. Thus, artisans' work decisions are often driven by an internal barometer for what is "right" when it comes to the practice of their art. For example, one artisan said:

"Every piece I make, I need to know that I've made well. If I want to make it even better, that means its not there yet and I do more work on it."

Similarly, because of these internal quality standards for their products, artisans will often sacrifice safe working conditions and put their personal health at stake when faced with a decision that might interfere with the perceived purity of their art. For example artisans do not use protective eyewear despite commonly experiencing splinters and wood chips flying from their lathes and getting lodged in their eyes.⁴ This is not a question of cost, access or ignorance. More than 80% of the workshops I visited had stacks of safety eyeglasses (distributed for free by the government) that lay unused. When quizzed about why artisans don't wear safety glasses, the matter seemed to be one of trading artistry for safety. Artisans explained that the glasses impede their ability to pay close attention to minute details in their designs. Thus, the artisans prioritize the attention to fine craftsmanship over the safety of their eyes. This sentiment was ubiquitous, confirmed by every single artisan I interviewed and supported by the wives of the artisans as well as the traders. As one artisan I interviewed articulated:

I [...] get dust in my eyes and would fall sick. I put my finger in to take it out but sometimes cannot. Because they mix chemicals in [the wood],

⁴A manual for woodworkers published online (<http://woodworking.about.com/od/safetyfirst/tp/safetyRules.htm>) states explicitly that "there is no time in the wood shop that you should be without your safety glasses. Put them on when you enter the shop, and don't take them off until you leave. Your eyesight is too important to take chances."

it's painful ... [but] When I work on the lathe, if I put on the shades [eye glasses], I am unable to see the wood as carefully [as I want to]. So no one wears them.

Traders, on the other hand, have no internal standards for their products, only hoping to earn the maximum amount of money from selling these products. Similar to artisans, traders also inherit their trade from their fathers, growing up with a deep understanding of the artistic processes. This skill enables them to appraise the quality of products accurately and negotiate contracts. One trader I spoke to confirmed,

Of course we know [if the wood is adequately seasoned], this is a family trade business. We've been seeing this for generations, we can see and tell apart the good wood [from the bad wood]. We can see and identify even if the color has been applied well.

And yet, despite being skilled appraisers of the craft products, traders do not voice or demonstrate affection towards the products that they sell or concern for inherent artistic quality, thus focusing on their profits instead. One trader said:

“Today I sell one thing [product], tomorrow another, its all the same”

Traders also display no commitment to selling only these handmade products. For example, seeing a rising demand for Chinese plastic toys that are substantially cheaper than their handmade wooden counterparts, traders have begun importing Chinese goods in large quantities and selling them beside locally-made wooden items. More than half of the traders in Channapatna now stock products from China. While artisans dearly value the products that they make, traders see the same products as being substitutable or replaceable depending on market conditions and consumer demand. Similarly, traders are willing to compromise on the quality of their products when raw materials become more expensive. A trader I spoke to explained this practice:

Well the material costs are increasing, what do you do? The cost of production doesn't get adjusted [on its own], so one solution is to lower the quality of the products, buy cheaper raw materials..you just adjust and keep going ... this is business.

2.5.2 Product Attachment and Price-Setting

The previous three subsections reveal that artisans and traders in Channapatna vary in how much they invest in their products, what the products mean to them and what internal standards they have for the products. Thus, even though artisans and traders sell the same products, they have very different relationships with their products. Artisans are willing to make sacrifices for their products, whether in terms of personal health and safety or with respect to their financial returns, due to their attachment to the products whereas traders are more singularly focused on the goal of profits and making money through the products.

My field observation additionally indicates that artisans' and traders' varying levels of product attachment might affect how they price. In observing the prices offered to different buyers that artisans and traders interacted with, a unique pattern emerged: artisans seemed to offer the highest prices to Indian tourists from the region (people who spoke the same language and were likely to be from a similar socio-economic background as the artisans themselves), while they often offered significant discounts to those who came from a discernibly more wealthy background such as foreigners. This pattern in prices was not observed among traders, who appeared to price in line with traditional economic theory, by charging seemingly wealthier buyers higher prices.

My interview data suggests that artisans care about selling to buyers who will provide a good home for their products, appreciate and take care of their products beyond the point of sale, and are willing to give discounted prices in order to transact with these discerning buyers even when they have a higher willingness to pay. Artisans connect so deeply with their products that they care not only about the artistic quality of their products but also about characteristics of the buyer that purchases

the product. Consequently, artisans derive value not just from finding a buyer for their product and charging the highest price possible, but also in ensuring that the *right* buyer is found, one that will take care of the product, appreciate its value, and show it off in aesthetically pleasing ways. One artisan, describing his preferences in buyers, said:

I want my product to be displayed well in the customer's home..I don't want it[the product] to lie on a dusty shelf somewhere or in a closed cupboard...some buyers will put my product on a center table, that's what I like.

In fact, I noticed that I often received lower prices from artisans when shopping for jewelry on days when I also happened to wear handicraft jewelry. Artisans would often notice the jewelry and ask about their origin. Artisans seemed to interpret my prior history with handicraft products on such days as a signal that I would be committed to their craft jewelry and take care of their creations beyond the point of sale, thus offering me a lower price for these goods.

Similarly, international tourists, despite their higher willingness to pay, were also seen by artisans as having a keen interest in Indian handicrafts, offering the opportunity for artisans to display their products in distant locations around the world. Some artisans explained why they liked selling to foreign customers:

Our necklaces which are brightly colored look good with a white shirt and usually foreigners know to wear this combination; then the necklace shines.

My products will now be displayed prominently in America. This makes me so proud.

Traders, on the other hand, seeing the same products as a means to an end, seek to maximize their economic gains from the selling process and charge buyers in accordance with their willingness-to-pay. This observation leads me to the following hypothesis that I test in this paper:

HYPOTHESIS: Sellers with attachment to their products will offer lower prices to discerning buyers who have a taste for their products, whereas sellers who are not attached to their products will price in line with profit maximization, charging wealthier buyers higher prices.

In the next section, I describe a field audit study that systematically tests this hypothesis that artisans and traders price discriminate differently to different kinds of buyers, owing to their varying levels of attachment with the products that they sell. By controlling for all differences in these transactions except for the fact that some buyers are trained to project a more discerning orientation towards craft products, and by measuring the prices charged by artisans and traders, the study is able to analyze whether sellers' attachment to the products being sold matters for the prices they charge to different buyers.

2.6 Field Experiment: Design

An audit study design, which has previously been used in the study of discrimination in sociology (Pager, 2007; Pager and Quillian, 2005; Correll et al., 2007), is adapted to study price discrimination in Channapatna. The experiment⁵ proceeded as follows. Six auditors were trained to be buyers of a standardized craft product, a pair of half-inch bangles, in Channapatna. Each auditor visited a sample of sellers in a randomly assigned order to make these purchases. The auditors negotiated for a price, according to a prescribed bargaining script, and recorded price and other information on a form after each sale. The experiment, which was conducted over a two week period in the middle of May 2012, coincided with a large cricket tournament in the area. This meant that there were more tourists than usual visiting Channapatna and the auditors in the experiment did not stand out. This section describes the design and implementation of the experiment in detail.

⁵A big thank you to Tavneet Suri for all her help with the experiment. Iyer and Schoar (2013) was also instructive in the design of the audit study.

Product and Sellers. The “Channapatna Bangle”, of half-inch width, was the standardized craft product chosen for the purpose of the experiment (See Figure 2-2 for a picture). This bangle is ubiquitous and widely produced and sold in Channapatna owing to its current popularity in Indian fashion. In addition, this bangle is standardized in its cost of production and yet, offers an avenue for creative expression and craftsmanship through differential color, pattern, and design. Since these bangles are usually worn in pairs, each auditor also purchased a *pair* of Channapatna Bangles of half inch width.

For this experiment, a sample of 77 sellers, 52 artisans and 25 traders, was created from Channapatna’s population of over 5,000 sellers.⁶ See Figure 2-4 for a map showing the geographic location of the chosen artisans and traders, collected through a GPS device. In choosing the sellers for the experiment, only those artisans and traders who had ample experience making and selling half-inch bangles, and who had sufficient stock of this product were considered. Further restrictions were imposed on the sample to select artisans and traders who were at least 500 meters away from other sellers in the sample. The final sample consisted of sellers across 8 localities of Channapatna. The sellers in the sample were divided into 20 groups, each consisting of 3 to 4 artisans or traders, based on geographical proximity. This aided in devising a schedule for the experiment.

INSERT FIGURE 2-4 ABOUT HERE

Auditors and Treatment. Six auditors were hired for this experiment, four Indians and two foreigners. The auditors were all women in their early twenties with 12 to 14 years of education. They came from families of 4 to 6 members and had 2 to 3 siblings each. They were also of similar height and weight. None of them had been to Channapatna before, or had prior familiarity with the craft work there.

The six auditors were similar except for their “look,” or material presentation,

⁶My participant observation and interviews encompassed a wider sample of artisans and traders, which enabled me to establish that the sellers in my sample seem to be similar to other sellers in Channapatna.

which constituted the key aspect of the treatment for the experiment. My fieldwork indicated that artisans preferred clients who were appreciative of their products, especially if they had traveled from a foreign country or if they signaled being discerning Indian appraisers of the craft. Accordingly, the auditors were assigned to three experimental roles, “International” foreign auditors who conveyed a high level of appreciation (apart from having a high willingness-to-pay), “Indian-Craft,” Indian auditors wearing several handmade products thereby conveying taste for craft work and “Indian-Baseline,” a control group that consisted of Indian buyers who dressed like the locals in the area.

In order to enact these roles, I hired four Indian auditors (who were randomly assigned to the Indian experimental categories) and two international auditors. The Indian auditors I hired were all from small towns about 450 kilometers away from Channapatna in the same state of Karnataka and spoke the same language - Kannada - as the locals in Channapatna. They dressed traditionally in the Indian attire of *salwar-kameez*, a pair of loose trousers, a long tunic and a scarf, just like the average female Indian tourist in Channapatna. However, the two auditors in “Indian-Craft” were directed to display an aesthetic taste for handmade, craft products in their fashion choices instead of the more common synthetic alternatives. Hence, they wore several craft items including handmade terracotta earrings, a handcrafted metal necklace, *salwar-kameezes* made from handwoven cotton and they each carried handbags woven out of natural fiber. These products were specifically from craft clusters in other parts of India, not from Channapatna, and were meant to indicate appreciation for craft work rather than familiarity with Channapatna’s products. On the other hand, the two auditors in “Indian-Baseline” dressed like they normally would, with plastic jewelry, *salwar-kameezes* made of polyester material and they carried synthetic handbags.

I also hired two international auditors for this experiment who were assigned to the “International” role. These auditors were from Thailand and Mauritius, spoke neither Kannada nor Hindi, and therefore conducted their transactions in English. They looked discernibly foreign, with their lighter skin color, distinct features and their

Western clothing consisting of dresses, skirts, pants and shorts, and as such, were similar to the average international tourist shopping in Channapatna. The six auditors were each paid Rs.10,000(\$200) for this assignment lasting two weeks. This is equivalent to the wage for an entry-level job at a call center in India.

Training. Prior to implementing the experiment, the auditors spent three days in training, consisting of classroom presentations and discussion, practical observation of the area, followed by a pilot exercise. The first part of the training involved introducing the auditors to the setup of the experiment without revealing the research questions of interest. This included educating the auditors about the wood and lacquerware products of Channapatna and specifically, the product that they would purchase in the experiment- a pair of bangles of half inch width. This would ensure that the auditors could easily identify the Channapatna bangle at the time of sale. Auditors were instructed to transact with the trader or artisan himself, not a relative or wife, and similarly, not to purchase from sellers not listed in the sample. Subsequently, the auditors were put through a range of role-playing exercises to practice acting like a buyer and to achieve consistency in their acting. This portion of the training involved memorizing a script describing what the auditor was doing in Channapatna, namely making a stop en route to the tourist city of Mysore, learning to deny any prior exposure to the wood and lacquer craft and learning the bargaining routine to haggle for the products. The final element of the classroom training entailed practicing how to fill out a “Transaction Form”, a custom form designed to capture prices and other details of the transaction, after each purchase.

The classroom education was followed by field training in Channapatna. Here, a mini-van was rented to drive through Channapatna and build familiarity with the area. Auditors were given detailed maps marking the locations of every artisan and trader in the sample and were shown the different localities of the town so that they could find their way alone during the actual experiment. Finally, a pilot experiment was conducted in a nearby town called Yarabnagar that makes carved wooden products. Here, auditors visited a small sample of sellers to rehearse their script, make

purchases in accordance with the bargaining protocol and practice filling out the transaction form after each sale.

Randomization. The schedule for the experiment, governing the transactions that an auditor would conduct on a given day, was created using a randomization code. Each day of the experiment was divided into two time slots, a morning slot and an evening slot. As established, the actors for the experiment comprised 6 auditors and 20 seller groups, each consisting of 3 to 4 sellers each. The goal of the randomization code was to assign one auditor and one group of sellers to each time slot such that: 1) each auditor visits a given seller group only once, 2) two auditors do not visit the same seller group in the same time-slot, 3) sellers do not receive auditor visits on consecutive days and 4) a seller does not receive more than 3 auditor visits in a week.⁷ Imposing these constraints on the randomization code mitigated concerns of “demand effects” or stockouts⁸ and ensured that sellers in the sample were not bombarded by auditors.

Buying Process. On any given day of the experiment, each auditor was given her schedule for the day and money for the transactions. The auditors would set out at 9AM and commute within Channapatna independently by rickshaw or bus. On reaching an assigned seller, the auditor would leisurely survey the seller’s products before choosing a pair of half-inch bangles for purchase. The auditor would then get the seller’s attention and ask the price of the bangles. Upon hearing the seller’s initial price, in the first round of bargaining, the auditor would offer half of this quoted price. If the seller did not accept this offer, he would suggest a second price to which the auditor would raise her initial price by Rs.2 in this second round of bargaining. If the seller did not accept this offer as well, the interaction would repeat with the seller offering yet another price and the auditor raising her price by Rs.2 again in the third round of bargaining. The bargaining would cease at this point and the

⁷Survey data indicate that sellers retail 70 bangles per week on average and therefore, the 3 auditor purchases per week of the experiment is unlikely to be noticed by the sellers or affect their behavior.

⁸A situation where the sellers price differently because of depleting stock.

auditor would pay the final price demanded by the seller. This bargaining routine, modeled on typical informal market behavior in India (Iyer and Schoar, 2013), was standardized across all transactions conducted in the experiment. After completing a transaction, the auditor would leave the seller’s premises and find an isolated spot to fill out the transaction form before proceeding to the next seller. If a transaction could not be performed due to unavailability of the seller, the auditor took note of this and revisited the seller on a different day.

At the end of the day, auditors would submit their purchased bangles and completed transaction forms to me. Each pair of bangles was labeled with both seller and auditor information. The forms were also checked for missing values and data entry was completed the very same day.

2.7 Field Experiment: Results

In total, the experiment comprised 455 audit visits to 52 artisans and 25 traders conducted by 6 auditors. Table 2.2 shows the distribution of sales transactions by each seller and buyer category. The table reports that each of the three auditor categories conducted between 100 and 103 transactions with artisans and 50 transactions with traders over the course of the experiment, thus making for a fairly balanced overall distribution in exposure to the experimental treatment, namely the 3 “looks.”⁹ Data from the experiment also confirm that the ordering of auditor visits to any seller was random, as planned. For example, a seller had a roughly 33% chance of receiving an International, a 31% chance of receiving an Indian-Baseline and a 35% chance of receiving an Indian-Craft auditor for their first transaction. In unreported analyses, I also verified that the mean prices offered by sellers on any given day of the experiment displayed no discernible trend over time. To be cautious however, all reported regressions include date fixed effects allowing me to control for any possible time trends in the results.

⁹While all 150 transactions with traders were conducted as planned, there were 7 planned transactions with artisans that could not be completed due to unavailability of the artisans in question. However, these incomplete transactions are also distributed evenly across the 3 auditor categories.

INSERT TABLE 2.2 ABOUT HERE

To confirm that randomization was conducted correctly in the experiment, Table 2.3 displays an OLS regression of the auditor categories on 3 baseline transaction-level characteristics that could have an impact on price. We would not expect any significant heterogeneity across auditor categories in these baseline measurements if the randomization was done correctly, since treatment assignment was random and orthogonal to these baseline characteristics. The first characteristic that the auditors took note of was whether there was electricity at the time of sale. This is relevant because Channapatna faces unpredictable power outages of 3 to 4 hours a day. Second, the auditors estimated the remaining stock of half inch bangles a seller had, after they had made their purchase; this stock varied widely based on the seller's day-to-day business. And third, the auditors indicated whether the seller's spouse was present while the transaction was being conducted; the spouse was typically present when there were other errands to complete such as cleaning or arranging the items on display. The table reports that electricity was available in about 58% of the 455 transactions, that a seller typically had between 12 and 17 pieces of half-inch bangles left and the seller's spouse was present during 22% of the transactions. However, as predicted, these baseline transaction-level characteristics do not vary significantly across the auditor categories, providing evidence that randomization was implemented according to plan.

INSERT TABLE 2.3 ABOUT HERE

2.7.1 Prices

This section first explores the variation in initial prices offered by artisans and traders to the auditors displaying different looks. Initial price, the price first quoted by the seller, is a particularly useful measure because, even though the bargaining protocol was standardized, initial prices reflect the sellers' appraisal of each buyer role and

should be independent of the way in which bargaining proceeded.¹⁰

Figure 2-5 illustrates the distribution of initial prices (in Indian Rupees, where approximately Rs.50=\$1) that auditors received when transacting with artisans and traders. The graph to the left shows that the mean initial price offered by artisans is Rs.27.91, but that there is significant variation in this price: it ranges from Rs.0 to Rs.60 and its standard deviation is 14.79. The graph to the right illustrates the corresponding initial prices that auditors received from traders. The mean initial price offered by traders is considerably higher than that of artisans at Rs.36.35. Traders' initial prices also vary widely, ranging from Rs.18 to Rs.75 with a standard deviation of 10.88. Note that, unlike artisans, traders do not offer any zero initial prices.

INSERT FIGURE 2-5 ABOUT HERE

In order to investigate whether average prices differ significantly between auditor groups, for both artisans and traders, Figure 2-6 plots the mean initial price offered to the three auditor groups, with error bars representing a 95% confidence interval around the mean. Consistent with the predictions of the hypothesis, the figure indicates that artisans charge the lowest mean prices to Indian-Craft (Rs.18.63) followed by International (Rs.28.15) and then Indian-Baseline (Rs.36.87). Artisans seem to distinguish between these three groups and charge them prices in accordance with their displayed taste and appreciation for handmade products. It is interesting to note that the discounts offered by artisans are greater for Indian-Craft as compared to the International auditors. This suggests, perhaps, that artisans are most responsive to the customers who not only signal an appreciation for craft (like the international tourists), but who demonstrate a physical and monetary commitment to handicraft products by purchasing and wearing them. Traders, on the other hand, price quite differently. They charge the highest mean price (Rs.45.30) to the International category, which is in accordance with pricing based on customers' willingness-to-pay.

¹⁰The focus of the analyses will mostly be on initial prices, but the results are robust to using final prices also. Final price is the price at which the product is eventually purchased after auditors engage in three rounds of standardized bargaining. On average, the buyers receive about a 15% price reduction after bargaining with artisans and a 10% price reduction from traders.

There seems to be no significant difference in the traders' prices offered to Indian-Craft (Rs.32.72) and Indian-Baseline (Rs.31.04), suggesting that traders disregard the handicraft products worn by the Indian-Craft category in making pricing decisions. In this way, traders seem to price in accordance with customers' willingness-to-pay for the products being sold rather than appreciation for the craft.

INSERT FIGURE 2-6 ABOUT HERE

Having explored the variation in prices offered to different buyer groups, Table 2.4 tests whether log initial and final prices (excluding zero prices) offered to different auditor groups are statistically different from each other. The OLS models I employ also allow me to account for error structures robust to group-level covariance,¹¹ add date and time-level fixed effects and log specifications allow me to interpret differences in percent-terms. Specifically, I regress price outcomes on three dummy variables, one for each buyer category, Indian-Baseline, Indian-Craft and International, using separate models for artisans and traders, focusing on the variation within sellers in prices offered to different buyer categories. Column (1) of the table regresses initial price on Indian-Craft and International, using Indian-Baseline as the omitted category. The constant term gives us the estimated mean initial price of the omitted category, Indian-Baseline, conditional on covariates, while the coefficients on the Indian-Craft and International dummy variables provide estimates of the difference in mean prices between Indian-Baseline and the respective category. The table reports that artisans offer a 50% discount to Indian-Craft and a 27% discount to International. A post-estimation F-test is performed to test the equality of the Indian-Craft and International coefficients, which shows that the difference in these coefficients for artisans is also statistically significant. This regression is then repeated in column (2) for traders. The table reports that traders charge almost the same price to Indian-Craft as they charge to Indian-Baseline, but charge 45% higher prices to

¹¹Standard errors are clustered at the level of sellers (77 clusters); this allows for potential correlation in the error terms within sellers and uses repeated observations on transactions with the same seller to estimate standard errors robust to this problem (Angrist and Pischke, 2008). Standard errors are clustered in a similar way for all the models reported in this study.

International as compared to Indian-Baseline. The post-estimation F-test indicates that the difference in prices between Indian-Craft and International is also statistically significant. Columns (3) and (4) repeat these regression for final prices and find the same pattern in price discrimination for both artisans and traders, confirming that the pricing behavior is resistant to bargaining. Overall, the regressions provide evidence to support the hypothesis that artisans offer discounts to those groups of buyers who display a taste for handicraft products in a way that traders, who focus on the buyers' willingness-to-pay, do not.¹²

INSERT TABLE 2.4 ABOUT HERE

It is further remarkable in my setting that in some cases artisans will offer bangles at a zero price to some auditors, even before they have bargained for it. Artisans seem so eager to sell to a particular buyer that they are willing to part with their product without any financial returns, serving perhaps as the strongest confirmation of my theory. Table 2.5 explores patterns in the zero prices offered by artisans to test whether there are significant differences across the 3 auditor categories. This is important because more than 10% of initial prices quoted and 12% of final sale prices were zero for artisans.¹³ To test whether these zero prices differ across the auditor categories, I created dummy variables for both initial and final price indicating whether a given price is equal to 0. Table 2.5 reports the OLS regression on zero prices offered by artisans using a specification similar to Table 2.4. Column (1) shows that Indian-Craft auditors are 18% more likely to receive a zero initial price than Indian-Baseline, and International auditors are 7% more likely to receive a zero initial price than Indian-Baseline. In addition, a post-estimation F-test rules out equality of the coefficients of Indian-Craft and International. Column (2) further shows that the results are even stronger for a zero final price. This demonstrates that the broader

¹²The results are robust to using raw prices, dropping fixed effects and including zero prices, indicating that the results are not likely to be driven by differences in transaction-level characteristics, but by the role played by the auditor herself.

¹³Note that there are more zero final prices than zero initial prices, implying that not all zero prices are prior to bargaining.

price discrimination pattern observed amongst artisans, namely offering the lowest prices to Indian-Craft and the next lowest prices to International, also holds for zero prices, with Indian-Craft having the highest likelihood of being offered a zero price followed by the International category.

INSERT TABLE 2.5 ABOUT HERE

2.7.2 Bargaining Rounds and Transaction Length

The previous section documented the main test of the hypothesis that artisans will charge lower prices to International and Indian-Craft auditors who signal appreciation for craft products, and that traders will charge higher prices to International auditors who presumably have a higher willingness-to-pay. This section will present additional analyses to suggest that product attachment is likely to be the mechanism driving artisans' pricing behavior.

If it is indeed true that artisans respond differently to the presence of more appreciative customers as a result of their strong product attachment, they can also be expected to haggle less with such clients. I collected detailed data on not only the prices charged, but also the number of bargaining rounds that took place before the transaction was completed. Table 2.6 compares the total number of bargaining rounds required to complete a purchase (where 0 is the minimum and 3 is the maximum) across auditor groups using an OLS model. Column (1) finds that artisans engage in fewer bargaining rounds with both International auditors (2.05 rounds) and Indian-Craft auditors (2.05 rounds) as compared to Indian-Baseline auditors (2.67 rounds). Column (2) shows that traders typically bargain more than artisans, but do not seem to bargain differently with different auditor groups in any way i.e. they bargain "hard" with all buyers. These results on bargaining rounds by buyer group, while strongly indicative of artisans' preferences over buyers to transact with, offer even more compelling evidence of product attachment when considered alongside a regression on transaction length.

INSERT TABLE 2.6 ABOUT HERE

I use data collected by the auditors who were trained to use a stopwatch to measure the time taken for each transaction to complete. Columns (3) and (4) of Table 2.6 report results from an OLS regression that regresses transaction length on each auditor category. Column (3) shows that even though artisans bargain significantly less with Indian-Craft and International, as compared to Indian-Baseline, they engage in longer transactions with these two groups of discerning buyers. Since auditors were rigorously trained to use a standardized script in conducting their transactions, differences in transaction length stemmed solely from variation in seller-initiated conversations for different auditor groups. Anecdotal descriptions confirmed that artisans asked Indian-Craft auditors questions about the handmade products they wore as part of the experimental treatment and asked International auditors questions about their home country. This resulted in artisans having longer transactions with Indian-Craft and International auditors, in an attempt to get to know the discerning buyers who were taking home their “babies.” The estimates reported in column (4) show that traders display no difference in transaction lengths between the different auditor categories, confirming that traders only care about buyers’ willingness-to-pay. Overall, these comparisons of transaction length and bargaining rounds find additional support for the theory that artisans’ strong product attachment, and their preference to sell to a certain kinds of buyers, is driving the observed pricing behavior in Channapatna.

2.7.3 Involvement in Work Processes

While we have established that prices offered differ substantially between auditor categories, it is reasonable to expect that as artisans engage in a greater number of work processes, such differences should become more stark. As Figure 2-3 makes clear, the process of producing artisanal products involves a number of distinct processes. While the majority of artisans manufacture the entire product themselves, some artisans who retail handmade products are not involved in the total manufacturing process, but will source semi-finished components from other local suppliers

or outsource preparatory or finishing processes. We would expect artisans who are partially involved in the production process to have a lower degree of product attachment as compared to those who are fully involved. Further, the variation in artisans' level of engagement with the production process allows us to examine the impact of artisans' product attachment on prices offered. In order to investigate such an effect, I use survey data that measures artisans' involvement in each of the the nine different stages that comprise the overall production process.¹⁴ I find that on average artisans engage in about 6.4 work processes with a standard deviation of 2.25.

Figure 2-7 graphs the impact of involvement in work processes using estimates from an OLS model. The underlying model regresses the initial price offered on dummy variables for auditor categories, as before, and also includes *Processes* as an independent variable. *Processes* is a continuous variable ranging from 1-9 measuring the number of work processes that a given artisan engages in. Crucially, in addition to these main effects, the regression includes interactions between auditor category and *Processes*. This interaction term estimates how prices offered change for different buyer groups as an artisan engages in a greater number of work processes. These estimates can then be used to calculate the predicted price than an auditor will receive from an artisan depending on the auditor's category and the artisan's *Processes*. A convenient way of displaying these predictions obtained from regression coefficients is using a "marginal plot," as shown in Figure 2-7.

INSERT FIGURE 2-7 ABOUT HERE

Figure 2-7 makes clear that the difference in prices offered to the three buyer groups increases with greater work process involvement. For example, while artisans who are engaged in only one work process are seen to provide a discount of about 40.5% to Indian-Craft auditors as compared to Indian-Baseline auditors, this discount increases to 53% for artisans engaged in all nine work processes. This finding offers

¹⁴These processes include cutting the wood, seasoning the wood, turning the wood on a lathe, assembling the products, polishing, lacquering, painting, finishing and selling.

greater evidence that product attachment is the mechanism for artisans' pricing behavior by showing that as artisans engage in more work processes, they are willing to give greater discounts to discerning customers.

Appendix A describes results from a number of robustness exercises performed to investigate the role of alternative explanations in explaining artisans' distinctive pricing behavior. These include controlling for age, work tenure, presence of neighboring sellers, income, distance from highway, business with traders, visits to Bangalore, education and religion of artisans.

2.8 Discussion

2.8.1 Product Attachment and Reverse Price Discrimination

My primary contribution in this paper is to introduce the concept of sellers' product attachment, by specifying its indicators, and then to demonstrate its role in price-setting. The current explanations of reverse price discrimination, with an underlying focus on sellers' short-term profits or long-term relationships with buyers, have not considered whether sellers view their products as being more than a means to an end. This is important because studies from the sociology of work show that when sellers invest significantly in their products, emotionally and/or physically, they can become attached to their goods and care about the products' welfare. When this is the case, sellers are willing to make monetary sacrifices in the production process in order to make the best product possible. I extend this perspective to the understanding of price discrimination in arguing that sellers will similarly be willing to make financial sacrifices in their sales revenue owing to concern for their products' welfare when they are attached to their products. In particular, I argue that sellers attached to their products will care about the kinds of buyers buying their products and whether these buyers will take care of their products beyond the point of sale and will be willing to give discounted prices in order to transact with these discerning buyers. In this way, I contribute to existing theories of reverse price discrimination by emphasizing

that sometimes, sellers maximize both the product's welfare as well as their personal gains in price-discriminating between different buyers.

This theory applies widely, beyond the setting of handicraft markets, as previous studies have indicated. For example, scientists attached to the original research that they meticulously develop have been shown to desire a wide, academic audience for their creative work, so much so that they compromise on their monetary rewards to retain the ability to publish their papers to such an audience (Stern, 2004). Like scientists, application developers for Apple's iPhone, identifying with the applications that they create, resist giving up control of their creative output to a commercial domain whose values they do not espouse (Mollick, 2012). In some other cases, sellers refrain from parting with their goods if the right audience is not found. Quilters in Southwestern United States neither use nor sell their most artistic quilts, where the stitches are as small as possible, the corners are turned to a tee and every seam is straight as an arrow, but instead put them away for safekeeping, finding no deserving buyer for these special hand-crafted quilts (Becker, 1982). Even beyond creative settings, sellers of rare books that are hard to acquire or sellers of cherished, used cars, can similarly value their products as being more than a means to an end and offer discerning buyers lower prices. Thus, a wide range of sellers who value their products as more than a means to an end, are willing to make monetary sacrifices in the selling process for the sake of their products, to see their products protected and nurtured.

2.8.2 Product Attachment and Other Economic Outcomes

Although the focus of this paper is on pricing behavior, one could reasonably expect product attachment to influence other, more complex economic outcomes too. This study offers a theoretical and empirical framework to understand these other economic outcomes as well. Consider three examples of economic decisions that could be influenced by product attachment. First, musicians often have to make decisions regarding where to perform. While it would seem advantageous to pick large concert halls that would generate more revenue from ticket sales, one can imagine that mu-

sicians also consider the likely quality of the audience- in particular, the ability to appreciate nuances in the compositions- in picking performance venues. For instance, the Society for Private Musical Performances, a concert venue specifically for small, discerning audiences, founded up by the Austrian composer Arnold Schoenberg, was a highly desired performance site among contemporary musicians in its time (Smith, 2009). Performances here were not motivated by financial returns, but were dedicated to the sincere study and appreciation of difficult contemporary works, so much so that each work was performed twice in the same evening to promote a deeper understanding of the music (Fonseca-Wollheim, 2012). Musicians' decisions to perform at the Society instead of a large concert hall can be explained by a deep identification with their music and desire to render carefully-prepared concerts to astute audiences.

Second, sellers also have to make investment and financing choices, where again identification with the creative output can influence the decision made. For instance, filmmakers, in choosing a production company for their film, are likely to consider which companies will preserve the artistic vision of their carefully crafted films, and not just regard the monetary rents from this contract. Kenneth Lonergan, a Hollywood screenwriter lamented that his original screenplay for the film "Analyze This", upon being sold, went through a "dozen different screenwriters", a process that he is not "comfortable having done to work [that he has] written for love, as opposed to money" (Lovell, 2012). Consequently, in future films, he ensured that he had "complete control over the finished film" in picking producers (Lovell, 2012). Similar to the musicians' decision about performance locations, this example illustrates how attachment to one's product plays a significant role in economic decisions.

Third, a wide range of sellers additionally have to choose what intellectual property (IP) or licensing scheme they would like to use to protect their products (Murray, 2010). In these decisions too, it is reasonable to expect that beyond the narrow financial rewards associated with protection, product attachment plays a role in the choice of IP regime. Silbey (2014) reports that recouping investment through IP arose infrequently in interviews with sellers, in contrast to abundant discussion about the value and meaning of their work output. Similarly, many sellers paid little or no attention

to the financial terms of their contracts that concerned intellectual property royalties, but they cared deeply about the future use of the work that they create (Silbey, 2014). Quoting a film industry veteran, Silbey (2014) reports how sellers prefer to “nurture their [intellectual] property” rather than “milk it ’til it’s dry and then put it to bed.” Each of these examples of economic behavior is similar to Channapatna artisans’ pricing decisions in that love for their products motivates an economic outcome even at the potential cost of financial gains. Further, this list of examples is far from exhaustive - beyond intellectual property, investment and performance decisions is a whole array of economic decisions for sellers, right from sourcing of raw materials to advertising to costing decisions, which could be influenced by attachment to the creative output. In this way, the results presented in this paper have implications for the study of economic behavior more widely as well.

2.9 Figures and Tables

Figure 2-1: Channapatna on Bangalore-Mysore Highway

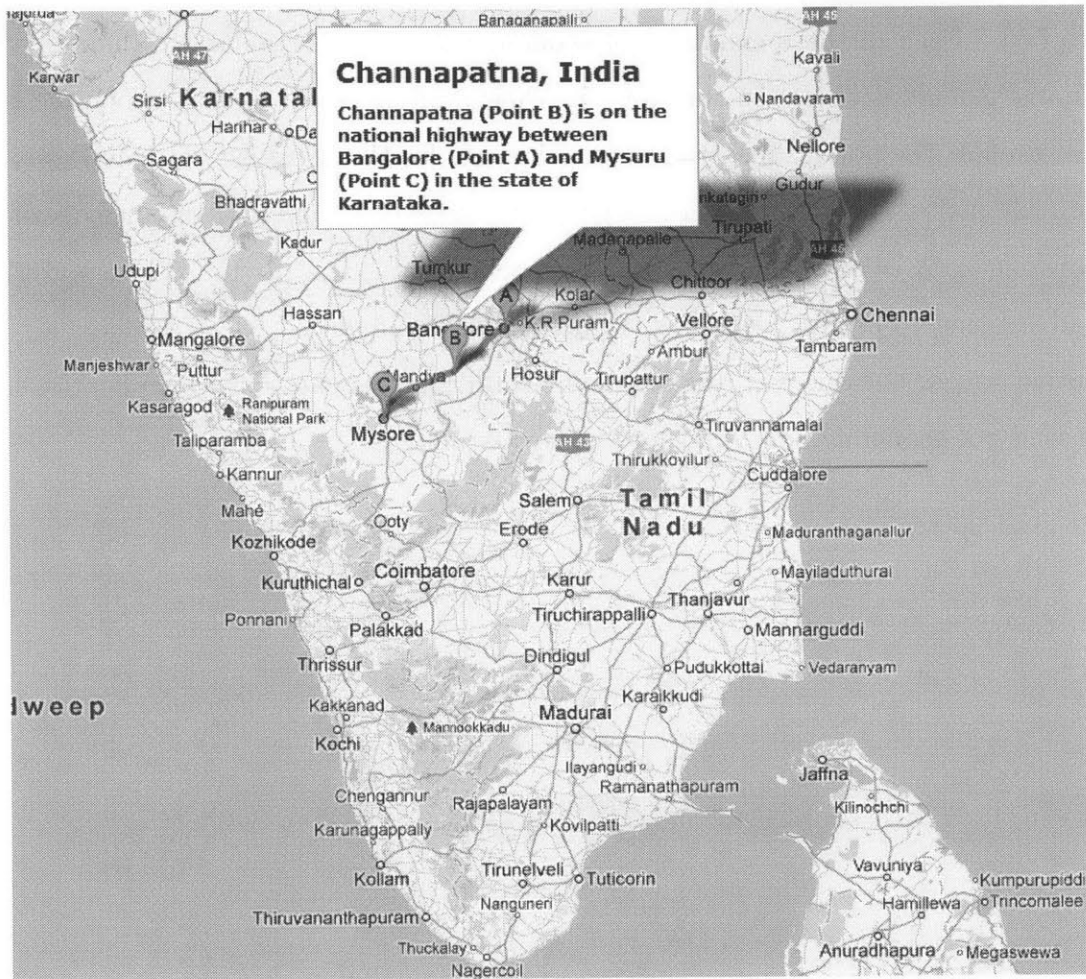


Figure 2-2: Some Channapatna Bangles at an Artisan's Home

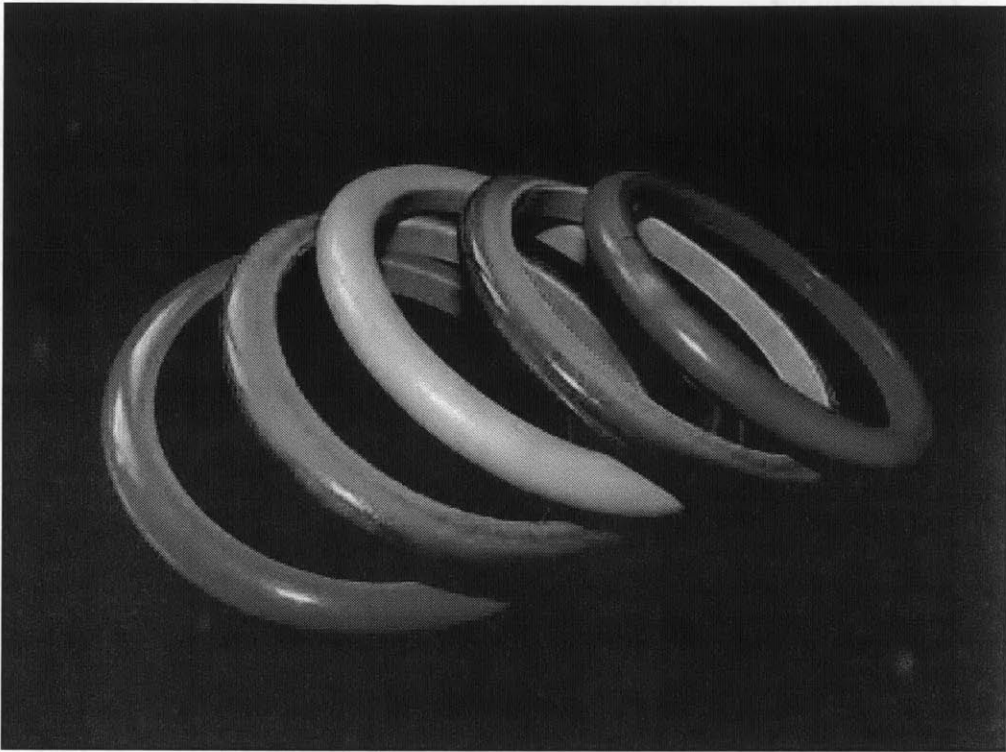


Figure 2-3: A Diagram illustrating the Production Process

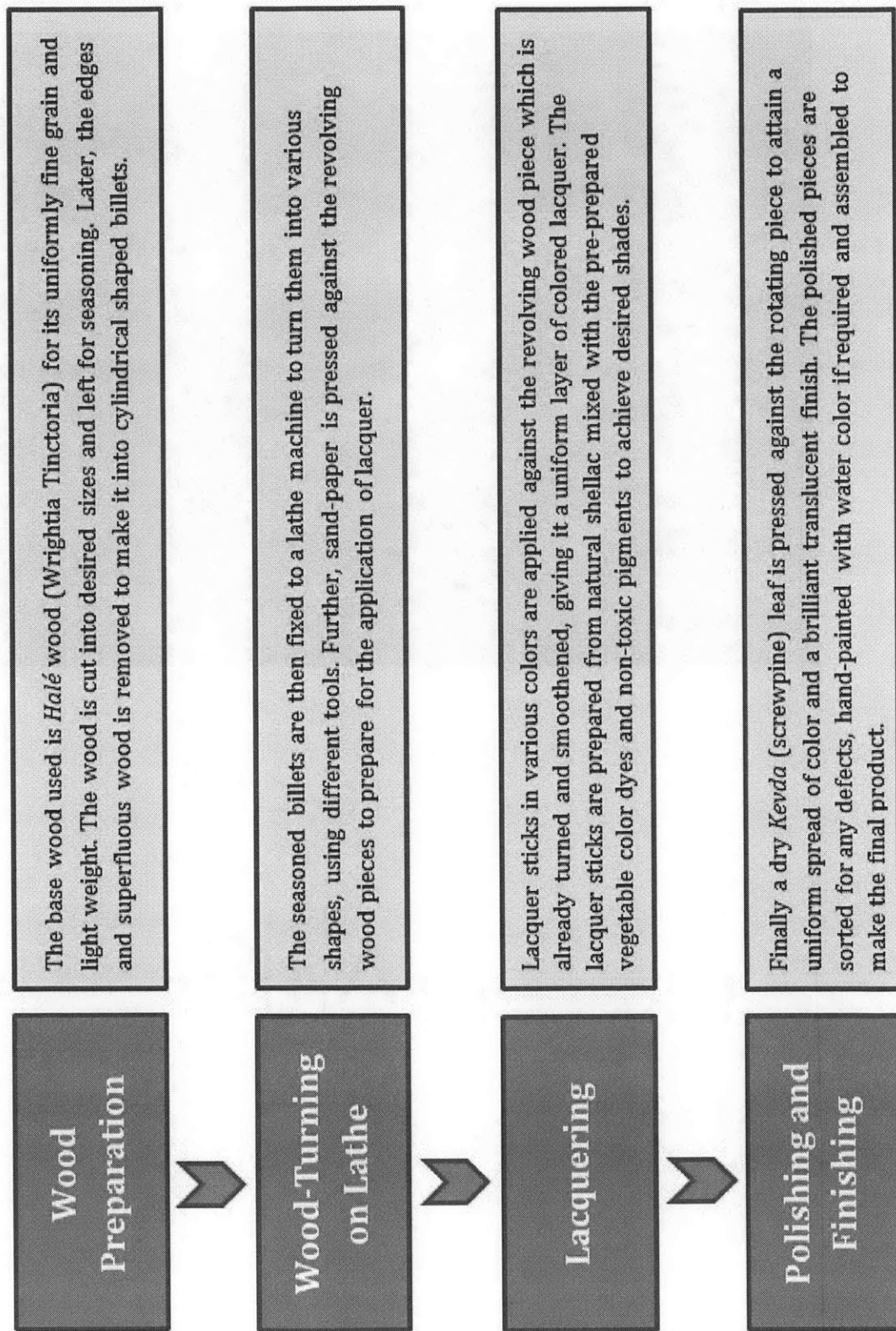


Figure 2-4: GPS Plot of Artisans and Traders in Sample

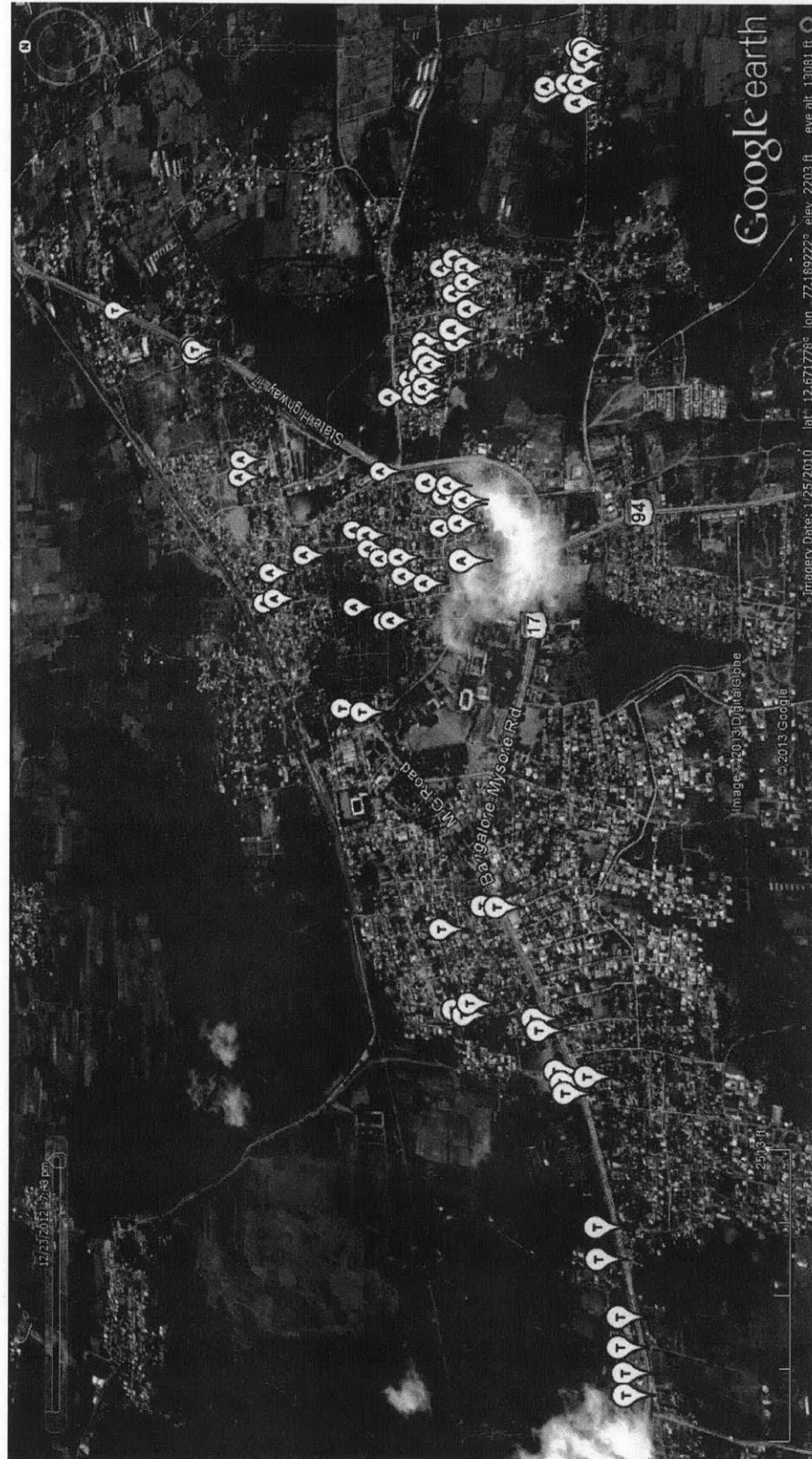


Figure 2-5: Distribution of Initial Price(in Rupees) for Artisans

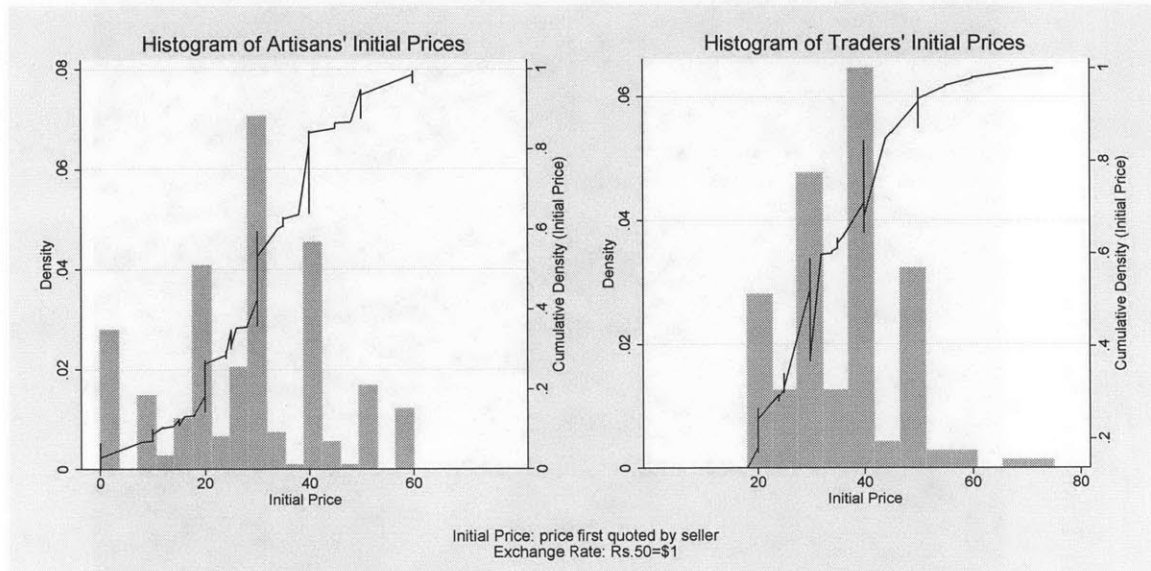


Figure 2-6: Mean Initial Price(in Rupees)

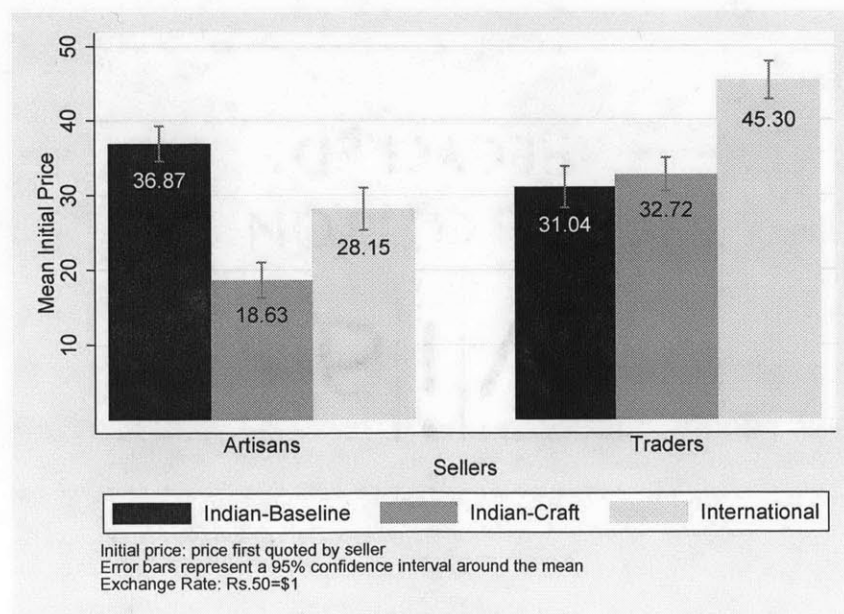
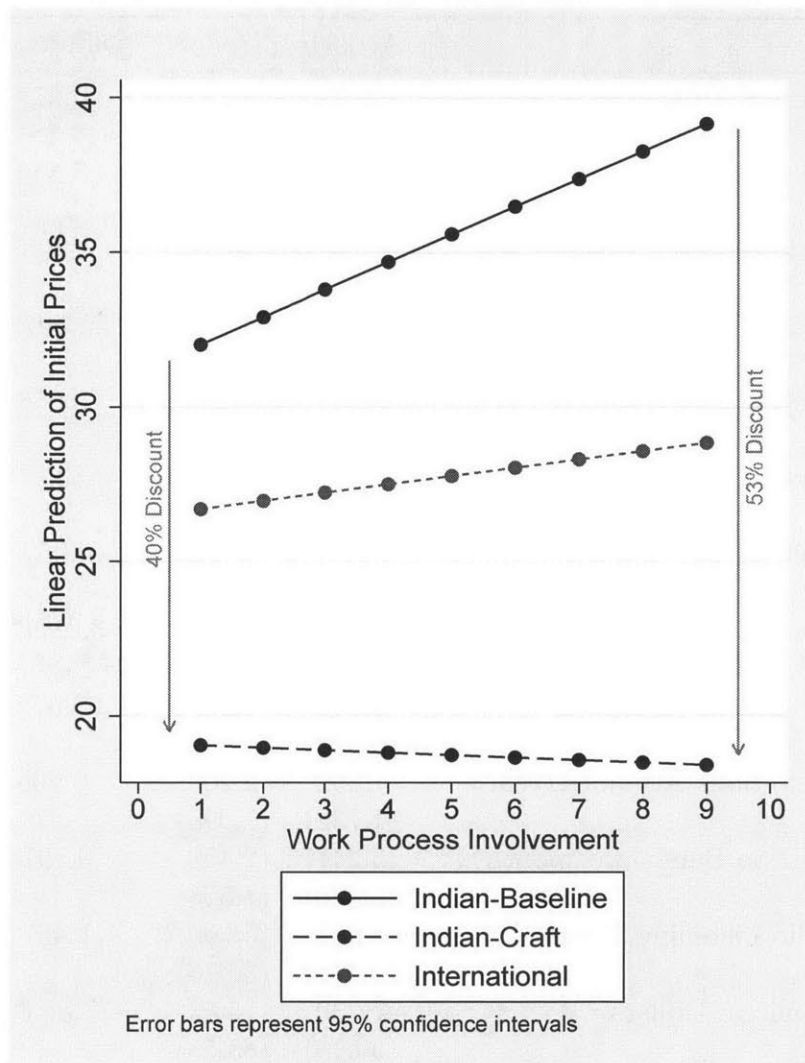


Figure 2-7: Predicted Impact of Work Process Involvement on Initial Prices



*Note:*The entire work process can be split into 9 steps, some of which can be subcontracted. *Processes* is a continuous variable ranging from 1-9 measuring the number of work processes an artisan engages in. The graph captures how artisans' prices change differentially for each category of buyers as they are involved in more work processes. Estimates are reported from a regression with *Initial Price* as the dependent variable and *Buyer Group* dummies and *Processes* as independent variables, including both main effects and interactions between buyer groups and processes. Each data point represents the predicted initial price at a given level of (buyer group, process level). For example, the predicted initial price for buyer group *International* for artisans engaging in 4 work processes is 27.48.

Table 2.1: Comparison of Seller Characteristics

	Artisan	Trader	Difference
Fraction Male	0.923 (0.269)	1 (0)	-0.077
Age	42.65 (9.903)	46 (9.582)	-3.346
Work Tenure (years)	23.71 (10.13)	19.32 (17.54)	4.396
Number of Family Members	6.423 (4.421)	5.826 (2.146)	0.597
Fraction Married	0.942 (0.235)	1 (0)	-0.058
Fraction Muslim	0.769 (0.425)	0.130 (0.344)	0.639***
Fraction <i>Backward</i> Castes	0.885 (0.323)	0.826 (0.388)	0.059
Years of Education Completed	6.788 (3.472)	10 (3.516)	-3.212***
Fraction Literate	0.885 (0.323)	0.957 (0.209)	-0.072
Exhibitions Attended/year	1.292 (1.732)	2.200 (1.095)	-0.908
Visits to Bangalore/month	3.241 (2.325)	2.450 (1.538)	0.791
Radio Listening Hours/day	4.667 (2.371)	3.200 (3.676)	1.467
Income in Dollars	77.39 (50.18)	155.2 (85.53)	-77.850***
Fraction in Cooperatives	0.288 (0.457)	0.261 (0.449)	0.028
Observations	52	23	

mean coefficients; sd in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Source: Survey conducted in June 2012 with sellers in experimental sample; 100% response rate for artisans and 96% response rate for traders; one trader refused the survey and one trader owns two shops in the sample

Table 2.2: Number of Sales Transactions by Sellers and Buyers

BUYERS	SELLERS		Total
	Artisans (n=52)	Traders (n=25)	
Indian-Baseline (n=2)	103	50	153
Indian-Craft (n=2)	102	50	152
International (n=2)	100	50	150
Total	305	150	455

Experimental Design:

6 buyers were hired to purchase bangles from a sample of artisans and traders;

Buyers visited the 2 types of sellers in a randomly assigned order;

The buyers represented 3 experimental categories:

Foreigners, Indians wearing handmade craft products and Indians dressed as usual

Table 2.3: OLS Balance Checks on Experimental Transactions

	(1) Availability of Electricity	(2) Stock Left	(3) Presence of Seller's Spouse
Indian-Craft	-0.095 (0.056)	3.865 (2.502)	0.119* (0.048)
International	-0.034 (0.057)	3.742 (2.510)	0.063 (0.048)
Constant	0.627*** (0.040)	12.438*** (1.766)	0.163*** (0.034)
Observations	455	455	455

Indian-Baseline is the omitted category

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: Auditors collected data on these baseline characteristics after every transaction;

Availability of Electricity: Dummy variable indicating if there was electricity at time of sale (Channapatna faces power outtages of 3-4 hours a day);

Stock Left: Estimate of number of bangles left with seller after sale;

Presence of Seller's Spouse: Dummy variable indicating if spouse was present during sale

Table 2.4: OLS Regression on Log Prices

	(1)	(2)	(3)	(4)
	Artisans-Initial	Traders-Initial	Artisans-Final	Traders-Final
[D2]Indian-Craft	-0.508*** (0.048)	0.113* (0.052)	-0.558*** (0.061)	0.049 (0.058)
[D3]International	-0.274*** (0.051)	0.451*** (0.074)	-0.325*** (0.057)	0.401*** (0.067)
Constant	3.733*** (0.069)	3.157*** (0.124)	3.569*** (0.079)	3.057*** (0.113)
Date FE	Yes	Yes	Yes	Yes
Time of Day FE	Yes	Yes	Yes	Yes
Observations	275	150	268	150
F-test [D2]=[D3]	18.054	34.728	10.795	43.924
<i>p-value</i>	0.000	0.000	0.002	0.000

[D1]Indian-Baseline is the omitted category

Standard errors clustered by seller are in parentheses

Zero prices have been dropped in this table to calculate log prices

Zero prices represent 10% of artisans' initial prices and 12% of artisans' final prices

Results are robust to raw prices (in Rupees), exclusion of fixed effects and inclusion of zero prices

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 2.5: OLS Regression on Likelihood of Zero Prices offered by Artisans

	(1) Zero Initial Price	(2) Zero Final Price
[D2]Indian-Craft	0.180*** (0.044)	0.237*** (0.051)
[D3]International	0.068* (0.037)	0.091** (0.038)
Constant	-0.034 (0.055)	-0.067 (0.055)
Date FE	Yes	Yes
Time of Day FE	Yes	Yes
Observations	305	305
F-test [D2]=[D3]	4.722	8.788
<i>p-value</i>	0.034	0.005

[D1]Indian-Baseline is the omitted category

Standard errors clustered by seller in parentheses

Results are robust to exclusion of fixed effects

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Zero Initial Price: Dummy variable indicating if initial price=0

Zero Final Price: Dummy variable indicating if final price=0

10% of initial prices quoted by artisans and 12% of final sale prices were zero

Table 2.6: OLS Regression on Bargaining Rounds and Transaction Length

	(1) Artisan-Rounds	(2) Trader-Rounds	(3) Artisan-Length	(4) Trader-Length
[D2]Indian-Craft	-0.621*** (0.129)	-0.120 (0.078)	4.014*** (1.149)	0.800 (1.244)
[D3]International	-0.280** (0.120)	0.020 (0.035)	2.402*** (0.798)	0.100 (0.629)
Constant	2.670*** (0.088)	2.940*** (0.033)	7.398*** (0.568)	7.860*** (0.306)
Observations	305	150	305	150
F-test [D2]=[D3]	5.184	3.086	1.081	0.385
<i>p-value</i>	0.027	0.092	0.303	0.541

[D1]Indian-Baseline is the omitted category

Standard errors clustered by seller in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Bargaining Rounds: Number of rounds of bargaining on price; ranges from 0 to 3

Transaction Length: Time taken for sale in minutes

2.10 Appendix A : Robustness Checks

This section describes results from a number of robustness exercises performed to investigate the role of alternative explanations in explaining artisans' distinctive pricing behavior.

First, the field experimental setting is able to rule out the competing alternative explanation of reputational incentives, that artisans give discounts in the short-run for lucrative gains from an enhanced reputation in the long-run. Artisans in Channapatna produce and sell in anonymity, lack branding (do not sign their products) and given the isolation of the town, engage in one-time transactions with tourists devoid of reputational concerns (over 90% of artisans reported never selling twice to the same direct customer).

In many settings, one might suggest that pricing behavior is driven by pervasive socialization of actors in an occupational community. How artisans price to different customers might be driven by values and practices that they are exposed to during their apprenticeship, which they gradually habituate through increased contact with their peers in the local community. If this process was important in my setting, we would expect to see that older and more experienced artisans would have a greater degree of socialization, offering greater discounts to Indian-Craft and International auditors. However, this prediction does not hold true in the data (Figure A.1 and A.2).

While socialization does not seem to be an important determinant of pricing behavior in this case, a similar but distinct alternative explanation could be that artisans' pricing behavior is driven by community norms around pricing, where sanctions are imposed if visitors from far away or people that display a taste for craft products are charged high prices. The idea here is that, while an individual artisan might not be willing to offer a discount, he is forced to do so because of peer pressure from other artisans in the vicinity who might be monitoring his behavior. While the paper has qualitatively established that artisans in Channapatna operate in relative isolation and are unable to observe each other's dealings, a formal test for this idea can

be performed using precise locational data obtained from a handheld ge positioning (GPS) device. This device enabled not only the collection of the exact latitudinal and longitudinal position for each artisan and trader, but also the calculation of the number of other sellers living within a certain radius of the business. Figure A.3 reports the mean prices offered by two groups of artisans, distinguished by the extent of other sellers present in their vicinity. The results indicate that artisans who live in a “sparse” surrounding (with less than 12 artisans in a 0.2 mile radius and thus, are less likely to be observed) do not price significantly differently than artisans who live in a more densely packed neighborhood (with relatively greater probability of being observed during transactions), suggesting that community sanctions do not seem to be an important factor as far as pricing decisions of artisans are considered.

The GPS data also facilitated the investigation of the alternative explanation that artisans’ pricing behavior is driven by their level of market exposure. If artisans do not have enough exposure to different types of customers, then we do not expect them to price “optimally” in a narrow financial sense, like the traders. This can be tested in two ways. First, artisans who live close to the highway (and therefore have relatively more exposure to tourists) should offer smaller or no discounts to discerning buyers as compared to artisans who live in interior regions. Second, artisans who transact with traders on a regular basis should be expected to offer lower discounts because they have a better sense of traders’ “optimal” pricing structures. However, the data seem to reject both of these predictions. Group means as indicated in Figures A.4 and A.5 suggest that artisans’ distance from the highway or whether they transact with traders does not seem to affect the size of discounts offered to Indian-Craft and International auditors. This finding provides some evidence that a lack of market exposure does not seem to be driving the pricing behavior in this setting.

Another alternative explanation that could account for the results is based on notions of artisans’ naivete or their fascination with customers from high status groups. Here, the idea is that artisans become so enamored with international tourists or customers wearing craft products that they find themselves offering discounts that they would not give to other customers. In the survey that I conducted, one ques-

tion asked artisans about the frequency of their visits to nearby cities, especially Bangalore because it is the capital of the state of Karnataka where Channapatna is situated, it is not too far away and because it is a prominent shopping destination both for international tourists and affluent, art-loving Indian customers. Insofar as Bangalore provides sellers exposure to high status customers and foreign tourists, one would expect that artisans who visit Bangalore have a lower degree of fascination towards International or Indian-Craft auditors. However, Figure A.6 demonstrates that this prediction is not true in the data, suggesting that fascination with high status customers or artisans' naivete does not seem to be an important driver of the main results.

Finally, while it seems unlikely, it is possible that international customers or those wearing craft jewelry might have relatively greater experience shopping for craft items in India and are therefore more conversant with the prices that are typically charged for such products, while other Indian customers are unaware of such details. This explanation predicts that artisans, knowing that experienced customers have a keen knowledge of "true" prices, offer such customers lower prices as compared to other inexperienced customers. Fortunately, the survey I conducted collects data on prices that artisans charge, on average, to retail clients for the Channapatna Bangle. The survey finds that the average price that artisans obtain for the Channapatna bangle is Rs.32.50, as determined by their answer to the question – "How much do you typically sell half-inch bangles for?" This price is significantly *higher* than the average initial price that both International and Indian-Craft auditors were offered, indicating that not only did artisans offer these buyers prices that were not equal to the average prices for bangles in the area, but they also seemed to forgo substantial profits in order to be able to sell to more appreciative customers. Experienced customers' prior knowledge of true prices therefore, does not seem to be driving differential pricing decisions here.

The results provided in this section, thus offer further confirmation of the theory that artisans' pricing behavior is driven by their attachment to their products.

Figure A.1: Robustness Check for Artisans: Age

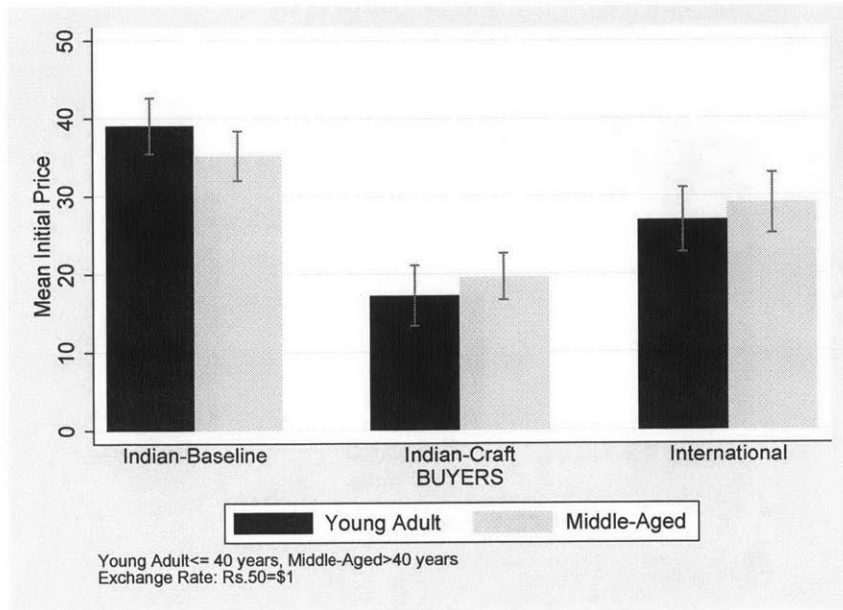


Figure A.2: Robustness Check for Artisans: Work Tenure

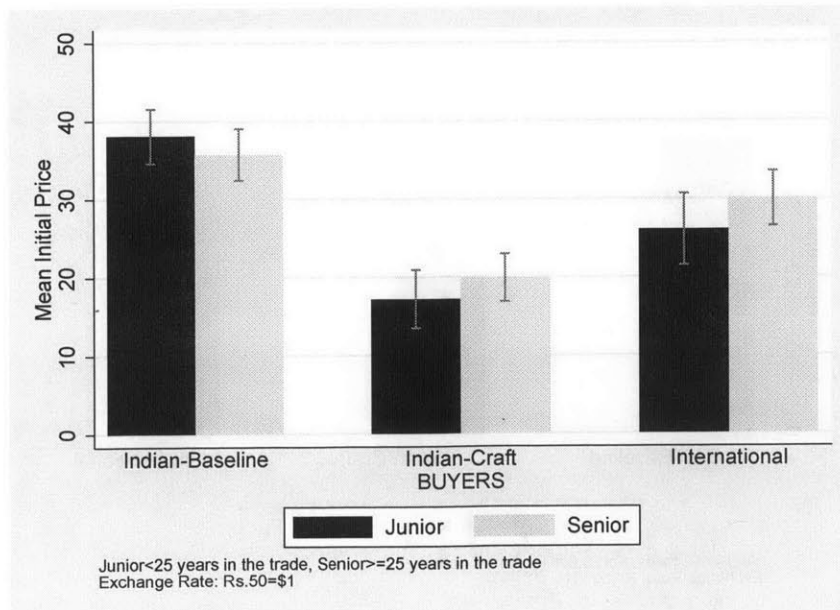


Figure A.3: Robustness Check for Artisans: Presence of Neighboring Sellers

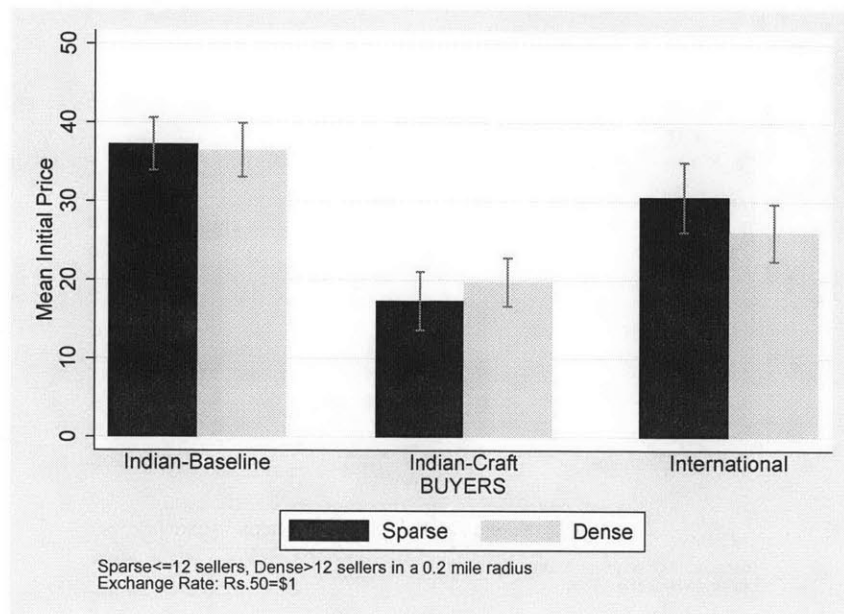


Figure A.4: Robustness Check for Artisans: Distance from Highway

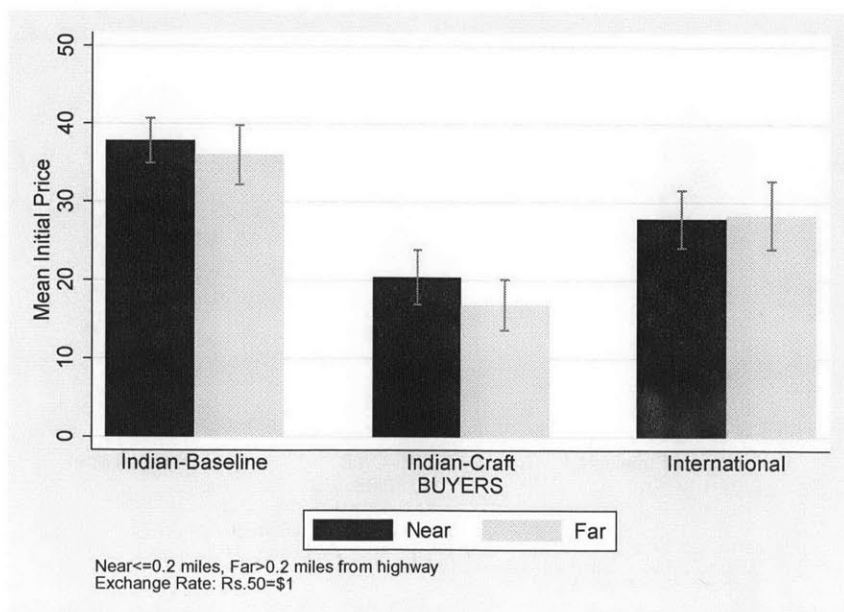


Figure A.5: Robustness Check for Artisans: Business with Traders

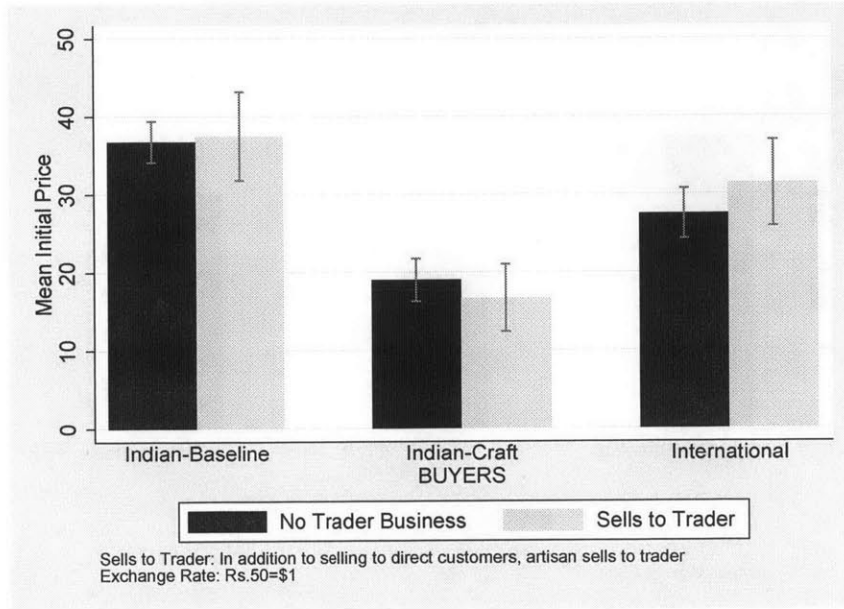


Figure A.6: Robustness Check for Artisans: Visits to Bangalore

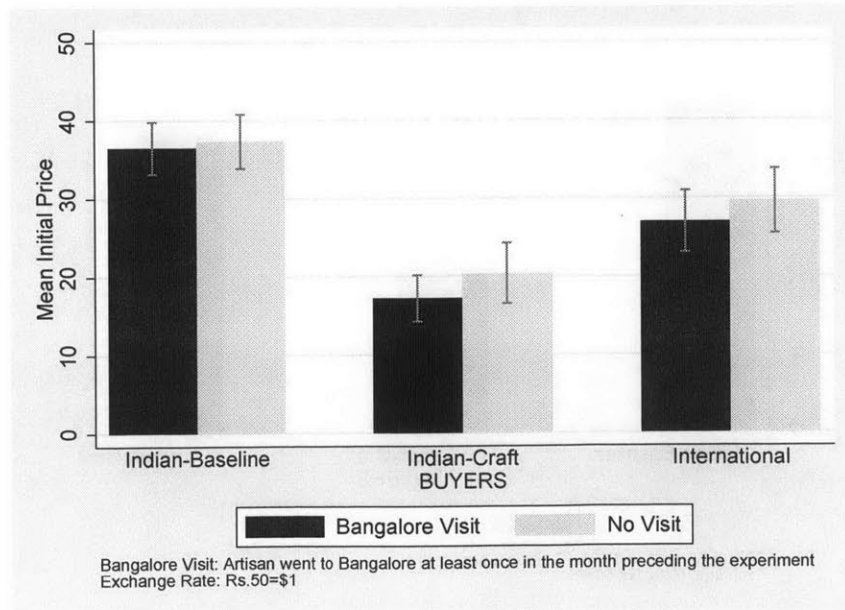


Figure A.7: Robustness Check for Artisans: Income

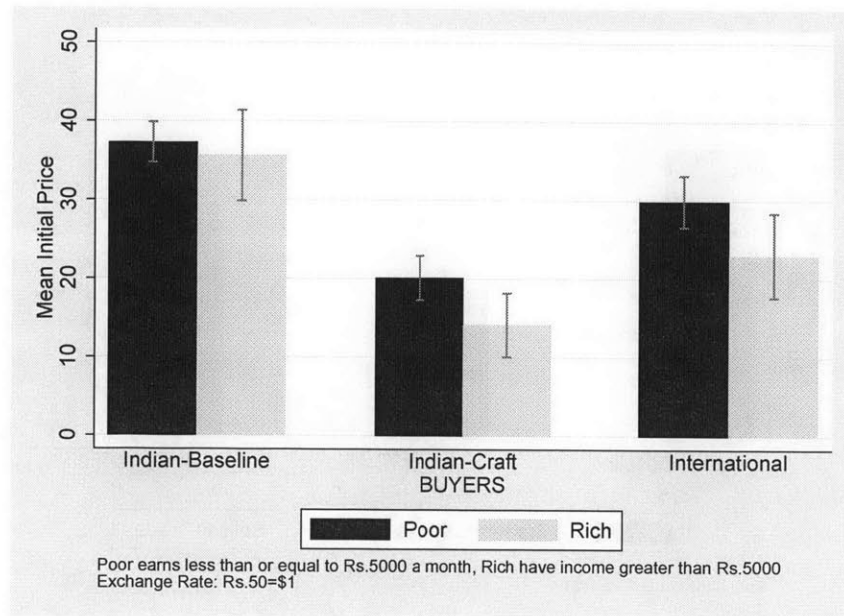


Figure A.8: Robustness Check for Artisans: Religion

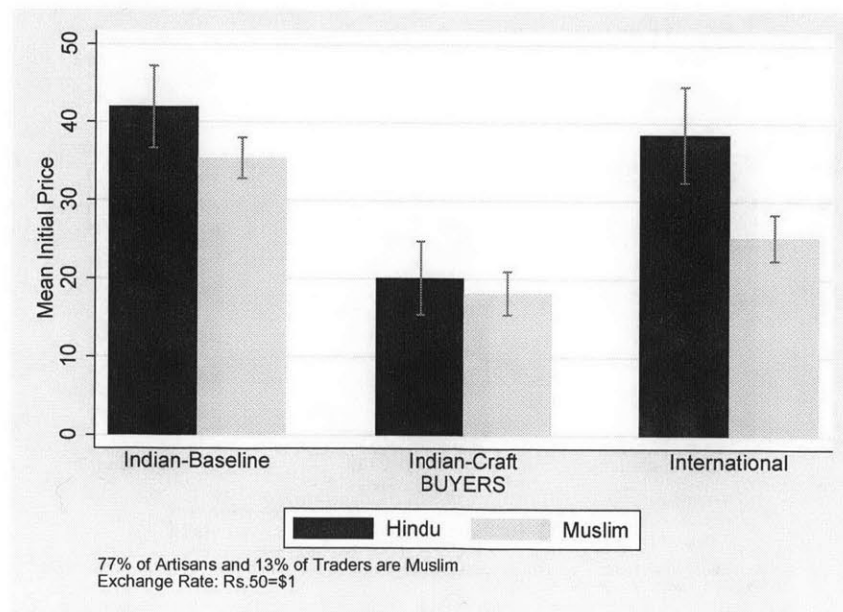
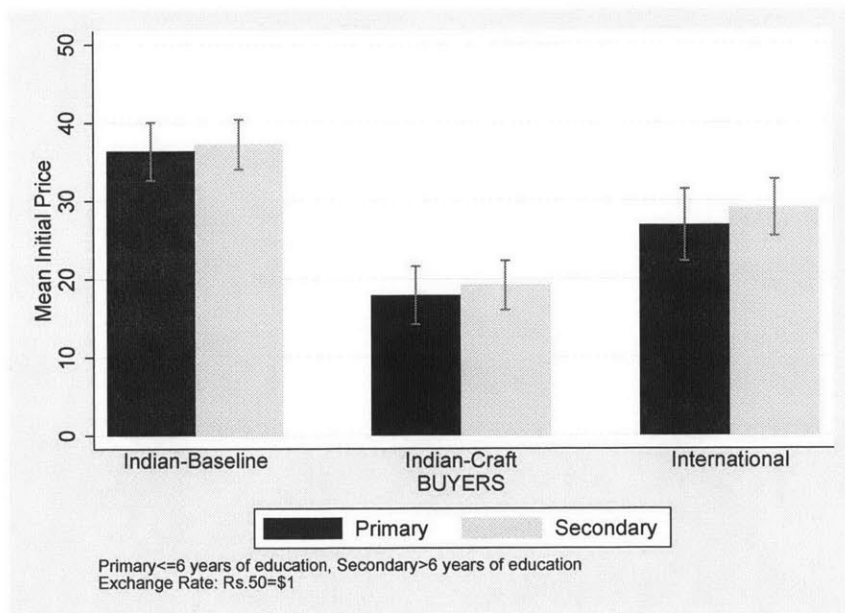


Figure A.9: Robustness Check for Artisans: Education



Chapter 3

Export-Oriented Industrialization and Technological Frames of Government Officials, Workers and Capitalists: Evidence from a Mechanization Project in India

Abstract

Export-oriented industrialization (EOI) is a common strategy for economic development in developing economies that can be achieved by increasing exports in large manufacturing sectors or smaller-scale, cluster-based industries. A key component of the EOI strategy, whether in the context of large- or small-scale production, is technological upgrading of manufacturing practices to facilitate exports and boost worker earnings. While the literature has recognized the salience of technological upgrading, it has focused predominantly on successful cases, thus overlooking problems in the implementation and adoption of such technology that could impede exports. In this paper, I draw on an ineffective export-driven mechanization initiative in a handicraft cluster in southern India to illustrate how key stakeholders might adopt incompatible “technological frames” in making sense of new technology, thus hindering the expansion of exports. I describe how government officials in this case viewed the technology brought into the sector through the frame of “status,” workers perceived the technology using a “creative control” frame, whereas capitalists saw the same technology as being a source of “profits.” These mismatched frames led to discordant actions by the stakeholders, resulting in limited adoption of the technology, weak exports and little improvements in worker earnings. By highlighting a key condition under which export-driven technology projects might fail, namely when key stakeholders’ technological frames are misaligned, this paper draws important implications for the many developing economies using EOI as their primary industrialization strategy.

3.1 Introduction

Export-oriented industrialization (EOI) is a common strategy for economic development in developing economies (Kuruville, 1996; Gereffi and Wyman, 1990; Haggard, 1990; Bjorkman et al., 1988). This strategy entails a country focusing on exports in certain targeted sectors initially and more industries over time, such that the export-driven foreign exchange earnings constitute the basis for economic development. The export growth is financed either by foreign investment and multinationals or by the state and domestic firms supported through export subsidies. EOI has been the primary industrialization strategy in several Asian economies like Singapore (Kuruville et al., 2002), South Korea (Frenkel and Peetz, 1998), Malaysia (Todd and Peetz, 2001), the Philippines (Erickson et al., 2003), Indonesia (Kuruville and Venkataratnam, 1996) and India (Bhattacharjee and Ackers, 2010; Kuruville and Ranganathan, 2008).

While EOI is typically associated with large manufacturing operations in sectors such as electronics or garments, this industrialization strategy can be fueled by exports from a country's smaller-scale or cluster-based industries too (Bair and Peters, 2006; Gereffi, 1999; Schmitz and Nadvi, 1999). Examples of small-scale industries in developing economies that are successful exporters, contributing to their respective countries' GDPs, include woolen knitwear (Tewari, 1999) and footwear production in India (Knorringa, 1999) and rattan furniture (Smyth, 1992) and roof tile production in Indonesia (Weijland, 1999; Sandee, 1995). The key distinguishing factor in such small-scale industries is that the producers are small, often worker-owned units with specialized skills, located in rural areas using more labor intensive production techniques (Roemer, 1981). Therefore, when small-scale clusters become successful exporters, there are benefits to the economy but also to the workers or producers, who share in the increased profits and improve their own financial situations (Schmitz, 1999).

A key component of the EOI strategy, whether in the context of large or small scale production, is technological upgrading of manufacturing practices to facilitate exports (Roemer, 1981; Altenburg and Meyer-Stamer, 1999). This is essential because in order for industries to successfully export, they need to transition from producing for an easy domestic market to being competitive on the global market and responding to international quantity, quality and speed requirements (Schmitz and Nadvi, 1999). Technology facilitates this transition by automating repetitive tasks and increasing efficiency and consistency in production (Albu, 1997). In some instances, foreign investors bring in modern technology to improve production processes like in the case of Singapore's electronics sector (Kuruvilla et al., 2002), whereas in other cases, the state encourages local innovations in technology to improve domestic firms' efficiency, such as in the case of South Korea's chaebols (Frenkel and Peetz, 1998; Kim, 1997). There are examples of technology upgradation among clusters as well. In the woolen knitwear sector in Ludhiana, India, small-scale producers sourced locally-made adaptations of imported machines to improve their productivity (Tewari, 1999), while in the roof tile cluster in central Java, Indonesia, the local government organized study

tours for local producers to see and assess the feasibility of newly-emerging handpress technology (Sandee and Rietveld, 2001).

While the literature on export-oriented development has acknowledged the important role of technology in the industrialization process, it has focused predominantly on successful cases of new technology spurring exports. These successful cases have been instrumental in helping us understand how technology might be “dynamic” in the long-run to sustain competitiveness and generate knowledge (Bell and Albu, 1999; Bell and Pavitt, 1993; Romijn, 1998) and what the advantages of early versus late adopters of technology (Sandee and Rietveld, 2001) and locally-developed versus imported technology (Katz, 2001) are. However, the literature has overlooked that sometimes, the implementation of new technology in order to increase exports can go awry, and has not specified under what conditions we might expect such failure, which is the key focus of this paper. Consideration of failed cases is important because significant manpower and monetary resources are pumped into the technology upgradation process by the state, and in such cases, the intended exports and benefits to the economy through foreign exchange earnings might not be realized. Further, in the case of small-scale industries, the earnings of the workers or producers also stand to be affected. In this paper, I present and analyze such a case where the transition from producing for a domestic market to exporting is thwarted by ineffective employment of new technology. While previous scholars have relied on retrospective case-based methods, this paper draws on forty in-depth interviews and participant observation of the real-time deployment of new technology.

The case is set in India, where industrial policy shifted to EOI in the 1990s (Bhattacharjee and Ackers, 2010). The focus was first on manufacturing industries, then on export-oriented services (Kuruvilla and Ranganathan, 2008) and now has expanded to small-scale sectors like handicrafts as well (Saith, 2001). Specifically, I study a small handicraft industry in southern India called Channapatna that is home to 5,000 artisans, specialized in producing wood and lacquerware objects like jewelry and toys, and 100 traders, who sell these products in local markets. In 2010, the Export Promotion Council for Handicrafts (EPCH) in India decided to target Channapatna and

promote exports from this cluster in order to capitalize on the surging global demand for wooden handicraft products, hoping to generate returns for the Indian economy as well as for individual artisan-producers who currently survive on a meager income of \$70 per day. To this end, \$8 million was spent on constructing the Channapatna Crafts Park, a facility spanning 14 acres with a large common facility center housing high-end imported machinery in woodworking. The plan was for artisans to use these machines to automate part of their production process in order to increase the scale of their operations, and for a select group of traders to then export the products made at the Crafts Park. However the initiative seems to have failed on several counts - the utilization of the Crafts Park is at 10% of capacity, commonplace basic wooden products like boxes are getting manufactured at the Park, and the handicraft sector has neither seen a rise in exports nor promotion on a global scale. In fact, the massive costs of setting up the Crafts Park are far from being recovered and few benefits have accrued to the individual artisans.

Using this case, I investigate under what conditions technology brought into an industry to facilitate exports under an EOI strategy might have a difficult adoption process. Traditional explanations of barriers to technology adoption, including appropriate incentives (Griliches, 1957; Suri, 2011), lack of information (Foster and Rosenzweig, 1995), credit constraints (Croppenstedt et al., 2003) and coordination costs (David, 1985), are not applicable in this context because technology decisions for EOI are fundamentally different from the classic examples of say, a farmer choosing whether to adopt a hybrid seed. Unlike the classic cases where individual agents are making rational decisions for themselves about a pre-specified technology, technology projects for EOI require coordinated action of multiple stakeholders, where the choice of technology is endogenous, and the individuals using the technology are not necessarily the individuals making decisions about the technology. These differences suggest that in analyzing technology decisions in EOI projects, the role of different stakeholders and their perspectives on the technology in question must be taken seriously.

The concept of “technological frames” (Orlikowski and Gash, 1994) offers such a

tool that facilitates the careful analysis of different stakeholders involved in the implementation of new technology in an industry. A technological frame is the lens through which a particular technology is viewed by an actor. This paper shows that different stakeholders in an EOI project might view new technology through different frames and while these frames might make sense individually, they can collectively result in the technology not being adopted and the goal of exports not being achieved if the frames are misaligned. In the case of the Crafts Park, three key stakeholders - government officials, artisans and traders - interpreted the machinery brought into the sector through widely varying frames. While the government officials viewed the machines through the frame of “status”, artisans perceived the machines using a “creative control” frame, whereas traders in this industry saw the same machines as being sources of “profits.” These frames informed key decisions by the stakeholders pertaining to the setup and utilization of the Crafts Park. In particular, the discordant frames led to mismatched actions where government officials ordered high-end imported machines for the Crafts Park that bestowed status on the industry, the artisans shunned the Crafts Park since the imported machines conflicted with their need for creative control over their work, while the profit-driven traders produced basic wooden objects, not distinctive of Channapatna, at the Park using fully-automated techniques. By highlighting the importance of alignment of technological frames adopted by key stakeholders for the successful implementation of technology and subsequent growth in exports, this paper draws important implications for developing economies investing in new technology to boost exports.

In the next section, I summarize the relevant literature on “technological frames.” Following that, I describe my research methods. I then describe my setting and present my qualitative data, outlining the different technological frames and actions of the government officials, artisans and traders in Channapatna. After that, I describe my findings on outcomes associated with the Crafts Park. I conclude with a discussion of alternative explanations and the contributions of this study.

3.2 Literature Review: Technological Frames

The concept of technological frames has been widely used in the literature on social construction of technology (SCOT) (Davidson and Pai, 2004). Technological frames refer to the assumptions, expectations and knowledge that actors use to understand technology within their context (Orlikowski and Gash, 1994, 1992). Frames are flexible in structure, having variable dimensions that shift in salience and content, by context and over time (Gioia and Sims, 1986). In particular, studies have emphasized the notion of “shared technological frames,” suggesting that while members of a particular community might have individual interpretations of technology, they typically share a set of core beliefs about the technology that they hold in common (Porac et al., 1989). This includes not only the nature and role of the technology itself, but also the specific conditions, applications and consequences of the technology (Orlikowski and Gash, 1994).

There are a number of features of the technological frames framework that make it a suitable research tool in this context. First, the notion of technological frames is particularly suited to analyzing the different outlooks of multiple stakeholders during the implementation of a novel technology. Of note is the study by Orlikowski and Gash (1994) which studied the early implementation of Lotus Notes in a large consulting firm to understand how two groups in this context, “technologists” and “users,” perceived this technology. A number of different studies have since successfully deployed the framework of technological frames to highlight the challenges of technology implementation in different organizational contexts with multiple stakeholders (Khoo, 2001; Lin and Conford, 2000; Puri, 2006). The fact that this idea can be employed for the simultaneous analysis of a single technology project and its reception by multiple stakeholders makes it a particularly attractive fit in this context.

Further, the technological frames approach relies on access to and in-depth data on the different groups that worked jointly towards the successful implementation of a new technology. This includes detailed interview and participant observation data that elicits deeply held assumptions, expectations and knowledge of the stakeholders

but also attends to language and metaphors that are important in these contexts (Davidson and Pai, 2004). These data can then be analyzed systematically to operationalize the technological frames that are relevant to the context. In my field site, I am able to gain this kind of unique access to the different stakeholders involved in a technology project. Thus, the tool of technological frames is extremely convenient in my setting because it does not impose pre-determined dimensions along which frames should differ but allows for their inductive investigation that is malleable to the technology and the context at hand.

Additionally, analysis of technological frames relies on access to multiple stakeholders while the process of technology implementation is still in progress. This enables distilling the technological frames of different stakeholders while they are still fresh in their minds. While it is possible to reconstruct attitudes and metaphors towards technology using retrospective and archival data, within the framework of technological frames, this method is particularly powerful when access can be obtained during the implementation process (Orlikowski and Gash, 1994). My setting is unique in that I am able to observe the real-time implementation of a technology and thus benefit from the technological frames approach.

Finally, what makes the idea of technological frames particularly suited to my context is its focus on “incongruence” across different actors. It has been argued that a technological artifact is often interpreted differently by multiple stakeholders in ways that might be incompatible. In fact, these interpretations are shaped and constrained by not only the actors’ interactions with technology but also by the actors’ “purpose, context, power and pre-existing knowledge base” (Pinch and Bijker, 1987). These different interpretations can lead to “incongruence” as is referred to in the literature. In fact, the literature provides examples of a number of studies where incongruence in technological frames among different actors can further lead to suboptimal outcomes for the organization. In an in-depth case study of the implementation of an Electronic Data Interchange (EDI) system in the London Insurance Market between 1993 and 1997, Barrett (1999) documents that incongruence in cultural assumptions held by key market participants resulted directly in a low-level of EDI adoption. Given the

highly differing backgrounds, knowledge levels and social statuses of the different groups in my context, the idea of incongruence is likely to be useful in this setting.

While my setting shares a number of features that make it conducive to the technological frames framework, I add to the literature by using the concept to understand a novel setting. The technological frames concept has traditionally been used to understand the implementation of information technology in large organizations, but I employ it to analyze a mechanization project in a developing country context. The literature has typically studied white-collar workers in formal organizations. In this paper, however, I illustrate how the concept is extremely powerful in understanding the reactions to technology among poor workers in informal settings, entrepreneurs and bureaucrats as well. In the next section, I describe my research methods in more detail.

3.3 Research Methods

This paper relies on eight months of ethnographic fieldwork, 40 interviews and a detailed survey of craft businesses in Channapatna. In November 2011, I started living in a small lodge locally and began doing fieldwork in Channapatna, interacting with artisans and traders to better understand their economic lives and the role of the Channapatna handicraft cluster in the Indian economy. I first heard about the Channapatna Crafts Park in one of these early conversations. At this point, the buildings at the Crafts Park were still under construction but I was able to meet the secretary of the Crafts Park, who became one of my key informants. The secretary gave me access to the Crafts Park premises and also introduced me to the various stakeholders involved in the project.

Over the next two months, I engaged in participant observation at the Crafts Park, carrying a visible notebook at all times to take notes and typing up my fieldnotes at the end of each day. I observed the implementation of the Crafts Park, as the machines arrived, machine operators were hired and training programs were conducted by the machine manufacturers. I also witnessed a wide range of government officials visiting

the facility to monitor its progress and would have informal conversations with them. In early 2012, the Crafts Park opened its doors to artisans and traders to use the facility. Over the next several months, I observed how the Crafts Park was being used, what products were manufactured and how different stakeholders were reacting to the facility. I participated in the programs that were conducted to raise awareness of the capabilities of the Crafts Park machines and had informal conversations with artisans when they visited the facility. In this way, for the first time in the literature, I was able to observe the implementation of a technology initiative to increase exports, while it was ongoing, devoid of any retrospective bias.

In addition, between November 2011 and June 2012, I conducted in-depth, face-to-face interviews with 40 actors in the handicrafts industry, including senior bureaucrats, government officials, consultants hired for the project, artisans, traders exporting products from the Crafts Park and other traders not involved with the Crafts Park. A list of these interviewees is attached in the Appendix. Often, I interviewed these individuals more than once, before and after the opening of the Crafts Park to capture their change of perspective over time. Obtaining these interviews was relatively straightforward as the stakeholders were keen to talk about this new, massive project and what they thought of it. Further, as a female “researcher from America” in a predominantly male industry, I was seen as non-threatening. I used a snowball sampling method, obtaining interviews with not just the list of persons provided to me by the secretary of the Crafts Park but also with others who were suggested to me by the interviewees themselves as persons with different experiences pertaining to the Crafts Park. I ensured that my sample captured multiple stakeholders involved with the project and that I talked to both, individuals intimately involved with the Crafts Park and those who were a bit more removed (Trost, 1986). The interviews were predominantly conducted in Channapatna itself, though I also met a few senior government bureaucrats in Bangalore.

The interviews lasted an average of 90 minutes and I conducted them either in Hindi or English. I used a semi-structured interview format, which entails the preparation of a number of questions and topics in the form of an interview protocol,

formulated in words familiar to the people being interviewed, but encourages changing the order of the questions and adding new ones as per the interviewee's responses (Berg, 1989b). I also probed far beyond the typical answers to prepared questions to elicit examples and stories from the respondents. I began each interview by asking respondents how they became involved in the handicraft sector. Following this generic opening, I inquired about what the interviewee knew about the Crafts Park and what their experience had been with the technology in this facility, asking them to distinguish their experiences from those of their colleagues. This led to an in-depth discussion of what was working and what wasn't working at the Crafts Park, who were the winners and losers, and what could have been done differently. I collected data inductively with the aim of capturing as much detail as possible about how the different stakeholders were making sense of the Crafts Park and how this was affecting their work practices. Each interview was digitally recorded and transcribed.

The analysis of the fieldnotes and transcripts was done using Atlas.ti, associating passages of text with one or more mnemonic codes to uncover the different ways in which the stakeholders were interpreting the Crafts Park technology. Some examples of these codes include distinctiveness of products, international reputation, exports and profits. I also engaged in extensive memo writing to identify puzzling observations which would inform future fieldwork. In this way, my theorizing and analysis of the qualitative data proceeded iteratively as is characteristic of grounded theory (Glaser and Strauss, 1967).

In addition to observational and interview data, at the end of my fieldwork in June 2012, I conducted a survey of 52 artisans and 23 traders in Channapatna. The survey collected descriptive and workplace data, and also asked specific questions about the future of the handicraft cluster, opinions about the Crafts Park and the role of technology in the wood and lacquerware craft. The survey, translated into Kannada, was developed through an iterative process of referring to field notes, relevant literature (Aziz, 1979), and in consultation with handicraft and survey experts. The survey was administered by three trained surveyors who read the questions aloud, elicited responses and filled out the surveys on behalf of the respondents. An individual sur-

vey took about 30 minutes to complete and respondents were compensated for their time away from work.

3.4 Setting: Channapatna Handicraft Cluster

This study is set in a wood and lacquerware handicraft town called Channapatna in the state of Karnataka in southern India, two hours away from the city of Bangalore. Channapatna has a 300 year long craft tradition of making a wide range of handmade products including toys and jewelry using *hale* or milk wood and vegetable-dyed lacquer. See Figure 3-1 for a list of some commonly made products. The town is home to more than 5000 artisans, constituting about 10% of the town's population, who make these products using power-driven lathes in their individual worksheds attached to their homes. These artisans learn the craft of making wood and lacquerware products through informal family-based apprenticeships. Channapatna is also home to a large number of traders who are not involved in the production process but sell the same products locally as well as in wider markets through retail establishments. Total annual lacquerware production for Channapatna is estimated to be around \$40 million (Ajayan, 2009), predominantly catering to the domestic market.

INSERT FIGURE 3-1 ABOUT HERE

Since the 1960s, there has been global interest in Channapatna's unique products. For example, in 1965, some Japanese consultants visited Channapatna to understand the craft production process and are said to have taken back a range of products with them (Campbell, 1991). In the 1970s, a Jewish department store in New York started sourcing napkin rings from Channapatna (Aziz, 1979). However, exports from Channapatna never soared beyond such one-off, small-scale orders. Then, in 2001-2002, in line with India's new export-focused industrialization policy, a program called the Baba Saheb Ambedkar Hastashilp Vikas Yojana (BAHVY) was launched with a thrust on integrated development of chosen handicraft clusters for export, aiming to increase artisanal income while also contributing to national exports.

As part of this scheme, market research was conducted in Channapatna to assess international demand for the industry's products. It was found that only 1% of the global demand for craft wooden products was being met by Channapatna's industry (DIC, 2003). Armed with this market research, in 2004, the Export Promotion Council for Handicrafts (EPCH), an apex body of the Government of India for the development and promotion of handicrafts in the international market, resolved to increase exports from Channapatna and conceived the idea of a Crafts Park, a mechanized facility for production to enable artisans to produce products of high quality to match international specifications of design, quantity and size.

The Channapatna Crafts Park, which opened in early 2012, spans 14 acres and houses a Common Facility Center (CFC) stocking imported machinery that perform various woodwork processes. This CFC is open for all artisans in Channapatna to use at subsidized rates. The total expenditure for this Crafts Park was \$8 million (20% of the size of the industry), funded predominantly by the central and state governments. Figure 3-2 shows a breakdown of the funding structure. The vision for the Crafts Park was that artisans would use these sophisticated machines to make products targeted at export and then, select traders, with pre-existing international market linkages, would export these products to global markets. Twelve traders, with prior experience in exporting, were chosen for this initiative and were allotted plots of land on the premises of the Crafts Park to construct individual worksheds for finishing and post-processing activities. Two of these traders was appointed secretary and president of the Crafts Park, respectively. Figure 3-3 illustrates the layout and location of the Crafts Park in Channapatna. Apart from setting up the Crafts Park, EPCH also invested resources in attracting global buyers and in training programs for artisans in product design and international tastes, and for traders in marketing and sales development.

INSERT FIGURE 3-3 ABOUT HERE

INSERT FIGURE 3-2 ABOUT HERE

This model for export development, including significant investment in technology along with allied initiatives, made sense in theory. The three key stakeholders, namely the government officials, traders and artisans, were also strongly in support of the program when it was conceptualized. Government officials were optimistic about this model of increasing exports from Channapatna becoming a prototype that would be followed by other governments. Artisans drew confidence from their prior experience with technology upgradation, when they had switched from hand powered lathes to power driven ones in the 1970s and had enjoyed dramatic increases in productivity. Traders, who were eyeing the export market with its larger margins for several years, were similarly supportive. And yet, the implementation of the Crafts Park was problematic, not achieving its expected growth in exports and artisanal income. The next section outlines how the three stakeholders interpreted the same technology through incongruent lenses or “frames,” which resulted in problematic implementation of the Crafts Park.

3.5 Key Actors and Their Technological Frames

Technological frames, as discussed in the literature review section, are specific interpretations of technology by parties in a given context. As the literature shows, such technological frames can have an impact on the actions that the parties take. When there are multiple parties involved in a technology implementation project, it is possible for each of them to view the same technology through different frames. Each party’s frame, in isolation, might make sense and be unproblematic. However, when the different frames adopted are incongruent with one another, the actions taken by each of the parties pertaining to the technology could be mismatched, which could affect the fate of the technology project. Thus, collectively, discordant frames can give rise to inefficiencies or failures in the technology implementation process.

In my context of the Channapatna handicraft cluster, government officials, artisans and traders adopted three different technological frames of status, creative control and profits respectively to make sense of the Crafts Park. Figure 3-4 illus-

trates these frames and their impact on certain outcomes, which will also be described in detail below.

INSERT FIGURE 3-4 ABOUT HERE

3.5.1 Government Officials: “Status” Frame

Government officials are the mid-level officers employed by government to implement policies approved at the center or state level. Such officers have often been called “street-level bureaucrats” (Lipsky, 1980).

While the decision to increase exports and the idea for the Crafts Park was conceptualized by heads of state and senior bureaucrats, the implementation of these initiatives fell on a group of street-level bureaucrats. Large sums of money were approved by both the central government and state government of Karnataka (as shown in Figure 3-2) but the street-level bureaucrats, a group of mid-level government officials, were given the discretion to spend this money appropriately for the setup of the Crafts Park and were given the authority to oversee the implementation of the Park.

In this case, a group of five officials, all residing in Bangalore, were given discretionary power over the Crafts Park. Prior to the Crafts Park, these officials had overseen other industry development projects in Karnataka including leather footwear from Mysore and hosiery from Mangalore. Two of these officials represented the Karnataka arm of the Export Promotion Council of Handicrafts, an agency of the central government, whereas the remaining three officials were employees of the state government, one of them employed by the Directorate of Industries and Commerce and the other two employed by the Karnataka Small-Scale Industries Development Corporation. All of these officials were employees being paid monthly wages without performance-based pay, and they were not subject to much supervision. It is not unreasonable to expect the incentives and perspectives of these street-level bureaucrats to be misaligned with those of the agencies that they represent (Lipsky, 1980). While

the government saw the Crafts Park as a means to increase exports and help artisans, these government officials seemed to see the same Crafts Park as a source of status.

In particular, the government officials seemed to be predominantly interested not in the productivity gains from the Crafts Park technology, but in the status benefits of having a “modern”, “advanced” and “sophisticated” mechanized handicraft sector. Thus far, Channapatna had made limited investments in technology, unlike their domestic and international counterparts. This cluster had been largely untouched over the centuries, barring the shift from hand-powered to power-driven lathes, but for this reason, had sometimes been considered to be “regressive”, “of lower status” and “not in touch with the times.” The government officials, who often attended national exhibitions and international craft fairs, were exposed to the wide range of wood-based crafts and their respective production technologies not only within the country but also across Asian economies. During these interactions, government officials reported feeling “ashamed” that Channapatna’s products had not changed much over the years and that they were still using very simple technologies to produce them, as compared to their counterparts, who were adopting sophisticated technologies.

Therefore, when the proposal for the Crafts Park emerged, these officials were very supportive, as they saw the technology through the frame of status and believed that the machines would elevate Channapatna vis-a-vis their domestic and international counterparts, as discussed below.

International Status. The government officials responsible for the implementation of the Crafts Park were in awe of other nations using complex machines to make handicraft products. In some instances, the officials had been invited to visit production facilities in other countries. One official, after returning from one such awe-inspiring visit to a Chinese factory, remarked:

Their industry is so large and modern. Each unit has at least 2,000 people working in it. They supply to Ikea, they supply to so many other big companies. They have a real good set up. They have all the facilities inside the factory. They even have a hotel set up inside the factory. I

don't know how they have managed this, but they have it very nicely done.

Similarly, another government official was impressed by the natural fiber technology available even in smaller Asian nations and lamented that India had a lot of catching up to do. He said:

This natural fiber craft is so advanced in other countries such as in China [and the] Philippines... this is such a good industry. But here [in Channapatna], somehow we have not been able to use this raw material to start a modern industry. You need high-end machines. Right now even Thailand is moving into this sector. So is Burma and we aren't there yet.

These quotes reveal that government officials paid a lot of attention to the level of sophistication of technology within handicraft industries and considered Channapatna, with its simple tools, to be of lower-status. Therefore, they viewed the Crafts Park through the frame of status. For them, the opportunity to bring technology and modern machinery was status-enhancing and a way for Channapatna to be on par with other countries. As one official said:

It's quite nice. I am also very excited about this whole Crafts Park because I used to have doubts about whether we'd ever reach other countries. This [Crafts Park] might not be that big compared to what China has..but now, we are not that far from China in presenting our talent to the world market. So hopefully having this Crafts Park will get us more exposure and we can say, "it's not that we don't have the skills or machines to do what you do."

Another official voicing the same sentiment proudly said, "Channapatna is now becoming China-patna." And yet another official said:

I travel outside frequently for fairs. I have been to China and other countries. The kind of industries they have are really advanced; India is still

very far off. But now there is a hope with the kind of work we are doing. I see some ray of hope of doing better. So we have to see how things turn out.

Further, the officials alluded to how when they first mentioned the Crafts Park to their international peers at the fairs, their claims were dismissed as not being credible but over time, these peers have been forced to update their perception of Channapatna. One official said:

First, when I talked about the Crafts Park, it looked like a fantasy to other people [foreigners]. They didn't believe me. Then I took one person from the US who was a retired officer from the UN to the Park. At that time, the machines had just started coming. He was very impressed. And that started giving me confidence.

Thus, for the government officials, the Crafts Park was a means to establish Channapatna's reputation as a high-status cluster and be recognized and respected for their technology. In fact, the officials were so proud of the Crafts Park that they wanted to increase awareness about this facility by certifying all goods produced there with a craftmark or logo. As one official said:

The products from Channapatna, we want to certify as *Made in Channapatna Craft Park*. We want to create this brand. This will build our reputation.

Domestic Status. The government officials' desire for status was not restricted to the international arena but extended domestically as well. These officials described how within India, handicraft clusters from Southern India, including Channapatna, have typically been treated as second rate because of their simple tools and lack of technological upgradation over the years. One official said, "North India is mechanized and they think that our south Indian handicrafts are second-class." Another said:

We are considered so low-status within India that even in Cauvery, the emporium in Bangalore that is supposed to be for Karnataka handicrafts, 90% of their products are from Jaipur or elsewhere in the North. You go ask them. Some 2% of products are from Channapatna, big embarrassment.

Upon inquiring about the reason for this disparity in “progress” between the clusters, one official said:

Unfortunately, with Channapatna the disadvantage has been that the government at the center and state level has always been different. Due to this, Karnataka has always been deprived of its due advantage. States like Gujarat and Tamil Nadu have developed technology immensely during the past 10-15 years but we are lagging.

Another official corroborated that Karnataka had not received governmental funding for machines before, unlike the Northern states, resulting in their low-status image:

There are machines in Jaipur and Jodhpur for sure. Rajasthan and Gujarat governments are giving great help to install latest machines, but we in the state of Karnataka are left behind.

The officials lamented that this lack of sophisticated machines had affected the image of the cluster among some Indian customers as well. One official said:

In handicrafts, Jaipur products are competing with the southern handicrafts. At the same time, with machinery and technology, many people now think that their [Jaipur’s] quality and production is also higher, even though South Indian products are better.

For these officials, then, the Crafts Park was a way to uplift the image and status of the Channapatna cluster within India. They viewed the machines through this lens of status. As some officials said:

So when all these things [setup of the Crafts Park] happen, it will be good for the government to get the feedback that Karnataka is doing something for technological development of industries.

It will give a lot of mileage to the government. Today they can bring any customer to show them the products and facility. They get impressed with the facility. People want to know how it [production] is done. It is very attractive. It is an easy way to market the product also.

And further, the government officials hoped that the Crafts Park project, with its unprecedented scale and generous budget, would put Channapatna in the number one spot in the Indian handicraft status hierarchy. As one official proudly said:

It's a unique project. Yes, it's the first in India. We didn't have a model to follow so we are just getting there on our own...charting new territory.

Action: Inappropriate Choice of Machines. As discussed in the previous sections, the government officials in charge of the implementation of the Channapatna Crafts Park seemed to interpret technology in handicraft production through the frame of status. For these officials, achieving status through technology had become an end in itself, divorced from the project's stated goals of exports and artisanal welfare. Some observers not associated with the Crafts Park pointed out:

Don't mind me saying all this. But here, people [government officials] are on ego trips really. They are just wanting a Craft Park without really knowing what needs to be done, what will be helpful. They have their names associated with the initiative, so they want to see it through without thinking about it carefully.

They're [government officials] constantly thinking "what happens to me?" without thinking about the crafts people. I guess that's how a bureaucracy works. So the people running the Crafts Park don't have much ground knowledge. They're not technical people, they really need a better idea of what is it that they are doing.

Further, as the literature on technological frames points out, the frames adopted by parties to view technological interventions also affects their actions associated with the technology. In this context, government officials had full discretion over the kinds of machines to purchase for the Crafts Park. While we would imagine that government officials would make these important decisions in consultation with the other key stakeholders - artisans and traders - especially given that the budget for these machines was almost \$4 million, half the budget for the entire Crafts Park, this was not the case. As one official said:

You can use democracy up to a certain point. But there would be difference of opinion when selecting the machines, with different folks asking for different machines, slowing down everything. We were smart, we decided, then consulted with some wood exports, prepared a project report which we then shared to all the other people, artisans, traders etc.

Given that the government officials were making decisions about machinery unilaterally, their interpretation of technology through the frame of status led them to choose high-end, imported, complex machines. As one said:

We wanted the best machines in the world, the latest machines, imported machines, as in India, we never had these kinds of machines. For at least 10 years, we will be the most advanced.

The government officials hired two wood consultants in India to help them pick the specific machines since, as per their own admission, they had very little knowledge about woodwork machines. As one of them said:

We hired some international level consultants and paid them to help us. They explained to us - this machine does this etc. We didn't have any knowledge no..we are small people with different skills.

But the officials were resolute on the kinds of machines that they wanted and made this clear to the consultants who then recommended machines accordingly. In the words of one official:

We told them about our needs for imported machines and they told us about the machines, keeping our budget and other specifications in mind. Based on that, they made some suggestions. They suggested to us that German machines are good for cutting, Italian machines are good for turning, and Taiwanese machines are also good.

Ultimately, the officials decided upon 28 machines, all of them imported, from countries ranging from Germany to China. None of these machines were customized to the Indian context or the craft work done in Channapatna. Table 3-5 provides a list of the machines, their respective functions, countries of origin, years purchased and cost. As we would expect, these machines were used in their home countries to perform very different functions, far from anything required to produce Channapatna's typical handicraft products. For example, the Six Spindle Moulder, acquired from Austria, costing \$84,000 was used to make door joints even though Channapatna's artisans typically did not make furniture.

INSERT FIGURE 3-5 ABOUT HERE

These machines, being high-end, were also very complex to operate, as evident from Figure 3-6 that shows the Auto Copy Shaper (Outer). As such, they were inaccessible to artisans, even if they wanted to venture into new product categories. Instead, the Crafts Park was forced to hire skilled machine operators from Bangalore who had prior experience working with imported machines. The machine manufacturers were also requested to come to India and demonstrate how their machines were operated and to train the Craft Park's machine operators. Given the complexity of the machines, the plan for the Crafts Park was that artisans would bring their own wood to the Park along with a blueprint of the jobs they wanted executed on their wood. Machine operators would then execute the jobs and upon completion of the jobs, the artisans would pick up their finished products from the Park and pay nominal fees for the work done.

INSERT FIGURE 3-6 ABOUT HERE

3.5.2 Artisans: “Creative Control” Frame

The previous section illustrated that government officials saw the Crafts Park technology through the frame of status. Artisans, living in the small town of Channapatna, were far removed from a desire for status and instead, viewed the same machines through the prism of creative control that they valued in making handicraft products.

These artisans were deeply committed to their occupations. A survey I conducted, whose findings are summarized in Figure 3-7, revealed that the artisans in my sample had been performing their craft for an average of 20 years despite earning a meager income of only \$70 a month. Artisans, with limited formal education, learned their wood-based craft through informal apprenticeships, typically with their fathers, given the dominance of men in this line of work. They did not undergo any formal training. During their apprenticeships, artisans built tacit knowledge about the technicalities of working with wood, molding it into various shapes and applying vegetable-dyed lacquer to create a variety of products. With this solid foundation, artisans then started innovating in product designs and customizing individual products.

INSERT FIGURE 3-7 ABOUT HERE

The main tool that an artisan used was a motorized lathe, a device on which a block of wood is turned as an artisan works on it. Artisans used hand tools to craft this block of wood on their lathe into the desired shapes and then, artisans applied layers of lacquer that had been previously dyed with vegetable colors. Figure 3-8 shows an artisan working on a piece of wood with hand tools as it turned on his power-driven lathe. In particular, note the vast difference in scale and sophistication of this artisan’s technology and the machines stocked in the Crafts Park (Figure 3-6).

INSERT FIGURE 3-8 ABOUT HERE

Through this process of making products from start to finish by hand, applying technical knowledge while also expressing themselves artistically, artisans came to

value the creative control they had over their work. This creative control allowed artisans to control the fate of each of their handmade pieces and influenced their production and marketing practices as well (Ranganathan, 2014).

Thus, artisans applied this frame of creative control to understanding and making sense of technology as well. In particular, artisans valued 1) control over the production process (including working with their hands) and 2) creativity in work. When technologies allowed artisans to be more productive without compromising control and creativity, they were welcomed and widely adopted. For example, artisans in Channapatna enthusiastically adopted motorized lathes when the Japanese brought this technology to the town in the 1970s (earlier artisans used hand-powered lathes). As one artisan recalled, this technology had allowed them to “go from Rs.2 to Rs.20 [be more productive] without compromising on the sanctity of their work.” In particular, this technology reduced the physical hardship of crafting wood, thus allowing artisans to spend more time on the creative aspects of work, and the technology even widened the creative landscape by allowing artisans to carve wood in certain ways that they could not do by hand. In the survey that I conducted, 75% of artisans in my sample responded “Yes” to the question “Do you think your products are made better using power lathes?”

On the contrary, the machinery purchased for the Channapatna Crafts Park reduced artisans’ control over the production process and also reduced the scope for creativity and customization in their work, as discussed below. These machines did not simply mechanize routine tasks but instead took away from core parts of the work that artisans valued the most. The machines were operated by machine operators, thus preventing artisans from playing around with them, and further, the machines automated the entire production process in a way that artisans would no longer be working with their hands on the products. Similarly the machines’ core competence was standardization so that individual pieces would look identical, leaving no room for the creativity and customization that bound artisans to their work and final products.

Control over Production Process. Artisans valued working with their hands and making products from start to finish. They enjoyed being part of the transformation of these products from raw wood to beautifully crafted pieces that they treated like their children. As one artisan said:

People like doing this work though..since they are making these beautiful pieces with their hand. People don't consider it dirty work, they don't mind getting their hands dirty. If the hands get dirty, we'll wash it off, big deal.

As a result, artisans had great appreciation for hand-made craft products. They believed that the investment of self required was irreplaceable and was what made the products unique. One artisans, commenting on German products, said:

It's all by hand. Even in Germany, weaving, they have to do by hand. They are advanced in terms of machinery, but there is no alternative for hand work. They can weave mats with machinery but they don't.

Artisans' high levels of creative control also meant that they held their craft skills in high regard and were unwilling to part with this control over the production process that they enjoyed. An artisan said:

Crafts hinge on hand-based skills for their basic production. They might seem like basic skills but they make all the difference in differentiating the product. These hand-based craft skills are the value addition. And these skills are honed traditionally.

However, the Crafts Park machinery required artisans to give up control over the production process. Artisans would no longer be able to execute and monitor every stage of production and use their hands to mold their products. In fact, in the way the Crafts Park was set up, artisans had to simply bring in raw wood to the facility and provide a blueprint of what they wanted done to their wood. Machine operators would then use various machines to execute the tasks and artisans would only come back to

pay a nominal fee for the services and pick up the finished goods. Thus artisans would not actually be making the products from start to finish nor would they be operating the machines. Artisans, who viewed technology through a creative control frame, saw the Craft Park machines as encroaching on their valued production process. Three examples of different stages of the production process illustrate artisans' desire to do these skilled processes themselves. For example, an artisan discussing the process of sanding freshly-made wood products to remove sharp edges said:

I know they have a sanding machine but why would I use it? I am very happy sanding my own products with my piece of sandpaper. When I do it myself, I can evaluate the quality of my own work, there's no benchmark with the machines.

Similarly, artisans took pride in turning wood on their lathes with such control and precision that the wood never got so heated that it developed black spots. They were unwilling to give up this core part of the work that they enjoyed:

In some products, you would have seen that wood gets dark at some points. This looks very bad. If wood has water content, when it interacts with tungsten, then the friction that occurs releases a spark..[and] when it gets heated, wood gets spoiled. I know how to do this well on my lathe, to make sure that the wood is perfectly turned so that this will not happen. How can I trust that machine operators will take so much care as I do? It is not their products, it is mine.

Finally the art of seasoning wood so that the moisture content was just right and the shade or color of the wood was beautiful was also something that artisans identified with. Here again, the creative control frame that artisans adopted made them view the Crafts Park technology with suspicion:

Right now, I season my wood by drying it in the sun and turning it frequently and checking on it everyday. The facility [Crafts Park] has a

wood seasoning plant. They can treat together 3000 cubic feet of wood in one kiln..the process is that they arrange wood in a particular criss-cross fashion and outside they have a boiler with steam generationso then they will circulate steam tubes inside the facility. So there's a procedure, that for this many hours, there should be this much steam and what should the wettability (how wet or dry) of the steam..its a wet stem..they calculate the dryness factor and all these things need to be taken into consideration..and then there's a cycle of say 15 days or 19 days or 24 days depending on their process. See different wood requires different processes of seasoning, the reason being that the moisture content of one type of wood is very different from that of a different kind of wood. But, as a Channapatna toy maker I will not put 3000 cubic feet at a time, I don't have that much wood...only a highly technical person can handle this and..I don't trust them [operators] with my wood.

These three examples illustrate how artisans, who viewed technology through a creative control frame, interpreted the Crafts Park machines as taking away control over the production process, which is one key aspect of work that they valued.

Creativity. Artisans additionally valued using their imagination and the ability to creatively customize individual pieces, with respect to design, patterns, textures and colors. As some artisans said:

It is in people's blood. He enjoys making new items, the act of creating and being able to concentrate on things like texture. It is creative work overall.

Also, input for design... that they love, like selecting the colors. They make decisions all the time by themselves. They have 20 dyes, so they can decide that blue goes well with orange and so on and so forth.

This sort of creativity was another key component of the creative control frame. Such scope for creativity often took precedence over monetary rewards for artisans,

who wouldn't trade this creativity for additional profits. As one artisan said:

It isn't about making profits only. Design is an outlet for us creative people. Retaining the exclusivity and uniqueness is important.

However the Crafts Park machinery required artisans to give up the creative control that they enjoyed in the traditional production process. Specifically creativity for artisans was the ability to make modifications on-the-go. Artisans did not make detailed sketches of products prior to making them. They felt liberated by the ability to improvise without being bound to blueprints. Thus artisans' creative decisions were often dictated by instincts and their prevailing moods and dispositions. However, executing jobs at the Crafts Park was very different - it required artisans to provide detailed plans of their products in advance, which the artisans thought interfered with their creative control over work. One artisans described this:

What is the plan, what is the left view, right view - these are the questions we get asked at the facility. But this is not how we make products. We make creative decisions as we go along, we don't sit down and make a drawing of the product and first decide..ok, i will do this, then this.

Two examples help to illustrate this further. When it came to decisions about how to cut or carve the wood, artisans modified dimensions based on what felt right. However, as one artisan describes, this flexibility was unavailable in Crafts Park machinery:

There is creativity in deciding if the depth of the cut is too much..if you're giving 10mm/12mm [millimeter] pieces of wood at a time..the feed, speed and depth of the cut is crucial. This is all basics, but with the machines you can't make these decisions as you're making.

Similarly, artisans appreciated that when they were making parts like beads, every bead looked slightly different, which allowed them to express themselves. The Crafts Park machines, when viewed by artisans through this frame of creative control, fell short by limiting these creative decisions. As one artisan said:

When we make beads, we don't like them to be all exactly the same. When we work, we can adjust with different woods, different thickness etc. Sometimes 5mm, sometimes 6mm, sometimes in between. But with machines you don't have that flexibility.

Thus the Crafts Park machines were seen as restricting both control over the production process and scope for creativity among artisans who viewed technology through the frame of creative control.

Action: Lack of Adoption of Crafts Park Machinery. As discussed in the previous sections, artisans evaluated the Crafts Park machinery through the lens of creative control. Artisans viewed the machines as limiting their ability to control the production process as well as curtailing their creativity. As a result, artisans did not adopt the Crafts Park machinery.

One government official lamented that despite the Crafts Park facility being open for several months, artisans have yet to use the Park:

They have started their services a few months back, but the business is yet to pick up among artisans.

Another government official, worrying about the future and sustainability of the Crafts Park, said:

As of now, only a small part of Channapatna's artisan community is making use of the Crafts Park - approximately 50 to 60 artisans out of perhaps 5,000 artisans in the district. The Crafts Park is earning 20 to 30 thousand rupees a month [\$500 a month] but we would need to take that up to at least Rs. 1,50,000 or 2,00,000 to become at least self sufficient [\$4000 a month]. And this is just a bare minimum to cover costs, we had hoped to earn much more. The government has provided funds for the first three years of operation; after that..

A senior member of the central government who had approved funding for this project but did not oversee the implementation was frustrated with the lack of adoption of the Crafts Park machines by artisans. He said:

The 120,000,000 rupees invested by the government just to develop the land is lying idle. If I call the press for an inauguration ceremony, then they will definitely raise this question: “wasn’t the Crafts Park supposed to help the artisans?” Thinking about this, I am not having a press conference. In fact, if the industry does not pick up, as per the terms of the allotment, we will give the land to someone else, no mercy..

One of the wood consultants was concerned that the machines were being used much less than had been projected in forecasts and that this would affect the health of the machines:

The machines have been brought more than 1 year ago, so maybe they’ll start rusting. If you don’t use a machine for at least half its capacity, the axes will get misaligned..even if the machine isn’t used, it’s important to keep running it every week at least once. But its been lying like that and the machine error is bound to increase.

Upon informing artisans about the concerns that government officials had about the Crafts Park’s utilization, the artisans’ common response was that the “appropriateness of the mechanization is crucial” and that “automation without meaning is pointless.” Artisans lamented that so much government money had been spent on machines that were of no use to them. Like one artisan who said, “Some Rs. 35 - 40 crore has been spent on this machine, then it needs to be put inside a temperature controlled room, and you need at least a diploma holder to handle it, then that operator will demand you Rs. 30 - 40,000 a month in salary...so much expenses but of no use to the artisans.”

Artisans gave several examples of the kinds of machines that would have benefited them without compromising their creative control and were clear that had such machines been brought, they would have surely adopted them and increased their own

productivity and earnings, while also being able to contribute better to exports. Like one artisan who said, “we’re not dumb to say no to more money..but just not at the cost of our handicraft.” One artisan described what would have been beneficial:

It makes more sense to be concerned with primary processing, you know, what kind of wood, what processing could to be done with the wood to make it stronger..In Channapatna, they use *hale* wood but we could also think of making these products using *padtal* (Himalayan fir wood), which would give us a lot of scope, if there was appropriate processing technology.

Similarly, several artisans described a pressing need for power generators to deal with power cuts for several hours a day which prevented them from working on their lathes. Other artisans said that some technology to be able to re-use smaller pieces of wood and reduce waste would also help them. However the choice of machinery for the Crafts Park diverged from these suggestions and as discussed, the Crafts Park machinery remained largely unused by artisans.

3.5.3 Traders: “Profits” Frame

Apart from government officials and artisans, who made sense of the Crafts Park machinery through the frames of status and creative control respectively, was a third stakeholder - the traders chosen to export products made by artisans in the Crafts Park - who interpreted the same machines through yet another lens. Prior to the introduction of the Crafts Park, these traders sourced handicraft products from Channapatna’s artisans (the traders never made handicraft products themselves) and sold them in local shops as well as more widely. Twelve traders from Channapatna were chosen to be Crafts Park exporters through an application process. The criteria for being chosen was having an export license, having significant experience exporting and having international buyer linkages. Once chosen, these traders were given plots of land for them to build individual work sheds on for finishing, packaging and post-processing activities of the products prior to exporting. In addition, the traders were

given a 10 to 15% subsidy from the Department of Industries and Commerce, tax benefits and marketing assistance in order to incentivize exports. In fact, if the traders exported a minimum of 30% of their annual production for 10 years, the plot of land within the Crafts Park housing their worksheds would be theirs to keep and the deed for the land would be transferred to their name.

Traders in Channapatna were predominantly motivated by profits and this was the frame through which they viewed the Crafts Park machinery as well. Traders, like artisans, were locally-based and were far removed from a desire for status, but unlike artisans, who were supposed to use the machines to make products, traders were brought in solely to export these products to global markets and thus did not have any creative attachment to the handicraft work and products. Traders, instead, saw the Crafts Park as being hugely lucrative, as they had the potential to benefit from higher export margins while also gaining access to government subsidies and benefits. In particular, the traders viewed the technology as having three key benefits, which would allow them to make significant profits: scale of production to meet large export orders, efficiency in production to meet export deadlines, and precision to meet quality standards in export markets.

However, the traders faced an unanticipated situation when artisans did not adopt the Crafts Park technology as per the original plan. At this point, if the traders wanted to continue benefiting from the government export benefits and incentives, they had to find a way to produce goods at the Crafts Park, even without the artisans' cooperation. The traders were not in a position to replicate the creative artisanal products that were typical of Channapatna – neither did they have the creative or aesthetic ability to design these products themselves, nor could the machines execute the stages of the production process easily and completely. Instead, traders who interpreted technology through the frame of profits, used the same Crafts Park machines to make basic, simple wooden products like photo frames and hangers using fully automated techniques so that they would make profits, and more importantly still be able to access the government benefits.

Figure 3-9 presents a list of the Crafts Park traders, the products that they are

making at the Crafts Park as well as the countries to which they are exporting these products. Below is a discussion of how traders' interpretation of technology through the frame of profits allowed them to see the Crafts Park machines as bestowing scale, efficiency and precision to the production process, thus resulting in greater profits.

INSERT FIGURE 3-8 ABOUT HERE

Scale of Production. The first advantage of the Crafts Park technology, in the minds of the traders, was the ability to handle large quantities of production. As some traders said:

With the technology, if you used to make 10 pieces, now you can make 50 pieces a day. This way you will earn far better and move up.

We cannot achieve any mass production or good quality without the equipment.

Having the ability to handle large-scale orders, for the traders, also gave them the confidence that they would be able to handle exports. As another trader said:

In export markets, people ask for 15,000 pieces in 60 days.. technology is needed to meet the requirements. Export market has some chain stores even asking for 100,000 pieces in 60 days. So, this is the infrastructure needed to meet demand and supply. Then only we will earn any profits.

Specifically, the traders praised the Crafts Park machinery for allowing them to produce large quantities at very reasonable costs. One trader, talking about the auto lathe, said:

In one minute, the machine makes 30-40 pieces. The cost is reduced from Rs.4 [if they were purchased from outside] to barely Rs.0.22 for a bead. Labor cost is also cut.

Another trader, admiring the abilities of the “laser cutting machine” at the Crafts Park that allowed him to cut large quantities of pieces, said:

If we get a bigger order such as we have to cut 200,000 or 300,000 pieces, then those machinery will be invaluable. Especially for simple items. If we want to cut this rod and a lot of such pieces [showing me the pieces] are required...we can feed it in the computer and get it done by laser cutting. With machinery, you can get the desired high production in a few days. It is more cost effective.

Efficiency. In addition to handling large quantities, the traders also valued the ability of technology to execute specific jobs efficiently, thus saving time which ultimately reduced costs and increased profits. Several traders compared the efficiency of the machines to the laborers who might have otherwise executed the same jobs. As one trader said:

To carve one door, if I hired laborers, I need a month’s time but if I use the CNC machine, it will take only 8 hours. For final touches, it will take 1-2 days. I can deliver in 3 days, which will be beneficial for the buyer.

Some traders similarly compared the task of making boxes by machines to doing the same thing by hand and specified the advantage of doing the job using machines for exports. As these traders said:

We got a corporate order from Hyderabad for 500 boxes in 8 days. If we do the box cutting by hand it will take 8 days to only cut the pieces. With the craft park machines, we made them in one day i.e. we started in the morning and finished by 3 pm. If we pass through one piece it will give 4 equal pieces. To meet the international demand, we are using this technology.

I am also making wallet boxes. Previously if I was able to make 1000 wallet boxes per month, now, I can supply the same quantity within one day.

And finally, traders articulated how the efficiency afforded to them by the Crafts Park machinery resulted in significant cost savings for them. As one trader said:

If a person is able to make 10 products in a day he will take 10 days to make 100 products. However with Crafts Park machines, he can make 100 products in a day. This will save the man hours and will ultimately bring the cost down. We will have at least 100% cost saving which can go to 200% also. The work that we used to make in 4 months now can be made in 20 days. In terms of accuracy, quality and cost I am very happy.

Precision. In addition to scale and efficiency, viewing technology through the frame of profits also allowed traders to appreciate the precision or accuracy of the Crafts Park machines that allowed them to make completely standardized products, where any two pieces looked identical. One trader described how the international market was more demanding in their quality standards, which necessitated the use of such machines:

International standards are strict, we follow them. There are a lot of conditions laid by international market and we adhere to all of them. They want pieces to look identical. We used to check each piece 3-4 times. First at the time of wood cutting, then at the time of color applying, then at the time of assembling and then at the time of packing. Now with the machines, I am less worried.

Another trader described how this trait of machines - precision - could never be achieved by artisans. He said:

Artisans' products are not standardized. That is how they ought to be because they are made by different people. They have a different sense of quality and different expectations of each piece. My sense of quality will be different from yours.

In contrast to artisans, traders appreciated the ability of the machines to take in design specifications and then execute them to the tee. As one trader said:

These machines give good production, better quality and whatever design we feed in it, it gives us the result perfectly.

The precision of the Crafts Park machines gave the traders confidence in venturing into new product domains that they had not attempted to compete in before. The traders knew that the machines would meet the basic, international standards of quality. As one trader said:

We have started a carpentry unit..we have used only basic machines like cutting, sanding etc so far..but going forward we will take more help from the Crafts Park. If we need some profile cutting like monetizing/tennoning, then we can use them and trust in them.

Action: Basic Wooden Products Made at Crafts Park. The previous sections described how traders, who viewed technology through the frame of profits, saw the Crafts Park machines as offering scale, efficiency and precision in production. This interpretation of the machines motivated traders to produce goods at the Crafts Park using fully-automated techniques, without the help of the artisans, who as discussed, displayed no interest in working with the machines. Exporting, for traders, had the advantage of growing their own businesses and profits, while also making them eligible for significant governmental support and benefits.

It was going to be impossible for the traders to use the Crafts Park machines to make handicraft products since they were not creative individuals, schooled and trained in the craft and aesthetics of wood and lacquerware products. They simply did not have the design skills and creative intuition required for artistic products. Further, the Crafts Park machines, given that they were imported, were not easily suited to making the traditional handicraft products, in such a way that one machine would make the product from start to finish. Various machines executed different production processes and even after that, artisans would be required to give the products their finishing touches. One trader acknowledged that the Crafts Park machines would never be able to produce products as sophisticated as those made by artisans using their hands. He said:

We cannot compete with locals because they have their skills from generations. It is a generational skill, you cannot give as much of accuracy in our Craft Park products. So Crafts Park products will not be as skilled as the artisans. So Crafts Park will make more simple products because we cannot compete with the skill of the artisans. More simple products like photo frames, not complicated products.

As the above quote hints, traders instead resorted to making more basic wooden products using the machines, such as photo frames, hangers, Christmas tree ornaments, kitchen aids and furniture components. Figure 3-10 displays pictures of some of these products made at the Crafts Park. For example, one trader, describing the products he was making, said:

I am making cutting boards and butcher blocks out of *neem* and acacia wood for export. Without this facility, it would not be possible for me to fill the orders I am getting.

INSERT FIGURE 3-10 ABOUT HERE

It is interesting to note that the products made by traders at the Crafts Park, were not only simple and easy to make using the machinery, but also strikingly similar in technique to products used by foreigner manufacturers to “demo” their machines during the installation process at the Crafts Park. As a result of using imported machines, the kinds of products and knowledge that the traders were exposed to was also “imported” in some sense. As one trader said:

What products can we make? For boxes, furniture, doors, frames etc., we have been recommended [by the machine manufacturers] to do laser engraving, cutting and carving by CNC machines.

In this way, the new products that traders were making were also not distinctive of Channapatna. For example, one of the key characteristics of Channapatna’s products

was the soft wood that was used, specifically *hale* wood. However the new products used various kinds of wood. As one trader said –

Now you can use different woods. You can use pine, cedar, neem; harder woods which would probably be difficult to use otherwise. When you are working manually you are restricted to a certain product form.

Another trader, acknowledging the lack of distinctiveness of the new products made at the Crafts Park, said:

Also what I noticed is that the kinds of products being made there are not the kinds usually made..like toys. They are pen stands, hangers etc..these are not even unique to India, they can be made anywhere. This particularly tradition, Channapatna’s craft of lacquerware, it’s not really being helped or promoted.

INSERT FIGURE 3-10 ABOUT HERE

In fact, traders, as a result of viewing technology through the frame of profits, displayed no attachment to the traditional craft of making products by hand. As one trader said “handicraft means working with hands but that is not possible today.” They felt no remorse in making machine-made products in a facility meant to benefit one of India’s oldest handicraft clusters. As one trader said –

Traditional craft are products completely made by hand with the help of simple tools, reflecting the creativity, the culture and the heritage of the craftsmen. The important part of the definition is – simple tools. But you cannot take a person in 20th century and ask him to use the ancient tools he used to use 100 years back. I think it is ridiculous ... So you have to take the tradition, heritage and culture up to a point.

This reaction was particularly ironic given that prior to the Crafts Park, these traders’ livelihoods depended on selling handicraft products made by the artisans

using simple tools. These traders went as far as claiming that their machine-made products were no different from the traditional handmade products. As some traders said –

Furniture and any woodwork is treated as handicraft, whether made my hand or machine. There is no distinction. Even if carving is done by machine of hand, the work is classified as handicraft.

I use a very broad definition of handicrafts – all wooden products are handicrafts, even hangers or frames, which use no manual labor to make them. Similarly, all furniture is under handicrafts.

Ultimately, the traders were thrilled that because of the Crafts Park, they were now able to increase their profits. One trader ambitiously remarked that “photo framing is normally a large industry in the US; it’s almost a \$4 billion industry which I’m now a part of.” Another trader said,

After this facility came to Channapatna, I have diversified my activity to include several orders for door and window frames. Before, I had received inquiries but I was not able to meet the demand because of lack of machinery and manpower. Now I am regularly using the facility and I can do it.

3.6 Outcomes

As demonstrated, government officials, artisans and traders viewed the Crafts Park and its machines through very different technological frames, which also affected their actions pertaining to the technology. Further, the technological frames of the three stakeholders were not just different, but also incompatible, impacting the overall success of the Crafts Park and the goals of increasing exports and helping artisans. This incompatibility is clearly visible along three dimensions, first identified by Orlikowski and Gash (1994), namely technology strategy, nature of technology and technology

in use. Figure 3-11 compares government officials, artisans and traders along these dimensions, helping to illustrate the actors' incongruent interpretations of the same technology. One observer, describing this, said:

See we three [stakeholders] are sitting here and it is not necessary that all of us have the same though process. We will have a different outlook. We can have difference of opinion but when you are working, you should first think what you are doing and what will be the impact.

This section documents that the incompatible technological frames of the key stakeholders of the Crafts Park project resulted in limited exports and few benefits to artisans, as discussed below.

INSERT FIGURE 3-11 ABOUT HERE

3.6.1 Exports from Channapatna

One of the key goals of the Channapatna Crafts Park was to increase exports from the handicraft cluster in accordance with India's EOI strategy. While traders exported their basic wooden products, these exports were dramatically lower than what had been forecasted for the Crafts Park. Traders used the Crafts Park at only 10% of its capacity and as a result, the government was running the facility at a loss given high overhead costs. Thus, the exports were not positively contributing to national earnings.

As indicated in earlier sections, artisans in Channapatna boycotted the Crafts Park and refused to use the imported machines that hindered their creative control over the production process. However the twelve traders, chosen to export products from Channapatna, had started making simple wooden products using fully automated techniques for export. One government official, describing this, said:

Well, its [the Crafts Park] mostly being run by these few exporters, who are able to do their work there, finish their products and export it.

By exporting basic wooden products to a range of countries, as indicated in Figure 3-9, traders were able to earn some profits. Some traders, describing their exports from the Crafts Park, said:

I am getting almost Rs. 40,000 per month as revenue. My magic product is this box. This box is exported all over the world.

It depends on the orders that we receive. I think I will make about Rs. 500-550,000 this year from here. It will fluctuate. So far I am making corporate wooden gift items to give out at the end of conferences.

However, the production undertaken by the traders was far lower than what was projected had there been significant takeup of the machines among Channapatna's 5000 artisans. Several interviewees reported that the Crafts Park machines were being used at only 10% of capacity, as that was all that the traders could handle on their own. A machine operator whom I talked to said that they had done "only some 30-40 orders" in total thus far. Similarly, one government official, lamenting over the low utilization rate, said:

If we want to continue taking support from government, we will have to keep up our promises and raise this industry by exporting more - there is only so much you can earn from using the machines at 10%.

Low utilization of Crafts Park machinery also affected the revenue earned by the government through exports. As one official explained, the main source of revenue for the government was the service charge levied for using the machines. While individual traders might have been earning profits from their Crafts Park production, this did not seem to translate into export earnings for the government, given the high overhead costs of running the facility. As a result, the Crafts Park was yet to become finally self-sufficient and break even. In its current state, the expenditure incurred in running the facility far exceeded the earnings. As some government officials said:

We [Crafts Park] have to become self sustaining and self reliant. We have to give payment to operators and managers and security, we have to take care of wear and tear, pay the rent of this building to state government. Right now we are earning Rs. 20-25 thousand per month. With this, we can't even pay the rent of Rs. 200,000 per month. We have told the government that right now there are a lot of small scale people trying to do their work here, please give us some more time.

The main revenue for the Crafts Park is collection of service charges since when the machines get used, the parties pay for their work. Right now, we're getting hardly Rs.20-30,000... that's not even enough for maintaining. This is in a primitive stage.

3.6.2 Artisanal Welfare

In addition to falling short of export targets, the Crafts Park also failed to improve the livelihoods of artisans. As one government officer said, "we wanted to support rural artisans, those who are in need [through] technology upgradation..but we have not been able to." There was no positive impact of the Crafts Park on artisans in terms of their income or in securing the future of their occupations. In fact, some artisans even organized a strike to express their dismay over how the Crafts Park had failed to make a difference to their livelihoods.

Artisans in Channapatna earned a meager income of \$70 a day and there were no indications that this changed as a result of the Crafts Park. In the survey I conducted, I asked artisans to report their current income as well as fluctuations in their income over the past year and there seemed to be no impact of the Crafts Park on earnings. Further, upon asking some artisans about this, they said:

How do you expect any change in income? We aren't able to use the machines. Only if we used would there be any change no. In this handicrafts line, I am continuing to go in the morning, come for lunch at 2 pm, go back at 3 pm and then come home at 7 or 8 pm. I work hard for almost

12 hours. And out of 365 days I work for 355 days. I was hoping that the Crafts Park would change this, but it hasn't.

We do not want to become the next Ambani [rich businessman], we just want to eat and live with dignity. We don't get two square meals a day right now. The [governmental] efforts should be towards giving us a means to survive and there has been no change because of the Crafts Park.

On the contrary, some artisans worried that the Crafts Park, with its massive government support, would give rise to a new industry focused on machine-made basic wooden products in Channapatna that would compete for resources with their own handicraft industry. Even though the products made at the Crafts Park were very different, catered to a different market and could not replace the handmade products, some artisans were concerned about the security of their occupation. 35% of the artisans that I surveyed responded to the question "What do you think of the future of your occupation?" by selecting the "Poor" option and upon being asked to specify reasons for their response, said "no artisan development centers from government" or "no government support." Some anecdotes also indicated that after the Crafts Park opened, a few artisans "quit this [occupation] and went to Bangalore to do something in garments."

Further, some of the artisans in Channapatna, organized a strike to express their disgruntlement with the Crafts Park machines that had not benefited them. As indicated in Figure 3-7, 28% of the artisans in Channapatna were organized into a Wood Craft Association that had been in existence since 1989. In the first week of February 2012, 200 artisans who were members of this association, conducted a strike on the main street in Channapatna (the Bangalore-Mysore highway) for half a day, demanding that the government invest in machines that would be to useful to them, instead of machines that only benefited the traders. The artisans were particularly upset that large sums of money had been spent on the Crafts Park in ways that had not benefited them. Some members of the association, recalling the strike, explained their grievances:

They [the government] didn't install small machines for us and only installed big machines in the Crafts Park. This Crafts Park is not for workers or artisans in its current form, it is only for traders.

Why did we strike? Our industry is lacquerware, that is the core of our handicraft. So there should have been at least a section of machines that would allow us to do our lacquerware better, but there isn't. The people [traders] here have upgraded to furniture. So, the members [of the association] protested that our traditional business is not benefiting. This is what Channapatna is famous for. And by doing furniture in the Crafts Park, we are not gaining at all. In fact, maybe this will hurt us.

Investing crores of rupees and finally doing machine made products..I mean machine made products, anywhere they can do. Not only Channapatna. If that money was utilized for handicraft in some way, that could have definitely..

However, the strike was ignored by the government and had no impact at all. As some observers said:

They tried to strike against the Craft Park but to no effect. The Park was established by the government. 7 or 8 traders were partners of this initiative..[but] there is no benefit of this to the artisans.

This protest that happened, did the government react? No, the protest was in Channapatna. There's no one to listen to them. The government will say that this is an export facility, it will help you in the long run.

3.7 Discussion

In this paper, I have shown how key stakeholders involved in the implementation of the Channapatna Crafts Park towards the end of exports, namely government officials, artisans and traders, viewed the new mechanized technology through the

different technology frames of status, creative control and profits respectively, that were incompatible and resulted in limited exports from this handicraft cluster and few benefits to the individual artisan-producers. This section will discuss alternative explanations and contributions of this study.

3.7.1 Alternative Explanations

There are a few different alternative explanations that one might raise to account for the outcomes that I described in the previous section. These fall into three categories - lack of awareness about the Crafts Park among artisans, insufficient training in the correct operation of the machines, and collusion between the government and traders. Below, I present data to rule out these explanations.

First, the government invested significant efforts in raising awareness about the Crafts Park among artisanal communities. The planning for the Crafts Park started in 2004 and the awareness programs started simultaneously once the government funding was approved for the project. After the Crafts Park opened, there were even more programs and seminars held for artisans to come to the facility and understand the functionality of each of the machines. In fact, in the survey that I conducted, I tested artisans in the sample about their knowledge of the Crafts Park. While the artisans referred to the facility by different names, including “high tech park” and “handicraft park,” 85% of the artisans sampled had visited the facility and were able to describe the machines in detail. As some government officials said:

We conducted many seminars. Everybody knows about it. This project is running for 7 years, so it is impossible that people do not know about it. We conducted seminars and told everybody about it. We will organize one more next month. For conducting each seminar, we spend at least Rs.20,000 (\$400).

Somehow it is frustrating to me that when people say that artisans don't know about this facility. We have planned a series of seminars. Most of them [the artisans] have been personally invited to see it [the Crafts Park].

I am planning to have more seminars within the Park itself. We have had a series of seminars, inviting the artisans there, showing them the facility, and teaching them how to start a business and then basic things like how to use the internet for designs. You don't have to pay for the designs, just download designs mix and match.

Second, it was not the case that no one knew how to use the machines. The government hired skilled machine operators to handle the imported machines and paid them healthy salaries of Rs.40,000 per month (\$800), which is more than they would get elsewhere. The secretary of the Crafts Park showed me one of the recent job advertisements they had placed in a newspaper for a "senior machine operator" requiring SSLC (10th grade) graduation and experience of "7 to 10 years in wood working machinery." Further the government officials required each machine manufacturer to personally supervise the installation of their machines in the Crafts Park Common Facility Center and also train the machine operators to handle the machines. As some government officials said:

Today, they have 4 machine operators for the facility and one manager. There is this Advanced Wood Working Center in Bangalore, which was set up in collaboration between the Indian and Italian governments- luckily they [machine operators] are all trained [from there]. We employ only those people who have the certification from this institute. After that we given them more training too.

Finally, the traders were not colluding with the government officials with the intention of making non-handicraft products from the start. The traders, while making some profits from exporting simple wooden products from the Crafts Park, would have made much more if the artisans had used the machines at the facility. While the traders were collectively using the machines at 10% of their capacity, had the 5000 artisans in Channapatna adopted the machines, this utilization rate would have been closer to 100%. In this scenario, the traders would have had not only more volume of goods to export but would have also had higher margins per good exported since

the artisans would be making unique, beautiful handicraft products which are highly valued globally in contrast to the generic wooden products they were currently selling. Further, the traders would not have had to invest in learning a new skill of using machines to produce wooden products, which they would have preferred. Instead they could have focused on what they are good at- marketing and selling. This rules out the possibility that the traders colluded with the government officials to get the machines they desired in order to circumvent the artisans. As one trader said:

There is no limit to how much we could have earned [had the original plan for the Crafts Park worked out]... the volume of work would have been greater and...of course, I would prefer selling artistic products. Obviously we want to use 100% capacity of the machines if we could.

3.7.2 Contributions of this Study

This study makes four key contributions. Scholars have long studied export-oriented industrialization as a key growth strategy for developing countries. Several of these studies have recognized the role of technology in spurring exports from an industry that had previously catered to domestic demand. However, these studies have predominantly focused on successful cases of technology implementation towards the end of increasing exports and have, as a result, not considered the conditions under which this kind of technology implementation might fail. My study, by focusing a case of problematic technology adoption and implementation in a handicraft cluster in southern India, contributes to this literature by suggesting that when key actors involved in the technology implementation process view the technology through widely varying frames, the implementation process might be troublesome, which could hamper the main goal of increasing exports from this industry.

Second, while studies of technology adoption have traditionally focused on the adoption decisions of individual actors making rational decisions for themselves, my study contributes to this literature by highlighting how it is insufficient to consider the individual actors in isolation. Most technology projects require the cooperation

and coordination of multiple stakeholders who might have different frames for viewing the same technology. And even if the frames individually make sense individually, incongruence between the frames collectively could lead to the failure of the technology project.

Third, while studies using the tool of technological frames have traditionally focused on implementation of information technology among white collar workers in large organizations, this paper contributes to these studies by adopting the same concept in a widely different setting. This paper shows that the concept of technological frames is just as useful to study the implementation of mechanization technology in a developing country context where the stakeholders are not organizational actors but small scale entrepreneurs and government officials.

Finally, this paper makes a key methodological contribution to studies in EOI by studying the implementation of technology in a handicraft cluster, while it was ongoing. Existing studies have typically relied on retrospective data, but this paper is able to offer deeper insights by capturing real-time interpretations of technology that can often not be reconstructed at a later time and by observing changes in perspective towards a particular technology over time.

The main policy recommendation stemming from this paper is to bring the different stakeholders involved in the implementation of technology for EOI together at various stages of the project and to have joint - decision making at every stage to ensure congruence between individual technological frames.

3.8 Figures and Tables

Figure 3-1: Sampling of Channapatna's Products

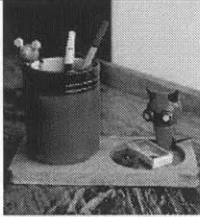

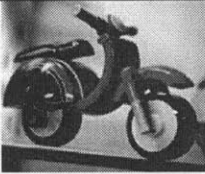
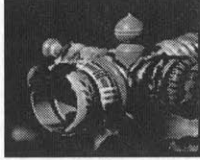
<p>Decorative & Utility Items:</p> <ul style="list-style-type: none"> • flower vases • bowls • salt & pepper shakers • napkin rings • wall-panels • pen holders • paper weights 	
<p>Dolls:</p> <ul style="list-style-type: none"> • dolls depicting characters from Hindu mythology • dolls in costumes from various parts of India • Russian dolls • dolls with moving heads 	
<p>Toys and Games:</p> <ul style="list-style-type: none"> • spinning tops • cars, motorcycles and trains • chess sets • disc sets • counting frames with beads 	
<p>Jewelry:</p> <ul style="list-style-type: none"> • bangles • necklaces • beads • earrings • jewelry stands 	

Figure 3-2: Funding for the Channapatna Crafts Park

SOURCE	AMOUNT		PURPOSE
	(in Rupees)	(in US Dollars)	
Central Government			
• <i>Development Commissioner of Handicrafts</i>	120,000,000		Land Development
	9,860,000		Wood Machinery – Round 1 (Year 2010)
	11,400,000		Wood Machinery – Round 2 (Year 2011)
	66,000,000		Wood Seasoning and Wood Treatment plants
	87,200,000		Natural Fiber Machinery
Subtotal (Central Government)	294,460,000	5,889,200	
State Government (Karnataka)			
• <i>Karnataka Industrial Area Development Board</i>	0		Land and Water Supply (Infrastructural Support)
• <i>Karnataka Small Scale Industries Development Corporation</i>	1,500,000		Maintenance Expenses – Year 1 (electricity, wages of managers & technicians, security)
	2,100,000		Maintenance Expenses – Year 2
	2,300,000		Maintenance Expenses – Year 3
	2,400,000		Maintenance Expenses – Year 4
	51,500,000		Construction of Buildings
Subtotal (Central Government)	59,800,000	1,196,000	
Traders	48,787,200	975,744	Individual Worksheds
TOTAL	403,047,200	8,060,944	

Figure 3-3: Location and Layout of Crafts Park

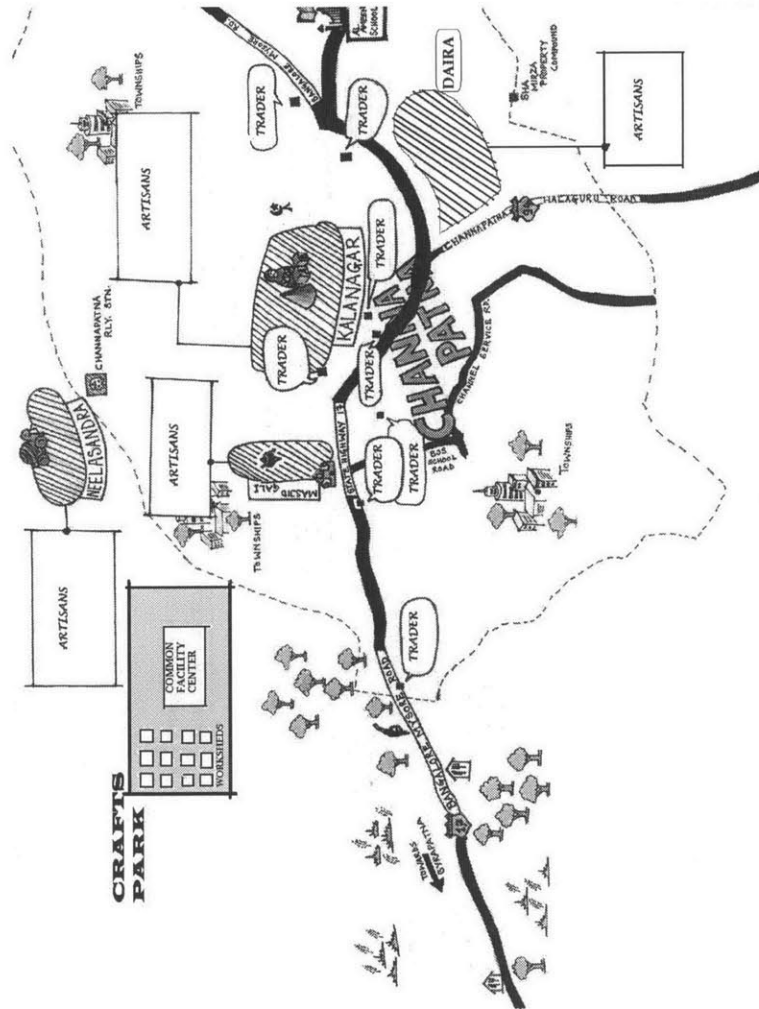


Figure 3-4: Technological Frames Adopted by Key Stakeholders in Interpreting Crafts Park Machinery

STAKEHOLDER	TECHNOLOGICAL FRAME	ELEMENTS OF FRAME	EXAMPLE QUOTES	OUTCOME
Government Officials	Status Frame <i>Technology bestows status</i>	International Status <i>Outside of India</i>	"Now, we are not behind China in presenting our talent to the world market."	Purchase of Imported, High-End, Complex Machines
		Domestic Status <i>Within India</i>	"In handicrafts, Jaipur products are competing with the southern handicrafts, but now we [state of Karnataka] are number one."	
Artisans	Creative Control Frame <i>Technology alters creative control over work</i>	Control over Production Process <i>Making from start to finish using hands</i>	"Even in Germany, they do weaving by hand. They are advanced in terms of machinery but there is no alternative for hand work. Making mats fully by machines is no good."	Lack of Adoption of Machinery in Crafts Park
		Creativity <i>Customizing using one's imagination</i>	"We enjoy the act of creating and being able to play with things like color. I wouldn't sacrifice this for anything."	
Traders	Profits Frame <i>Technology enhances profits</i>	Scale of Production <i>Quantity produced</i>	"Export market has some chain stores asking for 100,000 pieces- the choice is to use technology or lose the order."	Production of Commonplace Wooden Products
		Efficiency <i>Speed of production</i>	"If we make 500 boxes by hand it will take 8 days to only cut the pieces. With machines we can make them in one day i.e. we start in the morning and finish by 3 pm."	
		Precision <i>Uniformity in production</i>	"If we pass one piece through the machine, it will give 4 equally cut pieces."	

Figure 3-5: Listing of Machines at the Crafts Park

	MACHINE NAME	PURPOSE	COUNTRY OF ORIGIN	YEAR	COST (Rupees)
1	Auto Copy Shaper-Outer	Achieving uniform outer shape	China	2010	40,000
2	Auto Copy Shaper-Inner	Achieving uniform inner shape	China	2010	40,000
3	Open Type Belt Sander	High speed sanding of flat wood pieces	Hong Kong	2010	30,000
4	Vertical Drum Sander	Sanding vertical flat-edged components	Hong Kong	2010	97,000
5	Dust Collector (7 units)	Collecting dust from other machines	Taiwan	2010	175,000
6	Auto Wood Lathe	Turning wood	Austria	2011	100,000
7	Pneumatic Pin Router	Achieving uniform contoured edge	Taiwan	2011	33,000
8	Straight Line Rip Saw	Cutting thick wood sections to achieve thin straight sections	Italy	2011	84,000
9	Double Shaft Sponge Sander	Sanding irregular shaped components	Hong Kong	2011	74,000
10	Horizontal Oscillating Sander	Sanding horizontal flat edged components	Hong Kong	2011	100,000
11	Panel Saw	Precise cutting of laminated wood panels	Germany	2011	1,700,000
12	Stapling Machine	Stapling photo frames etc.	Taiwan	2011	20,000
13	Mitre Cut Off	Cutting 45 degree angles	Taiwan	2011	15,000
14	Single Spindle Shaper	Edge shaping	Taiwan	2011	100,000
15	Automatic Twin Tenoner	Removing wood at joints	Taiwan	2011	100,000
16	Automatic Twin Table Slot Mortiser	Creating slots for joints	Taiwan	2011	100,000
17	Oscillating Sander	Sanding all around	Taiwan	2011	200,000
18	6 Spindle Moulder	Door joints	Austria	2011	4,200,000
19	Engraving machine	Carving as per template	Italy	2011	750,000
20	CNC Router	Computerized woodwork	Germany	2011	8,500,000
21	Fire/Lightening/Surge Protection for Facility	Accident protection	China	2011	250,000
22	Dovetail Tenoner	Drawer joints	China	2011	100,000
23	Pad Printing Machine	Ability to print in one color	Taiwan	2011	30,000
24	Surface Planer	Smoothing wood	Hong Kong	2012	50,000
25	Rod Milling Machine	For curtain rods	Taiwan	2012	100,000
26	Generator for Facility	For power outages	China	2012	100,000
27	Wood Seasoning and Treatment Plants	Substitute for drying wood in sun and anti-fungal treatment	China	2012	66,000
28	Natural Fiber Machine	Processing natural fiber	Italy	2012	87,200,000
	TOTAL EXPENSES				174,460,000 (\$3,489,200)

Figure 3-6: Example of Crafts Park Machinery- Auto Copy Shaper(Outer)



Figure 3-7: Descriptive Statistics about Channapatna's Artisans

Fraction Male	0.923 (0.269)
Age	42.65 (9.903)
Work Tenure (years)	23.71 (10.13)
Number of Family Members	6.423 (4.421)
Fraction Married	0.942 (0.235)
Fraction Muslim	0.769 (0.425)
Fraction <i>Backward</i> Castes	0.885 (0.323)
Years of Education Completed	6.788 (3.472)
Fraction Literate	0.885 (0.323)
Exhibitions Attended/year	1.292 (1.732)
Visits to Bangalore/month	3.241 (2.325)
Radio Listening Hours/day	4.667 (2.371)
Income in Dollars	77.39 (50.18)
Fraction in Cooperatives	0.288 (0.457)
Observations	52

mean coefficients; sd in parentheses

Source: Survey Conducted in June 2012, 100% response rate for artisans.

Figure 3-8: Technology Used by Artisans- Motorized Lathes and Hand Tools



Figure 3-9: List of Traders Chosen to Export from the Crafts Park

	Traders' Companies	Products from Crafts Park	Export Locations	Annual Revenue (Rs.)
1	Bharat Arts and Crafts	photo frames, wooden trays, candle trays, wooden coasters, wooden table/place mats, curtain rings	US	12,00,000
2	Ajmal Handicrafts	boxes for displaying leather wallets	US (Tommy Hilfiger, Nautica)	50,00,000
3	Cycle Pure Agarbaithies	incense sticks (made from wood sawdust)	US, Chile, Japan, Africa, Sri Lanka	240,00,00,000
4	Sri Beereshwara Arts & Crafts	door knobs	US (EarthenTree), Hong Kong, Australia, Canada	27,50,000
5	MAYA Organic	furniture (cots, dressers, bedside tables, shelving units, chairs, dining tables, sofas, TV tables)	Japan, US	1,65,00,000
6	Ashrafi Fashion	Christmas tree ornaments (eggs), stationery	France	15,00,000
7	Reliable Woodcrafts	wooden hangers	US, Germany, Australia	25,00,000
8	Alpha Designer Cane	cane furniture	US, Australia	1,00,00,000
9	ChromaCrafts International	wooden kitchenware(cutting board, butcher blocks, bowls, spoons) and modular furniture (corner shelf, drawers)	US	25,00,000
10	Indus Tree Crafts Private Limited	natural fiber products (bins, boxes, mats), furniture (dining room sets, living room sets)	US (Crate and Barrel, Pier 1 Imports, TJ Maxx, IKEA, Target), UK (Interface, Habitat)	15,00,00,000
11	Shilpa Trust	corporate gifts (like boxes), carved wooden furniture (including carved doors)	UK, US (Ten Thousand Villages)	67,50,000
12	T.P. Arts and Crafts	kids' furniture (chair, table, bed)	UK	15,00,000

Figure 3-10: Products Made in the Crafts Park

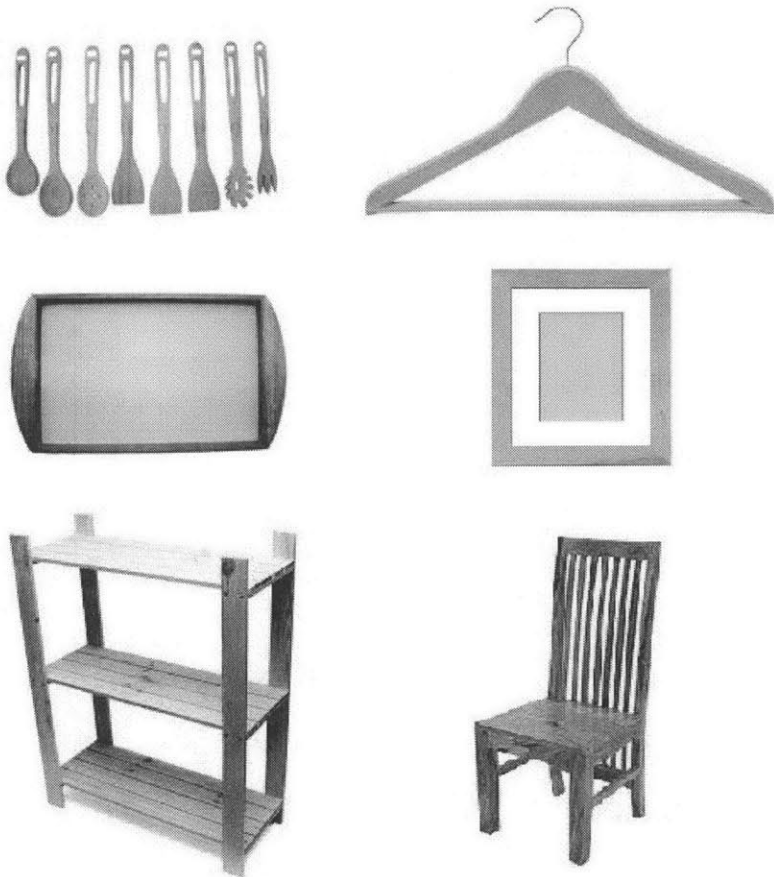


Figure 3-11: Incompatibility of Technological Frames

	Government Officials	Artisans	Traders
Technology Strategy <i>Motivation for technology</i>	Accrue prestige <i>"With technology, I am guessing that our reputation will develop."</i>	Increase scope for creativity <i>"Machines can be used to make boring things simpler so that I can spend more time painting and carving it by hand...more chance to use brains."</i>	Increase revenue <i>"So the bangle that I am selling at Rs. 40, I have a profit of 25% but if technology was used to reduce costs and then I export, I can have a 100% profit."</i>
Nature of Technology <i>Understanding of technology's capabilities</i>	Complex, novel <i>"These are the most advanced machines in the world, so there should not be any complaint. They are much ahead of us. In India we have never had these kinds of machines."</i>	Inflexible <i>"When we work, we can adjust with different woods etc. But with the machines, you don't have that flexibility, the parts need to be perfect."</i>	Large volumes, efficient <i>"Mass production can be done quickly and at better quality- the people just have to pay for the services."</i>
Technology In Use <i>Usage of Technology</i>	Hiring of machine operators <i>"We have hired skilled machine operators from Bangalore to operate the machines in the Crafts Park."</i>	Rejection <i>"The beauty of our toys lies in the fact that they are made by hand from natural colors and are not mass manufactured ..we won't let the machines change this."</i>	Production of simple wood products <i>"So Crafts Park will make more simple products. More simple products like photo frames, not complicated products."</i>

Appendix: List of Interviews

	NAME	ROLE	ORGANIZATION
1	Subba Rao	Trader (exporter)	Maya Organics
2	Srinivasan	Trader (exporter)	Maya Organics
3	Ajmal	Trader (exporter)	Ajmal Handicrafts
4	Ajmal's Employee	Trader (exporter)	Ajmal Handicrafts
5	Bhupathy	Trader (exporter)	Shilpa Trust
6	Neelam Chibber	Trader (exporter)	Indus Tree Crafts
7	Santosh	Trader (exporter)	Sri Beereshwara Arts and Crafts
8	Vincent	Trader (exporter)	Alpha Cane
9	Iliaz	Trader (exporter)	Bharat Handicrafts
10	Asghar	Trader (exporter)	Ashrafi Fashion
11	Wali	Trader (exporter)	Reliable Woodcrafts
12	Rangaramu	Government	Dept. of Industries and Commerce
13	Srikala	Government	EPCH
14	Manjunath	Government	KSSIDC
15	Nagaraj	Government	KSSIDC
16	Prabhu	Government	KSHDC
17	Thimmiah	Government	KSHDC
18	Salma	Artisan	
19	Kousar	Artisan	
20	Mushtaq	Artisan	
21	Syed Zabiullah	Artisan	
22	Srinivas	Artisan	
23	Syed	Artisan	
24	Syed's son	Artisan	
25	Rukamma	Artisan	
26	Shafiq Ahmad	Artisan	
27	Riyaz	Artisan	
28	Syed Naved	Artisan	
29	Fayim Khan	Artisan	
30	Sadar	Artisan	
31	Syed Aslam	Artisan	
32	Boraiyya	Artisan	
33	Amanullah Khan	Trader (non-exporter)	Shahid Handicrafts
34	Dilshad Bano	Trader (non-exporter)	Moonstar Crafts
35	Shivanna	Trader (non-exporter)	Maurya Handicrafts
36	Kartik	Trader (non-exporter)	Karnataka Handicrafts
37	Naseeb	Trader (non-exporter)	Naseeb Stores
38	Kareem	Trader (non-exporter)	Abdul Kareem and Sons
39	Srinivas	Exporter (not part of CCP)	Kushal Toys
40	Ramu	Wood Consultant	

Bibliography

- Abbott, Andrew. 1988. *The System of Professions: An Essay on the Division of Expert Labor*. Chicago: University of Chicago Press.
- Ajayan. 2009. "Time running out for industry to get forest produce certification." *Live Mint* .
- Albu, Michael. 1997. *Technological learning and innovation in industrial clusters in the South*. Citeseer.
- Altenburg, Tilman and Jrg Meyer-Stamer. 1999. "How to promote clusters: policy experiences from Latin America." *World development* 27:16931713.
- Amjad, Rashid. 1989. *To the Gulf and Back: Studies on the Economic Impact of Asian Labor Migration*. New Delhi, India: International Labor Organization.
- Angrist, Joshua D. and Jorn-Steffen Pischke. 2008. *Mostly harmless econometrics: An empiricist's companion*. Princeton University Press.
- Anteby, Michel. 2006. "Factory "Homers":: Understanding a Highly Elusive, Marginal, and Illegal Practice." *Sociologie du Travail* 48:e22e38.
- Autor, David H., Frank Levy, and Richard J. Murnane. 2003. "The skill content of recent technological change: An empirical exploration." *Quarterly Journal of Economics* 118:1279–333.
- Aziz, A. 1979. "Socio-economic Conditions of wooden toys and lacquerware artisans of Channapatna Taluk." *Report from the Institute of Social and Economic Change, Bangalore* .
- Bair, Jennifer and Enrique Dussel Peters. 2006. "Global commodity chains and endogenous growth: Export dynamism and development in Mexico and Honduras." *World Development* 34:203221.
- Barley, S. R. and G. Kunda. 2001. "Bringing Work back in." *Organization Science* 12:76—95.
- Barrett, M. I. 1999. "Challenges of EDI adoption for electronic trading in the London Insurance Market." *European Journal of Information Systems* 8:115.
- Becker, Howard. S. 1982. *Art Worlds*. University of California Press.

- Bell, Martin and Michael Albu. 1999. "Knowledge systems and technological dynamism in industrial clusters in developing countries." *World development* 27:17151734.
- Bell, Martin and Keith Pavitt. 1993. "Technological accumulation and industrial growth: contrasts between developed and developing countries." *Industrial and Corporate Change* p. 157209.
- Berg, Bruce L. 1989a. *Qualitative Research Methods for the Social Sciences*. Boston: Allyn and Bacon.
- Berg, B. L. 1989b. *Qualitative Research Methods for the Social Sciences*. Allyn and Bacon Boston.
- Bhattacharjee, Debashish and Peter Ackers. 2010. "Introduction: employment relations in India old narratives and new perspectives." *Industrial Relations Journal* 41:104121.
- Bjorkman, Maja, Laurids Lauridsen, and Herbert Marcussen. 1988. "Types of industrialization and capital-labour relations in the third world." *Trade Unions and the New Industrialization of the Third World* p. 5980.
- Bledstein, Burton J. 1976. *Culture of Professionalism: The Middle Class and the Development of Higher Education in America*. New York: W. W. Norton.
- Brannon, Robert. L. 1994. "Professionalization and work intensification: Nursing in the cost containment era." *Work and Occupations* 21:157.
- Campbell, J.Y. 1991. *Women's Role in Dynamic Forest-Based Small Scale Enterprises: Case Studies on Uppage and Lacquerware from India*. Rome: FAO.
- Cappelli, Peter. 1999. *The New Deal at Work: Managing the Market-Driven Workforce*. Boston: Harvard Business Publishing.
- Caves, R. E. 2000. *Creative industries: Contracts between art and commerce*. Harvard University Press.
- Correll, Shelley J., Stephen Benard, and In Paik. 2007. "Getting a Job: Is There a Motherhood Penalty?" *American Journal of Sociology* 112:1297—1339.
- Crawford, Matthew B. 2009. *Shop class as soulcraft: An inquiry into the value of work*. Penguin. com.
- Croppenstedt, Andre, Mulat Demeke, and Meloria M. Meschi. 2003. "Technology adoption in the presence of constraints: the case of fertilizer demand in Ethiopia." *Review of Development Economics* 7:5870.
- David, Paul A. 1985. "Clio and the Economics of QWERTY." *The American economic review* p. 332337.

- Davidson, Elizabeth and David Pai. 2004. "Making sense of technological frames: Promise, progress, and potential." In *Information Systems Research*, p. 473491. Springer.
- D'Cruz, Premilla and Ernesto Noronha. 2006. "Being professional: Organizational control in Indian call centers." *Social Science Computer Review* 24:342–61.
- DIC. 2003. "Taluk Industrial Development Plan - Channapatna TALuk." Technical report, Directorate of Industries and Commerce, Karnataka.
- DiPrete, Thomas A. 1988. "The upgrading and downgrading of occupations: Status redefinition vs. deskilling as alternative theories of change." *Social Forces* 66:725–46.
- Doner, Richard and Ben Schneider. 2000. "Business associations and development: Why some associations contribute more than others." *Business and Politics* 2:261–88.
- Erickson, Christopher L., Sarosh Kuruvilla, Rene E. Ofreneo, and Maria Asuncion Ortiz. 2003. "From core to periphery? Recent developments in employment relations in the Philippines." *Industrial Relations: A Journal of Economy and Society* 42:368395.
- Essah, Doris S. 2008. *Fashioning the nation: Hairdressing, professionalism and the performance of gender in Ghana, 1900-2006*. Ph.D. thesis, University of Michigan.
- Evetts, Julia. 2006. "Trust and professionalism: Challenges and occupational changes." *Current Sociology* 54:515–31.
- Faulkner, Robert R. 1971. *Hollywood Studio Musicians*. Aldine Book Company.
- Fernandez-Mateo, Isabel. 2007. "Who pays the price of brokerage? Transferring constraint through price setting in the staffing sector." *American Sociological Review* 72:291317.
- Fine, G. A. 1992. "The Culture of Production: Aesthetic choices and constraints in culinary work." *American Journal of Sociology* pp. 1268—1294.
- Fine, Gary Alan and Kimberly D. Elsbach. 2000. "Ethnography and experiment in social psychological theory building: Tactics for integrating qualitative field data with quantitative lab data." *Journal of Experimental Social Psychology* 36:5176.
- Fonseca-Wollheim, Corinna. 2012. "Schoenberg's Version of Mahler's 'Song of the Earth'." *The New York Times* .
- Foster, Andrew D. and Mark R. Rosenzweig. 1995. "Learning by doing and learning from others: Human capital and technical change in agriculture." *Journal of political Economy* p. 11761209.

- Fournier, Valérie. 1999. "The appeal to "professionalism" as a disciplinary mechanism." *Sociological Review* 47:280–307.
- Freidson, Eliot. 1970. *Profession of Medicine: A Study of the Sociology of Applied Knowledge*. Chicago: University of Chicago Press.
- Frenkel, Stephen J. and David Peetz. 1998. "Globalization and Industrial Relations in East Asia: A Three-Country Comparison." *Industrial Relations: A Journal of Economy and Society* 37:282310.
- Gereffi, Gary. 1999. "International trade and industrial upgrading in the apparel commodity chain." *Journal of international economics* 48:3770.
- Gereffi, Gary and Donald L. Wyman. 1990. *Manufacturing miracles: paths of industrialization in Latin America and East Asia*. Princeton University Press.
- Gioia, Dennis A. and Henry P. Sims. 1986. *The thinking organization*. San Francisco: Jossey-Bass.
- Glaser, B. G. and A. L. Strauss. 1967. *The discovery of grounded theory: Strategies for qualitative research*. Aldine de Gruyter.
- Griliches, Zvi. 1957. "Hybrid corn: An exploration in the economics of technological change." *Econometrica, Journal of the Econometric Society* p. 501522.
- Haggard, Stephan. 1990. *Pathways from the periphery: The politics of growth in the newly industrializing countries*. Cornell University Press.
- Halpern, Jennifer J. 1997. "Elements of a script for friendship in transactions." *Journal of Conflict Resolution* 41:835868.
- Heinz, John and Edward Laumann. 1994. *Chicago Lawyers: The Social Structure of the Bar*. Evanston, IL: Northwestern University Press. Revised Edition.
- Iyer, R. and A. Schoar. 2013. "Are there Cultural Determinants of Entrepreneurship?" In *International Differences in Entrepreneurship*, p. 209240. University of Chicago Press.
- Johnson, Terence J. 1972. *Professions and Power*. London: Macmillan.
- Kalnins, Arturs and Chung Wilbur. 2006. "Social capital, geography, and survival: Gujarati immigrant entrepreneurs in the US lodging industry." *Management Science* 52:233.
- Kar, Manoj and Ashutosh Mishra. 2010. "Drip, drip: Let's fix it." *Telegraph (Calcutta)* .
- Katz, Jorge. 2001. "Structural reforms and technological behaviour: The sources and nature of technological change in Latin America in the 1990s." *Research Policy* 30:119.

- Khoo, Michael. 2001. "Community design of DLESE's collections review policy: A technological frames analysis." In *Proceedings of the 1st ACM/IEEE-CS joint conference on Digital libraries*, p. 157164. ACM.
- Kim, Linsu. 1997. *Imitation to innovation: The dynamics of Korea's technological learning*. Harvard Business Press.
- Kleiner, Morris M. and Alan B. Krueger. 2008. "The prevalence and effects of occupational licensing." National Bureau of Economic Research Working Paper Series No. 14308.
- Knorringa, Peter. 1999. "Agra: an old cluster facing the new competition." *World Development* 27:15871604.
- Kumar, Sanjeev. 2008. "Plumbing in the depths." *Hindu* .
- Kuruville, Sarosh. 1996. "Linkages between industrialization strategies and industrial relations/human resource policies: Singapore, Malaysia, the Philippines, and India." *Industrial and Labor Relations Review* p. 635657.
- Kuruville, Sarosh, Christopher L. Erickson, and Alvin Hwang. 2002. "An assessment of the Singapore skills development system: does it constitute a viable model for other developing countries?" *World Development* 30:14611476.
- Kuruville, Sarosh and Aruna Ranganathan. 2008. "Economic development strategies and macro-and micro-level human resource policies: The case of India's" outsourcing" industry." *Industrial and Labor Relations Review* p. 3972.
- Kuruville, Sarosh and C. S. Venkataratnam. 1996. "Economic development and industrial relations: the case of South and Southeast Asia." *Industrial Relations Journal* 27:923.
- Larson, Magali Sarfatti. 1977. *The Rise of Professionalism: A Sociological Analysis*. Berkeley: University of California Press.
- Light, Ivan H. and Steven J. Gold. 2000. *Ethnic Economies*. Waltham, MA: Academic Press.
- Lin, Angela and Tony Conford. 2000. "Framing implementation management." In *Proceedings of the twenty first international conference on Information systems*, p. 197205. Association for Information Systems.
- Lipsky, Michael. 1980. *Street-Level Bureaucracy, 30th Ann. Ed.: Dilemmas of the Individual in Public Service*. Russell Sage Foundation.
- Lovell, Joel. 2012. "Kenneth Lonergan's Thwarted Masterpiece." *The New York Times* .
- MacDonald, Keith M. 1995. *The Sociology of the Professions*. Thousand Oaks, CA: Sage Publications.

- Manza, Jeff. 1992. "Classes, status groups and social closure." *Current Perspectives in Social Theory* 12:275–302.
- McClelland, Charles E. 1990. *Escape from freedom? Reflections on German professionalization 1870-1933*, pp. 97–113. *The Formation of Professions: Knowledge, State and Strategy*. London: Sage Publications.
- Mollick, Ethan R. 2012. "Filthy Lucre: What Motivates the Commercialization of Innovations?" *Unpublished Manuscript* .
- Mori, Hiroaki. 2005. "Activity to form the network of young engineers and researchers in relation to welding fields in Asia." *Journal of the Japan Welding Society* 74:62–65.
- Munshi, Kaivan. 2007. "The birth of a business community: Tracing the path to entrepreneurship in a developing economy." World Bank, http://siteresources.worldbank.org/INTFR/Resources/kaivan_Munshi_Nov_6_07.pdf [Accessed June 2010].
- Murray, Fiona. 2010. "The Oncomouse That Roared: Hybrid Exchange Strategies as a Source of Distinction at the Boundary of Overlapping Institutions." *American Journal of Sociology* 116:341—388.
- Nayyar, Deepak. 1994. *Migration, Remittances and Capital Flows: The Indian Experience*. New York: Oxford University Press.
- Norton, Michael, Daniel Mochon, and Dan Ariely. 2011. "The IKEA Effect: When Labor Leads to Love." *Harvard Business School Marketing Unit Working Paper* .
- Ody-Brasier, Amandine and Freek Vermeulen. 2014. "The Price You Pay Price-setting as a Response to Norm Violations in the Market for Champagne Grapes." *Administrative Science Quarterly* 59:109144.
- Orlikowski, Wanda J. and Debra Carol Gash. 1992. *Changing frames: Understanding technological change in organizations*. Center for Information Systems Research, Sloan School of Management, Massachusetts Institute of Technology.
- Orlikowski, Wanda J. and Debra C. Gash. 1994. "Technological frames: making sense of information technology in organizations." *ACM Transactions on Information Systems (TOIS)* 12:174207.
- Pager, Devah. 2007. "The use of field experiments for studies of employment discrimination: Contributions, critiques, and directions for the future." *The Annals of the American Academy of Political and Social Science* 609:104– 133.
- Pager, Devah and Lincoln Quillian. 2005. "Walking the talk? What employers say versus what they do." *American Sociological Review* 70:355—380.

- Paxson, Heather. 2012. *The Life of Cheese: Crafting Food and Value in America*. University of California Press.
- Pinch, Trevor J. and Wiebe E. Bijker. 1987. "The Social Construction of Facts and Artifacts: Or How the Sociology of." *The social construction of technological systems: New directions in the sociology and history of technology* 17.
- Porac, Joseph F., Howard Thomas, and Charles Baden-Fuller. 1989. "Competitive Groups as Cognitive Communities: The Case of Scottish Knitwear Manufacturers*." *Journal of Management studies* 26:397416.
- Portes, Alejandro and M. Zhou. 1992. "Gaining the upper hand: Economic mobility among immigrant and domestic minorities." *Ethnic and Racial Studies* 15:491–5221.
- Prakash, B. A. 1998. "Gulf migration and its economic impact: The Kerala Experience." *Economic and Political Weekly* 33:3209–13.
- Puri, Satish K. 2006. "Technological frames of stakeholders shaping the SDI implementation: A case study from India." *Information Technology for Development* 12:311331.
- Ranganathan, Aruna. 2014. "The Price is Right? Work Identification in the Sale of Handicraft Products in Southern India." *Working Paper* .
- Ray, Shovan. 2004. *Roles of agriculture*. Indira Gandhi Institute of Development Research.
- Ray, Shovan. 2009. *Handbook of Agriculture in India*. New York: Oxford University Press.
- Roemer, Michael. 1981. "Dependence and industrialization strategies." *World development* 9:429434.
- Romijn, H. A. 1998. "Acquisition of technological capability in small firms in developing countries." .
- Roy, Tirthankar. 2008. "The guild in modern South Asia." *International Review of Social History* 53:95–120.
- Sahoo, Mahendra Nath, Jatindra Singh, and Jagabandhu Nayak. 2011. "127 Kendrapada plumbers duped out of Rs. 1 Crore." *Times of India* .
- Saith, Ashwani. 2001. "From village artisans to industrial clusters: Agendas and policy gaps in Indian rural industrialization." *Journal of Agrarian Change* 1:81123.
- Sandee, Henry and Piet Rietveld. 2001. "Upgrading Traditional Technologies in Small-Scale Industry Clusters: Collaboration and Innovation Adoption in Indonesia." *Journal of Development Studies* 37:150172.

- Sandee, Henri Mickel. 1995. *Innovation adoption in rural industry: Technological change in roof tile clusters in Central Java, Indonesia*. Ph.D. thesis.
- Satpathy, Anoop, Jimutha Mishra, and Nisith Prakash. 2002. "Skill mapping and skill development for employability: the case of Cuttack." *Indian Journal of Labor Economics* 45:1235–50.
- Schmitz, Hubert. 1999. "Collective efficiency and increasing returns." *Cambridge journal of economics* 23:465483.
- Schmitz, Hubert and Khalid Nadvi. 1999. "Clustering and industrialization: introduction." *World development* 27:15031514.
- Scott Morton, Fiona M. and Joel M. Podolny. 2002. "Love or Money? The Effects of Owner Motivation in the California Wine Industry." *The Journal of Industrial Economics* 50:431–456.
- Shah, Sonali K. 2003. "Community-based innovation and product development: findings from open source software and consumer sporting goods." .
- Silbey, Jessica. 2014. *Harvesting Intellectual Property: IP Interventions and the Roles of Intellectual Property in Creative and Innovative Work*. Stanford University Press.
- Simon, Stephanie. 2011. "A license to shampoo: Jobs needing state approval rise." *Wall Street Journal* .
- Smith, Steve. 2009. "Mahler, Extra-Reduced for the River." *The New York Times* .
- Smyth, Ines. 1992. "Collective efficiency and selective benefits: The growth of the rattan industry of Tegalwangi (Indonesia)." *ids bulletin* 23:5156.
- Sorenson, Olav and David M. Waguespack. 2006. "Social structure and exchange: Self-confirming dynamics in Hollywood." *Administrative Science Quarterly* 51:560589.
- Spradley, J. P. 1979. *The Ethnographic Interview*. Orlando, Florida: Harcourt Brace Jovanovich College Publishers.
- Spradley, J. P. and K. Baker. 1980. *Participant Observation*. New York: Holt, Rinehart and Winston.
- Starr, Paul. 1984. *The Social Transformation of American Medicine: The Rise of a Sovereign Profession and the Making of a Vast Industry*. New York: Basic Books.
- Stern, Scott. 2004. "Do Scientists Pay to Be Scientists?" *Management Science* 50:835–853.
- Suri, Tavneet. 2011. "Selection and comparative advantage in technology adoption." *Econometrica* 79:159209.

- Tewari, Meenu. 1999. "Successful adjustment in Indian industry: The case of Ludhiana's woolen knitwear cluster." *World Development* 27:16511671.
- Tilly, Charles. 1999. *Durable Inequality*. Berkeley: University of California Press.
- Todd, Patricia and David Peetz. 2001. "Malaysian industrial relations at century's turn: Vision 2020 or a spectre of the past?" *International Journal of Human Resource Management* 12:13651382.
- Trost, J. E. 1986. "Statistically nonrepresentative stratified sampling: A sampling technique for qualitative studies." *Qualitative sociology* 9:5457.
- Turow, Joseph, Lauren Feldman, and Kimberly Meltzer. 2005. "Open to Exploitation: America's Shoppers Online and Offline." .
- Uzzi, Brian. 1999. "Embeddedness in the making of financial capital: How social relations and networks benefit firms seeking financing." *American sociological review* p. 481505.
- Uzzi, Brian and Ryon Lancaster. 2004. "Embeddedness and price formation in the corporate law market." *American sociological review* 69:319344.
- Van Maanen, John and Stephen R. Barley. 1984. "Occupational communities: Culture and control in organizations." *Research in Organizational Behavior* 6:287-365.
- Velthuis, Olav. 2005. *Talking prices: Symbolic meanings of prices on the market for contemporary art*. Princeton University Press.
- Waldinger, Roger. 1999. *Still the Promised City? African-Americans and New Immigrants in Postindustrial New York*. Boston: Harvard University Press.
- Weber, Max. 1968. *Economy and Society*. New York: Bedminster Press.
- Weeden, Kim A. 2002. "Why do some occupations pay more than others? Social closure and earnings inequality in the United States." *American Journal of Sociology* 108:55-101.
- Weijland, Hermine. 1999. "Microenterprise clusters in rural Indonesia: Industrial seedbed and policy target." *World Development* 27:15151530.
- Wherry, Frederick. 2008. *Global Markets and Local Crafts*. The Johns Hopkins University Press.
- Zbaracki, Mark J. and Mark Bergen. 2010. "When truces collapse: A longitudinal study of price-adjustment routines." *Organization Science* 21:955972.