ESSAYS ON THE CHINESE SKILL DEVELOPMENT SYSTEM

A Dissertation
Presented to the Faculty of the Graduate School
of Cornell University
in Partial Fulfillment of the Requirements for the Degree of
Doctor of Philosophy

by
Hao Zhang
August 2017

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This dissertation focuses on the Chinese vocational education and training (VET) system – an arena that recently has been gaining growing importance in Chinese economic reform. My central argument is that the Chinese state is trapped in a dilemma in which it faces two flawed choices with regards to its ongoing reform attempts to upskill the Chinese workforce in the coming decades. During the past decade, the central government has been taking steps to decentralize a school-based national skill development system and adopt a more marketized model that integrates extensive employer input. But currently neither a relatively centralized school-based system nor a decentralized employer-led model has produced the institutional conditions needed for upskilling to occur in China. In the absence of a private governance tradition, and lacking a role that proactive employer associations can play in coordinating coherent training agendas at the industry level, the skill development system has become focused only on the short-term specific needs of individual employers.

The current pre-employment skill formation process downplays long-term and general skills-focused training. In this introductory chapter, I develop this argument through a review of the relevant literature. Then in the three following chapters, each of which is geared toward a separate research agenda, I identify (a) the disorganization of the VET system and (b) the skill formation dilemma in China.

Chapter 2 examines subnational variation within the Chinese VET system. I find that partly because of decentralization, Chinese vocational schools have adopted four distinctive skill

development patterns: the high performance model, the industry-focused model, the local market-oriented model, and the labor agency model. I argue that skill development models reflect a combination of two institutional and two organizational factors that endow each school: state support and strategies, local industrial structures, a school's institutional legacies, and its ownership. Schools vary in these endowments, and, thus, they demonstrate differences in skill development patterns.

Chapter 3 focuses on an important employer strategy that is a response to the local market labor shortage: collaboration with vocational schools. I find that driven by a major external labor market failure – the skilled labor shortage – employers seek to shift part of their traditionally firm-based training to the workforce's pre-employment skill formation process. The decentralized VET system allows schools to customize their training programs according to the specific skill needs of collaborating firms without being bound to any industry-level standards. I call this "training for a targeted brand" model, and I argue that it is essentially an employer strategy that pursues externalization of internal labor market practices to fix the external labor market failure. Its product is a flexible reserve of students who are equipped with a considerable amount of specific skills that are valuable to a certain firm, but the firm is not bound by employment relationships to these workers.

Chapter 4 compares and assesses the early outcomes of two ongoing apprenticeship reforms by the Ministry of Education (MOE) and the Ministry of Human Resources and Social Security (MOHRSS). I find that the MOE has continued with a decentralized and disorganized approach to its reform, giving individual schools and employers complete freedom to devise a program, whereas the MOHRSS has adopted a top-down model and withheld control over the institution building process. Based on a three-level theoretical framework, I find that neither

approach has generated ideal skill development outcomes, although the decentralized model has achieved relatively desirable performance. I then argue that the Chinese state has been trapped in a skill formation dilemma: until effective civil society governance is institutionalized to coordinate the VET process, the system will continue to not deliver ideal outcomes, and this will confound the state's long-term upskilling agenda.

BIOGRAPHICAL SKETCH

Hao Zhang joined Cornell University's ILR School in 2011 as a PhD student after acquiring a MS degree in Labor Policies and Globalization from University of Kassel and Berlin School of Economics and Law (Germany) in 2010 and MS and BS degrees in Labor Relations from Renmin University of China in 2009 and 2007. His primary research focus is labor and employment relations and skill development, with special attention to China.

ACKNOWLEDGMENTS

This dissertation would not have been possible without the generous help and continuing support of many people and organizations. My first and primary thanks go to my doctoral committee chair, Professor Sarosh Kuruvilla. He has been both a responsible and inspiring advisor and a career mentor who has patiently guided me through the process of entering academia and becoming a professional junior scholar. Although difficult, this process has been extremely beneficial under his supervision. He has pushed me to be a scholar who is capable and culturally adaptable to the Western academic community. He has showed me how to do quality research and write academic works by revising my papers over and over again with unflagging patience. He has a serious demeanor and he does not smile much, but I know that deeply rooted in his personality is an extremely warm heart.

Professor Eli Friedman has been my role model since my Day One at Cornell. We entered the university together in 2011. He is a person that I always admire and try to imitate. He has showed me how to be a successful junior scholar, a collegial colleague, and a nice person. Professor Friedman has also been my paramount coauthor. While it has been my great luck to have a China-focused professor on my committee, I also have benefited from collaborating with him on several other research projects, and from that experience I have learned a great deal about how to do research, write, and publish in academic journals.

Professor Rosemary Batt, who also sits on my committee, has offered very useful guidance. She has worked with me on both my Master's thesis and my dissertation, and she has offered much insightful advice. Her input has been indispensable and critical at several important

moments during this process. In particular, she helped me theorize my arguments and oriented me towards the right conceptual frameworks.

Outside Cornell, I have benefited from many professors and anonymous informants. My fieldwork would not have been as successful without the invaluable help of the following people: Professor Kai Chang, Professor Yu Chen, Professor Yanyuan Cheng, Professor Gaochao He, Professor Min Li, Professor Siqi Luo, Professor Qingjun Wu, Professor Pengfei Zhao, and Professor Zhiqun Zhao. Professor Kai Chang, my Master's advisor at Renmin University of China, helped to guide me into the field of labor relations and commit to a scholarly career in this arena. He is like a rigorous father – often critical of my proposals, but I know I can always count on him for help when I need it.

I am also indebted to many organizations that provided generous financial support for my research. In particular, Cornell University's East Asian Program's Hu Shih Fellowship in Chinese Studies and Cornell ILR Schools' travel grant have subsidized my multiple trips between Ithaca and my fieldwork in Guangdong, China.

Finally, I would like to thank my parents for offering unconditioned support both psychologically and financially. Their love has been and will continue to be my ultimate source of energy for both work and life.

I love Cornell; I love ILR; I love the people and friends that I have been so lucky to meet in Ithaca and beyond during the past six years. Their endless help, daily company, and selfless support have brought me to achieve this stage of life.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

Relevance and Research Questions

The vocational education and training (VET) system has become a recent focal point of Chinese economic reform, gaining growing importance in the advancement of the skill development of the Chinese workforce, in employers' strategies for tackling the increasingly significant shortage of skilled labor, and in the state's recent institution building efforts under its overall industrial restructuring and upgrading agenda. To begin with, vocational schools have undoubtedly become an important labor market institution in today's China. According to the official data, vocational schools have been training more than four times as many students as academic colleges and universities. Furthermore, under the estimated 90% initial employment rate, graduates from vocational schools comprise 79% of the newly-added urban workforce and 51% of the second and tertiary sectoral workforce in 2014. Just ten years previously, in 2004, these numbers were 51% and 21%, respectively.[1]

Employers are now engaging in extensive collaboration with vocational schools to tackle the problem of skilled labor shortage. According to Li and Sheldon's (2014) research in the Yangtze River Delta area, collaborative strategies include providing various forms of financial support, transferring the latest technology and know-how to vocational schools, and co-developing curricula and training materials. My own study in the Pearl River Delta region

[1] These estimations are based on data from the 2004 and 2014 China Statistical Yearbooks.

indicates that firms also have established on-campus practical centers, dispatch teachers to work at schools, and help train schoolteachers in their own workplaces and training centers.

Finally, a profound reform of the Chinese VET system has been put on the state's agenda. The "Made in China 2025" guideline issued by the central government in 2015 announced continuing investment in human capital in the Chinese workforce as well as skill development reform agendas whose goal is industry restructuring and upgrading. The overall objective is to sustain the Chinese "economic miracle" into the forthcoming decades. According to the guideline, leveraging the VET system is a vitally important component of the central government's "supply side reform," which seeks to leverage the workers' skill development process in order to encourage skill and industry upgrading by employers.

Although media reports have made tremendous efforts to cover these developments in the Chinese VET system, scholarly understanding of this topic is still very limited, outdated, and somewhat biased. In particular, prevailing wisdom in the China labor field depicts the Chinese VET system as primarily school-based and state-centralized (Cooke 2005; Lai and Lo 2006) that requires central and local governments to tightly control the VET process. The system leaves schools very little room to devise their programs and does not offer any formal and stable institutional mechanisms to incorporate firms' input into the training process. It has rendered the VET process in China ineffective and non-market oriented, and consequently, it often fails to accommodate the skill needs of employers (Durden and Yang 2006). More recently, scholars have found that student interns in electronics manufacturing firms are treated as unskilled seasonal cheap labor and that Chinese vocational schools are quasi-labor agencies that simply trade student interns with firms in exchange for unjustified commissions (Smith and Chan 2015;

Su 2010-2011). Among scholars, this depiction of labor agencies has in recent years become the dominant perception of Chinese vocational schools.

These studies were based on methodologically deficient research. The centralization argument was based on very limited, secondary, and often piecemeal data that were collected primarily before or at the turn of the new century. The "labor agency" theory of Chinese vocational schools emerged from a research project that targeted Foxconn. In addition to the obvious industry bias, it is unclear whether the authors had implemented a sound school sampling strategy. I argue that these stereotypes correctly reflect several existing problems within a certain portion of the Chinese VET system, but they by no means constitute the mainstream perspective.

Furthermore, the literature leaves unresolved the puzzle of the external labor market failure. The research implies that school-firm collaboration in China is a secondary labor market strategy employed by employers: unable to provide useful skilled workers, schools function as temp agencies that supply flexible cheap labor to employers. However, Li and Sheldon (2014) find, and my research confirms, that employers engage in a wide portfolio of collaborative activities with vocational schools, including various forms of technology and knowledge transfer to schools. If all of these practices are merely secondary labor market strategies to gain unskilled seasonal labor, then why would firms not simply rely on labor agencies (which currently in China provide cheap labor to employers) that do not have to bear these extra costs? More importantly, as is widely known, firms in China during the past decade have faced a major shortage of labor. This is a structural shortage of skilled workers: there is still a surplus of relatively low-skilled migrant workforce (Kwan 2009), but employers often cannot secure in the labor market technicians and other skilled workers (Chan 2010; Farrell and Grant 2005; Li and

Sheldon 2010). This structural shortage implies a major external labor market failure — that is, labor market institutions (e.g., temp agencies) cannot solve the skilled labor shortage problem, which is most urgent problem that employers face. If the hypothesis advanced in the literature — that vocational schools function primarily as labor agencies — is correct, then what has motivated employers to invest significant time and resources in the VET process? In other words, it is reasonable to suspect that vocational schools provide something more than what labor agencies provide —something that provides a partial fix the external labor market failure.

My dissertation attempts to resolve this puzzle of external labor market failure by carefully examining the Chinese VET system and the interaction mode among key players in VET processes, including schools, employers, and the state. In broad terms, I am interested in what is unique about the VET system in China and how and why the system operates and is being reformulated. What forces actively shape this process? In particular, now that both employers and the state have been incentivized to leverage the VET system for various political and economic reasons, which of them is dominating the actual training process? Similarly, in the arena of school development and reform, what is the division of labor between the state and employers? In practical terms, I attempt to evaluate the capacity of the current Chinese VET system to upskill the Chinese workforce in the forthcoming decades, and I identify and examine the challenges that the skill upgrading agenda currently faces.

To this end, each of the three following chapters carries out a separate research agenda. My objective in the first paper is to break the labor agency stereotype and on the basis of solid empirical research, establish a comprehensive scholarly understanding of the Chinese VET system. In particular, I seek to capture and account for variation within the Chinese VET system, which, as I will show, is important but is downplayed in both China studies and the Western

national skill formation system analysis. The second paper, which targets the external labor market failure, clarifies how and why that failure has driven employers to externalize part of their internal labor market practices and shift firm-specific training to workers' pre-employment skill formation processes through collaboration with vocational schools. The third paper focuses on the state's role in enforcing nation-wide reforms on apprenticeship. To compare and assess the early outcomes of the two ministries that have jurisdiction over the Chinese VET system – the Ministry of Education (MOE) and the Ministry of Human Resources and Social Security (MOHRSS) – I use a three-level model of skill development that is derived from a comprehensive review of relevant theories.

Argument and Relevant Literature

I argue in this dissertation that the Chinese state is trapped in a dilemma caused by the fact that the state faces two flawed choices in its ongoing attempts to upskill the Chinese workforce during the coming decades. While the central government has been taking measures to decentralize a school-based national skill development system into a more marketized model that has integrated extensive employer input during the past decade,[2] currently neither a relatively centralized school-based system nor a decentralized employer-led model provides the

[2] This is conservatively estimated. Although Lai and Lo (2006) have documented a state-directed decentralization reform that started during the 1980s, their evaluation of this reform and that of others (e.g. Cooke 2005) during the early 2000s indicates that decentralization reform failed. Given the contemporary decentralized status quo that I have found, I assume that during the past decade (2006 to today) there have been great changes and decentralization in the VET system.

institutional conditions needed for upskilling to be successful in China. In particular, under decentralization reform, the state has given substantial authority to schools and employers to devise and carry out training programs. But these programs, I find, are guided by the short-term specific skill needs of the individual firms that collaborate in the process, and the program lacks independent industry-level skill standards. I contend that this disorganized skill development system is the product of the absence of effective private governance. What is needed, in other words, is the participation of employer associations to coordinate the diversified interests of firms at the industry level. Human capital theory and the literature on the post-war Western and Asian experience in skill development lay the foundation for my argument, which, first, identifies an important collective action problem in training and, second, suggests that several institutional arrangements are needed for skill formation models to be successful, but in this paper I find that these conditions are by and large absent in the Chinese case.

The central mission of every skill development system is promoting an appropriate cost-sharing structure to effectively engage employers and individual trainees (or households) for the sake of sufficient investment in human capital (Hashimoto 1981).

Typically the state stipulates coherent institutional arrangements to frame this structure, while employers and individuals are motivated by various institutional and economic incentives to co-share the costs in different formats. Getting employers to pay is both a key and a difficult task. Policy makers and practitioners of advanced Western skill development systems — in particular, the state and labor unions — historically have made tremendous political and economic efforts to engage employers in skill development (Thelen 2004).

Transferability of Skills and the Collective Action Problem

The challenge of engaging employers is accounted for by a theoretical problem known as the collective action problem in skill development, which is derived from the human capital theory advanced by Becker (1993). Becker sees skills as a unique type of capital associated with human beings. The process of skill formation, including education and training, is regarded as a form, and, indeed, as the most important form, according to Becker, of investment in human capital. Becker further specifies two types of human capital, which he calls general skills and (firm) specific skills. Skills that tend to benefit every firm to the same extent are known as general skills, whereas those that only benefit firms that offer the training are specific skills. In reality, most skills are what Stevens (1999) defines as transferable skills, which potentially can be capitalized on by other firms but not to the extent that they are subject to perfect market competition, wherein "the wage is driven up to the marginal product." In other words, suppose different types of skills are located on a continuum wherein completely general skills lie at one end and completely specific skills lie at the other end. Most skills, including a notable proportion of industry-transferable skills, are situated between the two ideal types. In this dissertation, unless specified otherwise, I use the terms "transferable skills" and "general skills" interchangeably to denote skills that lean toward the general skills end of the continuum and "specific skills" for skills that lean toward the firm-specific skills end.

Because of the transferability of skills, vocational training often is underfunded at the societal level. Analytically separating general from specific skills in a training process can be difficult. That said, employers obviously have strong incentives to focus their training efforts on relatively specific skills. This can be understood as an avoidance strategy to sidestep a major collective action (free-riding) problem: workers equipped with more specific skills are less

attractive in the labor market, and, thus, they are less likely to be poached by other firms than are workers who have more general skills, holding other factors constant. But Streeck (1989) argues that even in the case of completely specific skills, employers tend to insufficiently fund training when workers can quit whenever they want under a regime of free employee termination. When that happens, employers immediately lose their sunk investments in training.

Individual trainees tend to underinvest in skills, too. A young worker who has just started or who has not yet started a career probably lacks the money and motivation to invest in human capital that will be of benefit only during later stages of his or her career. Such an investment in a young worker involves a high degree of uncertainty: workers simply cannot accurately predict what skills will be needed in the future, and this leads to an insufficient self-financing of skills (Streeck 1989). These realities make the investment strategies of individuals complicated, unpredictable, and often below the optimal.

In addition, the skill formation process has externalities. That is, an individual receives returns for the investment by others in their own human capital, and firms that might not benefit directly from hiring these workers, can still capitalize on indirect investment in their human capital. For instance, if more people in an economy invest in human capital and the economy moves from a low-skill equilibrium to a high-skill equilibrium in which skills are better appreciated and rewarded, then every worker ends up better off, and firms benefit from the higher productivity and bonuses that the economic boom brings about (Finegold and Soskice 1988). However, an individual or entity's level of investment in human capital is often based on his, her, or its own cost-benefit calculation, which tends to fall below the socially optimal level. Overall, individuals' and firms' investment in human capital based solely on market logic tends to insufficiently fund skills. Lucas (1988), for example, proposed that to reach the optimal level

the US economy during the 1980s needed to invest almost three times more human capital than it did.

In institutional theory, therefore, skills are deemed as public goods. Streeck (1989) summarizes the market failure in the provision of sufficient skill training as follows:

> "…successful self-interested, utilitarian behavior in market environments requires the presence of collective resources, common values, and shared expectations that rationally acting individuals cannot normally generate, protect, or restore even if they fully recognize their vital importance. This is because such resources are in significant respects 'collective goods' which cannot be privately appropriated and to whose generation rational capitalist actors have therefore no, or no sufficient, incentives to contribute. As a consequence, the unbridled pursuit of self-regarding interests results in suboptimal outcomes not just for the community at large but also for economically rational individuals themselves"

Every skill development system faces the challenge of getting employers to pay for the training, and, more specifically, to pay for both transferable and specific skills. In other words, the state should seek to ensure that training programs provide a balanced delivery of both general and specific skills. Some industry-level governance is needed to institutionalize a wide portfolio of skill standards to ensure skill transferability at the industry level. If training programs overlook firm-specific skills and focus only on general skills, employers will not be motivated to invest, because free riders can poach these workers. But in an overly decentralized skill development system, in which employers are invited to dominate the training process in an uncoordinated manner, the process will be dominated by the specific and immediate skill needs of individual firms. This can harm the employability of the workforce and, thus, labor market mobility. This outcome can increase the retraining costs of firms that constantly seek new employees from the external labor market.

Western national skill formation systems have featured either a school-based model, in which the formation of initial vocational skills relies on the public education system funded by

the state, or a relatively decentralized employer-led system, in which firms significantly invest in the pre-employment skill formation process in direct formats. Both models, however, would not be deemed successful if they did not achieve a balanced delivery of general and firm-specific skills. Based on the experience of exemplar countries, I identify below several preconditions that are needed for national skill formation models to be successful.

Preconditions for a Successful School-based Skill Development System

In a school-based skill development system, the state serves as a major provider of initial vocational skills. The mechanism that compels employers to pay for vocational education is state mandatory taxes and special funds. Although taxpayers foot the bill, decisions regarding how to the use the money — who to subsidize, what programs to fund, and levels of student enrollment — are made by the state. In this system, a significant proportion of general skill training transpires through public education subsidized by the state.

Systems that rely on the formal public education system to give the workforce initial vocational skills often are supplemented by extensive workplace-based continuing training that offers specific skills. The state often encourages this approach because it ensures that employers have a say in vocational training processes, and the approach prevents the school-based system from being disconnected from industry and overly focusing on general skills. A commonly employed state strategy is to subsidize firm-based training. Money collected through taxation comprises special funds that employers can obtain for training purposes. In the US, the Department of Labor funds two major federal-level training programs: Registered Apprentices and Job Corps. The Job Corps focuses on young trainees from economically disadvantaged families, and the Registered Apprentices funds training programs provided by employers or

groups of employers – sometimes with the help of labor unions – that imitate the much admired German apprenticeship system (Stone III and Lewis 2010). At the local level, states have experimented with similar efforts (Osterman and Batt 1993). Federal and state governments provide grants for employer-based training programs, and individual employers decide what programs to offer and what modules to include in the training. Scholars estimate that in the US these state-subsidized training programs have not been very influential (Parker and Rogers 1999; Stone III and Lewis 2010).

More successful school-based national skill formation systems that feature mutually supplementary public and private trainings are seen in both Singapore and Japan. In the Singaporean model there is greater state intervention than in the US and Japan. Kuruvilla, Erickson, and Hwang (2002) ascribe the success of the post-war Singaporean economy to what they call a model of private-public sector collaboration in development. In this collaboration, the government runs a public education system that offers comprehensive vocational training, and it taxes the equivalence of 1% of the payroll of employees who earn less than $1,500 per month. It then uses these taxes to finance a special skill development fund. Firms that carry out training programs often recoup up to 80% of their contribution from this fund to cover their training costs.

During the early 1980s, the state also encouraged foreign-invested firms to set up training centers in order to secure technology and skill transfer to the domestic industry. To incentivize firms, the Singaporean government offered participating firms preferential investment and market protection opportunities and it gave these firms preferred access to hire the graduates of the training institutes. The government later expanded this project to include other national governments, and it extended preferential opportunities to all firms from these countries. This model successfully encourages foreign firms to invest in skill development – ensuring that up-to-

date technologies and skills are transferred to the Singaporean workforce – and it secures a sufficiently large high-skilled labor for the local establishments of these foreign firms. The state-organized Council for Professional and Technical Education was created in 1979 to coordinate training in both vocational schools and employer-funded training institutes (Kuruvilla and Chua 2000). In Singapore civil society actors do not play a significant role in this process.

In Japan, firm-based continuing training is an integral part of the skill development system, which has played a vital role in the post-war economic miracle. Employers provide comprehensive and continuing vocational training to workers throughout their careers, and this is motivated by mutual commitments between employers and employees, both of whom expect lifetime employment. Employees/trainees, in other words, are culturally embedded in the Japanese employment relations system. The lifetime employment system features internal labor markets that provide workers with extensive on-the-job training, ubiquitous bonus payments, and job security in exchange for work commitment. This model ensures, first, that employers and workers co-share the investment in the formation of specific human capital and, second, that this arrangement is not undercut by potential free riders in the external labor market. It also ensures that employers have input into the skill development process throughout the development of their workers' careers, and it guarantees that employers will benefit from their investment in training (Hashimoto 1979; Yu and Hashimoto 1980).

As shown, in school-based national models, state-funded public education provides comprehensive general skill training, and this is supplemented by extensive employer-offered training that focuses mostly on specific skills. The approach of the Singaporean government is interventionist: to engage employers it funds employer-offered training programs and it encourages foreign firms to establish training centers. The risk of free riders is avoided through

comprehensive taxation and preferential trainee recruitment policies. The Japanese system, in contrast, is rooted in a unique employment relations system that features internal labor markets and lifetime employment. Through this arrangement, work commitment is ensured and the challenge of the collective action problem is avoided. In both Singapore and Japan, institutional arrangements incentivize employers to pay for training and ensure that employers will later benefit fairly from their investment.

Preconditions for a Successful Employer-led Skill Development System

In relatively decentralized employer-led or mixed systems, such as in Germany and the UK, employers directly participate in the pre-employment skill formation of the workforce through innovative institutional arrangements that coordinate cost sharing among all players. In the German dual system, the state has established an institutional framework for apprenticeship training that provides various resources and incentives to engage private players. During the late 1960s, the German corporatist government inherited the craftsmanship tradition of apprenticeship training and enshrined the dualist system into the training law. Under this system, youths in both workplaces and schools are trained under contracts negotiated between employer associations and unions. The contracts concern the contents of training programs that last from three to three and a half years (Culpepper 1999a). The state, which does not seek to dominate the training process, establishes a tripartite institutional framework that allows private governance to autonomously coordinate skill development agendas (Streeck 1987). Underlying this arrangement is a specific rationale: the skill standards making and training process must have the capacity to accommodate industry needs and, consequently, must have the flexibility to keep pace with industry developments. State centralization often fails to meet this requirement.

Moreover, employer participation is crucial because the training process needs to be informed and partly funded by industry — ideally by transferring the latest technology and knowledge to schools and by providing trainees with real-workplace training experience. This process is particularly important in the case of vocational education, which focuses on practical skills rather than academic knowledge.

Employers participate in this process through a collective format provided by employer associations and chambers. As noted, the corporatist social partnership in Germany has laid the foundation for the private governance of skill development. A tripartite framework encourages employer participation, and it coordinates the interests of employers and workers/trainees at the industry level. There is a general division of labor among key social partners, which is arranged as follows. Employers are approved, and training processes are monitored and eventually evaluated by industry, commerce, and trade chambers. The state, through the Federal Institute for Vocational Training, provides expertise to these players in designing the apprenticeship programs. Collective labor, which is largely absent in many other major countries, plays a unique role in the German system. In particular, the training contents of apprenticeship programs are negotiated between employer associations and unions at the industry level. At the level of individual firms, works councils have the right to co-determine issues that are workplace-specific. Works councils play a monitoring role: they help programs avoid deviations from stipulated training agendas and prevent the abuse of apprentices. By avoiding the collective action problem and, thus, underinvestment in skills, this institutional structure encourages cost sharing among: a) the state, which pays for vocational school operation; b) firms, which pay for workplace training; and c) apprentices, who contribute by working at lower wage rates than regular workers (Culpepper 1999a).

These private governance arrangements ensure that training processes are coordinated at the industry level and, thus, are not overly decentralized. Although employers receive trainees in their individual workplaces, the contents of training programs are stipulated by the collective governance framework, which prevents an over-focus on skills that individual employers need but are not transferable across firms.

Even where such effective tripartite frameworks are absent, private governance can play a pivotal role in the setting of skill standards at the industry level. In the UK, which is another often-imitated national system, unions' roles are largely absent. Training contents, therefore, are not co-determined by capital and labor, but employers do negotiate among themselves to determine what skill standards are to be stipulated. The state subsidizes training programs but leaves standards making, qualification, and program development to licensed private actors. A sectoral skills council (SSC), founded at each national industry level by employers, functions as an administrative body that establishes national vocational standards and issues certificates through approved awarding organizations. The certificate indicates that the receiver has been trained in skills relevant to a particular occupation. These widely transferable skills are recognized by specific national industries. The council-determined standards are used to guide both institution and employer-based training (Delebarre 2016).

In summary, civil society actors, especially employer associations, and negotiations in skill standards making are vital for the success and sustainability of a successful employer-led national system. These negotiation processes – either between capital and labor or among employers themselves – help to secure the industry-level transferability of skills, and this prevents individual employers from dominating the training process and over-focusing on specific skills that they in particular need. The state engages employers either by funding training

directly, as in the UK, or through private governance that via employer associations and labor organizations pressures individual firms to invest in training.

To avoid complicating my summary, I have not discussed several important problems and changes in these models of skill formation systems. Although I recognize these problems and changes, I portray these national models in their ideal formats only because this allows me to identify the necessary institutional preconditions for successful skill development and the rationales that underlie these preconditions I use these models to illustrate, first, the collective action problem in skill development and, second, the fact that in successful national models, institutional arrangements are geared towards actively engaging employers and achieving transferability of skills at the industry level.

The Skill Formation Dilemma in China

In this dissertation, I argue that in the absence of these institutional preconditions – including the interventionist state, a lifetime employment relations system and internal labor markets, or an effective private governance framework and proactive employer associations – the Chinese state during the last decade has faced a dilemma as it has sought to transform the Chinese skill formation system from a centralized school-based model into a relatively decentralized model that invites employers to participate and sometimes even dominate the training process. As shown, a school-based model can avoid an excessive focus on general skills if employers are motivated to participate in either pre-employment or workplace continuing training and if this training supplements training in initial vocational skills by public schools. But scholars have found that there is very limited firm-based training in Chinese workplaces and that most of it is, first, concentrated in foreign-owned firms or JVs (sometimes big SOEs) and larger

firms and, second, targeted at managerial and high-level workers (Child 1994; Cooke 2005; Warner 1993; Xiao and Tsang 2004). And the state has by and large failed to systematically motivate employers to participate in skill development (Cooke 2005; Lai and Lo 2006).

Employers have failed to play an active role in part because of the absence of long-term employment relationships and work commitment in Chinese firms. With the breakdown of the internal labor markets in the Chinese state-owned sector and the informalization of employment in the emerging private sector during the economic reform, turnover has been consistently high in most Chinese workplaces. In response to employment instability, the 2007 Labor Contract Law encourages long-term employment relationships by imposing various termination restrictions on employers (Gallagher and Dong 2011). But the law stipulates the free termination of employees and it provides only minimal space for employers to protect their training investment in an employment contract. Article 22 allows employers to claim liquidated damages from an employee who has received professional and technical training and now initiates termination. But it requires the employer to "conclude an agreement specifying a term of service" in advance, and it stipulates that "the liquidated damages that the employer requires the employee to pay may not exceed the portion of the training expenses allocable to the unperformed portion of the term of service." In fact, most employers would rather not sign this agreement for every training activity. This limited restriction over employee termination discourages employers from offering comprehensive workplace-based continuing training. During my field research, a great many employers complained to me about this issue.

In response to the problem of insufficient workplace-based training, the government in recent decades has enforced a process of decentralization reform that invites employers to engage in workforce pre-employment training (i.e., the school-based VET process) through

technology and knowledge transfer. Lai and Lo (2006), who have documented the state's decentralization efforts since the mid-1980s, conclude that decentralization reform failed during the early 2000s. I find that the state currently has largely withdrawn from the daily operations of schools, granting schools almost full autonomy to devise and carry out their training agendas, and it has encouraged employers to provide input to the workforce pre-employment training process. As a consequence, the discrepancy between the school-based VET process and the industry that concerned scholars a decade ago (Cooke 2005; Durden and Yang 2006; Lai and Lo 2006) has been greatly reduced.

Nevertheless, reform has gone to the other extreme in the respect that most employer-dominated training programs now only focus on the specific needs of collaborating firms, and the state has neither established widely recognized skill standards nor motivated individual employers to coordinate coherent training agendas at the industry level. The progress of the Chinese decentralization process, in other words, has been extremely disorganized: individual firms have taken over the *for-degree* training agendas provided by vocational schools without effectively coordinating across programs. Judging from Western experience, the problem of over-decentralization could have been avoided if there had been either private governance or an effective skill credentialing system that guided the training agendas of individual programs. In post-socialist China, where civil society actors, especially employer associations and labor unions, are government-controlled and have little interest in coordinating the skill development of the workforce, private governance is largely absent. I find that the national skill credentialing system — the national vocational certificate system (NVCS) run by the MOHRSS — has been marginalized from the vocational training processes and from employers' hiring decision-making processes because it has failed to take into account an important attribute of contemporary

Chinese industry: the different regions in China are at different stages of development, and, consequently, in these regions industries require training in different skills and techniques, even in the case of a single vocation. In other words, a one-size-fits-all approach to vocation certification is not useful in China.

I conclude that the current Chinese skill development system is disorganized and disordered. Individual rather than organized employers have replaced the state as the dominant force in the vocational schools' training process, but these employers have failed to institutionalize an effective system of coordination at the industry level. Thus, there is disorder. This disorder can be attributed in large part to two important causes: the absence of employer associations that have the capacity to establish coherent skill development agendas that cross programs; and the state's failure to enforce appropriate skill standards at the regional and national levels, which has left skill development programs individualized and uncoordinated. This system accommodates the immediate and specific skill needs of individual employers (and, thus, it clarifies the external labor market failure puzzle discussed at the beginning of this introduction), but it downplays general skill training, which is also necessary. I contend, then, that the Chinese VET is trapped in a skill formation dilemma: In the absence of effective private governance to coordinate diversified interests of employers at large scales, neither a centralized school-based nor a decentralized employer-led approach to VET can deliver ideal skill formation outcomes, and this presents a challenge to the long-term upskilling agenda of the Chinese economic reform.

Through an analysis of the experience of Guangdong Province – an information-rich case (Patton 1990) in terms of reform dynamics and school-firm collaboration – I empirically examine this skill formation dilemma in the Chinese VET system, the problems that it has

generated, and recent reform attempts by the state to partly remedy the disorder. I argue that VET policy makers and practitioners in Guangdong are faced with a paradox. On the one hand, the decentralization reform has successfully incorporated employers' input in the training process, and this has shown promise in closing the gap between VET processes and the industry needs revealed by scholars a decade ago. Motivated by a skilled labor shortage and external labor market failure, employers have shifted their focus from a traditionally firm-based training to a workers' pre-employment skill development process in order to secure firm-specific skills and a flexible reserve of labor. On the other hand, the system has generated several important problems. Individual schools are given too much autonomy without being bound to any industry-level skill standards, and because employer participation is disorganized, an industry-wide coordination of skill transferability is completely off the table. The MOE and the MOHRSS now enforce independent apprenticeship reforms, but the MOE continues to pursue a disorganized and decentralized approach that, with very little state intervention, allows experimental programs to devise training schemes that address the individual needs of collaborating firms. Once again, specificity overrides generality. To remedy this disorder, MOHRSS employs a top-down model that aims to revitalize the National Vocational Certificate System (NVCS), but this approach, too, is disconnected from industry and does not encourage employers to participate in the skill standards making process. I contend that the key problem lies in the absence of civil society governance in China. Employer associations and labor unions need to participate in the VET process, based on the Western experience, in order to coordinate employer needs and their diverse interests, on the one hand, and avoid the problem of training over-specificity, on the other hand.

This dissertation borrows from and holds implications for the comparative literature on national skill formation systems, including the Chinese system. Below I review this literature and examine its implications.

Contributions from a Comparative National System Perspective

Western skill development studies widely adopt a national system perspective (see Ashton, Sung, and Turbin 2000 for a review). Scholars focus on characterization, typologization, and comparison of national skill formation systems. One important approach to typology that many scholars employ classifies national systems on the basis of the main provider of vocational skills. These studies have identified several types of systems, including school-based systems in the US, Japan, Canada, France, Sweden, and Italy, employer-led or dual models in Germany, Switzerland, and Austria, and mixed models, such as those in the UK (Furth 1985; Green 1991). Exemplar Western and Asian national systems demonstrate distinctive models of school-firm interplay and varying levels of decentralization. Identifying common themes in these models is a useful exercise because it highlights the peculiarity of the school-based but employer-dominated Chinese system.

Western skill development scholarship indicates that in both school-based and employer-led models, a certain level of decentralization and employer input in the VET process is indispensable. Different systems adopt distinctive approaches to decentralization, and the process is not unique to China. In Japan and Singapore, school-based systems are supplemented by massive employer-provided workplace training. Germany's employer-led system and the UK's mixed model encourage employers to have direct input into the pre-employment skill formation process.

I argue that the Chinese VET approach to engaging employers is particularly disorganized and disordered. It features extensive school-firm collaboration that is instituted at the level of individual organizations and provides no industry-level coordination among schools, employers, or individual trainees. This disorder could have been avoided had China followed Singapore's example and imposed strong state intervention or state-organized employer coordination, but China did not do this. Through decentralization reform, China's central and local governments have given individual schools and employers full autonomy to develop their own training agendas. The NVCS has long been criticized and marginalized from vocational school training because, according to Kong (2015) and my own findings, it has failed to accommodate regional and industrial needs. Private governance that seeks to institute skill standards at the regional industry level is a superior solution, but this solution currently is not practical because in China there are few proactive employer associations. The important institutional arrangements that precondition the success of advanced Western skill development models by and large are absent in contemporary China, and because the Chinese state has not been able to engage employers systematically, as the Singaporean government did during post-war development, its system suffers from disorder.

I contend also that two important perspectives have been largely overlooked in the national skill formation system literature. First, the national system approach, which reduces national complexity to a single national modelled abstraction, downplays regional, sectoral, and even occupational idiosyncrasies within each country case (Crouch, Finegold, and Sako 1999) — that is, it overlooks potential subnational variation. While Locke (1992) suggests that subnational system analysis might provide a better understanding of industrial relations dynamics in general, particularly related to skills, Osterman (1982, 1987) identifies four employment subsystems—

industrial, salaried, craft, and secondary—each of which features a distinctive model of skill development and HR strategies. This subnational system approach is particularly relevant to China labor studies, where regional differences can be huge and often explain many aspects of employment relations outcomes (Hurst 2009).

The second perspective under-valued in the literature is an informal institution approach. National skill formation system analysis tends to focus on formal institutions and overlook informal institutions, which Helmke and Levitsky (2004) define as socially shared rules that are mostly unwritten and that exist outside of official sanctions. Nee and Ingram (1998) remind institutional scholars that individuals and organizational entities are widely embedded in social norms and informal networks, and this accounts for many important phenomena in organizational processes. K. Tsai (2006), L. Tsai (2002, 2007), and Nee and Opper (2012) find that in China informal institutions play important roles in a wide range of socio-economic domains. But studies in the skill development arena have failed to examine the roles of informal institutions.

Consistent with trends in the Western literature, studies of the Chinese VET system adopt a national system perspective: that is, they often propose arguments or characterizations that pertain to the entire national system, but they overlook potential subnational variation, and they focus on formal institutional structures only. This literature sees a centralized school-based skill development system in China and it perceives major discrepancies between the vocational education processes and employer-based training. The literature depicts a VET system that has three key features: 1) a school-based model that has very limited employer participation; 2) a state-centralized system that is too rigid to be market oriented or accommodate industry needs; and 3) the presence in some Chinese vocational schools of student intern "selling" activities. The

third factor, combined with ineffective training processes, prompts scholars to stereotype schools as quasi-labor agencies. I examine each these features below.

First, the literature portrays the Chinese VET system as a school-centered model characterized by very limited employer participation and input (Child 1994; Cooke 2005; Warner 1993; Xiao and Tsang 2004;). Schools, including both public and a small number of private ones, are the main providers of workers' initial vocational skills. Figure 1 illustrates the system's structure in terms of age of enrollment. At the workforce's pre-employment skill development phase, the VET system consists primarily of two types of schools: vocational schools/colleges attached to the MOE, and technical schools/colleges attached to the MOHRSS.[3] A 15-17 year-old student who wishes to pursue a vocational education can enter either a vocational school (*zhongzhi*) or a technical school (*zhongji*). The degree received at this level is equivalent to a high-school degree. Thereafter, s/he can choose to either enter the labor market or further pursue vocational education by attending a vocational college (*gaozhi*) or a technical college (*gaoji* or *jishi xueyuan*). Less frequently, vocational college graduates enroll in two-year degree-upgrading programs (*zhuan sheng ben*) to acquire bachelor (university) degrees. These schools and pre-employment training comprise the main body of the Chinese skill formation system (Cooke 2005). Employer-provided firm-based training is limited: it is concentrated in foreign-owned firms, JVs, and (occasionally) in large SOEs, and it targets only managerial and high-level workers (Child 1994; Warner 1993; Xiao and Tsang 2004).

[3] In this dissertation, the term "vocational schools" covers both types of schools, unless otherwise specified.

Figure 1. Chinese Education System

<table>
<tr><th>Age of Enrollment</th><th colspan="5">Education Institutions</th></tr>
<tr><td>3-4</td><td colspan="5">Kindergarten</td></tr>
<tr><td>5-6</td><td colspan="5">Pre-elementary school</td></tr>
<tr><td>7-11</td><td colspan="5">Elementary school</td></tr>
<tr><td>12-14</td><td colspan="5">Middle school</td></tr>
<tr><td>15-17</td><td colspan="2">High school</td><td>Vocational school</td><td>High school</td><td>Technical school</td></tr>
<tr><td rowspan="2">18-21</td><td colspan="2" rowspan="2">University</td><td colspan="2">Vocational college</td><td>Technical college</td></tr>
<tr><td colspan="2">University</td></tr>
<tr><td>22-24</td><td colspan="2">Master program</td><td colspan="3" rowspan="3">Adult education</td></tr>
<tr><td>25-27</td><td>PhD program</td></tr>
<tr><td>≥28</td><td colspan="2"></td></tr>
</table>

According to the literature, the second key feature of the Chinese VET system is strong state control, which was not affected by the decentralization reform carried out during the mid-1980s (Lai and Lo 2006). The state is the largest provider of initial vocational skills. Most vocational schools are state owned, and they are funded primarily by state educational spending (Cooke 2005). By giving funding responsibilities to local governments and introducing self and social funding mechanisms, the 1980s reform sought to diversify the financial sources of schools, but the central government continues to play a dominant role, and it remains a major provider of school funding (Schnarr, Yang and Gleissner 2008). During the early 2000s, state policies shifted towards a recentralization of both financing and the supervision of education funding (Murphy and Johnson 2009). With regards to curriculum development, specialty committees organized by local educational departments now reserve the right to approve the establishment of new specialties in vocational schools, which means schools have no authority to make such decisions themselves (Lai and Lo 2006). The MOHRSS and the MOE now largely control the graduate qualification system: the former is in charge of the centralized NVCS and the latter issues degree certificates. In other words, Lai and Lo (2006) conclude that the decentralization of the VET system in China is limited. During the reform, the central government transferred some responsibilities to the local level, but it continues to tightly control the entire system through national policies and directives. Local governments can only enforce these policies, and schools and institutions have no authority to develop their own programs. That the state maintains strong control over the VET system is not surprising: the ideological function of the education system is crucial to the post-socialist authoritarian regime (Althusser 2006). But state centralization has generated rigidity in the VET process (Durden and Yang 2006), which is supposed to be flexible enough to accommodate rapid technological change in industry.

Third, studies undertaken in the literature from a sociological perspective depict Chinese vocational schools as quasi-labor agencies. This literature posits two main arguments. First, the training quality and effectiveness of Chinese vocational schools is generally low (Woronov 2012). Many vocational schools do not provide students with useful vocational skills. Instead, they carry out what Woronov (2012) calls a "mimetic labor" process wherein the schooling process constructs students' social subjectivity of employable workers, but it rarely equips them with truly useful skills. Second, vocational schools sell student interns to businesses for unjustified commissions. Sociologists in a major Foxconn-focused research project revealed the abuse of student interns in Foxconn factories. Student workers were "forced" to work on low-skilled assembly line jobs and perform supplementary seasonal labor tasks that are irrelevant to their specialties (Smith and Chan 2015; Su 2010-2011). Given their ineffective training and labor selling behaviors, Chinese vocational schools, scholars have concluded, are quasi-labor agencies. Smith and Chan (2015) characterize the internship work as a type of constraint labor, and Su (2010-2011) calls vocational schools "middlemen."

Contrary to the literature just reviewed, my research indicates that the Chinese VET is a disorganized and decentralized system that is distinguished by three features: 1) schools are given nearly full autonomy to devise training programs; b) the variation across vocational schools is beyond the mere labor agency stereotype; and c) it is dominated by individual employer-dominated school-firm collaborative training. With regards to the first feature, my study shows that the state has largely withdrawn from the daily operations of vocational schools, and it has given vocational schools autonomy to carry out VET processes. The state plays a role at the regional and national level, and its focus is strategic planning and the provision of financial support. The recent apprenticeship reform instituted by MOHRSS aims to recentralize the system

through direct intervention in program building, but the reform has not produced significant changes. These findings are inconsistent with the prevailing wisdom — that the Chinese VET system is state-centralized and that the state controls the school training processes.

With regards to the second feature, both the Western literature and China studies have employed national system analysis. Western studies offer useful national system characterizations and typologies, but they often overlook subnational variation. The assertion that vocational schools are quasi-labor agencies reflects the important problems that affect some Chinese vocational schools, including the abuse of student interns and the low quality of training. But the assertion fails to capture the system's larger landscape. Given the decentralized status quo noted above, variation across vocational schools is likely to be salient in China. From my sample of 25 vocational schools in Guangdong, I have identified four distinctive skill development models. These include but are not limited to the labor agency pattern.

With regards to the third feature, I show that although the state has largely withdrawn from the daily operation of schools, employers have stepped in and now dominate individual training programs. This finding corrects previous findings by scholars that the Chinese VET system is a school-based model that provides very limited opportunities for employer participation. Scholars who seek to characterize and typologize national systems tend to focus on formal institutions. Yet as presented here, the China case indicates that informal arrangements, too, should play an important role when systems are defined. It is not surprising that the Chinese VET system frequently is defined as a school-based model, given that there is no institutional arrangement enshrined in law that stipulates that employers are obliged to participate in the workforce pre-employment training process. But careful examination of the actual training processes carried out by schools reveals significant deviation from this model. Indeed, I show

that long before the state's current apprenticeship reform process was instituted, VET practitioners in China had developed a de facto apprenticeship training model that involved extensive school-firm collaboration.

Methods

The study is based on my two-month preliminary and one-year extensive field research in Guangdong Province that provides an information-rich case (Patton 1990: 181). Better known as the Pearl River Delta area, Guangdong for the past three decades has developed the most dynamic regional economy in China, and it now hosts the most advanced manufacturing and service industries. If Guangdong's success is deemed to epitomize the achievement of China's 30 years' economic reform, the province also epitomizes the most urgent problems that currently bottleneck the "made in China" model. Specifically, Guangdong's fast economic development is impeded by a major shortage of skilled labor and by rapidly increasing labor costs and conflict. Correcting these problems will require industrial restructuring and upgrading, and, therefore, skill upgrading of the workforce. Guangdong state officials and employers have historically been especially effective at enforcing various innovative economic reforms, and so we should expect that Guangdong will lead attempts to resolve the skilled labor shortage through VET reform. Indeed, we should expect to see the most dynamic school-firm collaboration scenarios and various creative reform attempts in Guangdong Province.

Furthermore, Guangdong is the biggest VET province in China, hosting more VET facilities that educate a bigger workforce than any other Chinese province. Guangdong vocational schools generate over one tenth of China's vocational school graduates every year. In

addition, Guangdong shows tremendous diversity across its cities. The Pearl River Delta region, which includes the cities of Guangzhou, Shenzhen, Foshan, and Dongguan, has the country's most advanced market economies and its best vocational schools. In contrast, peripheral areas, which include the cities of Qingyuan, Zhanjiang, and Zhaoqing, resemble the less developed provinces of China's hinterland. I do not claim that Guangdong is a prototypical case. Instead, the province is representative of diversified scenarios within the Chinese VET system, and, hence, it provides an information-rich case.

Data

I collected three types of data during field research. First, I conducted 322 interviews with various stakeholders of the VET system. The appendix lists all my interviews. Those interviewed include: a) officials from the MOE and the MOHRSS and their local branches; b) presidents, administration, teachers, students, and parents from 25 schools; c) managements, firm-level union officials, and workers from 21 firms; and d) officials from 12 other organizations that include local official unions, think-tank organizations, NGOs, employer associations, and academic institutes. Some of the interviews took place during group meetings, which are very common in China. Individual and group interviews lasted two hours on average. These in-depth interviews constitute my major information resource for understanding the Chinese VET system.

Second, to further explore the school-firm collaboration processes and interaction among relevant stakeholders, I have engaged in a great deal of participant and non-participant observation. I achieved this in various ways. First, I attended meetings whenever possible. My good relationship with government officials and school presidents allowed me to attend

numerous public and nonpublic meetings, informal conversations, and dinners, which provide a common forum for informal communication in China. I also participated in two ongoing reform projects – curriculum and apprenticeship reform – in Guangdong. I served as an external consultant for curriculum reform in Guangdong's beauty sector from late 2015 to early 2016. I also served as a translator for the MOE's apprenticeship consultants from the UK in April 2016. These experiences allowed me to gain valuable insider information regarding how different stakeholders within the VET system interact and collaborate. I also observed many training processes at schools, practical centers, and firms, as well as several skill competitions.

Third, my research is supplemented by a considerable amount of secondary data that I collected during fieldwork. These data include relevant state policies, internal documents of governments, schools, and firms, and internet-based resources that provided background information on the schools and firms that I studied and important news and reports. These secondary data have two major functions. First, they allow me to triangulate from the firsthand data that I collected using the above-mentioned methods. Second, they provide information that my process tracing through interviews could not yield.

Three Studies

Each of the three following chapters is tasked with a separate investigative mission, but all contribute constructively to my central argument. Chapter 2 (*How Institutional and Organizational Factors Explain Models of Skill Development in Chinese Vocational Schools*) provides a school-centered study that seeks to break the stereotype that Chinese vocational schools are labor agencies. Methodological deficiencies in existing studies and the currently

decentralized Chinese VET system hint at the existence of variation across Chinese vocational schools that has not previously been detected by scholars. I ask, how and why do skill development patterns in the workforce vary across Chinese vocational schools? I examine a representative sample of 25 vocational schools in Guangdong and find that they do not all function as labor agencies. Instead, there is substantial variation in the effectiveness of school training, in funding sources, and in students' skill levels and job market scopes. I identify four skill development models that schools typically adopt: a high performance model, an industry-focused model, a local market-oriented model, and a labor agency model. I show that "labor selling" behaviors exist but are limited to certain poorly funded private schools. I argue that in China, skill development models reflect a combination of two institutional and two organizational factors that endow each school: state support and strategies and local industrial structures (institutional); and a school's institutional legacies and its ownership (organizational). Schools vary with regard to these endowments, and, therefore, they demonstrate differences in skill development patterns.

Chapter 3 (*Externalizing Internal Labor Market Practices: "Training for a Targeted Brand" in Chinese Vocational Schools*) focuses on an important employer strategic response to local market labor shortages: collaboration with vocational schools. I ask, how and why do employers who face skilled labor shortages seek collaboration with vocational schools? The literature suggests that collaboration between Chinese employers and vocational schools is limited and is merely a secondary labor market strategy that produces low-skilled operational labor rather than useful skills. In contrast, I find that schools do engage in "training for a targeted brand" activities that feature individual school-firm collaborations and employer-dominated training processes. Driven by skilled labor shortages, which reveal a major failure of the external

labor market, employers seek to shift part of their firm-based training to prospective workers during the latter's pre-employment skill development phase. Through this process, schools enjoy a substantial technology and knowledge transfer from employers, and they integrate these transfers into their for-degree training programs. In exchange, they offer customized training processes to individual collaborating firms. I argue that "training for a targeted brand" is essentially an employer strategy that externalizes internal labor market practices in order to fix the external labor market failure. Working with vocational schools, employers externalize both their employment and part of their internal labor market practices. Of paramount interest in this dissertation is firm-specific training. This strategy generates a flexible reserve of students who are equipped with firm-specific skills that certain employers value, but employers are not committed to employment relationships with these workers. I also argue that this "training for a targeted brand" system emerged from the interaction of two variables: 1) the decentralized Chinese VET system and the autonomy that schools are given to carry out training processes; and 2) the skilled labor shortage that employers face.

Finally, Chapter 4 (*The Skill Formation Dilemma in the Chinese Apprenticeship Reforms*) assesses the state's recent reform efforts, part of which seeks to resolve the current disorder in the Chinese VET system through the enactment of relatively centralized apprenticeship reform. I ask, how are the MOE and the MOHRSS currently carrying out their respective apprenticeship reforms, and why have they generated different outcomes? Each of the two ministries has recently launched an independent reform that seeks to institute apprenticeship training in their own vocational schools, but each follows a drastically different approach to institution building. The MOHRSS has adopted a top-down model that uses very detailed central policies and "quota management" to establish every single experimental apprenticeship program. In contrast, the

MOE follows a collaborative model that legitimizes existing "training for a targeted brand" programs in vocational schools to maximize the input of individual schools and employers. I construct a three-level collaborative model of skill development that is based on institutional theory, the regulation school, and human capital theory, and I use it to evaluate the reform efforts of the two state ministries. I find that the MOHRSS's top-down model has not been as successful as the MOE's collaborative model. Indeed, the latter promises to address two key problems in skill development: the collective action problem and the accommodation of industry needs. That said, neither approach has successfully achieved a balanced delivery of both general and firm-specific skills, and this can be attributed to the fact that proactive employer associations are absent in China. The MOHRSS's top-down model is exclusively focused on general skill training, whereas the MOE's collaborative model (training for a targeted brand) is overly focused on the specific skill needs of individual collaborative firms. I then argue that in the arena of current apprenticeship reform, the Chinese state has been trapped in a skill formation dilemma. Until effective private governance is institutionalized to coordinate the VET process, the system will continue to not deliver ideal skill development outcomes, and the state's long-term upskilling agenda will continue to be confounded.

Before turning to these three chapters, I present below empirical evidence that, on the one hand, is independent of the studies described in the following chapters but that, on the other hand, is crucial to the making of my central argument. This evidence provides an important empirical motivation for my entire research project.

Decentralization in the Chinese VET System: Empirical Motivation and a Start

During my preliminary field research, the first thing that struck me as radically different from my impression of the Chinese VET system, given the literature, is its astonishingly high level of decentralization. There is a considerable diffusion of state authority to vocational schools, which receive from the state almost full autonomy to design the training process. This counter-intuitive phenomenon provided my initial empirical motivation to carry out this project. In this section I start the empirical analysis that leads to the three chapters that follow.

Table 1 summarizes the level of authority diffusion that affects specialty establishments, student admissions and qualifications, and curriculum development across different types of Chinese vocational schools. In most cases, de facto decision-making falls at the school level or below, and the local government maintains authority only over a small number of issues, including the NVCS, a few mandatory courses, and specialty establishment (dis)approval. I examine below the three issues that are affected by authority diffusion. Even in the case of these issues, schools often find ways to circumvent state intervention and retain considerable freedom.

Specialty Establishment

In the literature, scholars argue that the state tightly controls the establishment of new specialties in vocational schools through local government-organized specialty committees and national specialty indexes. By strictly following the relevant specialty index that only updates every 3-5 years (Chen 2015), a specialty committee reserves the right to (dis)approve schools' initiatives of establishing new specialties, which can leave a school with no space to maneuver (Lai and Lo 2006). What I found in Guangdong's vocational schools, however, is different. In all

schools that I studied, officials share the belief that they can without difficulty set up new specialties.

To decipher this process, we need to distinguish two circumstances. The first is what happens when a school wants to establish an indexed specialty. In interviews that I conducted, officials from the Guangdong Department of Education (GDDOE) and the Guangdong Department of Human Resources and Social Security (GDDOHRSS) who are in charge of school affairs confirm that they maintain laissez-faire attitudes toward schools:

> With only a few exceptions, establishing specialties in Guangdong vocational schools is completely free from state control…Schools enjoy full autonomy and need not be approved by us, including non-indexed specialties. The MOE's policies require that non-indexed specialties have to be put on record in the provincial educational department, but Guangdong is more advanced in this than the national standards. We think that even non-indexed specialties do not have to be put on record, leaving autonomy entirely to the school. (Author: what about vocational colleges?) That is the same, except for one procedure – their specialty establishment has to be put on our record. Note that this is different from approval! …Vocational education needs to be suitable for local economic development. Schools should be able to adapt themselves to what the local economy needs – to be dynamic regarding specialty development and student enrollment. Leaving autonomy to schools, the schools will realize their potential to accommodate the market. This is our consideration (I: 5).

> Technical schools used to be firm-run schools, training skilled workers for firms. Training processes therefore have to be compatible with what firms need, and focus on practice. Therefore, the MOHRSS requires schools to be connected with employers and the market… We focus on how to encourage firm participation in our educational processes, including devising (programs), teaching capacity building, and curriculum making, to keep pace with modern technological development… And we government agencies do not get involved in this process, but let them collaborate freely. (Author: are schools free to determine specialty establishment and student enrollment?) Yes, completely free! (I: 8).

Table 1. Authority Diffusion in the Chinese VET System

		Ministry of Education		MOHRSS
		Vocational Colleges	**Vocational Schools**	**Technical Schools**
Specialty Establishment		State-approval needed	School	School
	"Direction"	School	School	School
Student Admission		*Gaokao* – plus, however, a significant proportion of school autonomous admission	School	School
	Qualification	NVCS and school degree	NVCS and school degree	NVCS and school degree
Curriculum development		Department, and state mandatory courses	Department, and state mandatory courses	Department, and state mandatory courses
	Textbooks	Teacher	Teacher	Teacher

The second question concerns what happens when a school wants to establish a non-indexed specialty. This is probably the more important question given the fact that markets change quickly and indexes often lag behind. If schools are only allowed to establish specialties within an existing index — even if the state approval process is relatively loose — they can feel constrained if the index is outdated.

As shown above in the interview quotes, the Guangdong government has given schools more room than national standards have to establish non-indexed specialties. But even without that extra space, schools have various ways to circumvent the index restriction. They can set up what is called a "direction" (*fangxiang*) under an old specialty, and very often the central state will later include the direction in an update of their specialty index. In Chinese vocational schools and universities that face similar index restrictions this is a common, state-consented practice. It solves two problems: how to set up a "probation period" during which a new specialty is tested by the market; and how to tackle the problem of the rigidity of specialty indexes.

In vocational education, for instance, robot-related training was established in schools during the past several years, when this industry emerged in China, but the specialty was not officially listed in the index until it was updated by the MOE in 2015. Schools circumvented the index problem by setting up robot-related training "directions" (e.g., Industrial Robots, Robot Application and Maintenance, and Smart Manufacturing) that they attached to existing indexed specialties, such as CNC, Mechatronics, Internet of Things, and Electronics Application. Because schools control curriculum development and the actual training processes (see below), the committee does not know what a school will teach under a new specialty direction or whether

it will differ from the original specialty. This practice is state-consented. An official from the Dongguan Bureau of Education (DGBOE) provides an example:

> Many schools would not establish a completely non-indexed specialty. The Robots, for example, was non-indexed until last year. But Dongguan Science and Technology School offered this specialty, and used the name Mechatronics with a direction of Industrial Robots… In student recruitment, they noted Industrial Robots; otherwise students would not understand what the specialty really is going to do (I: 11).

This strategy has allowed schools to instantly react to important market changes and establish new specialties that are compatible with contemporary industry trends without being bound to a rigid index. While the MOE did not index any robot-related specialty until 2015, media reported that by 2014 nine vocational schools had established specialties, and 120 schools had established specialty directions on robots in the country.[4] A similar case involves 3D Printing. Vocational schools established specialty directions to train specialized workers for this emerging industry prior to 2015, when the MOE eventually listed the subject in its specialty indexes. Indeed, many schools in my sample actually offered robot and 3-D printing related specialties in 2013 and 2011.

Table 2 compares 2012 vs. 2016 vocational school graduates across industries in Guangdong. Paralleling the deindustrialization process and the continuous growth of the service industry in Guangdong, the educational focus of vocational schools has de-emphasized manufacturing and emphasized healthcare, social work, education, and arts training. The table also compares Guangdong to the 2014 national average. The proportion of graduates of the first and second sectors in Guangdong (agriculture, manufacturing, and construction) currently is significantly lower than in other provinces. Compared to the national average, Guangdong, which for years has focused on industrial upgrading, has generated more IT, finance,

[4] http://robot.ofweek.com/2015-06/ART-8321202-8440-28967449.html, March 5, 2017

management, and commerce talents. Also, as a province that is scarce in natural resources, Guangdong educates relatively few energy and natural resources students. As the table indicates (and irrespective of national specialty indexes), local governments have given schools freedom to establish and adjust their specialties in response to local market needs.

Student Admission and Qualification

With regards to student admission, a major threshold for vocational college applicants that is out of the college's control is the *gaokao* system (the National Higher Education Entrance Examination). Other types of schools have been given full autonomy to decide who to recruit during a school year. Nonetheless, I have found that vocational colleges can admit the students they want even though these students might fail the *gaokao*. This is possible under reforms that central and local governments have experimented with in recent years. These reforms seek to "diversify vocational colleges' student admission approaches,"[5] including a *gaokao* system that is separate from universities and academic colleges and that focuses mostly on the practical skills of students.[6]

Another reform that gives vocational colleges more autonomy to decide who to admit is experimental autonomous enrollment (*zizhu zhaosheng*). This year, for example, 50 vocational colleges in Guangdong have been given a quota of 22,609 autonomous enrollments, which will account for about 20% of the total planned enrollments in those colleges. Under this system, each school develops a test that includes paper exams and interviews to evaluate students beyond what the *gaokao* attests to. Passing this test, a student is exempt from all *gaokao* exams. Autonomous enrollment allows schools to recruit students who are not necessarily proficient at

[5] http://edu.qq.com/a/20140929/018346.htm, March 13, 2017
[6] http://www.gaokao.com/e/20161121/58325193cedbf.shtml, April 8, 2017

theory or who do not have wide general knowledge of math, Chinese literature, and English, which typically are the focus of the *gaokao*, but who, instead, have practical skills that lie at the core of vocational education. This system has been a central policy focus of the VET reform for many years, and over time schools have been granted expanding quotas.[7]

Students can be admitted within the autonomous enrollment system even if they fail a *gaokao*, but to graduate they must overcome two major obstacles presented by the "double certificates to graduate" (*shuangzheng biye*) system: a school degree and a NVCS certificate that is relevant to a student's specialty. The latter can be a constraint because it is nationally standardized. But I found that NVCS tests rarely act as real obstacles to student graduation. Many of the vocational schools, training institutes, and even state-authorized entities that carry out these tests have strategies to help students gain certificates. Moreover, schools have strong incentives to do the same because a low graduation rate would be a deterrent against student enrollment. In fact, during recruiting, many vocational promise students that when they graduate they will receive both certificates.

Curriculum Development

Although NVCS certificates are not difficult to obtain, allowing them to shape a schools' curriculum development is problematic because the NVCS is disconnected from industry (Kong 2015). I find, however, that the NVCS system is widely regarded as useless and, thus, it has been largely removed from vocational schools' training processes. Many teachers and employers that I interviewed expressed this point of view decisively. Instead of centering curriculum development

[7] The quotas given to Guangdong vocational colleges from 2012 to 2016 are 7,628, 9,475, 11,690, 18,609, and 23,634, respectively (see: http://edu.ycwb.com/2017-02/14/content_24203372.htm, April 8, 2017).

on skill credentials, schools pragmatically provide special additional training that typically lasts a couple of weeks and that gives students these certificates. As I will demonstrate in Chapter 3, employers have more input in school curriculum making than do the state and the NVCS.

Table 2. Regional and Historical Comparison of Graduates Distribution across Sectors

	Guangdong 2012	**Guangdong 2014**	**National 2014**	**Guangdong 2016**
Agriculture	3.5%	5.7%	10.1%	3.2%
Natural Resources and Environment	0.3%	0.1%	1.6%	0.3%
Energy	0.3%	0.1%	1.0%	0.2%
Construction	1.3%	1.7%	3.7%	2.2%
Manufacturing	15.7%	12.9%	18.2%	13.2%
Petro-chemistry	0.3%	0.5%	1.0%	0.4%
Textile and Food	0.8%	1.5%	1.4%	1.2%
Transportation	5.5%	6.0%	7.4%	6.5%
IT	20.2%	18.6%	16.2%	16.5%
Healthcare	9.9%	9.9%	9.8%	11.5%
Leisure and Health	0.7%	0.3%	0.8%	0.3%
Finance, Business Management, and Commerce	22.1%	20.6%	9.6%	21.5%
Tourist Service	3.8%	3.9%	4.1%	3.0%
Arts	3.6%	3.9%	3.5%	4.5%
Sports and Fitness	0.4%	0.7%	0.7%	0.3%
Education	6.0%	8.3%	6.2%	9.4%
Legal Service	0.4%	0.3%	0.4%	0.3%
Public Affairs and Social Work	2.3%	1.9%	1.7%	2.8%
Others	3.0%	3.3%	2.4%	2.8%

(Sources: 2012 and 2014 data from Reports on Chinese Vocational School Graduates' Employment Conditions 2006-2012 and 2014 by the MOE; 2016 data from the Guangdong Department of Education)

In general, schools have been given nearly full autonomy over curriculum development by the state. Mrs. Feng, the Dean of Academic Affairs at Qingyuan Polytechnic, told me:

> In total between 1,400 and 1,800 credit hours, no less than 50% application course hours, and no more than 26 hours per week; as long as they meet these standards, departments have full autonomy to devise their curricula (II: 49).

I find that some schools can circumvent even these credit restrictions and mandatory political and ideological courses. In a meeting, Vice Provost of Guangdong Science and Technology Polytechnic explained the following to several collaborative employers who had concerns about mandatory political courses:

> All courses in the curricula can be changed freely, except for those mandatory courses. But, indeed, we have even changed a lot of those courses for you. The state policy stipulates that political courses have to have 36 credit hours. We now have 18 of them that are taught in the classroom, and the other 18 are application courses (meaning students use those hours to study vocational skills, as noted by the author). This indicates that we do have some strategies to maneuver curricula development. Nowadays our autonomy to devise curricula is quite considerable (II: 118).

As this conversation indicates, when schools want to maximize their capacity to act on an employer's interests, they can employ a variety of strategies to circumvent state restrictions on curricula. Additionally, teachers decide which textbooks to use, and many select self-compiled teaching materials provided by collaborative employers.

In summary, contrary to what earlier scholars found, the Chinese VET system is very decentralized. The local state still formally maintains some control over specialty development and mandatory courses, but schools can employ various, sometimes state-consented means to bypass these restrictions. Taking this position as a start, the following three chapters together demonstrate that the process of decentralization has been disorganized. This has caused problems, including a skill formation dilemma, for Chinese VET reform.

CHAPTER 2

HOW INSTITUTIONAL AND ORGANIZATIONAL FACTORS EXPLAIN MODELS OF SKILL DEVELOPMENT IN CHINESE VOCATIONAL SCHOOLS

Introduction

The vocational education and training (VET) system is gaining growing importance in China. According to the official data, vocational schools have been training increasingly more and four times as many students as academic colleges and universities do. Estimated based on a 90% initial employment rate in respective sectors, graduates from vocational schools accounted for 79% of the newly-added urban workforce, and 51% of the second and tertiary sectoral workforce in 2014. These numbers were only 51% and 21% in 2004.[8] In light of this, not only have employers been engaging vocational schools to tackle the local market skilled labor shortage (Li and Sheldon 2010), but the state has also enforced a series of reforms in recent years to facilitate a profound industrial restructuring and upgrading in China, for which, continuing investment in human capital and strengthening the VET system are deemed vital important institutional supports.[9]

In sharp contrast to its growing relevance in practice, the scholarly understanding of the Chinese VET system is still quite limited and somewhat biased. In particular, prevailing wisdom in the China labor field stereotypes Chinese vocational schools as quasi-labor agencies, arguing that their by and large ineffective and non-market-oriented training processes (Cooke 2005; Durden and Yang 2006; Lai and Lo 2006) can generate only unskilled workers (Woronov 2012), who are "sold" to firms as seasonable cheap labor for unjustified commissions (Smith and Chan

[8] These estimations are based on data from the China Statistical Yearbook 2004 and 2014.
[9] According to the "Made in China 2025" by the central government in 2015.

2015; Su 2010-2011). These studies were based on methodologically deficient research, however. Earlier research was based on very limited, secondary, and often piecemeal data that were mostly collected before the new century. The labor-selling behaviors were revealed later by a research project that targeted Foxconn. In addition to the obvious industry bias, it is unclear to readers if the authors had implemented a plausible sampling strategy on the school side. These deficiencies of existing research hint unnoticed variation within the Chinese VET system.

I argue that the "labor agency" depiction correctly reflects several existing problems within a certain portion of the Chinese VET system, but vocational schools maintain much variation beyond what this literature has depicted. In order to capture and account for this variation, I studied a representative sample of 25 vocational schools and 21 of their collaborative firms in Guangdong – an information-rich area (Patton 1990) with regard to its diversified VET scenarios. I identified four patterns of skill development across these schools, respectively named as the high performance model, the industry-focused model, the local market-oriented model, and the labor agency model. Schools under different models feature different levels of training effectiveness and funding sources, and graduates' skill levels and job market scopes.

As noted, a small amount of scholarship in English on Chinese VET already exists but is somewhat outdated and limited in scope, while this paper seeks to enrich our knowledge of the Chinese VET system through presenting a wide variety of vocational schools in China and explaining the distinctive skill development models they adopt. I draw linkages between distinct institutional and organizational factors, and the divergent models that are thereby produced for pursuing skill development. Concretely, I contend that state support and strategies, local industrial structures, a school's institutional legacies, and its ownership are key factors in determining which skill development model is at work. Before delving into relevant literature

and my own argument, I briefly outline the structure of the Chinese VET system as an institutional background.

Chinese VET System

Figure 1 in the previous chapter has illustrated the Chinese education system with the age of enrollment. As shown, the VET system – at the workforce's pre-employment skill development phase – mainly consists of two types of schools, i.e. vocational schools/colleges attached to the Ministry of Education (MOE), and technical schools/colleges attached to the Ministry of Human Resources and Social Security (MOHRSS).[10] Pursuing vocational education, a student at his/her 15-17 years old can choose to enter either a vocational school (*zhongzhi*) or a technical school (*zhongji*). The degree one receives at this level is equivalent to a high-school degree. After that s/he can choose to either enter the labor market or further pursue vocational education by attending a vocational college (*gaozhi*) or a technical college (*gaoji* or *jishi xueyuan*). Not frequently happening, but a vocational college graduate may enroll in a two-year degree-upgrading program (*zhuan sheng ben*) in order to acquire a bachelor (university) degree.

An important feature of the Chinese VET system is the dualist administration of the MOHRSS and the MOE. Table 3 compares the number of schools, teachers, and enrolled students in the MOHRSS vs. MOE schools in China and in Guangdong. As shown, the two ministries each run or administer a significant number of vocational schools in China. The MOE has more schools and teachers, and train more students, but the MOHRSS also has considerable VET entities.

[10] In this paper, unless specified otherwise, I use "vocational schools" as a general term that covers both types of schools.

Table 3. MOHRSS and MOE's VET Systems in 2014

	MOHRSS Technical Schools	MOE Vocational Schools
Schools	2,818 (243 in Guangdong)	8,930 (574 in Guangdong)
Teachers	194.6 thousand (20.8 thousand in Guangdong)	1.1 million (89.2 thousand in Guangdong)
Students	3.4 million (622.6 thousand in Guangdong)	22.3 million (2.1 million in Guangdong)

(Sources: national data from China Statistical Yearbook 2015; Guangdong data from Guangdong Bulletin on Educational Affairs 2014-2015)

Relevant Literature and Argument

Existing scholarly understanding of the Chinese VET system is limited and somewhat biased as noted. Early scholars (Cooke 2005; Durden and Yang 2006; Lai and Lo 2006) focused on a national system analysis. They depicted Chinese vocational schools as ineffective and non-market-oriented entities, and ascribed this problem to state-centralization and therefore the very rigid VET system. As a result, vocational schools have by and large failed to accommodate skill needs of the industry. Later, critical theorists conducted field research in Foxconn – a major electronics manufacturer – and found extensive use of student interns as temp workers during peak seasons. In the name of interns, these students were found to be involuntarily performing assembly-line operational tasks under the dual control of both schoolteachers and firm managers (Smith and Chan 2015). Su (2010-2011) concluded that school-firm collaboration in China demonstrates a dual-commodification of labor and education – Through internship programs schools provide firms with flexible and cheap labor as an important but unjustified approach to revenues. Given their failure to produce useful skilled workers on the one hand, and the seasonal cheap labor selling behaviors on the other, Chinese vocational schools have for long been

stereotyped as running no more than labor agency businesses. While Su called these schools "middlemen," mass media reported them as "illegal labor brokers" (*hei zhongjie*).[11]

This literature has inherent methodological problems. Early research on the VET system was based on very limited and often secondary empirical evidence. Much of their data was piecemeal and collected before or around the end of the 20th century. With the deepening of the marketization reform in the VET arena throughout the past decade, we should expect to see an updated version of Chinese vocational schools today. The literature that focuses on the use of student interns has an obviously limited industry scope, i.e. only based on the electronics manufacturing industry which, according to Lüthje, Luo, and Zhang (2013), has frequently adopted a standard mass production system, and therefore has significantly more assembly-line jobs than many other industries. Indeed, these studies were solely based on a well-known collaborative research project that focused on Foxconn. Targeting one single employer, it is unclear to readers if they had implemented a plausible sampling strategy on the vocational school side. This very limited and potentially biased scholarly stereotype on Chinese vocational schools leaves space for more nuanced analysis of the system. It is reasonable to suspect much variation across Chinese vocational schools that is beyond the labor agency depiction.

In this paper, I argue that there is a lot more variation in the Chinese VET system than previously thought by scholars. Based on firsthand research of a representative sample of vocational schools and their collaborative firms in Guangdong, I have identified four models of skill development across these schools, respectively named as the high-performance, the industry-focused, the local market-oriented, and the labor agency model. I argue that the emergence of these models is explained by four important institutional and organizational

[11] http://news.youth.cn/jy/201604/t20160419_7879083.htm, March 16, 2017

factors: state support and strategies, local industrial structures, a school's institutional legacies, and its ownership. Following an inductive approach to theory building, my 25 school cases in Guangdong clearly illustrate these patterns and their linkages with these explanatory factors. Before delving into case analysis, however, I present a number of theoretical reasons for us to expect these linkages in the rest of this section.

Local State Support and Strategies

Nowadays, the state has by and large withdrawn from vocational schools' daily operation and left them sufficient autonomy to devise and carry out their training programs as suggested in Ch.1, but central and local governments still provide various forms of support to schools, as well as conduct strategic planning that potentially changes the way that schools perform and interact with other players. To begin with, the MOE and the MOHRSS and their all-level branches are the administrator of Chinese vocational schools, and the primary funder of all public ones (Cooke 2005; Lai and Lo 2006). Estimated based on the China Statistical Year Book 2016, approximately 80% vocational schools are public ones, whose graduates accounted for 92.6% of the total vocational school graduates in 2015. Although the 1980s reform of the VET system sought to diversify the schools' financial sources by placing more funding responsibilities on the local governments, as well as introducing self and social funding mechanisms, the central government still plays a dominant role and serves as a major provider of school funding (Schnarr, Yang, and Gleissner 2008). And in the early 2000s, there was a trend of state policies toward recentralizing the financing approach and the supervision of the fund of the educational system in general (Murphy and Johnson 2009). I found that state support is crucial to sustaining the high performance model of top-tier public schools. In this case, national and regional governments

provide tremendous resources in various forms to schools, in recognition of their achievement, but also in exchange for their cooperation on certain state-initiated projects.

The state provides various supports also to private schools although to a much lesser extent. This is justified by the fact the education is essentially public goods that often entail state direct intervention to remedy a major collective action (free rider) problem (Streeck 1989). What I found in Dongguan supports this theory, and indicates that state support and regulatory strategies help avoid private schools' short-term behaviors, and potentially move those trapped in the labor agency model up to the local market-oriented model.

The second factor here is local state strategies. The state can enforce various reform agendas to restructure the VET system, some of which can engender fundamental changes to the way that practitioners interact with one another. And this role of the state has recently become more significant given the growing importance of VET in China's economic reform. In the ongoing apprenticeship reforms documented in Ch.4, the MOE and the MOHRSS have each adopted a different approach to institution building, but both have imposed a certain level of restructuring on how schools and employers collaborate and train students together. In this paper, I present a case where Dongguan Bureau of Education (DGDOE) successfully enforced a reform over local market-oriented schools to reinforce their integration with local industry clusters. All in all, we expect to see different levels and forms of state support and strategies to be linked to different skill development models of vocational schools.

Local Industrial Structures

Vocational schools are inherently tasked with the mission of serving local industrial development, which entails extra direct input of local employers in their training processes

compared to other schools. The dominant industrial relations paradigm provides the insight that product market structures and changes are often reflected in labor market practices (Kochan, Katz, and McKersie 1986). As the Chinese VET system has become an increasingly important labor market institution for employers to tackle the problem of skilled labor shortage (Li and Sheldon 2014), the linkage between local industrial structures and vocational schools' skill development patterns is expected to be strong and further gain strength. This linkage can be also derived from the regulation school pioneered by Boyer (1987) and Leborgne and Lipietz (1988), as well as the varieties of capitalism perspective (Hall and Soskice 2001). Both literatures consent on the fact that skill development systems – in their equilibrium conditions – are historically proven to be often compatible with the dominant production modes of an economy (Green 1992; Sorge and Streeck 1988).

Here an often seen phenomenon is industry-cluster embeddedness of vocational schools. In geographers' careful examination of industrial clusters' formation processes, educational institutions are deemed indispensible infrastructures for the emergence and sustainability of a cluster. In turn, these co-located firms, with their economy of scale advantage, provide educational entities with various resources and job-market opportunities to incentivize them to customize training programs according to what local employers need (Feldman, Francis, and Bercovitz 2005). In both the US and Europe, community colleges are found to intentionally target industry clusters in which they are embedded. An industry cluster benefits from vocational schools continuous supply of skilled labor, but also actively shapes the local VET system through transferring technology and know-hows, as well as constructing formal and informal learning contexts for trainees (Rosenfeld 2000).

But even without salient industry clustering, both community colleges in the US (Dougherty and Bakia 1999) and vocational schools in China (Ch.3) are found to have strong local industry orientation, actively collaborating with important firms to serve dominant regional industry needs. It is therefore reasonable to assume that local industrial structures, especially dominant industries and leading firms, play important roles in the formation of vocational schools' skill development models. In this paper, I found in Dongguan that local market-oriented vocational schools have historically emerged and embedded in district industry clusters, and therefore each have a strong clustered-industry focus.

Institutional Legacies

Institutional legacies are important in general for explaining organizational outcomes. This can be derived from the resource-dependence theory where institutional legacies are seen as important external resources that organizations can capitalize on, and devise their strategies against (Pfeffer and Salancik 1978). Relevant to the discussion here, two important institutional legacies are crucial to vocational schools' development in China. The first is reputation. Prestigious schools can secure sufficient student supply, and attract better students (Monks and Ehrenberg 1999). Moreover, high reputation can be socially reproduced. Reputation is deemed a valuable organizational attribute that can generate high performance, which in turn reinforce their high social recognition and thus further sustain the high-speed growth. This theory has been well applied to the context of educational organizations; In particular, American business schools are the most frequently used examples by management scholars (Boyd, Bergh, and Ketchen 2010; Corley and Gioia 2000; Pfeffer and Fong 2002). Scholars also found in the American higher education system that reputation is often able to generate a premium for top schools to charge

high tuition (Peters 2007), which is consistent with my findings in some private "high performance" vocational schools in Guangdong.

Frequently, reputation is embodied in various school rankings, which in the Chinese context are often associated with state recognition and generous support. In the higher education arena, state funding is found to often lean toward top-tier universities led by Tsinghua and Peking in order to build their international fame and competitiveness (Ngok and Guo 2008; Yang and Welch 2012). And I found that this same rationale applies to the VET field as well.

Another important institutional legacy that is unique to many Chinese vocational schools is their industry connections dating back to the socialist centrally planned economy. Since the establishment of the communist regime, vocational schools have founded and operated by industry-focused ministries (e.g. the Ministry of Textile that was in charge of the textile industry) and/or their SOEs, tasked with the mission of training cadres and technicians for the early Chinese industrialization. By 1992, 4,392 technical schools had been established – about half by firms – which had generated 5.3 million technicians mostly working in SOEs (Xu 1993). The political and economic reform throughout the 1980s and 1990s first abolished those industry-focused ministries[12] – when ownership of these schools were transferred to the SOEs that were transformed from those ministries – and later in the late 1990s required SOEs to reduce their social functions and detach their schools.[13] The result was that ownership of most vocational schools was ultimately transferred to the MOHRSS or the MOE.

In other words, after the 1990s, the MOE and the MOHRSS own most, if not all, public vocational schools in China. But many schools could, to varying extents, retain their connections with those founder SOEs, many of which are still the leading firms of certain industries. Such

[12] http://politics.people.com.cn/GB/1025/9893075.html, March 5, 2017
[13] http://www.gd.lm.gov.cn/gdlss/zcfg/zc/zypx/zypxjggl/t20000316_3701.htm, March 5, 2017

cases are most frequently seen in relatively centralized sectors, with SOE-dominated or even oligopolistic structures, e.g. telecom, construction, railway, and marine transportation. Consequently, many Chinese vocational schools fall into an industry-focused model where their development and revenues considerably rely on these leading firms and their subsidiaries and suppliers.

Ownership

Ownership itself does not directly lead to the emergence of any pattern, but it is often associated with the other three factors noted above. Privately owned vocational schools often find themselves in a condition of what I call "triple scarcity," i.e. lack of state support, industry cluster embeddedness, high state and social recognition, or historically rooted major industry connections, and therefore have to at times resort to labor-selling businesses to make up the extra costs in their student recruitment processes. In the China context, private schools typically do not have comparable state support or inherited SOE connections, and tend to be less socially recognized than public schools. Alumni endowment that is an important revenue approach of American private schools is not a reliable tradition in China, and those limited endowments are concentrated in universities and academic colleges (also mostly public ones). We therefore expect private ownership of vocational schools to be associated with the labor agency model.

Methods

I studied 25 vocational schools in Guangdong Province during my two-month preliminary research in 2014-2015 and one-year intensive fieldwork in 2015-2016. I chose

Guangdong for two reasons. First of all, Guangdong is an information-rich case (Patton 1990) with regard to diversified VET scenarios. It is not only a most industrialized province in China with both high-end and low-end manufacturing and service industries clustered in its major cities, but also the biggest vocational education province, hosting 574 vocational schools and 243 technical schools that respectively account for 6.4% and 8.6% of the total numbers in the country in 2014. 2.7 million students enrolled in these schools in that year, accounting for about 10.6% of the national total (See, Table 3). We therefore expect to see more dynamic scenarios of school-firm collaboration in Guangdong than other provinces. In addition, Guangdong is where many of the above mentioned authors have conducted their studies. It is reasonable to update their theories based on research in the same political economic context.

Table 4 lists the 25 schools that I have studied. As shown, this list has covered both vocational schools and technical schools. Within each type, I selected at least one high-end, one mid-range, and one low-end school, based on their training effectiveness, funding sources, graduates' skill levels and job-market scopes, as well as official and social recognition. This approach enabled me to compare different types of schools as well as identify common themes. Also, these schools are located in a wide range of cities within Guangdong, from the most industrialized areas such as Guangzhou, Shenzhen, Dongguan, Foshan, and Zhuhai to the least developed areas like Qingyuan, Zhanjiang, and Zhaoqing. It is noteworthy that the high-end schools are not necessarily located in the most advanced cities, although local government support does play an important role in a school's development, as I will show. In addition, Guangzhou, as the capital city and education center of the province, hosts the most and also many of the high-end schools.

Table 4. Schools Studied by Cities

	Developed Areas					Less Developed Areas		
	Guangzhou	***Shenzhen***	***Dongguan***	***Foshan***	***Zhuhai***	***Qingyuan***	***Zhanjiang***	***Conghua***	***Zhaoqing***
High-end	GDPST (MOE) I GDIP (MOE) I GZPYP (MOE) I BYTCBT (MOHRSS) I GDMTC (MOHRSS) I	SZP (MOE) I		SDLVTS (MOE) III		QYP (MOE) III			
Mid-range	GDCP (MOE) II GZHSC (MOE) II GZRP (MOE) II GDCP (MOE) II GDMEC (MOE) II GZVSLI (MOE) III GDLNCIC (MOHRSS) I GZTC (MOHRSS) III		DGEES (MOE) III	SDVTS (MOE) III			ZJHS (MOE) II		ZQMC (MOE) II
Low-end	GDVCPT (MOE) II GZIT (MOE) III		Anonymous (MOE) IV		ZHHS (MOE) II			GZCHTS (MOHRSS) III	

Note: I, II, III, and IV correspond to skill development models in Table 5. See the interview list for full school names.

Data

This paper draws on three types of data generated from the field research. The first consists of 322 interviews with various stakeholders of the VET system. In particular, the 200 in-depth interviews with presidents, administration, teachers, students, and parents from 25 schools constitute my major information resource for understanding daily operation of Chinese vocational schools. My interviews with officials from the MOE and the MOHRSS, and their local branches not only granted me a useful overview of the VET landscape in both China and Guangdong, but also helped identify and connected me to representative school cases across different levels. Beyond that, the state itself is an important stakeholder of the VET system whose roles were also probed into through conversation. Likewise, existing literatures have spent great efforts to examine schools' collaboration with firms as an important approach to vocational education. I therefore also conducted interviews with managements, firm-level union officials, and workers/trainees from 21 firms to examine their important input. In addition, I interviewed officials from 12 other relevant organizations including local official unions, think-tank organizations, NGOs, employer associations, and academic institutes who provided useful supplementary information. Some of the interviews took place during group meetings, which is very common in China. Individual and group interviews last two hours on average.

Second, further exploring the linkages between vocational schools and relevant stakeholders, I have engaged in tremendous participant and non-participant observation over their continuous interaction. I achieved this via two primary ways. First, I was allowed by government officials and school presidents to attend various public and nonpublic meetings, informal conversations, and dinners – a typical way of informal communication in China. I also participated in two VET reform projects in Guangdong. Throughout late 2015 and early 2016, I

served as an external consultant for the curriculum reform in Guangdong's beauty sector. And during April 2016, I was invited to be a translator for a team of British consultants for the MOE's apprenticeship reform. These experiences allowed me to gain valuable insider information regarding how VET practitioners strategically link schools' daily operation with those stakeholders' various activities and innovative initiatives.

Last, I have collected a considerable amount of secondary data to supplement these primary information resources, including relevant state policies, internal documents of governments, schools, and firms, and internet-based resources such as background information of schools and firms that I studied, and important news and reports. These secondary data not only prepared me for better and more strategic interviews, but also served to cover information that my process tracing through interviews could not yield.

Four Skill Development Models in Chinese VET

The Chinese VET system has demonstrated great variation across schools. I found that vocational schools in Guangdong converge into four distinctive skill development patterns based on a school's training effectiveness and funding sources, and its students' skill level and job market scope. Table 5 summarizes these features of the four models, and I examine these models in turn below.

Table 5. Skill Development Models of Vocational Schools

Model	Training Effectiveness	Skill Level	Job Market Scope	Funding Sources
I. High Performance Comprehensive	High	High	High-end firms around the country, schools, and research institutes	High or regular tuition, and state funding
II. Industry-focused	Medium	Medium-high	Local (provincial) firms, and research institutes	Regular tuition, state funding, and non-degree training revenues
III. Local Market-oriented	Medium	Medium-low	Local (municipal or provincial) firms	Regular tuition, and local state funding
IV. Labor Agency	Low	Low	Local or nation-wide, but low-end firms	Internship and labor dispatching commission, low or zero tuition

High Performance Model

The first is what I call the high performance model, where schools are able to target relatively high-end job markets and secure high tuition and/or state funding by providing high training effectiveness and levels of skills. Schools falling into this category have historically achieved great performance in these aspects, and are deemed "national key schools" that have gained great state support and social recognition. More importantly, these schools have been able to reproduce this high recognition overtime, further securing sustainable high performance.

A school under this model can equip its students with high levels of skills, who are often employed by high-end firms across the country on relatively high-skilled jobs. Some excellent students are seen to work in research institutes and other vocational schools. Guangdong Machinery Technician College falls into this category in my definition, and they have a tradition

of training top-notch students to participate in national and international level skill competitions. In the 43th WorldSkills Competition in 2015, players from this school won five medals including three of the five that the Chinese delegation won in total. Four of the five medal-winners were retained by the school as teachers, while the other one (a champion) was eventually hired by the China Institute of Air to Air Missile. The school president told me:

> We have many other students that also received training but did not participate in the final competition. They are excellent too. Many of them went to other schools as teachers. These students have systemic knowledge, consummate skills, and higher levels of work ethics and passion. Even if going to firms, they work on key technical positions (II: 189).

Although not every student receives this kind of training, it indicates the high level of training effectiveness of the high-performance schools in general.

Given the wide social recognition, schools under the high performance model have a steady supply of students, and are therefore well funded by student tuition. Baiyun Technician College of Business and Technology is one of the best private vocational schools in China, and has indeed been ranked the top one technical school in Guangdong by the Guangdong Department of Human Resources and Social Security for many years, overriding all public schools. An important and most striking evidence for Baiyun's success is its much higher tuition than public schools. While the state stipulates tuition of 3,500 yuan/year for public vocational schools, Baiyun charges between 11,500-14,000 yuan/year. Even though there are quite many public schools available for students, Baiyun has been able to secure sufficient student supply despite the high tuition. A Baiyun official proudly explained to me why they are able to do so without conceding on enrollment:

> This is a word-of-mouth thing – the result of our great efforts on students' employment outcomes and career development. There is no prize that can be compared with the students' word-of-mouth marketing (II: 191).

My interview with a second-year Baiyun student in the architecture department confirmed this word-of-mouth marketing, and revealed how the school is able to reproduce that social recognition, as well as students' willingness to pay for that. When asked why he chose Baiyun regardless of its high tuition, the student said:

> This school has conditions that are worth (the high tuition). I asked many senior fellows (before coming, and they said) as long as you want, you will be able to find better jobs than other schools… The school recently offered the XXX technology course, which is a cutting-edge and the latest construction-estimating program in China. The school offers this course to enhance our job-market opportunities (II: 197).

High-performance schools offer comprehensive subjects, often targeting high-end industries and cutting-edge technologies. Within only four months in 2013, Baiyun established one of the few 3D printing programs in Guangdong. As an emerging industry in China, 3D printing is high-tech and expensive. An industry-used 3D printer costs from tens of thousands to millions of yuan. Baiyun have established two practical centers with 35 such printers plus 5 scanning systems, in collaboration with two major printer providers in Guangdong. Their graduates are nowadays seen to be working in R&D, sales, technician, and administration teams in various 3D printer firms.

Baiyun's achievement indicates that private ownership in not incompatible with a high-road approach to vocational education, although a lot of the low-end labor agency model schools, as I show soon, are also privately owned. I found that Baiyun's internship programs are much regulated, and "labor selling" behavior does not exist here. Their agreements with collaborative firms have stipulated a number of requirements regarding the use of student interns: First, interns have to be put on positions relevant to their specialties. No assembly-line work is acceptable. Second, overtime work is only acceptable in occasional and justified cases. Finally, the agreements also clearly stipulate the stipends/wages, career development paths, as well as

insurance and other welfare benefits that firms should offer. Beyond these, the way that the school takes care of their student interns was quite surprising to me. A department head, Mr. Mo introduced:

> If a student does not like the intern position, we can change for him/her. If a student feels that this position is not suitable for his/her development, s/he can require change. (Author: how often does that happen?) Quite often indeed, I have tried to do this for some students five or six times. They just came back, not satisfied with the job. We communicated, tried to make it up, and got new positions for them… This is the baby-seating job that we have been doing, and the service we provide for such high tuition (II: 193).

Public schools cannot exceed state tuition standards, but high-performance public schools have privileges over private and other public schools in that they can secure more state subsidies and various other resources. Mo compared themselves with peer public schools:

> Nowadays state support for public schools is quite considerable, but that for us is different. For instance, some special funding for practical center building can offer them 100 million yuan, but when it comes to us, it may be 10 to 20 million. That is enough for them to purchase 10 to 20 German CNC machines, but only one or two for us (II: 193).

In exchange, the state expects public schools to be cooperative in various projects that the state occasionally initiates. In 2000, VW started to establish their fourth China-based assembly plant in Foshan, investing in the first cycle 13 billion yuan as well as the latest and most advanced technologies. 4,000 skilled workers were expected to be in need by 2013 when the factory was designated to be in operation at its full capacity. They resorted to the local state for help. This challenging but also much admired opportunity was introduced to four best local public vocational colleges in Guangdong including Guangdong Industry Polytechnic. A school official, Mr. Jie, said that they "appreciate this opportunity for students to enhance their skills and improve their incomes" – After all, "there are not many firms as good as VW in China" (II: 8). My personal observation of this VW factory confirmed this comment. The workshops are

equipped with high levels of automation, advanced robots, and other latest technologies, much better than a VW Germany-based factory, as well as many other Japanese carmakers' workshops that I have visited.

These students were sent to receive training in Changchun in Northeast China – where VW's first joint venture (JV) plant in China is located. Jie recalled:

> We recruited over 100 (third year) volunteer students to do internship in VW's HQ in Changchun… Throughout the six years' collaboration from then on, we have in all supplied them with over 2,000 students. The Changchun factory is more developed. Just like a training center, experienced workers guide freshmen there. And then students were sent back to the Nanhai factory… About 800 students were eventually retained. The school spent a lot of money on this, mainly to subsidize teachers that go with the students. They (VW) did not give us any money (II: 8).

According to my interview with a VW manager, these retained workers have been put on various positions, mostly as welders. Their initial wages range between 8,000 and 9,000 yuan/month in addition to very generous year-end bonuses. In comparison, Foshan's minimum wage in 2014 was only 1,310 yuan/month, indicating high-performance school graduates' extraordinary job market achievement.

Industry-focused Model

The second model that many schools adopt is what I call the industry-focused model. A school under this model has specialized expertise in a certain industry based on its historically rooted connections with state administration and leading state-owned enterprises (SOEs) in that sector. These connections are an institutional legacy of this type of schools that were established by state ministries with authority over key industries under the socialist centrally planed economy as noted. Many schools have – to varying extents – retained their strong connections with those industries and leading SOEs, as well as the tradition of specialized education and

training for those sectors. These connections also enable schools to integrate up-do-date technologies and know-hows into their trainings.

Guangdong Vocational College of Post and Telecom (GDCPT) is a telecommunication industry-focused vocational school. Founded in 1949, the school was initially tasked with the mission of training specialized talents (technicians and managements) for the industry under the centrally planned economy. From the 1950s to the 1990s, the school served as a technician and cadre school for the former Guangdong Post and Telecom Bureau. This sector underwent a couple reforms from the late 1990s on – the separation between the post and the telecom sector, and in 2000 the transformation of the telecom industry from a state ministry into a monopolistic Guangdong Telecom Corporation. Today, this corporation has retained its ownership of the school, different from many other sectors, but the education affairs of the school are administered by the MOE. The school currently has four departments: Information and Communication Engineering, Mobile Communications, Computer Science, and Economics and Business, indicating its strong telecommunication industry focus.

Consequently, intensive knowledge exchange regularly takes places between the school and the telecommunication industry. On the one hand, the school offers a lot of customized non-degree training for firms in the industry. Industry-focused schools are mostly, if not none, public, such that they cannot charge higher tuition, but non-degree industry-focused training has become an important approach to revenues for this type of schools. In 2008, the GDCPT founded a training company, providing state agencies, SOEs, MNCs, and other private firms with non-degree training services. Nowadays, the school trains over 300 thousand person-days a year, with yearly revenues of over 100 million yuan from this business.[14] On the other hand, knowledge and

[14] http://www.gupt.net/?CorporateTrain/Business/Business_B/, April 2, 2017

technology are transferred from leading SOEs to schools. Since 2004, the GDCPT has established six firm-based practical centers including one with the Guangzhou Post Bureau, and another one with Guangdong Telecom. These leading firms have also dispatched 80 of their senior technicians and engineers to work part-time in the school as guest teachers.

Industry-focused schools are most frequently seen in relatively centralized sectors dominated by several leading or even oligopolistic firms. In the GDCPT case, telecommunication is an extremely centralized industry where the "Big Three" including China Telecom dominate the industry nowadays, whereas the post sector is still by and large state-monopolized. China Telecom and China Post and their subsidiaries and suppliers are long-term partners of the GDCPT. Guangdong Communication Polytechnic (GCP) was founded in 1956 by the former Guangdong Department of Communications, so that it has inherited not only its connections with both the railway and marine transportation sectors that are by and large SOE-dominated, but also expertise on both transportation management and infrastructure building. In addition, foreign and domestic carmakers, as well as their JVs have historically gained connections with this polytechnic. The school thus also has an automobile department that maintains extensive collaboration with major carmakers and part suppliers including BMW, Bosch, Nissan, and Toyota.

Graduates from industry-focused schools are consequently equipped with relatively high skills and consummate knowledge of a particular industry, and can often find jobs in that sector. In 2016, 61.5% of GDCPT's graduates were employed in the telecommunication and its highly related IT industry. Top-ten employers all belong to the telecommunication sector, most of which are Guangdong Telecom's subsidiaries and suppliers. As an industry-focused school often represents the highest level of vocational education of a sector, it can generate top-notch students

that achieve high-end job markets. Professor Guo from the auto department of the GCP related to me:

> We have students that went to work in research institutes. This is not a typical case in other schools' auto departments… For instance, we have students hired by the Guangzhou Automobile Group's Institute of Automobile every year. (Author: what skills of our students do they appreciate?) I think it is their strong manual skills. Even the R&D of auto products needs people to perform many such practical tasks (II: 88).

Local Market-oriented Model

The third pattern is the local market-oriented model. Schools here demonstrate more flexibility than those under the industry-focused model in terms of specialty and curriculum development without constrained by any historically rooted industry legacy. But their training effectiveness and thus students' skill levels are not as high as the above two types of schools also due to the absence of those connections with leading firms. Students' job market scopes are by and large within the city or district a school is located. Schools therefore follow very pragmatic and market logics, focusing on employment outcomes in local job markets. Consequently, local product market structures, especially local industry clusters, greatly shape the development of these schools. Market logics tend to underlie schools' short-term behaviors, however, potentially including running labor agency businesses. Therefore, another important factor at work here (to differentiate from the labor agency model) is the local state support and strategies that help to avoid these short-term behaviors.

To begin with, industry clustering often facilitates the emergence and reinforcement of local market-oriented schools. Dongguan is probably the best illustration of this phenomenon in Guangdong. An earliest and most industrialized city in Guangdong, Dongguan's industrialization process during the past decades has resulted in and featured industry agglomeration, where major industries cluster in its 32 towns and an industrial park. Large-scaled and well-known industry

clusters include the apparel town named Hu'men, the knitwear town Dalang, the automobile town Liaobu, the furniture towns Houjie and Dalingshan, the mold towns Chang'an and Hengli, and the electronic towns Tangxia, Shijie, Shilong, and Chang'an. Dongguan's VET system, consequently, has been historically integrated into these local industry clusters. By 2012, 18 MOE schools had emerged in Dongguan, mostly located in industry towns instead of the central city districts (which is a typical case in many other Chinese cities). Table 6 has a list of these schools and which industry cluster/town they each belonged to before 2012. As shown, 11 of these schools were located in major industry clusters, each receiving funding from the respective town-level education bureau, and had a strong expertise and educational focus on the local industry cluster.

In the late 2000s, however, the DGBOE observed a phenomenon that local vocational schools started to establish many "fast food" specialties, including accounting, management, and other business administration subjects. These specialties are at low costs of the schools compared with traditional manufacturing subjects that entail tremendous investment in equipment purchasing and practical center building. These new subjects are gaining growing importance given the deindustrialization process in the Pearl Rive Delta area throughout the past decade, admittedly, but it became a reasonable concern of the DGBOE that schools were prompted to do so only for "cost-efficiency" reasons. A DGBOE official, Ms. Zeng, related to me:

> Schools did this on the one hand to save money. On the other hand, it is appealing to parents who often belittle blue-collar workers. But graduates from these specialties cannot find high-skilled jobs. Accounting students, for instance, mostly end up working as cashiers in supermarkets. Also, development of local industries needs skilled workers (I: 11).

Table 6. Dongguan Vocational Schools and Industrial Clusters before and after 2012

Before 2012	After 2012	District/Town	Industrial Cluster
School of Business and Economics of Dongguan	School of Business and Economics of Dongguan	Guancheng (central district)	
Dongguan Vocational & Technical School			
Dongguan Sports School	Dongguan Sports School	Dongcheng (central district)	
Dongcheng Vocational & Technical School	Dongguan Commercial School	Dongcheng (central district)	
Nancheng Vocational & Technical School		Nanchen (central district)	
Dongguan Health School	Dongguan Health School	Daojiao	
Dongguan Science & Technology School	Dongguan Science & Technology School	Hengli	Plastic mold manufacturing
Humen Weiyuan Vocational School	Dongguan Textile & Fashion School	Humen	Apparel manufacturing
Dalang Vocational School		Dalang	Knitwear manufacturing
Houjie Technical School	Dongguan Light Industry School	Houjie	Shoes and furniture manufacturing
Chang'an Vocational School	Dongguan Electromechanics Engineering School	Chang'an	Electronics and metal mold manufacturing
Tangxia Science & Technology School	School od Electronics & Technology of Dongguan	Tangxia	Electronic manufacturing
Changping Huangshui Vocational School	Dongguan Electronics & Commerce School	Changping	Logistics and e-commerce
Shijie Vocational School	Dongguan Information Technology School	Shijie	Electronic manufacturing
Shilong Vocational & Technical School		Shilong	Electronic manufacturing
Mayong Vocational School		Mayong	
Liaobu Vocational & Technical School	Dongguan Auto-Technology School	Liaobu	Automobile manufacturing
Dalingshan Vocational & Technical School	Dongguan Furniture School	Dalingshan	Furniture manufacturing

Here we see important local state efforts that aimed to further strengthen the ties between local vocational schools and the industry clusters they serve, and avoid schools' short-term behaviors. In 2012, the DGBOE enforced a local VET restructuring and consolidation reform, reintegrating the 18 schools into 13, and enhancing the expertise of each school on its focused industry. Zeng continued:

> We reintegrated and renamed some schools, to enhance their local industry focus, and got rid of several "fast food" specialties. The bureau gave them money. We allocate a special funding of 30 million/year for schools' equipment purchasing, but only for their industry-featured specialties in order to encourage them to reform (I: 11).

Table 6 compares vocational schools in Dongguan before vs. after 2012. The result of this reform, as indicated, is that local vocational schools now each have an even neater industry focus, and even deeper integration with the local industry cluster.

A school under the local market-oriented model is less able to receive national and provincial level government resources compared to the above two models, but can be even better funded than those schools if it is within a relatively wealthy city or district, as demonstrate by the Dongguan case. However, some schools may be in less developed areas but enjoy equally strong local government support. Qingyuan is one of the least developed cities in Guangdong, featuring a substantial component of agriculture in its economy. The Qingyuan government, however, has been impressively supportive for VET development. By offering generous support in various forms, the Qingyuan state encourages local schools to adapt their curricula to better serve the local industry. In Qingyuan Polytechnic, school officials appreciate the generous support from the Qingyuan Bureau of Education, and in return, they are motivated to establish specialties that are compatible with the local industrial structure, such as a featured Agricultural Technology and Management specialty.

Schools under this model generate graduates with middle-level skills that can secure themselves relatively good jobs. In Conghua Technical School that I have categorized into this pattern, I interviewed the recruiting manager of Gree, Inc., one of the biggest electric appliance manufacturers in the world. Gree's HQ recruits students from the school on a yearly base. The manager told me:

> Our HQ factory has full production chains, but students will not be working on assembly lines. What we need are: First, students in Molding will work in our molding workshops; Second, students in Refrigeration will work on refrigeration detection or assistant refrigeration R&D jobs; Mechanics students will work in our Institute of Electromechanics, the Institute of Automation, or the Automatic Equipment Manufacturing Department, all relevant to their specialties (III: 1).

Labor Agency Model

The last is the labor agency model. This is the stereotype of Chinese vocational schools in literature. But I found that in Guangdong only a small number of schools, typically poorly funded private ones, fall into this category. These schools are under "triple scarcity" – They lack historically rooted industry connections (as in the industry-focused model), strong state support (as in the local market-oriented and the high-performance model), or high social recognition (as in the high performance model). They rarely receive additional state subsidies, as those resources typically target high-ranked and lean toward public schools. Neither is there any institutional legacy – social recognition or industry connections – for them to derive success from. Consequently, these schools cannot deliver effective training processes, and their students thus cannot acquire adequate vocational skills and decent jobs. The result is that schools are faced with insufficient supply of students, and therefore often have to offer lower than state-stipulated tuition in order to encourage enrollment. These schools are therefore further deprived of resources for improving their training capacity, and at the same time, have to very often resort to

"selling" these students as cheap labor to low-end firms for illegal commissions in order to make up that tuition loss, stuck in a vicious circle as a result.

These schools have employed all kinds of strategies in order to attract students, including offering reduced or even zero tuition. Sometimes they give a considerable proportion of student tuition to teachers or other agents as commissions in order to encourage them to find students. These extra costs in the student recruitment process add to their already quite heavy financial burdens. Schools thus resort to certain forms of labor agency businesses in order to make up that loss. A frequently used strategy has been documented by literature, i.e. sending student interns as cheap labor to involuntarily engage in low-skilled, mostly assembly-line jobs in mass production factories, in exchange for commissions from these employers that are faced with labor shortage and high worker turnover. Further, although state regulation bans vocational schools from doing so, some private schools are seen to send student interns to firms in their second year. This practice compresses schooling time, rendering the training process even more ineffective and meaningless. Not equipped with sufficient skills, second-year student interns very easily fall on low-end operational jobs.

Both central and Guangdong local governments are aware of this phenomenon. In Dongguan, for instance, the DGBOE has devised two strategies to tackle this problem. First of all, they limit the tenure of internship – for public schools, three to six months at maximum; for private schools, no more than a year – and forbid schools from sending student interns in their second year. At the same time, they offer private schools more funding. While state-subsidized tuition only covers the first two school years according to the central policy, the DGBOE offers one additional year tuition-subsidy. An interviewed official of the DGBOE related to me:

> The state's support for private schools is not that big. They largely rely on tuition for operation… Many of them used to sell first and second year students to factories as

> interns, while we have completely forbidden this behavior. Any school that is found to do so will immediately lose their license (I: 11).

While it is unclear to me if these strategies have completely eliminated the "labor-selling" phenomenon in Dongguan private schools, it indicates that local state strategies and support can serve as important forces to prevent vocational schools from conducting short-term behaviors and running labor agency businesses.

Indeed, labor agency schools are more frequently seen in inland provinces that are less developed, with surplus labor from the agricultural sector who typically lack accesses to industrial jobs in East China. Private schools under the labor agency model have thus emerged in these areas. Many middle school graduates who have decided not to continue to pursue higher education but are still under legal working age of 16 end up recruited and eventually sold to sweatshop factories in East China industrialized cities.

As shown, Chinese vocational schools differ from one another with regard to levels of training effectiveness and primary funding sources, and students' job market scopes and skill levels. Cases presented have demonstrated that this variation is linked to four explanatory factors, namely local state support and strategies, local industrial structures, a school's institutional legacies, and its ownership. Table 7 summarizes these factors and their variation across four skill development models. I now turn to a discussion of these factors and how they account for the emergence of distinctive skill development patterns in China.

Table 7. Factors that Account for Variation in Skill Development

	Institutional Factors		**Organizational Factors**	
	State Supports and Strategies	*Local Industrial Structures*	*Institutional Legacies*	*School Ownership*
High Performance	High national and local supports, and having VET lead local industrial development	Cutting-edge industry influenced	Social reproduction of high state and social recognition	Public or private
Industry-focused	Medium-level state support	Single industry focused	Industry and leading SOE connections	Most, if not all, public
Local Market-oriented	High local state supports, and localization strategy of the state	Local industry cluster embeddedness	Local reputation and industry connections	Public or private
Labor Agency	No or little state support	No industry cluster embeddedness	No industry connections beyond "labor trading"; low social recognition	Most, if not all, private

Note: shading-highlighted cells represent dominant factors in the formation of a certain model

Discussion

In contrast to what the literature has presented, my investigations find considerable variation in vocational schools' operation that was previously unknown to scholars. I argue that the combination of dominant institutional and organizational factors a school is endowed with influences its skill development pattern, and variation across schools in these endowments leads to the variation in their skill development models. I also argue that factors at work include institutional contexts such as state support and strategies, and local industrial structures, as well

as organizational endowments like institutional legacies and ownership. The evidence from the 25 Guangdong-based vocational schools, described above, provides support for these arguments.

As examined above and summarized in Table 5 and 7, the skill development approaches in the 25 schools exhibit different patterns. Although these patterns are a product of unique historical, economic, and political circumstances, their basic contours reflect the interplay of four important institutional and organizational factors whose relative influence varies across schools. As Table 7 shows, the four skill development patterns reflect combinations of institutional and organizational factors, as well as the dominance of specific factors. Dominant factors at work for each model are highlighted in the table.

I find that *high performance* schools are characterized by a high level of training effectiveness, whose students are equipped with relatively high skills. Graduates from these schools find themselves working in high-end firms as technicians, managers (after several years), or performing teaching and research tasks in other vocational schools and research institutes around the country. In return, high-performance private schools can charge tuition higher than state standards but still secure sufficient student supply. Public schools cannot do so, but receive generous state financial support for their high-end approach to VET.

The dominant factors here are a school's high social recognition, and high state support that is also somewhat associated with its reputation. This high reputation is socially reproducible and thus can sustain a school's high performance; It also poses an obstacle to other schools that strive to catch up. This is consistent with a major latecomer disadvantage in the strategic management literature (Lieberman and Montgomery 1988; Barney 1991) that "the rich get richer, and the poor get poorer" (Corley and Gioia 2000). Because these schools target national and provincial level job markets, they are less influenced by local industrial structures, and therefore

often offer comprehensive subjects. But cutting-edge industries assert themselves in these schools' development in that schools often offer up-to-date subjects consistent with the latest industrial development trends in order to maintain their top-tier positions.

The *industry-focused* model represents a contrast in that sense. These schools focus their subjects largely on a certain industry (or its highly related industries). Their training effectiveness can be very high, and sometimes represent the highest level of skills in that particular sector due to their historical connections with leading firms of the industry. Graduates are recruited by those leading firms and their subsidiaries and suppliers. Most if not all of these schools are public ones, such that they cannot charge tuition higher than state standards. But a very important revenue approach of these schools is non-degree training for the industry.

These features are derived from an important institutional legacy of industry-focused schools. Established by industry-focused ministries in the socialist centrally planned economy, these schools have, to varying extents, retained their historical connections with those industries, especially leading SOEs. They have therefore inherited various resources regarding employment, technology, and expertise, as well as their roles as external training institutes for these firms, although most of them had formally detached from those firms by the beginning of the 21st century.

Local market-oriented schools are middle-range or low-end schools. Their key difference from high-performance schools is the lack of a widely recognized fame. As a result, they target only regional (city and district mostly, sometimes provincial) job markets, and focus tremendous efforts on local labor market outcomes. They typically do not target cutting-edge industries and unique talents production, but aim to prepare middle-range workforce that are immediately and most useful for local firms. These schools are therefore very flexible with their specialties and

curricula, demonstrating a significantly higher level of local market orientation than the above two types.

Local industrial structures are often reflected in these schools' specialty and curriculum development. Historically, many such schools emerged in and became well integrated with regional industry clusters, and developed their expertise that is focused on and informed by that industry. Another important factor is local state support and strategies. As shown in the Dongguan case, the city educational bureau used both administrative power and economic incentives to reinforce local vocational schools' ties with corresponding local industry clusters. But even in cities without significant industry clustering, e.g. Qingyuan, local state support often motivates schools to serve the local dominant industry needs. In addition, local state support helps avoid various short-term behaviors of schools. Every middle-range or low-end school has an instinct for local market orientation, which potentially leads to various short-term behaviors, but it is the local state support that often prevents them from falling into a labor agency model and conducting unjustified labor-selling behaviors.

Finally, *labor agency* schools feature both low-end training and labor selling behaviors. These schools fall on the bottom proportion of a school ranking in terms of training effectiveness and students' skill levels, but they are categorized into this type also because they engage in businesses of selling student interns and graduates to low-end firms as cheap labor in exchange for illegal commissions. Because many of them send students to work in their second school year, further compressing the already ineffective schooling process, these schools' major labor market function is labor dispatching rather than education. It is better to describe them as quasi-labor agencies therefore, and their products as cheap labor instead of useful skills. Some schools in Guangdong are known to conduct these behaviors, but most frequently such schools are seen in

hinterland China to engage in inter-province labor selling activities. Indeed, Smith and Chan (2015) and Su (2010-2011) in their Foxconn-centered project only identified student interns from inland China including Henan, Anhui, Hubei, Sichuan, and Guangxi.

These schools are mostly poorly funded private schools that are trapped in a "triple scarcity" situation, lacking support from either national or local governments, lacking historically rooted connections with key industries or regional industry clusters, and lacking reproducible social recognition. They rely on student tuition as the primary funding source, but due to low reputation, bear significant extra costs in order to secure student supply, often having to offer lower or even zero tuition to encourage enrollment. They therefore have to resort to student selling businesses to make up that loss. To be sure, private ownership is neither a necessary nor a sufficient condition for the labor agency model. Baiyun represents a scenario in which private schools have successfully used market mechanisms to achieve a high-performance model. And in relatively less regulated areas in inland China there must be cases where public schools engage in labor selling conducts too. I find that most labor agency schools in Guangdong are privately owned, however. This is likely because private ownership tends to be associated with the above-mentioned triple scarcity; Private schools typically do not have comparable state support or inherited SOE connections, and tend to be less socially recognized.

The literature has revealed several important problems existing in some Chinese vocational schools, including low training effectiveness, and unjustified intern selling businesses. Although most schools I studied in Guangdong do not conform to the labor agency behavioral pattern as suggested, I do agree that there is space for Chinese vocational schools to improve training effectiveness, and their internship programs in general need to be better regulated – more so in some schools and less so in others. Even in the much-admired German apprenticeship

system, employers are often found to abuse the firm-based part of the training, and assign apprentices with various tasks "non-related to stipulated training agendas," and there is wide concern about the training quality as well.[15] German people have for long been struggling to find ways to remedy their system through various forms of state and social governance, but these problems have not prevented the German system from becoming an exemplar national skill development model. In fact, as media reports became widely reprinted and spread across the Internet, the MOE and the MOHRSS together enforced a series of policies in 2016 to regulate the use of student interns. Although the effects of these regulations are still to be examined, a more comprehensive view over the Chinese VET system should not be overlooked, and is indeed indispensible for elucidating several feasible pathways toward upgrading labor agency schools into more advanced models – generous state support and strategies, and leading firms' input have been suggested in this paper.

Conclusion

I have developed a framework that focuses on the underlying institutional and organizational factors that shape skill development patterns in different Chinese vocational schools. I argue that skill development models – in the China context – reflect a combination of two institutional and two organizational factors that a school is endowed with, namely state support and strategies, local industrial structures, a school's institutional legacies, and its ownership. Case studies of 25 schools in Guangdong demonstrate that the relative importance of

[15] See the DGB (German Confederation of Trade Unions) 2016 Union Report, Ch.3 and following, available at: http://www.dgb.de/presse/++co++2d7d8286-6f95-11e6-8e3e-525400e5a74a, March 20, 2017

these endowments vary across schools. Typically, it is one or the interplay of two factors that act as dominant factors that determine the emergence of a pattern. The cases also reveal that different combinations of factors lead to differences in skill development. Four distinctive models were identified: high performance, industry-focused, local market-oriented, and labor agency.

This framework has enabled me to fill an important research gap in scholarship on the Chinese VET. The limited and somewhat biased labor-agency stereotype on Chinese vocational schools has hinted variation across schools that is previously unknown to scholars, and left open the research question what factors explain the potential variation. I find that substantial differences exist in Guangdong regarding a school's training effectiveness and funding sources, and its students' skill levels and job market scopes. Some vocational schools fall into the labor agency pattern, consistent with the existing stereotype, but most schools do not conform to this behavioral mode. Rather, those schools have adopted relatively advanced but also different skill development patterns that are beyond this model.

This research is geared to break the stereotype on the Chinese VET system. But it is noteworthy that by identifying four skill development models, I have no intention to impose another stereotype, or a set of stereotypes, on Chinese vocational schools. The taxonomy represents a wide spectrum of vocational schools that I have studied in Guangdong, but given the regional variation in Chinese industrial development and local state strategies, the VET system in China should also demonstrate local characteristics. The Guangdong experience allows me to show the existence of variation, and provide a preliminary explanatory framework for that variation, but the nuances within the Guangdong system that I have suggested are subject to more empirical tests based in other areas. Future research is encouraged to identify and compare

potentially different skill development patterns in elsewhere China, as well as unique factors that account for that variation. Indeed, both Chinese (Cooke 2005; Durden and Yang 2006; Lai and Lo 2006) and Westerns literature (see Ashton, Sung, and Turbin 2000 for a review) have by and large focused their efforts on national skill development system analysis. This literature absolutely offers great insights especially from an international comparative perspective, but I encourage skill development scholars, especially those that focus on relatively decentralized systems like the one in China, to endeavor to capture and explain important subnational variation.

CHAPTER 3

EXTERNALIZING INTERNAL LABOR MARKET PRACTICES: "Training for a Targeted Brand" in Chinese Vocational Schools

Introduction

It is widely consented that China has witnessed the emergence and continuing expansion of secondary labor markets ever since the economic reform at the end of the 1970s. What Friedman and Lee (2010) called a "casualization of employment" process took place in China via various reforms in the state-owned as well as private sectors. Gallagher, Lee, and Kuruvilla in their edited volume (2011) further noticed several striking changes, including the rapid expansion of the non-state sector, reduced job security for state workers, the emergence of an informal sector, and the growing use of agency workers that further split the Chinese labor markets into the primary and the secondary sector, the latter often dominated by low-skilled rural migrant workers. Zhou (2013) estimated that 187.97 million Chinese workers are employed in the informal sector in 2009, accounting for 60.4% of the urban workforce. This expansion of the secondary labor market has led to the emergence of various labor market institutions. In particular, with more labor-protective state regulations being enforced from 2008 on, we have seen a rise of the labor dispatching industry in China (Xu 2008). These labor agencies provide employers with relatively low-skilled operational workers for relatively peripheral jobs at low costs (Liu 2016). Liu (2015) found that firms are using labor agencies as a secondary labor market strategy to avoid job security commitment and legal costs associated with internal labor market strategies.

This paper deals with another important labor market institution in China, i.e. vocational schools, which are said to be engaging in quasi-labor-agency businesses. Literature has documented employers' use of vocational school students as a secondary labor market strategy to tackle the local market labor shortage. Student interns are found to be dispatched by vocational schools to work in low-end manufacturing firms in China, engaging in low-skilled operational jobs on various assembly lines (Smith and Chan 2015). In addition, vocational schools themselves are unable to provide students with important market-demanded skills (Cook 2005; Durden and Yang 2006), and therefore run no more than labor agency businesses, trading interns and graduates for unjustified commissions with employers (Su 2010-2011).

Vocational schools have undoubtedly become an important labor market institution in today's China. According to the official data, they have been training increasingly more and four times as many students as academic colleges and universities do. Further, estimated based on a 90% initial employment rate in respective sectors, graduates from vocational schools account for 79% of the newly-added urban workforce, and 51% of the second and tertiary sectoral workforce in 2014. These numbers were only 51% and 21% in 2004.[16] If nearly 80% of the newly-added Chinese urban workforce are trapped in the secondary labor market, as the literature has suggested, who are training skilled core workers for Chinese employers? In addition, the labor agency depiction of vocational schools was based on a research project that focuses on Foxconn. In addition to the obvious industry bias, targeting one single employer, it is unclear if the authors had implemented a plausible sampling strategy on the vocational schools' side.

More importantly, this "labor agency" argument has left a puzzle unresolved, i.e. the external labor market failure. As widely known, the labor shortage in China is by and large a

[16] These estimations are based on data from the China Statistical Yearbook 2004 and 2014.

shortage of skilled workers (Chan 2010; Farrell and Grant 2005; Li and Sheldon 2010), while the demand-supply ratio for unskilled labor in Chinese labor markets are much lower according to the MOHRSS's quarterly labor market reports. Employers' paramount problem would not be solved through working with vocational schools, therefore, if they could expect only cheap labor as opposed to useful skills from schools. But in fact, many employers are engaging in long-term collaboration with schools, and investing tremendously in their training processes (Sheldon and Li 2013; Li and Sheldon 2014). This would not be a cost-efficient strategy, given the much lower costs of acquiring cheap operational labor from labor agencies. Therefore, employers leveraging workers' pre-employment skill development process must be motivated by a mix of various expectations, and beyond the mere demand for seasonal cheap labor.

In this paper, I argue that, instead of a mere secondary labor market strategy, firms' collaboration with vocational schools is a strategy that seeks to externalize their internal labor market practices – in particular, shifting traditionally firm-based training to workers' pre-employment skill formation process – in order to secure both high levels of firm-specific skills (a key advantage of the internal labor market strategy) and flexible employment arrangements (a key advantage of the secondary labor market strategy). I demonstrate this externalization of internal labor market practices through presenting a model of "training for a targeted brand" prevalently existing in Chinese vocational schools, and documenting the antecedents and consequences of this system.

Based on my two-month preliminary (2014-2015) and one-year extensive field research (2015-2016) in Guangdong Province, I found that the emergence of this "training for a targeted brand" model is facilitated by the interaction between the supply and demand side of the local labor market. On the supply side, vocational schools nowadays enjoy tremendous freedom in

carrying out their trainings through the state's decentralization reform since the mid-1980s (see, Ch.1), and therefore can customize their programs based on collaborative firms' specific skill needs. On the demand side, employers have been faced with an increasingly significant skilled labor shortage, prompting them to seek constructive collaboration with vocational schools in order to prepare a reserve of skilled labor ready to work in their workplaces. This collaboration has been prevalently instituted across Chinese industries, and is becoming increasingly attractive to employers as it performs both external and part of internal labor market functions.

My argument runs contrary to the literature on the Chinese VET system that regards employers' use of vocational school students as a mere short-term secondary labor market strategy. I also contribute to the internal labor market literature through a discussion of employers' strategies of externalizing their internal labor practices.

Prior Literature

Internal Labor Market

The internal labor market literature defines two HR strategies that employers frequently adopt, i.e. internal vs. external labor market strategies. According to early scholars that advanced the internal labor market theory (Doeringer and Piore 1971; Reich, Gordon, and Edwards 1973), there is a major dual segmentation of the labor market, primary vs. secondary. Primary or internal labor markets provide relatively high pay and advanced working conditions, extensive on-the-job training, and job security for core workers, whereas peripheral workers are by and large trapped in the secondary sector and subject to intensive market competition. Skill and

technology specificity, and on-the-job training are critical to the emergence of internal labor markets, argued Doeringer and Piore (1971).

Although this argument turned out to be faced with some empirical difficulties later (Althauser 1989), it has revealed an important fact that skills are a key concern for employers in determining to adopt internal vs. external labor market strategies. Firms use internal labor market mechanisms to offer extensive trainings to secure important firm-specific skills, and high skilled core workforce that are otherwise scarce (Davis-Blake and Uzzi 1993). On the other hand, they offer job security, and internal promotion opportunities to reduce turnover (retain these skilled labor), often with assistance of unions (Knoke and Ishio 1994). A number of important studies later engaged in further identifying more nuanced labor market segmentations, and different ways that the skill level and specificity are associated with different segments (Osterman 1982; Loveridge and Mok 1979; Lepak and Snell 1999), but scholars by and large agreed that internal hiring is associated with firm-specific skill needs of employers (Klein, Crawford, and Alchia 1978; Williamson 1981), while external labor markets very often fail to offer high-skilled labor as well as specific skills (Williamson, Wachter, and Harris 1975).

Emergence of Secondary Labor Markets in China

Since 1970s, with the worldwide pursuit of flexiblization (Piore 2002), scholars have documented a shift of employer HR strategies from relying on internal labor markets toward secondary labor markets, including practices like production offshoring, manpower outsourcing, as well as temp agency recruitment (Abraham 1990; Cappelli 1995). In China there has been a similar tendency of employment externalization. The post-socialist employment relations system reform has featured “casualization of employment” and “breaking the iron rice bowl” (Friedman

and Lee 2010; Gallagher, Lee, and Kuruvilla 2011). This came hand in hand with a fundamental shift from internal to secondary labor markets in employers' HR strategies, evidenced by the shrinking internal labor markets in the state sector, and the emergence and continuous expansion of an informal sector in China. Due to different working definitions being employed, scholarly estimates of the size of China's informal sector vary, but are equally astonishing. Zhou (2013) estimated that 187.97 million workers are employed in the informal sector in 2009, accounting for 60.4% of the Chinese urban workforce. From 2008 on, the increasing legal costs for discharging workers derived from new pro-labor legislations have further prompted employers to resort to secondary labor markets, and their institutions (e.g. labor agencies) to acquire workers (Liu 2015). Researchers have found that the large-scaled and ever-growing labor dispatching industry in China is ready to provide firms with large numbers of operational workers as well as additional employment relations management outsourcing services at very low costs (Liu 2016; Xu 2009).

Vocational schools as secondary labor market institutions: Scholars by and large regard Chinese vocational schools as secondary labor market institutions, and see school-firm collaboration as a secondary labor market strategy of employers, in pursuit of cheap and low-skilled operational labor, as a short-term reaction to local market labor shortage. This depiction has two essential arguments. First of all, vocational schools have failed to be market-oriented, and their training processes are ineffective, therefore generating cheap labor only instead of any useful skills. While a successful VET system in fact must be connected to the market and flexible enough to suit the rapid technological change of the industry (Culpepper 1999a), the Chinese VET system has demonstrated a low degree of this market orientation – According to Durden and Yang (2006), vocational schools deliver programs with only curricula that are

outdated, over-focused on theory, and irrelevant to industry practice, therefore generating graduates that have mastered no market relevant skills. Cooke (2005) documented a mismatch between the demand of skills in the labor market and the supply of skills from vocational schools drawing on secondary data collected at the end of the 1990s. Woronov (2012) argued that vocational schools, instead of providing students with useful skills, carry out a "mimetic labor" process where students use the schooling time only to construct their social subjectivity of employable workers.

The Western experience shows that firm participation is crucial to tackling this discrepancy between VET and industry. The German system has long been deemed an exemplar national VET model. Its much admired apprenticeship system is aimed at integrating in-classroom with on-the-job training so that trainees gain not only general but also firm-specific skills that are immediately useful for prospective employers (Streeck 1992). This system entails effective civil society governance to make sure that employers are willing to participate and fairly share the training costs without discouraged by a potential collective action problem (Streeck 1989). In China, this civil society governance tradition is absent due to "unorganized interests" of private players under tight state control (Zhou 1993). In the perhaps more comparable Singaporean case where civil society governance is also by and large absent, the state assumes a bigger role, but still makes all efforts to motivate firm participation. Through encouraging MNCs to establish training centers, the state makes sure that skills and latest technologies are transferred from foreign firms to the local workforce, and on the other hand these MNCs' local subsidiaries have sufficient labor supply (Kuruvilla and Chua 2010). The rationale underlying both strategies is consistent – to encourage firm participation in the

workforce's pre-employment skill development process in order to make sure that VET processes are able to accommodate industry needs.

Firms do seek collaboration with vocational schools in China, but their aim is said to be quite different, and their input in general limited. This pertains to the second argument of the literature: Schools function as labor agencies, and employers' collaboration with them is very limited, and exclusively a secondary labor market strategy. In general, school-firm collaboration is limited and informal, depending on teachers' personal connections with certain employers (Lai and Lo 2006). Further, this collaboration is regarded as firms' short-term reaction to local market labor shortage. Critical theorists conducted field research in Foxconn – a major electronics manufacturing firm – and found extensive use of student interns as temp workers during peak seasons. Under the name of interns, these students are found to be involuntarily performing assembly-line operational tasks under the dual control of both schoolteachers and firm managers (Smith and Chan 2015). Su (2010-2011) concluded that school-firm collaboration in China demonstrates a dual-commodification of labor and education – Through internship programs, schools provide firms with flexible and cheap seasonal labor as an important approach to revenues. Clearly, this literature implies that working with vocational schools is a mere secondary labor market strategy of employers.

External Labor Market Failure

Scholars have observed an external labor market failure in China ever since the turn of the 21st century. As noted above, external labor markets often fail to provide important firm-specific skills. This applies to various labor market institutions. Labor agencies offer only supplementary and often temp workers (Xu 2008; Liu 2016). Likewise, without sufficient firm

input in VET processes, vocational schools generate only general, and often low skills, as suggested by the internal labor market literature. This apparently cannot fulfill employers' skill needs, as it is widely consented that the current labor shortage in China is a shortage of skilled workers (Chan 2010; Farrell and Grant 2005; Li and Sheldon 2010). While there is still a surplus of rural migrant labor in China (Kwan 2009), skilled workers are much more demanded by employers – The MOHRSS releases quarterly labor market reports, which show that the demand-supply ratios of skilled workers across regional labor markets have been constantly higher than those of unskilled ones throughout the past decade.[17]

A puzzle that the labor agency depiction of vocational schools cannot clarify, therefore, is why firms still invest tremendous efforts and resources in schools if they can acquire only low and general skilled labor from that. According to Sheldon and Li's (2013) survey in a major industry park in the Yangtze River Delta region, 46% firms have established some collaborative programs with local vocational schools. More importantly, many firms are found to be providing all kinds of resources to schools and trainees that are beyond intern positions. These include financial supports in various forms, technology and equipment transfer, and co-developing curricula and training contents (Li and Sheldon 2014). In addition to these, my own study in the Pearl River Delta region indicates that firms also seek to establish on-campus practical centers, dispatch teachers to work at schools, and help to train schoolteachers in their own workplaces and training centers. If all of these practices are primarily a secondary labor market strategy, and solely in exchange for unskilled and cheap labor, it does not solve their paramount problem of skilled labor shortage. Also, why would not firms simply go for labor agencies instead? Given the much higher costs for firms to collaborate with vocational schools, these schools should have

[17] The reports are available at: http://www.mohrss.gov.cn/SYrlzyhshbzb/zwgk/szrs/sjfx/, March 1, 2017

been acting as institutions beyond mere temp agencies. In other words, vocational schools must be performing some internal labor market functions and providing something more than what labor agencies can offer.

Actually, both Li and Sheldon and my own study have found that firms collaborating with vocational schools are mostly aimed at gaining skilled labor. Well recognizing vocational schools' failure to cater to industry practice, these firms seek collaboration with them to remedy this problem in order to gain skilled talents that they need (Li and Sheldon 2014). In my own research, employers seek to transfer firm-specific skills to the pre-employment training process, and eventually put those workers on skilled instead of operational jobs. Schools on the other hand, provide customized training programs to individual collaborative firms based on their specific skill and managerial needs without bound to any national or industry level standards – hence "training for a targeted brand."

Methods

I conducted ethnographic field research in three industries – auto, robot, and beauty – for two reasons. First, they each represent an important sector in today's China, respectively traditional manufacturing, modern manufacturing, and modern service. The latter two have been most recently promoted by the local state in Guangdong as a local industrial upgrading and restructuring strategy. While there is a general deindustrialization process in Guangdong's traditional sectors, auto is somehow exceptional to this trend, being continuously regarded as a pillar industry in the local economy. Second, these industries have been commonly faced with the external labor market failure, i.e. insufficient skilled labor supply in Guangdong. Therefore,

while I am not arguing that the "training for a targeted brand" model is a universalized practice in every regional industry, these three do serve as information-rich cases (Patton 1990) to demonstrate the emergence of this China-peculiar model of VET. In terms of area focus, I studied Guangdong Province. While Li and Sheldon, as noted, based their research in the Yangtze River Delta region, their empirical evidence by and large supports what I found in Guangdong, the Pearl Rive Delta area, which can therefore serve as important triangulation.

Indeed, I have observed such "training for a targeted brand" practices in many other industries, widely existing across different types of Chinese vocational schools. I have in total studied 21 firms and their collaborative programs with vocational schools that fall into a wide range of industries in traditional manufacturing (including construction), modern manufacturing, and service, as well as their overlapping sectors. This is illustrated by Figure 2. While these sectors share the problem of skilled labor shortage, as I will show soon, employers have their unique concerns in each sector, including labor market instability, firm-specific skill shortage, high turnover, and value-chain labor shortage. I also conducted research on the supply side. I in total studied 25 vocational schools in Guangdong.

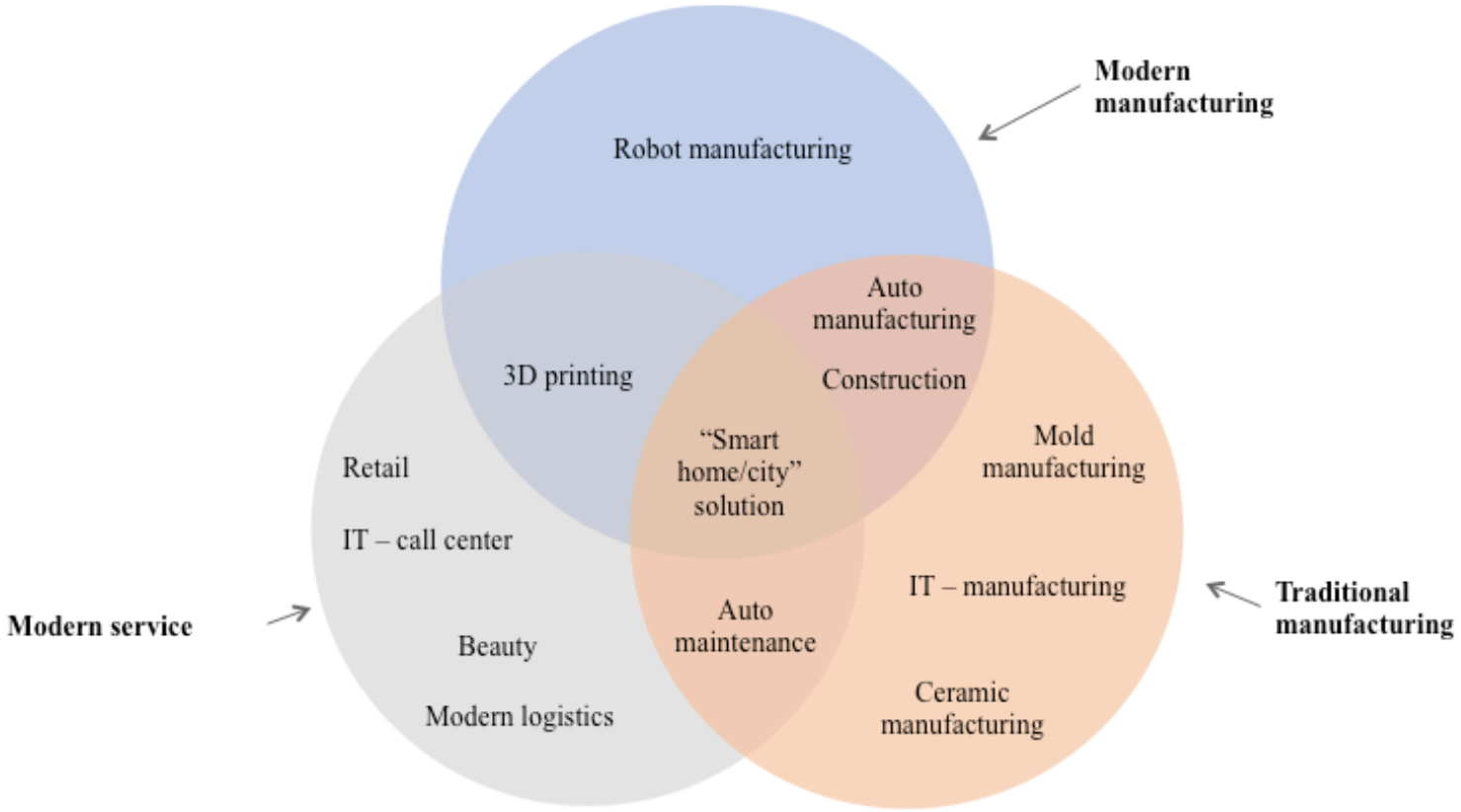
Data

This paper draws on three types of data generated from the field research. The first consists of 322 interviews with various stakeholders of the Chinese VET system. In particular, in-depth interviews with managements, firm-level union officials, and workers/trainees from 21 firms constitute my major information resource for understanding the complex dynamics of the "training for a targeted brand" programs studied. These programs were initially identified through my interviews with presidents, administration, teachers, students, and parents from 25

schools, who also provided valuable information regarding their collaborative roles with firms. As important supplements, I have also interviewed officials from the MOE and the MOHRSS, and their local branches, as well as officials from 12 other organizations including local official unions, think-tank organizations, NGOs, employer associations, and academic institutes, who have helped me understand the overarching institutional framework and state strategies that cover such "training for a targeted brand" practices.

Given that this study focuses on a unique type of school-firm collaboration, I have also engaged in tremendous participant and non-participant observation over processes and mechanisms through which interaction takes place between employers and schools, as well as with other relevant stakeholders. I achieved this primarily through attending all kinds of meetings allowed by my good relationship with government officials and school presidents. These include many nonpublic meetings, informal conversations, and dinners that are a typical way of informal communication in China. I also participated in two ongoing reform projects in Guangdong. In a curriculum reform project, I served as an external consultant for the skill standards making in Guangdong's beauty sector. With another apprenticeship project, I was invited to be a translator for the MOE's consultants from the UK during April 2016. These experiences enabled me to gain valuable insider information regarding how school-firm collaborative programs engage different stakeholders of the VET system. In addition, I observed a lot of training processes at firms, practical centers, and schools, as well as a few skill competitions.

Figure 2. Collaborative Firms Studied by Industries



Finally, my research is supplemented by a considerable amount of secondary data that I have collected during fieldwork. This includes relevant state policies, internal documents of governments, schools, and firms, and internet-based resources such as background information of schools and firms that I studied, and important news and reports. These secondary data not only serve as triangulation information for the firsthand data that I collected through above-mentioned methods, but are also used to cover information that my process tracing through interviews could not yield.

External Labor Market Failure in the Auto, Robot, and Beauty Industry

Firms in Guangdong Province have been faced with a major external labor market failure, i.e. a shortage of skilled labor during the past decade. This has been massively documented in literature and mass media, which I do not repeat here. It is noteworthy, however, that it is a structural shortage of skilled workers as opposed to unskilled labor that has struck Guangdong and elsewhere China. According to an official report, the Guangdong labor market maintained a monthly shortage of 175 thousand skilled workers on average during the first three seasons of 2015.[18] Firms find it increasingly difficult to recruit workers equipped with the skills they need from the external labor market. This shared eager for skilled workers has eventually prompted employers, especially leading firms, to seek collaboration with vocational schools. As I show in this section, the auto, robot, and beauty industries each represent a different type of employer motivation for collaboration, but they share the general problem of external labor market failure – These firms are unable to find sufficient skilled workers through local labor markets or other

[18] http://tech.qq.com/a/20160608/007066.htm, September 12, 2016

labor market institutions (e.g. temp agencies), and have therefore devised the strategy of establishing collaborative programs with vocational schools as a remedy.

Auto

In the auto industry, brand-specific skills account for a considerable proportion of auto maintenance workers' essential skillset. The specific-general skills ratio certainly varies across industries, and may be much lower for electronics processing jobs, for instance, where operational workers perform by and large similar tasks from Foxconn to Flextronics. Within the auto sector, however, car models are very different across brands. In relatively advanced auto workshops, nowadays multiple car models are being simultaneously assembled, such that an operational worker needs to be familiar with parts of various models that are s/he assembles. A maintenance man in a 4S store has to be even better educated about all car models of a brand in order to be able to examine, prescribe, and implement repair and maintenance.

In that sense, if skilled labor shortage is a common problem that all employers face, for auto employers, qualified maintenance men for their brands are even scarcer given this relatively big proportion of specific skills in a worker's essential skillset. And brand-name carmakers often have to spend a lot of time and efforts on firm-based training in order to prepare a qualified maintenance crew. This typically includes building training centers that offer service to not only their own 4S stores but also authorized maintenance firms. In addition, 4S stores themselves assume a lot of on-the-job training responsibilities, and thus often complain about the time and efforts it takes to get a freshman ready to work independently. An auto maintenance firm manager estimated that without school-firm collaboration, it takes three months in order for a maintenance man to be able to perform maintenance tasks under senior workers' monitor. To

show the difference, it takes only about one week initial plus one to two weeks' on-the-job training under a senior worker in order to prepare a freshman to be a qualified independent assembly-line operational worker according to a workshop head from VW (Foshan). As a result, auto maintenance men are among the most wanted workers in Guangdong's local labor market given the continuously expanding consumer market.

In light of this, employers have developed the strategy of shifting part of their traditionally firm-based trainings to vocational schools, including agendas of co-building practical centers, and transferring technologies, training materials, and car models to collaborative schools. Schools, in exchange, are very willing to customize their curricula and training processes accordingly in order to accommodate collaborative firms' needs. Kong from VW (Foshan) said:

> Our maintenance training needs more knowledge and skills (than operational workers), and our firm has a set of standards and skills… Many schools have a problem that they do not know what we need, because they do not know where students will eventually work at. So we collaborate with them on training… Many schools only train specialty (general) skills: basic knowledge on automobiles, automobile structures, assembling, and mechanical drawing etc. In our collaborative programs we will integrate our brand-specific knowledge: e.g. knowledge on electric circuits of Audi cars, and on maintenance of Audi cars (III: 69).

Kong estimated that in collaboration with schools, they were able to secure 20% of firm-specific training for a maintenance worker in schools' curricula.

This program that Kong mentioned is what I call the "training for a targeted brand" model in the Chinese VET system, where an individual school and an individual firm co-establish a school-based training program that focuses on training for this specific firm. Except for state mandatory courses and a limited number of theory courses, students in almost their entire training processes, have very few, if not none, opportunities to get to know other brands'

technologies and equipment (in this case, cars). This prevalently exists in the auto industry. A school may collaborate with several brands simultaneously, but have different programs respectively correspond with those brands. In Guangdong Communication Polytechnic's School of Automobile Application, for instance, students receive mandatory courses and general skills training in their first year, and as soon as entering the second year, they are asked to choose a brand-name program to enter, including the BMW Class, Toyota Class, Nissan Class, Bosch Class, and Volvo Class, where they started to delve into extensive brand-specific trainings and car model knowledge.

An auto program in Guangdong Mechanical and Electrical College (GDMEC) offers a three-year collaborative program with Jaguar-Land Rover. Students in their first year receive 900 credit hours training that are mostly mandatory courses including state-required political and ideological education as well as general skills training such as mathematics, Chinese literature, and computer science, in addition to a few auto-related theory courses. From the second year, however, they enter the practical center co-built with Jaguar-Land Rover, and started to receive brand-specific courses for 486 hours, and use only Jaguar-Land Rover's car models. And in the third year, they enter Jaguar-Land Rover's 4S stores to do internship to further their knowledge about those cars via learn-by-doing processes guided by senior workers, which account for 1,020 credit hours. Throughout this entire process, students have no interaction with any other brands' technologies. Interviewed students actually quite appreciate this concentration on a particular brand, and one of them related to me:

> We in our first year studied a wide range of things. So when it comes to the second year, we must focus on a specific brand's car models. We should not be like, seemingly to know of many cars, but indeed unfamiliar with any. We have to be specific if we want to be an expert. This program provides such an opportunity, and has rich contents. It gives us a deeper understanding of a specific brand (II: 107-114).

Robot

Robot manufacturing (and likewise 3D printing) is an emerging industry in Guangdong, and another promising sector where we see growing employer demands for such "training for a targeted brand" programs. Guangdong local governments have in recent years issued various public policies and subsidies to encourage an industrial upgrading agenda of "replacing workers with robots." The most commonly seen industrial robots are robotic arms, but broadly defined robots indeed include 3D printers. By 2015, 159 major robot manufacturers were clustered in Guangdong. More importantly, robot manufacturers in and outside of Guangdong supply robotic arms for a wide range of manufacturing industries, replacing hundreds of manual workers. Estimated by the provincial government, by 2014, 23 thousand robots had been introduced into Guangdong workplaces, with a replacement of 151 thousand operational workers, whereas by 2015, these numbers became 41 thousand and 269 thousand. The government expects to see 300 thousand robots in Guangdong by 2020, by when about 1.95 million workers will have been replaced.[19]

The fact that exponentially increasing robots are being introduced into traditional manufacturing workplaces calls for a profound change of the skill structure of the workforce. It is estimated that on average, with application of robots in a traditional workplace, operational jobs will be reduced by 19%, whereas the demand for technicians will increase by 17%.[20] Employers now need technicians to regularly perform installing, programing, and maintenance tasks.

This demand for technicians is intensified by a major external labor market failure. While in the auto sector carmakers can rely on labor poaching to gain talents that they need with some

[19] http://gd.qq.com/a/20160411/020899.htm, September 12, 2016
[20] http://gd.qq.com/a/20160411/020899.htm, September 12, 2016

necessary retraining if not working with schools, this is simply not a feasible option for robot makers, given the fact that robot is an emerging sector and there simply are not enough qualified workers in local labor markets. In other words, retraining a traditional technician into a qualified robot maintenance man entails much more efforts than, for example, making a Toyota technician able to work on Jaguar-Land Rover models. And this obstacle often impedes potential robot-user firms from employing more robots. An official from the GDDOHRSS related to me:

> Replacing operational workers with robots is an inexorable trend of industrialization. But robots also need workers to maintain and repair. So the demand for skilled labor to perform maintenance tasks is huge, (not only in robot user firms) but also in manufacturing firms, and these jobs have a certain level of skill threshold. With robots become increasingly prevalently used, we are faced with this labor shortage, and we have been aware of that (I: 8).

This threat to industrial upgrading has become a concern of not only the local government, but also robot manufacturers. While the local state has encouraged it as part of their VET system reform, employers are actively seeking collaboration with schools to prepare a qualified local workforce. Here they are working under a "training for a targeted value chain" model, a variant of the "training for a targeted brand" model. A robot manufacturer has strong incentives to train robot installers, maintenance workers, and programmers for not only themselves but also the production chain that they lead, including existing and potential user firms of their machines. As a result, an increasing amount of robot-related training programs are emerging in Guangdong nowadays.

3D printing is a very similar emerging industry, with leading printer suppliers working closely with schools, aiming to prepare a workforce for the local labor market where themselves and their potential buyers are needy for such talents. Guangzhou Baiyun Institute of Business and Technology's (Baiyun) Mechatronics Department has both robot and 3D printing programs

in collaboration with brand-name equipment providers. The department chair offered a good summary of their collaborators' mixed incentives:

> Jiehe 3D Printer's collaboration with us, a very important incentive for them, is that we train students that will serve to advertise their printers. Because our students were trained with their printers, we become a constant worker provider and training base of theirs. It is very important that we co-train workers that they need… Winbo Company is the same. Our graduates every year serve as a major talent pool for their worker recruitment. I give them however many they need. An American firm named Heke (unclear to the author), when entering the Chinese market in 2012, brought their latest five-axis machines. After negotiations, we became their strategic collaborator in the South China area. Many firms bought their machines but do not know how to use them. Programming and operating are not something that a regular worker can do, but need strict training. Unable to use the machines after buying, firms have this talent shortage concern… Then we have an agreement: Heke gave equipment to us for free, while we provide them with a whole resolution on talents (II: 193).

While highest-skilled R&D jobs are left to PhDs and Masters, vocational school graduates are mostly seen in the middle-range job markets of these industries, taking jobs such as installers, operators, maintenance, programmers, and salesmen. But they are sometimes seen to be performing assistant tasks in R&D as well, such as designing, 3D modeling, and raw material development.

Beauty

The "training for a targeted brand" phenomenon also prevalently exists in the service sector. In the beauty industry, for example, firms are faced with the problem of high labor turnover, and thus are motivated to work with schools in order to prepare a stock and continuous supply of labor in order to make sure that job vacancies are immediately filled by workers that are ready to work in their workplaces. A Guangdong Department of Education (GDDOE) research group based on their own survey in the Guangdong labor market reported that 83% beauty firms are faced with the problem of labor turnover and shortage. These employers

therefore often have to offer relatively high wages in order to retain and attract talents. The average wages of a beauty worker is reported as over 4,000 yuan/month in 2015, while the local minimum wage in Guangdong only varies between 1,210 and 1,895 yuan across cities in that year.

In addition, leading firms in the beauty sector also share with robot manufacturers the incentive to train for value chains. Leading beauty firms not only provide beauty services in their own salons, but also supply brand-name products (e.g. cosmetics and equipment) to their franchisees as well as small entrepreneurial businesses. A firm therefore has the incentive to transfer their brand-specific knowledge and know-hows across the industry as widely as possible with the aim to expand their product market share. In an interview (III: 15), the president of a leading beauty firm used "incubators" to describe their collaborative programs with schools, training graduates to become not only their own employees, but also potential entrepreneurs. For the latter case, the firm will provide them with various supports including technology, expertise, and even capital. That way, the brand's products and equipment are widely used across the market.

Many employers therefore decided to shift a significant proportion of their firm-based training to the workforce's pre-employment skill development process by establishing collaborative programs with vocational schools. The same report as above mentioned indicates that 77% of the surveyed employers conduct hiring through vocational schools, and many of these are under the "training for a targeted brand" model.

As shown, firms in all three sectors have various incentives to work with schools to train students with firm-specific skills before recruiting some of them as formal employees, while schools benefit from this collaboration regarding graduates' employment, and knowledge and

technology transfer from firms. In exchange, they are willing to offer customized curricula based on skill needs of individual firms at work. The decentralization in the Chinese VET system (as Ch.1 has suggested) has left sufficient room for vocational schools to maneuver their training processes in order to accommodate a collaborative firm's needs. This autonomy, in combination with employers' enthusiasm for collaborating with vocational schools in the context of external labor market failure, has resulted in the "training for a targeted brand" model, to which I now turn.

"Training for a Targeted Brand"

The external labor market failure has prompted employers to seek to dominate and customize vocational schools' training processes, and shift part of their firm-based training to the workforce's pre-employment skill development process, to both reduce training costs and secure a flexible labor reserve for them to counter labor market instability and/or high turnover. This "training for a targeted brand" model features individual school-firm collaboration, and employer-dominated training processes on the one hand. On the other hand, it renders vocational schools' training processes over-focused on individual collaborative firms' specific skill needs but overlook general skills. In this section, I showcase these features and shortcomings of the "training for a targeted brand" system.

Individual School-Firm Collaboration

Different from the German apprenticeship system, a key feature of this "training for a targeted brand" model is that collaboration is by and large institutionalized at the most

decentralized, individual school-firm level. This is partly due to the absence of effective civil society coordination among private players in China. The official chamber in Guangdong, the Guangdong Provincial Enterprise Confederation (GEC), lacks interests in workforce skill development. A department director, Ms. Li, related to me:

> To be honest, our confederation is doing nothing with regard to education and training. (Author: why not?) We lack the capacity, and enough employees, and we cannot understand what firms need. We used to have a department of training, which was closed later, because they could not develop any business (IV: 15).

The MOHRSS that runs the National Vocational Certificate System (NVCS) also lacks confidence about industrial associations' capacity to coordinate employers such that they are reluctant to authorize these bodies to run industry-related certificates. My interview with an anonymous official from the MOHRSS that is in charge of the VET affairs revealed this concern of the state:

> Employer associations in China are under-developed… Traditional industrial associations are not real employer associations, but rather former government institutions, whereas those associations self-organized by firms do not have sufficient capacity [to run vocational certificates]… We certainly hope to maximize their role, but they themselves are still under development. Whenever they have sufficiently reformed, and can really represent specific industries, they may be able to assume a bigger role (I: 2).

While employers are by and large excluded from the NVCS's skill standards making, the NVCS itself – the only skill credentialing system in China – has been marginalized from schools' training processes given its disconnection with industry practices as suggested in Ch.1.

While various forms of labor organizations – labor unions and works councils – in Germany assume important responsibilities in workers' skill development processes at both industry and organizational levels, official unions in China, the ACFTU, and their firm-level union committees play only limited, if not none, roles. A former union official in Guangzhou

told me that the only function that unions perform in workers' skill development nowadays is organizing skill competitions within firms (IV: 11).

While employer and labor organizations lack interests and necessary capacity, formal and informal school networks can occasionally serve as coordination platforms. In the beauty sector, the Guangdong Health Vocational Education Association (GHVEA) is where major beauty programs in Guangdong form coalition and start to coordinate on curriculum development and standards making at the industry level. Such cases are not commonly seen in other sectors. But even in beauty, the GHVEA lacks governability over its membership. The chairwoman, Ms. Li, is a retired former healthcare school president. She is now leading a group of four full-time workers in the association. She regarded the GHVEA as a "service platform" that lacks governability over its 32 member schools and six member firms – "Even paying member fees is voluntary" (IV: 7). About the association, an active member school's director had this to say:

> As a platform and communication mechanism that connects schools and the state, and promotes skill competitions, the association plays some role… But, commitment needs clear rights and obligations. What can they give us? If we do not obey their standards, what sanctions can they impose on us? Nothing. My boss told me: whatever the association tells you to do, if useful for our specialty development and consistent with what you think, you listen; Otherwise just ignore it (II: 65).

Clearly, it is really members' strategic cooperation, instead of any compulsory mechanism, that brings members together in GHVEA. It is therefore suspicious if the association can impose industry-level curriculum standards on its member schools, as doing so obviously conflicts with members' self-interests in serving individual collaborative firms' specific training agendas.

Without any industry-level coordination or binding standards imposed by the state or unions, skill development under the "training for a targeted brand" model is extremely customized, focusing on specific skills of a certain brand or firm at work. Given the absence of

state regulation regarding a reasonable cost-sharing structure among firms, schools, the state, and individual trainees, it is unclear if public schools are justified to engage in this kind of targeted training for one single firm in their degree programs. But this "training for a targeted brand" phenomenon has already become a prevalent and indeed state-consented practice in the Chinese VET system. In fact, both the MOE and the MOHRSS have been promoting such school-firm collaboration, and many schools strongly encourage departments to find their "partners" and regard that as an important criterion for teachers/department officials' performance evaluation.

Employer Dominated School-based Training

Consequently, it is typically an individual collaborative firm instead of the state or any industry-level governing bodies that dominates training processes in a VET program under the "training for a targeted brand" model. This domination is realized through three major mechanisms. The first is co-developing specialties and curricula, where schools are often willing to accommodate a collaborative firm's needs. They consult with the collaborative firm what curricula to set up in a program at the beginning of the initiative. A school is usually very willing to incorporate modules that the collaborative firm cares about into their curricula. A firm-dispatched teacher in a beauty program once showed off to me some advanced beauty machines unique to their firm and how they have integrated those firm-specific technologies and skills into the training process:

> We follow modules provided by the firm and teach the courses. And these (what we taught) can be immediately used when (students) go to our firm. We are the Taiwan Natural Beauty Group, and have a unique business model. Firms in the beauty sector all have different models, so that they have different standards and processes… We have in our curricula, for instance, training for a special skin detector – a machine we use prior to all other beauty care procedures. Whereas other firms use only gross observations, we believe naked eyes can lie, so that we use a special instrument… Another example is body examination, for which we use a machine to examine people's irises in order to

> detect past and potential health problems… So our teaching is very different. Some of our regular courses, other schools have never even heard of (III: 5).

In their program's training plan, not surprisingly, I saw 12 specialty-core courses, nine of which are named by the Natural Beauty Group or its brand name, including a course named "Natural Beauty Health and Iris". These courses teach techniques and know-hows that are based on specific services this group provides in their salons, and use textbooks that are also provided by them.

Zhang Songwen directs a department that has collaborative programs with both auto and robot manufacturing firms. He compared a program with Nissan and another with a robot provider:

> Nissan inputted five to six hundred credit hours and two textbooks into our curricula, to train maintenance workers for them. At the beginning they have teachers come over and teach those courses. Later our teachers learnt how to do it… According to their standards, they require students to learn how to repair machines in a fast way, how to ensure security, and how to fill out some procedural forms… This is different from a robot manufacturer, who typically requires specific trainings about designing, installing, and debugging their machines (II: 174).

The second mechanism is technology transfer from firms to schools. Collaborative firms often provide schools with important equipment used or produced in their workplaces. Here a frequently employed strategy is co-building on-campus brand-name practical centers. A practical center as such contains important equipment – cars, beauty machines, robots, or 3D printers – of the collaborative brand. And most, if not all, application courses take place in these centers. In Guangdong Communication Polytechnic's auto school, for example, I saw at least five brand-name training centers including BMW, Bosch, Nissan, Toyota, and Volvo, each with the latest car models and/or equipment from respective collaborators. Students enrolled have to choose a brand as their concentration at the beginning of their second school year, and form brand-name

classes accordingly. Each class in their specialty-core courses uses car models of the particular collaborative brand only. Trainees thus receive only limited, if not none, training about other brands.

In the beauty sector, likewise, different programs use different firm-provided training materials – usually firms' internal training documents – and work in practical centers that are built in imitation of real workplaces of the firm. A school official from Qingyuan Polytechnic introduced their beauty practical center to me:

> Ellehuis Beauty invested a lot of money in our school, and built a practical center that is exactly the same as their beauty salons. What students do in there is almost the same as in a real salon… And they put all what their employees use everyday there. Even the furnishing of the center (is the same as stores), where our students study and provide services to peer students and teachers as a practice. The entire operational process is the same, including for example activating a VIP card (II: 49)

In Baiyun, I was showed their two brand-name 3D printing practical centers. One of them is co-built with Jiehe 3D Printer, with 20 printers and programs, and five scanning systems provided by the firm for free, whereas the other one is with a company named Winbo that also donated 15 printers and programs.

Technology transfer is often associated with knowledge transfer, which serves as the last mechanism for firm domination. Three strategies are typically adopted here. First, employers often offer textbooks (training materials) as well as workers to teach at these programs. Schools rely on employer-provided training materials especially for new specialties that more general textbooks are still unavailable. Zhang Songwen introduced how they compiled their training materials for the Industrial Robots specialty:

> Since the emergence of the specialty, every school is compiling their own textbooks. There is no available textbook, so we compile by ourselves, or even use firm-provided textbooks… There is no textbook that is suitable for every firm. In our specialty,

> we compiled textbooks based on certain equipment, which are therefore only compatible with that equipment. If you apply them to other equipment, it will not work (II: 174).

Knowledge transfer also often involves dispatched firm teachers. A collaborative firm sometimes sends trainers to teach in schools. In beauty, they always dispatch a teacher to work as a full-time teacher in the school to teach application courses. In a beauty program, I met a firm trainer, Ms. Xie, who works full-time at the school. She has been well integrated in the workplace that sometimes she even represents the school to attend various meetings of the GHVEA. She teaches about 60% of the program's specialty-core courses in students' second year, where she ensures that specific skills of her firm are delivered to students. A typical division of labor between these firm-dispatched trainers and schoolteachers is that the former teach application courses (e.g. beauty technics), while the latter teach theory courses (e.g. beauty basics). In other industries, firm teachers are more seen to be part-time working in the school. Mr. Kong from Jiehe is a firm engineer. He is dispatched to Baiyun every year to teach a one-week intensive course on installation, debugging, maintenance, and user know-hows of their 3D printers.

In addition, knowledge transfer often involves firm-provided training for schoolteachers. In Guangdong Communication Polytechnic, the auto department chair introduced how BMW provided systemic training for their teachers:

> BMW is a typical case: Our own teachers…have received trainings and become BMW-certified trainers, the same as their own trainers. A few of our teachers have acquired their top-level trainer certificates, very skillful. So they are schoolteachers, as well as BMW trainers. They also sometimes go to BMW's training centers and teach courses there. They renew their BMW certificates every year… We have a BMW training center on campus, so BMW also sends their employees to receive training here (II: 88).

Very often, multiple domination mechanisms are employed at the same time to ensure successful transfer of firm-specific skills to the VET process. Mr. Mo from Baiyun had a good illustration of this:

> Winbo provided us with not only free equipment, but also great support in our curricula development at the beginning… At the same time, they send their engineers to teach courses here… They also carry out teacher-training processes. Whenever our teachers need, they can go to their firm and study (II: 193).

Employment Flexibility: Firms under this system not only secure a deeper integration of specific skills into the training process, but also enjoy the priority to recruit graduates over non-collaborative firms. Given that these "targeted for a brand" trainees are still under the student identity, firms do not have any obligation to employ them eventually, but always have the priority to select students in the first place. After that, the school will introduce the rest students to other firms. Students are usually incentivized to work in these collaborative firms as their first choice because 1) these are often leading firms of the local industry, and 2) most what they have learnt are specific skills of this particular firm. In a day during my field research in Baiyun in May 2016, General Manager Li of Jiehe came and recruited five prospective graduates in that year. In an interview with him, he introduced to me the jobs that they will take:

> They will engage in two kinds of jobs. The first is R&D in mechanics. The second is to provide service in our newly built 3D printing service center for healthcare, helping customers to use our printers. For instance, if we receive a pattern from a hospital, they devise a resolution based on the pattern, program the model, and eventually print it out for the customer. They have to conduct the entire process (III: 75).

Over-focusing on Specific Skills

Although it seems that employers, schools, and students all favor and take pride of this "training for a targeted brand" approach, it is by no means an ideal skill development system. An important negative effect of this "training for a targeted brand" model at the societal level is that

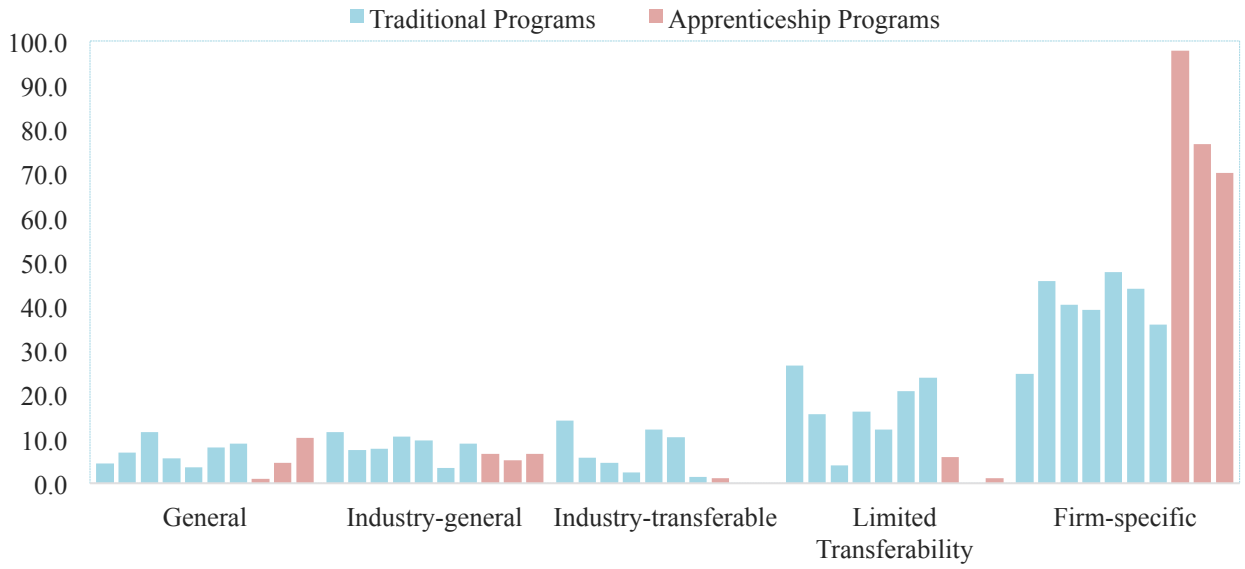
they in general tend to overly focus on specific skills that individual collaborative firms need, but overlook industry-general skills training. I have coded the curricula of ten beauty programs under the GHVEA. As shown in Figure 3, all of the programs focus their curricula on firm-specific skills or skills with limited transferability. Further, three of the ten programs have engaged in even more extensive collaboration with firms under the current apprenticeship reform of the MOE (examined in Ch.4). As highlighted in Figure 3, these programs are even more over-focused on specific skills than the other seven. This indicates that prevalently using this "training for a targeted brand" model renders skill development in public schools over-focused on firm-specific needs.

This inconsistency of curricula across training programs for the same specialty has led to incoherent skill structures of the workforce within the local industry. The GHVEA in 2016 started to run a provincial skill competition in the beauty sector. I participated in their preparation process as an external observer and noted tremendous controversy among schools regarding what skills are essential to a beauty worker's job and thus have to be tested in the competition. In a meeting I sat in in January 2016, for example, member school directors engaged in drastic debates regarding contents and qualification standards of the skill competition. I was really impressed that they even could not reach a consensus regarding issues like what are the basic treatment techniques of the Chinese traditional massage. On this specific issue, a program teacher from the Zhuhai Health School apparently stood out against other programs. She argued:

> Our massage training focuses on the know-hows in the lymphatic drainage service in aromatherapy. So we do not teach this "rubbing" treatment. The lymphatic drainage is to diffuse the lymph to the armpits, so we use only "pushing," but not "rubbing." (Another teacher: why do not you teach students all the basic techniques and then focus on the use [in different services]?) That is because we do not have those services in our

salons. Our training is targeted [for a specific firm], so we do not want to teach them many irrelevant things (Field notes, February 2016).

Figure 3. Skill Spectrum of Ten Major Training Programs in Guangdong's Beauty Sector



Note I: Y-axis value: standardized course credits; X-axis: a program's aggregated courses that focus on each of the fives types of skills.
Note II: General: CS, Mathematics, Chinese, and English; Industry-general: specialty-related courses shared by >60% (7-10) programs; Industry-transferable: specialty-related courses shared by ≥50%, but ≤60% (5-6) programs; Limited Transferability: specialty-related courses shared by ≥2, but <50% (2-4) programs; Firm-specific: specialty-related courses unique to a program. Here mandatory ideological courses (political education) and physical education are excluded.

In light of this, even though firms and schools, and frequently students themselves, are quite satisfied with the "training for a targeted brand" model, negative effects can be significant. Over-focusing on firm-specific skills in workforce's training, especially during the pre-employment phase, not only undermines workers' employability across the local industry, and therefore their labor market mobility, but also increases retraining costs of firms. While systemically estimating the level of these impacts is beyond the scope of this study, they have been well demonstrated by Western countries' experience. And there are hints already in China's

beauty sector. A beauty program director commented on the Zhuhai Health School's over-focus on Natural Beauty's specific skills:

> I feel their focus is too narrow. They (the firm) have iris detectors, so they (the school) offer an iris examination course. But this technology is only used in Natural Beauty. If I do not work there, it is useless… The curricula developed based on one firm's practice, I can by no means apply it to another one. They are completely incompatible (Anonymous, May 2016).

An interviewed beauty worker said:

> Although I did not do well in my Chinese Medicine Basics course, (I took it at least). After I entered the workplace, every salon has different trainings for us because they have different products and different massage technics… This cannot be changed, but I feel it is very easy for me to understand those trainings. Many colleagues from other programs, they do not even know where each acupuncture point is located (II: 78).

This indicates that "training for a target brand" might be even more problematic given it is within for-degree training programs, which are supposed to grant students sufficient general skills (e.g. the Chinese Medicine Basics course mentioned by this worker) that are indispensible for their future continuing education and self-learning processes.

Discussion

The post-socialist industrialization process has put Chinese employers in an "externalization dilemma." On the one hand, the "casualization of employment" trend and increasing legal costs associated with permanent employment relationship have prompted employers to continue pursuing external and secondary labor market strategies. On the other hand, firms have to deal with an increasingly significant external labor market failure as the low and general skilled workers that the external labor markets provide have failed to cater to the fast

industrialization process, and high and firm-specific skills needed by employers. In particular, this has posed a challenge to the industrial upgrading agenda promoted by the Chinese government and pursued by many employers in Guangdong Province for which a pool of skilled labor equipped with high levels of firm-specific skills is indispensible. While the Chinese state has been recently attempting to tackle this problem through various reforms in the VET system (some important efforts will be examined in Ch.4), in this paper, I find that VET practitioners themselves – leading firms and schools – actually have already worked out a non-ideal but effective solution to the "externalization dilemma."

In this paper, I have documented the emergence of the "training for a targeted brand" model in the Chinese VET system, where vocational schools act as firms' external training institutes and focus tremendous efforts on firm-specific skills per requirements of individual collaborative employers. I argue that this system has emerged as employers' strategic response to a major external market failure – the skilled labor shortage – in which they seek to externalize certain internal labor market practices, shifting part of their traditionally firm-based training to workers' pre-employment VET process in order to secure a flexible reserve of labor equipped with sufficient firm-specific skills before some of them are formally recruited as employees. My argument runs contrary to the classic stereotype on Chinese vocational schools, which suggests that schools function as no more than labor agencies that provide undifferentiated cheap labor without useful skills for employers as a short-term solution to seasonal labor shortage, implying that employers' collaboration with vocational schools is a mere secondary labor market strategy. My findings, instead, indicate that through "training for a targeted brand," vocational schools perform certain internal labor market functions that are beyond what pure secondary labor market institutions typically do.

In Ch.1, I have depicted a decentralized Chinese VET system and the autonomy that schools thus enjoy in devising and running their own training programs without constrained by state intervention. This freedom has laid the foundation for the emergence of the "training for a targeted brand" model in the Chinese VET system. In this context, VET practitioners have developed a targeted training system that features extensive collaboration between an individual school and an individual firm in developing a program, customizing its curricula for the firm's specific needs, and recruiting students and carrying out trainings accordingly. Drawing on experience of the auto, robot, and beauty industry, I have shown that this "training for a targeted brand" system has been facilitated by a major skill shortage in the Chinese labor markets. Employers' specific motivations vary across these industries, however. In auto, collaboration has been incentivized by a demand for brand-specific skills, i.e. familiarity with car models of a particular brand in order to be qualified for maintenance work. In robot, leading firms engaged in a "training for a targeted value chain" model as skilled labor shortage in buyer/user firms potentially impede robot manufacturers' product market performance. In beauty, as in many other service industries, high labor turnover has become a major concern of employers, for whom a flexible reserve of skilled labor ready to work in their salons is desirable. At the same time, beauty firms also hope to generate skilled beauty workers and entrepreneurs so as to expand the market coverage of the services and products that they supply. In all cases, at the kernel of these employers' mixed incentives is an important external labor market failure, in which employers are unable to find sufficient skilled labor they need for their specific work purposes from the local labor market.

In light of this, firms have sought to establish collaborative programs with vocational schools, shifting a considerable proportion of their traditionally firm-based training to the pre-

employment skill formation process. Although this collaboration risks losing the sank training costs given potential free riders – a major collective action problem (Streeck 1989) – leading firms are willing to invest tremendously in schools. I contend that this is explained by the double advantages that employers gain through this process. Integrating intensive firm-specific training into potential workers' pre-employment stage of skill development, firms secure a reserve of skilled labor that are ready to work in their own workplaces, but themselves do not have to be committed to any employment relationships with these students.

While western scholars have frequently associated firm-specific skills with internal labor market strategies (Klein, Crawford, and Alchia 1978; Williamson 1981; Williamson, Wachter, and Harris 1975), the China case presented here illustrates a scenario in which firm-specific trainings are conducted in external labor market institutions through extensive school-firm collaboration, in order to tackle the "externalization dilemma" firms are faced with presented at the beginning of this section. This concern is not unique to Chinese employers. Lepak and Snell (1999) in their theoretical model identified an HR strategy that employers seek to acquire less valued firm-specific skills in the external labor market through forming alliance and sharing human capital with business partners. The "training for a targeted brand" practice adopted by Chinese employers is under a similar rationale – i.e. the cost-efficiency and flexibility concern – but represents a different type of firm alliance with vocational schools. These schools act as external training institutes that take over part of collaborative employers' firm-specific training, which saves employers tremendous costs associated with firm-based training and internal labor market hiring practices that would be otherwise necessary.

But school-firm collaboration on VET is not unique to China – why would not the German dual system, for instance, be regarded as an employer strategy that externalizes internal

labor market practices? Admittedly, the German apprenticeship system also features sufficient employer input, but their specific skill needs are not accommodated to the same extent in the training process, because industry-level negotiations between employer association and labor unions determine the training contents in advance, and union shop stewards and works councils' monitor at workplace helps prevent deviation from those stipulated training agendas (Streeck 1987). Effects of these institutional arrangements certainly vary across programs, but such mechanisms in general guarantee that the training is not geared toward employers specific skill needs. German employer's cooperation is therefore not driven by firm-specific skill needs, but in fact encouraged by a wide range of institutional incentives and obligations, as well as cost sharing by the state and apprentices (Culpepper 1999a). Although the Chinese "training for a targeted brand" system receives no comparable state support – indeed mostly out of employers' voluntary participation – and there is also the threat of free-riders as noted, firms are motivated by the urgent skilled labor shortage, and enticed by vocational schools' great flexibility with their training processes. The latter is enabled by the extremely disordered decentralized VET system peculiar to the Chinese context where vocational schools are free from any industry-level constraints regarding what to teach.

This system hence performs both external and part of internal labor market functions at the same time. On the one hand, school-based training ensures flexibility – no committed employment relationship is imposed on collaborative firms, but they enjoy the priority to choose the best trainees eventually while leaving others to the external labor market (schools) without bearing any legal costs. On the other hand, employers' intensive input in the training process secures themselves graduates that have mastered considerable firm-specific skills, whom they

often find it hard to acquire from external labor markets. This type of school-firm collaboration is hence an employer strategy of externalizing the internal labor practices.

My findings fly in the face of existing literature that argues that Chinese vocational schools are running no more than temp agency businesses by trading interns as undifferentiated and unskilled cheap seasonal labor with firms for unjustified revenues (Smith and Chan 2015; Su 2010-2011), implying that school-firm collaboration is a secondary labor market strategy of employers. It is worth noting, however, that I do not deny that some vocational schools conduct labor agency behaviors. I admit that a lot of vocational schools especially many with private ownership and from hinterland China do engage in businesses like dispatching student interns as well as graduates from their hometown provinces to East China factories. Indeed, in another paper of mine (Ch.2), I focus on the diversity within the Chinese VET system through identifying four types of vocational schools in China, the labor agency model as one of them – but that is not the mainstream in the Chinese VET system, I argue.

That being said, this "training for a targeted brand" model is by no means an ideal VET system. Based on disordered decentralization and individual school-firm collaboration, this system differs from exemplar Western apprenticeship models where multi-employer coordination is instituted at the industry level to balance general and firm-specific skills. Partly due to the absence of effective civil society governance in China, a program under this system tends to be dominated by the individual collaborative firm at work, rendering training processes over-focused on firm-specific skills. My comparative analysis of ten major beauty programs in Guangdong has provided support for this argument.

These findings hold important policy implications for the ongoing VET system reform in China. The Chinese government has been promoting decentralization in the VET system since

the mid-1980s, aiming to strengthen the ties between vocational education and industrial processes as if they were quite disconnected (Lai and Lo 2006). The centerpiece of this reform, i.e. facilitating school-firm collaboration is undoubtedly desirable, but if the state allows unchecked market forces to intervene in public schools' training processes based on their short-term needs without any effective coordination, negative impacts will inevitably ensue. In particular, over-focusing on firm-specific skills at the vocational education stage of the workforce's skill development process will undermine workers' employability and thus labor market mobility, as well as increase firms' retraining costs in the long run. A policy implication here is that the state should focus on capacity building of civil society actors – employer associations and labor unions in particular – to cultivate civil society governance in the Chinese society. These entities will ideally determine industry-level skill standards that serve as benchmarks for individual schools to follow in devising their own programs.

Conclusion

In this paper, I have discussed the emergence of the "training for a targeted brand" model in Chinese vocational schools. This model features extensive individual school-firm collaboration and employer-dominated training processes to ensure that a collaborative firm's specific skills are well integrated into workers' pre-employment skill development process. The product of this model is a flexible reserve of labor that are on the one hand ready to work in a firm's workplaces, and on the other hand under no committed employment relationships with that employer, who is thus exempt from legal and managerial responsibilities (and potential costs) associated with an internal labor market strategy.

I hence argue that this "training for a targeted brand" system is an employer strategy to externalize certain internal labor market practices – in particular, shifting firm-specific trainings to workers' pre-employment skill formation processes – driven by the decentralized Chinese VET system on the one hand, and the skilled labor shortage on the other. Decentralization has granted Chinese vocational schools nearly full autonomy to customize their curricula and training processes according to market needs, making targeted training possible. But leading firms have been ultimately motivated by a prevalent external labor market failure, i.e. a shortage of skilled workers, therefore seeking collaboration with vocational schools. That way, technology and knowledge are transferred from the industry to vocational schools, but it is individual collaborative employers as opposed to any level of the state bureaucracy or any form of private governance that dominate vocational schools' training processes – therefore "training for a targeted brand."

CHAPTER 4

SKILL FORMATION DILEMMA IN THE CHINESE APPRENTICESHIP REFORMS

Introduction

In both advanced and developing economies, vocational workforce skills have been found to be crucial for economic growth. For example, scholars ascribe the success of the German economy partly to its unique apprenticeship system, which has helped to create the high-skill equilibrium that has powered the development of a competitive and much admired export sector (Streeck 1992). Other scholars attribute the "economic miracle" of the Four Asian Tigers (South Korea, Taiwan, Singapore, and Hong Kong) to the strong state role in coordinating the supply and demand of skills relevant to different stages of economic development (Ashton, Green, James and Sung 1999).

The "economic miracle" of China during the past three decades has been largely based on an economic strategy characterized by low cost labor-intensive production for export. This strategy is now under question, however, given slowing economic growth, rising labor costs, and a shortage of skilled workers. Many economists suggest that China will encounter the middle-income trap (Lin and Treichel 2012), without radical changes in its economic strategy. And, given the importance of the Chinese economy to the world economy, the World Bank (2013) is encouraging the Chinese government to facilitate the restructuring and upgrading of its industries to avoid the middle-income trap. Chinese policy makers have therefore articulated numerous policies to rebalance the Chinese economy. Increasing workforce skills thus has become a crucial element in this attempt at economic restructuring.

In this paper, I focus on the state's recent endeavors to establish national apprenticeship systems. The goal of this reform is to generate a supply-side boost to industrial upgrading – i.e., to leverage the skill development process in order to encourage skill and industry upgrading by employers. Two state agencies have broad authority over the skill development in China – the Ministry of Human Resources and Social Security (MOHRSS) and the Ministry of Education (MOE). In recent years, both agencies have independently launched an apprenticeship system, but following drastically difference approaches. While the MOHRSS has employed a state top-down approach to its institution building in apprenticeship training, the MOE has adopted a collaborative model that involves collaboration with non-state actors, including firms, vocational schools, and a limited number of industrial associations. I studied the early outcomes of these reforms in Guangdong Province – a major frontier of Chinese economic rebalancing efforts – as an information-rich case (Patton 1990: 181), and found considerable variation. So far, the MOE has successfully established ten times as many apprenticeship programs as what the MOHRSS has done in Guangdong. Moreover, the former's programs are in general much welcomed by employers, whereas the latter's have triggered a lot of complaints from both employers and vocational schools. In light of this variation, a systematic comparison and evaluation of the two ministries' reform models is at the heart of my research endeavors.

What constitutes a successful skill formation system? Economic and institutional theory has provided the insight that institutional arrangements should be able to effectively address three key problems in skill development in order to achieve desirable outcomes. The first is the collective action problem (Problem I). Skills are essentially public goods. While individuals are faced with budget constraints and uncertainty, and therefore often fail to self-fund sufficient training, firms too are often reluctant to pay for skill development as other firms, via labor

poaching, can harness these skills without bearing any cost of the training (Streeck 1989). Major economies typically rely on state intervention, to varying extents, to remedy this market failure by encouraging or obligating firms and individuals to invest in skill development.

The second problem concerns how to best accommodate industry needs in skill development (Problem II). The "regulation school" provides the insight that institutional arrangements should be compatible with dominant modes of production in an economy (Boyer 1987; Leborgne and Lipietz 1988). This theory, if applied to the skill formation arena, indicates that skill development institutions ought to be customized according to the local industrial structures and leading production systems. The German "dual system" of apprenticeship is an exemplar of employer involvement in vocational training via combining in-classroom with on-the-job training (Culpepper 1999a). The key here is to cater to employers' needs and arouse their enthusiasm for participation in the workforce's pre-employment training process.

Finally, training with employer participation risks being over-focused on individual employers' specific needs. Human capital theory differentiates general skills from firm-specific skills based on the extent to which certain skills are transferable (able to be harnessed) across firms in a labor market (Becker 1993). When labor markets are segmented, however, such transfer is more problematic, partly because of mobility costs and imperfect information (Stevens 1999). This entails effective private governance among firms at the industry level regarding skill standards making and curriculum development to coordinate their interests and achieve balanced delivery of both general and firm-specific skills (Problem III). All in all, a successful skill formation system entails three-level collaboration among the state, civil society organizations (employer associations and sometimes unions), and individual training institutes and firms, in order to effectively address the three theoretical problems.

In this paper, I found that of the two models, the approach of the MOE is more likely to be successful, because it involves collaboration with non-state actors in ways that would address the "collective action problem" in skill development (Problem I), i.e., successfully engaging firms in the pre-employment skill formation process, as well as better accommodate industry needs (Problem II) by allowing a fundamental customization of curricula and training processes based on individual collaborative employers' specific needs. In contrast, I predict that the top-down non-collaborative approach of the MOHRSS would result in failure in addressing these problems. That being said, both the MOE and the MOHRSS's reforms would fail to address Problem III, namely achieving a balanced delivery of general and firm-specific skills, given the absence of effective civil society governance in China. The MOHRSS's centralized apprenticeship system imposes standardized training based on the National Vocational Certificate System, rendering training programs over-focused on general skills. As for the MOE, in contrast, the ministry has granted individual programs full autonomy to develop their own curricula and control over training processes. The result is that trainings are dominated by individual collaborative firms' skill development agendas and thus frequently over-focus on their specific skill needs without effective coordination across the industry. I hence argue that the Chinese state has been trapped in a decentralization dilemma with regard to skill development reform. Until effective civil society governance is formed to coordinate the VET process, the system will continue failing to deliver ideal skill development outcomes and confounding the state's long-term upskilling agenda.

This study enters the debate on the Chinese reform by developing a three-level collaborative model for understanding and furthering the reform in not only skill development but potentially various other socio-economic arenas. Scholarly accounts of China's socio-

economic reform fall into an either/or debate. That is, while most studies emphasize state centralization and its decisive role in leading the reform of various domains, an emerging but considerable stream of literature has suggested what can be broadly called a "capitalism from below" approach (Nee and Opper 2012) through highlighting the role of proactive grassroots actors, and informal networks and institutions. As a result, institution building in China is believed to follow either a top-down or a bottom-up approach. In this paper, I suggest an alternative model that state-initiated reform agendas involve fundamental diffusion of authority and division of labor among the state, civil society actors, and individual non-state players that can indeed generate more desirable outcomes. As an important policy implication, the state should seek to enhance the capacity of civil society organizations, including employer associations and labor unions, in order to facilitate the formation of civil society governance mechanisms that would better serve the function of this collaborative model.

Literature Review

Theoretically, a skill formation system must effectively address three key problems in order to deliver desirable outcomes: the collective action problem, the accommodation of industry needs, and the balance between general and firm-specific skills. These problems are derived from three theoretical perspectives relevant to the skill development arena: institutional theory, the "regulation school," and human capital theory respectively. In this section, I first summarize the three theoretical perspectives, the problems they pose to a skill formation process, and institutional arrangements that are typically adopted in major economies for resolving these problems (see, Table 8). These theories altogether suggest that successful skill development

entails effective collaboration among the state, civil society actors, firms, and training institutes, based on which I have proposed a three-level collaborative model of skill development. I also use Germany, UK, Singapore, and the US to demonstrate successful or partially successful institutional arrangements and practices of collaborative skill development with regard to addressing each of the three problems. I propose that while the MOHRSS's top-down model is inferior to the MOE's collaborative skill formation approach, the latter will be at best partially successful given the absence of civil society governance tradition and capacity in China.

Table 8. Theoretical Perspectives, Key Skill Development Problems, and Institutional Resolution

Theory	**Institutionalism**	**"Regulation school"**	**Human capital theory**
Problem	Collective action problem – skills are essentially public goods	Accommodation of industry needs – skill formation processes must be compatible with dominant modes of production	Balance between general and firm-specific skills – to avoid over-focusing on individual firms' specific skill needs
Institutional resolution	State intervention and subsidy – to oblige and/or incentivize cost-sharing among firms and individuals	School-firm collaboration – to engage and motivate firm participation	Corporatist civil society governance – to widely coordinate firm interests

Problem I: Collective Action Problem

Institutional theory suggests that skills are inherently public goods. Streeck (1989) argues in his classic work:

> "…successful self-interested, utilitarian behavior in market environments requires the presence of collective resources, common values, and shared expectations that rationally acting individuals cannot normally generate, protect, or restore even if they fully recognize their vital importance. This is because such resources are in significant respects 'collective goods' which cannot be privately appropriated and to whose

> generation rational capitalist actors have therefore no, or no sufficient, incentives to contribute. As a consequence, the unbridled pursuit of self-regarding interests results in suboptimal outcomes not just for the community at large but also for economically rational individuals themselves"

This situation can be illustrated by a collective action problem. As suggested by the classic game theory model of public lands, assume there is a public farmland shared by a community, where everyone in the community can farm and harvest crops that belong to him/herself. Without effective coordination among the community, no individual has the incentive to fertilize the land because, economically, assuming that everyone seeks to maximize his/her own wellbeing, fertilizing the land by him/herself is not a good strategy for an individual, as others will become free-riders and simply benefit from his/her fertilization of the land without bearing the costs. If everyone adopts this strategy, however, the land will eventually become infertile and everyone will end up worse off. The same free-riding problem exists in most public arenas where collective actions take place.

In these arenas, the market logic fails to result in the best outcomes for the community, and a certain level and format of collective governance over individual choice is therefore indispensable. A significant example in the industrial relations sphere is unions and strikes, which Olson (1965) uses to illustrate this necessity of governance. He argues that in order for union actions to be effective and to avoid the free-riding problem in strikes, some form of compulsory membership in unions is crucial. The compulsory membership here is one type of governance that overrides the market logic. Likewise, in the field of skill formation, the free rider problem is prevalent and some collective governance is necessary.

Here we see similar "market failure" in the skill development arena. Decisions based on individual trainees and firms' "rational choice" will result in underinvestment of skills at the

societal level. Individual trainees and employers tend to underinvest in skills. Young workers that just or even have not started their careers likely do not have enough money or motivation to invest in human capital that they can only benefit in later stages of career, because of the uncertainty associated with the investment – Workers simply cannot accurately predict what skills will be needed in the future – which therefore leads to insufficient self-financing of skills (Streeck 1989). Employers also tend to insufficiently fund skills, argues Streeck, providing that workers are able to quit whenever they want under the regime of free employee termination. And once that happens, employers immediately lose the sunk investments in the training they provide. These possibilities make investment strategies of employers and workers much more complicated and unpredictable, and often below the optimal.

In addition, the skill formation process has externalities. That is, an individual receives returns for others' investment in their own human capital, and firms, who even though may not benefit directly through for example employing workers who own certain skills, can still capitalize on individuals' investment in their human capital indirectly. For instance, if all people in an economy invest in human capital and the economy moves up from low-skill equilibrium to high-skill equilibrium where skills are better appreciated and rewarded, then every worker ends up better off, and firms acquire higher productivity and bonuses that the economic boom brings about. However, an individual's level of investment in human capital is often based on his/her own cost-benefit calculation, which tends to fall below the social optimal level. All in all, individuals and firms' investment in human capital based solely on market logic tends to insufficiently fund skills. Lucas (1988), for example, proposed a model suggesting that the US economy in the 1980s ought to invest almost three times as much in human capital as it did in order to reach the socially optimal level.

Therefore, certain degrees of governance, public or private, is needed in just any regime to encourage higher levels of investment in skills than what individuals and firms would otherwise have achieved based on sole market logic, and very often, there is a strong motivation for the state to assume that role. Specifically, to avoid the collective action problem and skill development failure, we need strong state regulation, and/or certain forms of private governance such as effective coordination that seeks to impose certain types of obligation on individual firms. This is comparable to the case of strikes where we need state regulation to ban (or limit) the use of replacement workers, and/or unions to facilitate the coordination among individual workers so as to reduce scabs. In other words, we need institutions to avoid free riders. This same rationale applies to the skill formation arena.

Institutional resolution: state subsidy and/or intervention: The key policy issue here is to promote fair cost sharing among players – workers, employers, and the state – for the sake of sufficient investment in human capital at the firm and the societal level. And in nearly every major country, the state plays an indispensible role in investing time, effort, and money in skill development, or obliging or encouraging other players to do so. Table 9 summarizes how exemplar countries – Germany, UK, Singapore, and the US – have employed various institutional arrangements to resolve the three key problems in skill development. As shown, strategies that a state often uses for addressing the collective action problem are threefold.

The first and most straightforward strategy is that the state foots (part of) the bill by itself. It is commonly seen in most, if not all, major countries that the state subsidizes VET in various ways. But it is a strategy particularly favored by liberal market economies as it entails less direct intervention. The governance of the state-funded VET system in the US, for example, – including both schools and workplace-based training programs such as apprenticeship – is

through strategic allocation of state funding. While the state does not directly intervene in program design or use mandatory mechanisms, they do rely on economic incentives, i.e. issuing subsidies to exert influence and control over training processes (Stone III and Lewis 2000). In the UK, the state subsidizes training programs but leaves standards making, qualification, and program development to licensed private actors (Delebarre 2016).

Table 9. Exemplar Skill Development/Apprenticeship Systems

Countries	Collective Action Problem	Accommodation of Industry Needs	Balance between General and Specific Skills
Germany	State subsidy	Chambers, employer associations, and BiBB*	Employer associations, unions, and works councils
UK	State subsidy	Employer-led sectoral skills councils	Employer-led sectoral skills councils
Singapore	State subsidy and intervention	State and MNCs-funded training centers	State-organized multi-MNCs collaboration
US	State subsidy	Community college-firm collaboration	Lack of coordination, but some local centralization efforts

* BiBB: Federal Institute for Vocational Education and Training

Second, the state may oblige employers and individuals to share the costs of training. It is not all that common, however, to see state compulsion regarding employer or individual direct payment for certain training in major countries. But the state may do so in indirect ways. Taxing is one such approach: In Singapore, for instance, employers are required to contribute the equivalence of 1% of the payroll of employees earning less than $1,500 per month to a special skill development fund, which is granted to firms that carry out training programs (Kuruvilla, Erickson, and Hwang 2002). The state may also make individual trainees to bear part of the costs through, for example, 1) allowing lower apprentice wages than the legal minimum for regular

workers, 2) allowing employment contracts stipulating mandatory post-training severance periods and liquidated damages on breaching such agreement, and 3) encouraging long-term employment relationships and discouraging labor poaching via all kinds of legislative arrangements. Some of these arrangements are seen in major European, East and Southeast Asian countries, as well as China in the Labor Contract Law. In Singapore, for instance, the state in early 1980s encouraged foreign-invested firms to set up training centers in order to secure technology and skill transfer to the domestic industry. And in order to incentivize firms to do so, they guaranteed that these firms have the right to hire the graduates before they can be selected by other firms (Kuruvilla and Chua 2000).

The third strategy is institution building to facilitate private governance. In Germany, for example, employers have to pay compulsory membership dues to the chamber of commerce and industry, which is used to fund chambers' activities including supervising apprenticeship training processes, and evaluating trainees ultimately. This private governance also imposes soft obligations on employers to fund skill development. Employers are incentivized to continue offering apprenticeship positions even though that may conflict with their economic interests. This "logic of appropriateness," argue Finegold and Wagner (2002), is derived from the institutional pressure they suffer from unions, the state, and the chambers, as well as cultural and legitimacy consideration at the broader societal level.

All in all, the state's role is indispensible in solving the collective action problem in skill development. Given the absence of civil society governance mechanisms in an authoritarian regime like China, state direct intervention is probably even more crucial to the success of a skill development system.

Problem II: Accommodation of Industry Needs

Marxist theory provides the insight that the "economic base" or mode of production defines the limits of variation of the superstructure – understood as a configuration of institutional arrangements that the ruling class uses to govern the society. And a change of the dominant mode of production in a society will facilitate transformation of the superstructure (Marx [1859] 1978). The "regulation school" has inherited this rationale of economic determinism, and advanced the notions of the accumulation regime and modes of regulation, the conjunction of which defines a mode of development. Once existing institutional forms become incompatible with a society's mode of development due to technological revolutions, for example, a structural crisis emerges and the mode is unable to reproduce itself in the long term. The institutional forms then need transformation (Boyer 1987; Leborgne and Lipietz 1988).

This theory, if applied to the skill development arena, suggests that skill formation institutions must be compatible with the mode of production that consists of technologies and the labor processes being adopted in organizations. The Fordist mass production that once dominated the manufacturing industry in the US, for example, was associated with many features of the US skill formation system – including the extensive use of general and standardized skills, limited firm-specific training, and a low level of skills in general – until 1970s when the Japanese lean production system started to challenge the Fordist model in the North American market. Firms has since then started to integrate post-Fordist components into their production process that entails flexible work organization such as teamwork, multi-tasked jobs, and worker participation and problem solving mechanisms. This differs from the traditional Fordist production based on the Taylorist rationale of scientific management, which intentionally separates the conception (the brain, or management) and execution (the hand, or workers)

(Braverman, 1974). A structural crisis thus emerged under the new circumstance, calling for a transformation of the skill formation system to provide workers with a new and wider array of skills that go compatible with the new production mode (Green, 1992).

The German skill formation system characterized by the high-skill equilibrium (Finegold and Soskice 1998), as another example, was established based on the diversified quality production (DQP). This production system, different from either traditional Fordist production or flexible production, features incremental customization that allows firms to invest and also afford the relatively costly high-skilled German workers via the apprenticeship system (Sorge and Streeck 1988; Streeck 1992). Scholars see the combination of the high-skill equilibrium and the DQP model as what sustained the comparative advantage of German products in the global market until 1990s – when the global just-in-time production which entails faster innovation and reaction to market changes, as well as shorter production turnaround started to challenge this regime of production, rendering the skill formation system inappropriate (Culpepper 1999b).

A key problem regarding skill development derived from this theory is that training processes should be able to engage firms, and best accommodate skill needs of the industry, to make sure that supply and demand sides of the labor market are matched and avoid a structural crisis. Institutional arrangements should cater to industry voice in skill standards making, curriculum development, and qualification, and encourage firm participation in the pre-employment skill formation process in various formats. While firms may be willing to invest in an apprenticeship program, for instance, for one cycle – especially if it is state-subsidized or mandated (Problem I) – their willingness to commit continuous effort in the long run hinges on if the program can actually cater to their skill needs (Problem II).

Too much state direct intervention may have negative effects here. Especially in a country like China where regional variation is huge from here to there, flexibility in curricula and specialty development is indispensible for accommodating regional and industrial specificities. The centralized VET system in China had once generated the rigidity problem and renders training programs unable to cater to the skill needs of industry (Cooke 2005; Durden and Yang 2006). Therefore, although state intervention potentially helps firms to overcome the collective action problem, employers may still have negative feedbacks about it, if it is not flexible enough to fulfill their demands.

Institutional resolution: ***school-firm collaboration***: Certain levels of authority diffusion is thus necessary especially in the skill development arena where the ultimate success or failure of a system hinges on if it best serves the industry and market needs. And in order to realize that, the making of skill standards and the development of curricula, specialties, and programs must be informed by the industry and regional market (Culpepper 1999a: 4). In major countries, therefore, institution design regarding skill development often involves certain forms of collaboration between relevant state ministries, training institutes, and firms, with a proper division of labor and authority among these organizations.

The German case, for instance, well exemplifies a social partnership of skill development with clear division of labor among social partners and substantial diffusion of authority regarding institution design. In the late 1960s, the German corporatist government inherited the craftsmanship tradition of apprenticeship training and enshrined the dualist system into the training law. This system involves training of youths at both workplace and schools under contracts negotiated between employer associations and unions regarding the contents of the training, in programs lasting from three to three and a half years. Employers are approved, and

training processes are monitored and eventually evaluated by chambers of industry and commerce and of trades. And at workplace, works councils play a role – to varying extents though – in codetermining firm-specific issues regarding the training. The state leaves authority and therefore flexibility to this private governance at the workplace and industry level, but itself only serves to provide expertise consultancies to players in designing apprenticeship programs via the Federal Institute for Vocational Training (BiBB). This institutional structure has successfully solved the collective action problem (underinvestment in skills) by encouraging cost-sharing among 1) the state that pays for vocational school operation, 2) firms that pay for workplace training, and 3) apprentices that contribute by working at lower wage rates than regular workers. More importantly, apprenticeship ensures that firms' particular skill needs are met on the one hand, and on the other, sectoral unions' role in devising program contents helps to avoid going to the other extreme that training is too narrowly focused on the particular firm's specific skills (Culpepper 1999a: 3-5).

In probably more comparable East Asian cases, the state tends to assume a bigger role than in European corporatist or liberal market economies. Ashton, Green, Sung, and James (1999) have focused on the strong state intervention in Asian Four Tigers – Singapore, Taiwan, Hong Kong, and South Korea – in the skill formation arena throughout their post-war industrialization, and its success in leading skill development in these countries. They have used a developmental state model of skill formation to highlight the state's role and top-down manipulation of the process, which was able to not only facilitate the development of the national skill formation system, but also proactively shape and coordinate the demand and supply of skills in the market, in the absence of a strong private governance tradition in these (once) authoritarian regimes.

That being said, important elements of state-private actors collaboration have been identified in these countries based on a closer examination of these systems. Kuruvilla, Erickson, and Hwang (2002), for instance, ascribe the success of the post-war Singaporean economy to what they call a model of private-public sector collaboration of skill development, where state organized skill development has been able to engage foreign invested firms to establish training institutes since 1970s. The Singaporean government offered firms doing so preferential policies regarding investment and market protection, and granted them priority over other firms in hiring graduates from those institutes. The government later expanded this project to collaborate with other national governments, and accordingly, offered such preferential policies to all firms from those countries. This model has been able to both successfully encourage foreign firms to invest in skill development, ensuring that up-to-date technologies and skills are transferred to the Singaporean workforce, and secure sufficient high-skilled labor for those foreign-invested firms in Singapore.

Problem III: Balance between General and Specific Skills

Engaging firms is an important, but ought not to be the ultimate goal in skill development. Indeed, firm-led training risks being over-focused on individual employers' specific and immediate skill needs and failing to assume a long-term skill development perspective at the societal level. This is derived from human capital theory advanced by Becker (1993), who sees skills as a unique type of capital associated with human beings. The process of skill formation, including education and training, is thus regarded as a form – indeed the most important form according to Becker – of investment in human capital. Becker further specified two types of human capital investment, i.e. general skills vs. (firm) specific skills. Skills that tend to benefit

every firm to the same extent are known as general skills, whereas those that only benefit firms that offer the training are specific skills. Most skills in reality, however, are what Stevens (1999) defines as transferable skills that can be potentially capitalized on by other firms but not to the extent as if they are subject to perfect market competition that "the wage is driven up to the marginal product." In other words, suppose different types of skills are located on a continuum with one end as completely general skills, and the other end as completely specific skills, most skills in fact are situated in between the two ideal types. In this paper, unless specified otherwise, I use transferable and general skills interchangeably to denote skills that lean toward the "general skills" end of this continuum, and specific skills for the skills that lean toward the "firm-specific skills" end.

Although it is not entirely able to separate general from specific skills in a training process given this continuum, employers obviously have strong incentives to focus their effort on training of relatively specific skills. This can be understood as an avoidance strategy to sidestep the collective action problem mentioned above – workers equipped with more specific skills are less attractive in the labor market, and thus less likely to be poached by other firms than those with more general skills holding other factors constant. If employers are invited to participate in curriculum development and carry out part of the training in the pre-employment skill formation process, the entire process risks being dominated by specific and immediate skill needs of individual employers at work.

This poses a great challenge to not only individual trainees, but also employers themselves as well as the entire labor market. For one thing, over-focusing on specific skills undermines individual workers' employability by making them less attractive to a broader group of employers in the labor market as noted. And it limits opportunities for a worker's long-term

career development. For another, a workforce with a skill structure biased toward individual firms' specific use undermines labor market mobility, and increases retraining costs for new employers. Therefore, the absence of a long-term plan in skill development at the societal level will eventually hurt the economy.

Institutional resolution: civil society governance: The key here is to effectively coordinate firms' interests at the industry level regarding skill standards making, curriculum development, qualification, and training process monitoring in order to achieve a balanced delivery of both general and specific skills. Major industrialized countries have employed two important institutions to facilitate the formation of transferable skills of the workforce. The first is the skill credentialing system that focuses on occupation-related standards making and certification for general skills mostly instituted at the industry level. These standards are used to guide the development of training programs and curricula, to ensure that essential skills of a certain occupation are covered in training. In the UK, for instance, sectoral skills councils (SSC) are founded at each national industry level by employers, functioning as bodies that establish national vocational standards and issue certificates with approved awarding organizations. Such a certificate attests to receivers' employability for a particular occupation with relevant skills that are widely transferable and recognized in a certain national industry. These standards are used to guide formal institute-based training (Delebarre 2016).

For employer-based training such as apprenticeship programs, worker voice and monitoring mechanisms are necessary in order to prevent the problem of over-focusing on firm-specific skills, or abuse of apprentices in workplaces based on the will of unchecked employers. Civil society governance, in particular unions here often seek a role in training program development and process monitoring at workplace in pursuit of that balance, as they are

incentivized to strengthen member workers' employability over time and across firms (Locke, Kochan, and Piore 1995; Olney 1994). In the German dual system, for example, an apprenticeship program is negotiated between employer associations and unions regarding training contents. And in individual firms, works councils have the right to co-determine issues that are workplace-specific. Here the unions and works councils help prevent program development and training processes from being overly firm-specific and for employers' immediate use only. In terms of training process monitoring, chambers assume a role via apprentice evaluation, while works councils often serve as an important day-to-day monitoring mechanism at workplace (Streeck 1987; Culpepper 1999a).

Collaborative Model of Skill Development

Based on the discussion above, I have compiled a three-level collaborative model of skill development (see, Figure 4). All in all, a successful skill development system entails intensive collaboration among the state, civil society actors, and individual employers and training institutes in order to deliver desirable skill development outcomes through effectively addressing the three key problems: the collective action problem, the accommodation of industry needs, and the balance between general and specific skills.

Evaluation criteria and predicted outcomes*:* I evaluate the success of a program based on three criteria as to measure if these three key problems in skill development are successfully solved: 1) employer participation, for the collective action problem, 2) employer satisfaction, for the accommodation of employer needs, and 3) a proper balance between transferable and firm-specific skills, for the problem of over-focusing on firm-specific skills. Based on the discussion above, it is reasonable to expect that collaborative approaches adopted between the state and

non-state actors are more effective in addressing the first two issues than the traditional top-down, state-centralized model. But both models are likely to deliver poor performance regarding the third issue, given the lack of civil society governance in China. Table 10 summarizes these criteria, and indicators that I use to measure the two reform programs of the MOE (following collaborative approaches) and the MOHRSS (following the top-down approach), and expected outcomes.

Figure 4. Collaborative Model of Skill Development

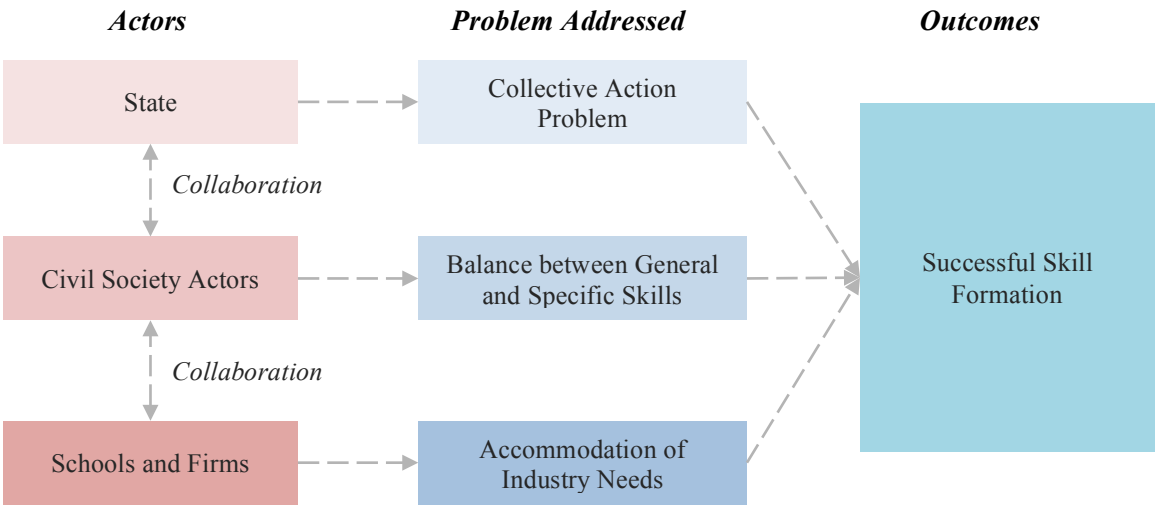


Table 10. Evaluation Criteria and Prediction

Key problems	Criteria	Indicators	MOHRSS: top-down	MOE: collaborative
Collective action problem	Employer participation	1) Number of programs established; 2) Firms and schools involved, and 3) Apprentices trained	Fewer	More
Accommodation of employer needs	Employer satisfaction	1) Sustainability of programs; 2) Employer feedback	Lower	Higher
Balance between firm-specific and general skills	Proper balance	Curriculum consistency	Over-focused on general skills	Over-focused on firm-specific skills

Methods

I employed ethnographic field research methods. The MOE and the MOHRSS's recent parallel reform efforts have provided us with an ideal comparative analytical framework where we can compare "apple to apple" while holding the broader socio-economic context constant. In order to evaluate and compare the two ministries' reforms, I looked into how their national reform agendas and policies on apprenticeship are being institutionalized at the local level. I started my fieldwork by leveraging and studying national-level organizations in Beijing – the capital city of China – where I interviewed central MOE and MOHRSS officials in charge of the VET affairs, their think-tank organizations' officials, as well as some academics. I made inquiries regarding respective ministries' central policy-making processes, their perceptions of the institutional division and potential competition between the two ministries, and their response to problems and challenges they are faced with during reforms. These interviews also enabled

me to establish good connections with government officials that later offered great help for my field research in Guangdong.

Next, in order to examine the institutionalization of central reform policies at the local level, I focused on Guangdong as an information-rich case (Patton 1990) in terms of both early reform outcomes and a wide range of possibilities that it is able to show. To begin with, Guangdong has been well known as China's economic reform frontier during the past three decades. Its economic development is currently faced with greatest challenges, however, including skilled labor shortage and rapidly increasing labor costs and conflict, which entail industrial restructuring and upgrading, and therefore skill upgrading of the workforce. Guangdong government officials have historically proven to be particularly efficient in effecting economic reforms. While the apprenticeship reforms are relatively recent central initiatives and local governments may or may not have fully embraced these agendas, we expect to see most dynamic reform practices and substantial early outcomes in Guangdong.

Second, we are more likely to see a wide range of scenarios in Guangdong regarding skill development. Guangdong is the biggest vocational education province in China, owning more VET facilities that educate a bigger workforce than any other Chinese province. Guangdong generates over one tenth of the national vocational school graduates on a yearly basis. Moreover, Guangdong shows tremendous diversity across its cities: At the kernel of the Pearl River Delta region (including cities like Guangdong, Shenzhen, Foshan, and Dongguan) are the most advanced market economies, as well as best vocational schools in China; Western and Northern Guangdong (such as Qingyuan, Zhanjiang, and Zhaoqing), in contrast, resembles typical circumstances of less developed provinces in hinterland China. While I am not claiming that Guangdong is a prototypical case here, it does somewhat represent the diversified scenario of the

entire Chinese VET system. All in all, Guangdong is a good start to evaluate the early outcomes of the current reform, both successes and failures, as a case rich in both dynamics and diversity.

I compare the MOE and the MOHRSS's recent reform efforts by focusing on apprenticeship training (see, Table 11) – an institutional arena with intensive competition between the two ministries in the current Chinese VET reform. By mid-2016 when I left the field, the MOE's apprenticeship system had generated two cycles of 51 programs in 19 schools in Guangdong, while I was able to cover nine schools including all the seven involved in the first cycle of apprenticeship experimentation. The MOHRSS's apprenticeship system had not been as successful; By mid-2016, they had recruited only four schools and five firms with five apprenticeship programs, none of which, however, had completed even the apprentice admission process. And I studied one of the five programs. These cases constitute the main part of my empirical work.

Table 11. Comparative Case Analysis

		MOHRSS: ***Top-down model***	**MOE**: ***Collaborative model***	
			Legitimizing	**Subcontracting**
Apprenticeship training		"New apprenticeship system"	"Modern apprenticeship system"	
	Curricula	National Vocational Certificate System		Individual-program based

Data

This paper draws on three types of data generated from the field research. The first consists of 322 interviews with various stakeholders of the VET system. In particular,

apprenticeship training entails active collaboration among governments, schools, and employers. I have therefore first conducted 28 interviews with officials from the MOE and the MOHRSS, and their local branches. The central and local governments' roles have been probed into through conversation, but state officials also helped me identify experimental programs, and establish important connections with those schools. I then proceeded to focus on school-level research, and collected 200 interviews with presidents, administration, teachers, students, and parents from 25 schools including ten currently experimenting with apprenticeship training. These schools further introduced me to their 21 collaborative firms, where I did another 79 interviews with managements, firm-level union officials, and workers. These in-depth interviews constitute my major information resource for understanding the complex dynamics of each experimental program. In addition, useful supplementary information was extracted through conversation with officials from 12 other organizations including local official unions, think-tank organizations, NGOs, employer associations, and academic institutes. Some of the interviews took place during group meetings, which is very common in China. Individual and group interviews last two hours on average.

Second, further exploring institution building approaches and interaction among relevant stakeholders during the process, I have engaged in tremendous participant and non-participant observation. I achieved this primarily through participating in two ongoing apprenticeship reform projects in Guangdong. Throughout late 2015 and early 2016, I served as an external consultant for the curriculum reform in Guangdong's beauty sector. And during April 2016, I was invited to work as a translator for a team of British consultants for the MOE's apprenticeship reform. My good relationship with government and school officials partly derived from these works allowed me later to attend many meetings, informal conversations, and dinners that are a typical way of

informal communication in China. These experiences granted me valuable insider information regarding how apprenticeship reform projects have been carried out under extensive collaboration among all aspects.

Finally, a systemic examination of the complexities of these nation-wide reform projects is enabled also by a considerable amount of secondary data collected during fieldwork. This includes relevant state policies, internal documents of governments, schools, and firms, and internet-based resources such as background information of schools and firms that I studied, and important news and reports. I use these data to "triangulate" with the firsthand data collected via above-mentioned methods, as well as to cover information that my process tracing through interviews could not yield.

Results

Table 12 previews outcomes of the two ministries' apprenticeship reforms in Guangdong by mid-2016 when I left my field. As shown, the MOE has overridden the MOHRSS regarding the number of programs and apprentice positions that were generated, indicating that the former has been more effective in addressing the collective action problem (Problem I). Furthermore, the MOE's programs received positive feedbacks from employers, and by mid-2016, had started another cycle of apprentice recruitment. In contrast, the MOHRSS's reform has triggered tremendous complaints from employers, who are unlikely to renew their programs for more cycles. Obviously here the MOE's programs have turned out to be abler to satisfy employers and accommodate industry needs (Problem II). Finally, both reforms have failed to secure a balanced

delivery of general and specific skills. The MOHRSS's programs offer exclusively general skills training, whereas the MOE's programs are overly focused on firm-specific skills (Problem III).

Table 12. Key Outcomes of Apprenticeship Reforms in Guangdong

Key problems		**MOHRSS**	**MOE**
Collective action problem	**Schools**	4	19
	Programs	5	51
	Firms	5	51
	Students/apprentices	N/A*	2,350
Accommodation of industry needs	**Cycles**	<1*	2
	Employer feedback	"Triple complaints"	Welcomed by employers
Balance between general and specific skills		Over-focused on general skills	Over-focused on firm-specific skills

* Apprentice admission not completed by mid-2016 when I left the field

What explains this significant variation? I find that it is derived from the two ministries' drastically different skill development models adopted in reform. The MOHRSS has followed a state top-down model that relies overwhelmingly on detailed state policies and guidelines, quota management, and subsidies, as well as centralized skill standards and curricula to motivate employer participation and guide them through apprenticeship training processes. The MOE, in contrast, has adopted a collaborative approach to apprenticeship training – subsidizing and legitimizing existing school-firm collaborative programs at vocational schools. In this section, I present the two ministries' reforms in a comparative perspective, and in particular focus on their top-down vs. collaborative models and the different outcomes thereby generated.

MOHRSS: Top-down Model

Following the central state's agenda of experimenting with apprenticeship training in the "Made in China 2025" guideline, the MOHRSS launched its "New Apprenticeship" system in July 2015. Its central policy offers a very detailed guideline and roadmap that seeks to direct firms through the institution building process. Each firm is required to offer 100 apprentice positions to enroll in a one or two-year program no later than September 2015, where apprentices receive relevant trainings for national vocational certificates that firms purchase from technical schools. The state will subsidize 60% of the training costs. While this subsidy has the potential to encourage firm participation, it has largely failed to do so in Guangdong, where the local government had already been subsidizing 100% of vocational certificate training for individuals that successfully receive a certificate at the end[21] – firms now are required to pay for 40% of something that would otherwise be covered by workers and the local government.

In addition, the MOHRSS uses quota to manage the process. As noted, a participant firm is imposed on a quota of 100 apprentices in a cycle. Also, according to the policy, participants have to be large and medium-sized firms in which, first, skilled workers account for over 60% of the workforce, and second, a comprehensive internal training system has already been established. This rigid central policy essentially excludes two types of firms. First, small firms typically cannot afford 100 apprentice positions in a cycle, and are therefore excluded. Even a big firm may not need as many new workers/apprentices if not under fast expansion. Second, firms with fewer than 60% skilled workers, or without a comprehensive internal training system are excluded. Such firms, if selected to enroll in the MOHRSS's reform experimentation, probably cannot make the reform look as "good" as those large and high-end firms, but they are

[21] Guangdong Department of Human Resources and Social Security (2014), Administrative Measures on the Special Fund for Guangdong Workforce Training, Relocation, and Employment.

absolutely more needy and enthusiastic than the latter about state-subsidized training. In contrast, why would a large firm that already has a comprehensive internal training system and 60% skilled workers be keen on an additional training that may not be useful for them anyway?

NVCS: Skill standards and curriculum making is much centralized as well. As noted, the training is tied to the National Vocational Certificate System (NVCS) run by the MOHRSS. Established in 1950s, the NVCS was one of the major tools that the state once used to manage employment and compensation in the centrally planed economy. Until the market reform in the 1980s, a state worker's wages and benefits were exclusively tied to the vocational certificates and seniority that s/he carries, no matter what firm, industry, or often area s/he works.

With the decentralization of the market reform that seeks to break the "iron-rice bowl" and authorize firms with discretion to determine wages and benefits based on various factors such as firm profits and individual performance since the late 1970s, the centralized NVCS was rendered incompatible with the new labor market circumstances. In particular, the MOHRSS runs an overwhelming majority of vocational certificates by itself, with only a few exceptions where industry associations or industry-relevant state ministries are authorized to manage certain professional certificates and related qualification processes such as doctors and lawyers. Skill standards making is exclusively within the national ministry, while local Bureaus of Human Resources and Social Security and their approved entities – typically public technical schools – are responsible for carrying out qualification and related training processes.

The NVCS has long been criticized for this centralization, and thus rigidity and outdatedness. To begin with, the system is too centralized to accommodate industrial and regional specificities. While a certain occupation may be employable in many different industries, essential technologies adopted and thereby know-hows required for workers likely vary across

these industries – welders, for example, use very different tools when they work in an auto-manufacturing firm vs. in an electronics-manufacturing firm. Furthermore, the national system is unable to cater to regional difference. Most complaints I heard about the NVCS in Guangdong pertain to how "backwards" the standards are that it fails to catch up with the relatively advanced industrial status quo there. An interviewed school provost related to me:

> The MOHRSS's vocational certificates do not really attest to someone's actual level of skills, and are useless [in workplaces]. We have a certificate for food inspectors. Workers holding this certificate cannot do the work in factories… For example, in terms of setting up a laboratory, we went to a food factory last time, and set up an entire laboratory for them. We were very clear about what they need, but a worker working there cannot do this at all. Nowadays every food factory is required to employ a fulltime food inspector, but workers (holding this certificate) are often not really qualified for this job. What does this tell? Holding a vocational certificate does not represent the real skill level a holder has. (Author: why do you think it is so?) The MOHRSS finds a number of old experts and makes up a set of standards, without updating it for years. They are not really doing this according to industrial development. These experts are probably unfamiliar with industrial circumstances, so they do not really test the most important things [in qualification] (II: 49)

In addition, major updates of most skill standards occur every five years, rendering these standards outdated and unable to catch up with the fast technological change in industry. While a VW assembler firm in Foshan, Guangdong is nowadays using robots to conduct most, if not all, welding work, they are least interested in hiring a welder with a national certificate that attests to his/her ability to operate traditional manual welding guns who, however, likely knows nothing about operating and maintaining a robotic welding machine.

Urged by Prime Minister Li Keqiang, the MOHRSS has recently embarked on effort to reform the NVCS. A centerpiece of this reform is decentralization – to diffuse authority to industrial associations and let them manage relevant vocational certificates like in the case of UK and Germany. According to my interview with a MOHRSS official, however, the ministry is

reluctant to authorize these civil society actors to run certificates, unconfident about their capacity of doing so:

> Employer associations in China are under-developed… Traditional industrial associations are not real employer associations, but rather former government institutions, whereas those associations self-organized by firms do not have adequate capacity [to run vocational certificates]… We certainly hope to maximize their role, but they themselves are still under development. Whenever their reform is sufficient, and can really represent specific industries, they may be able to assume a bigger role (I: 2).

In Guangdong, evidence largely supports this argument. A director of the official chamber of Guangdong, the Guangdong Provincial Enterprise Confederation (GEC), related to me:

> To be honest, our confederation is doing nothing with regard to education and training. (Author: Why?) We lack the capacity, and enough employees, and we cannot understand what firms need. We used to have a department of training, which was closed later, because they could not develop any business (IV: 15).

This official also admitted that except for a few cases where certain associations are allowed by the MOHRSS to run some professional certificates, most employer associations in China do not play a role in VET. In my own research, I found only one case in Shunde District in Guangdong's Foshan City where the district-level government has been establishing localized skill credentialing systems with support from several local industrial associations. Other than those, employers do not have a significant collective role or voice in skill credentialing in China. As a result, skill standards and curriculum making of the NVCS is likely to remain centralized and run by the MOHRSS in the long term.

Now that the MOHRSS seeks to apply the NVCS to its apprenticeship system, an fundamental concern here is that curricula derived from these standards would fail to cater to industry needs (Problem II) and over focus on general skills development (Problem III). The case of the Toyota & Guangzhou Technician College (GZTC) apprenticeship program illustrates these problems.

Toyota & GZTC apprenticeship: Following the central policy and guideline, in October 2015, Guangdong Department of Human Resources and Social Security (GDDOHRSS) formally announced five experimental apprenticeship programs with participants of five firms and four technical schools. GAC-Toyota (referred to as Toyota) is included.

Toyota is a joint venture between Guangzhou Automobile Group (GAC) – a state-owned enterprise (SOE) – and Toyota. Established in 2014, the auto assembly firm currently employs 9,600 workers with an annual production capacity of 380,000 cars.[22] While Toyota holds 50% of the share, the human resource management system within the firm largely follows a typical Japanese MNC model that offers continuous internal training for workers. Toyota was selected as an experimental firm of the MOHRSS's apprenticeship reform in Guangdong in 2015. From both the firm and the state's perspective, Toyota's participation seems inevitable. In the Chinese auto industry, the success of an auto firm – whether a JV, SOE, or private firm – almost always hinges on the local government's overtime support in various forms, Toyota not an exception. In exchange, maintaining a good relationship with the local government for firms like Toyota entails their willingness to participate in state-initiated projects like the apprenticeship reform even though it may seem irrational based on short-term cost-benefit analysis. From the GDDOHRSS's perspective, as a "star firm" in Guangdong and a leading firm of the local auto industry, Toyota's participation will definitely make the entire project look good.

State-subsidized training would not be too much a burden for firms, if without two major obstacles in this regard. The first is policy conflict between the MOHRSS and the GDDOHRSS regarding subsidy on NVCS training as mentioned above. Now that Toyota has budgeted 100,000 yuan for its first cycle apprenticeship training, based on their estimation, they

[22] http://about.gac-toyota.com.cn/visit/index.html, October 21, 2016

themselves will eventually fulfill a bill of about 45,000 yuan that would be otherwise unnecessary.

What further annoys Toyota is the fact that they have to offer 100 apprentice positions in a cycle. Without significant production expansion, they would not have as many new positions to be filled by even ready-to-work workers in a year or two, let alone inexperienced apprentices. Alternatively, they decided to recruit 100 existing workers.[23] This strategic solution renders apprenticeship training meaningless. The underlying rationale of apprenticeship training is to combine in-classroom with on-the-job training for apprentices unfamiliar with their prospective jobs to gain both general and specific skills. Existing workers, in contrast, have already been well integrated in the workplace, making at least the on-the-job training part formalistic.

Toyota's anonymous HR specialist, whom I call Ms. Wang here, was appointed to coordinate this apprenticeship program. Per the GDDOHRSS's requirement, she made a detailed plan for the project, and budgeted 100,000 yuan for purchasing NVCS trainings from the GZTC. These trainings are composed of three programs/classes, each with 16 trainees, respectively on auto maintenance (middle-level and senior-level), and auto examination clerk (middle-level). According to the director of the GZTC's NVCS training center, Ms. Chen, these trainings will strictly follow relevant NVCS standards, without any customization for Toyota (II: 187). While these trainings are exclusively focused on general skills, I cannot identify any component of on-the-job training in their training plan.

"Triple complaints": The MOHRSS's apprenticeship experimentation has triggered triple complaints in Guangdong. From the employers' perspective, such general skills are useless

[23] The MOHRSS's central policy clearly requires that apprentices have to be newly recruited or appointed workers.

for their currently employed production system. It is worth quoting at length a section of my interview with Ms. Wang:

> Author: Do you think the 60% subsidy from the state is appealing?
> Wang: No. When we do something we want to know why we do it and what outcomes to expect. At the beginning when we were assigned the task [from the government], we did not know why we have to do this. Even now we are not much interested, but just to complete the task. Also, if our workers go to take these NVCS-related trainings, for instance, senior-level mechanics, [they pay] about 2,000 yuan training fee. But according to the policy of our province, the state will refund over 3,000 yuan. Now [under the apprenticeship program] they only reimburse 60%. We are actually losing money by paying 40% of it.
> Author: Why then did you still decide to do it?
> Wang: It is required by the GDDOHRSS. Their commanding document was sent to us… We said in private that this is a task from the state, The firm cannot really resist it. We also have a general manager from the Chinese partner – we are attached to the GAC, a state-owned firm. So we have to participate no matter if we are willing or not.
> Author: What do you think about the future of this program?
> Wang: (Shaking head) In the long run we definitely suffer a loss. But even if in the future the subsidy is increased to 100%, we still have to do too many things. We have our internal training system. Although we would also encourage our workers to go and get these certificates… if you ask us to organize them to get them (we are not happy), because these certificates are not very useful for us. So we would never force them to get them. Based on our own production system, we have our own training system.
> Author: Are relevant NVCS certificates recognized in the auto industry in general?
> Wang: We are happy if workers have these certificates, but they are not necessary. For instance, the certificate for auto maintenance, they are not really linked with real workplace [situations] (III: 74).

Obviously, they regretted agreeing to participate. Toyota was reluctant to turn in their proposal to the GDDOHRSS. Indeed, none of the selected experimental firms had done so by mid-2016 when I left the field – nine months later than what the MOHRSS's roadmap had required.

GDDOHRSS officials were very concerned with this situation. Local officials from both the MOHRSS and the MOE by and large welcomed my fieldwork in Guangdong. Partly because of my connections with central ministries, local officials were mostly willing to show me their "successful models." The only exception was, however, the apprenticeship programs of the GDDOHRSS. Throughout my fieldwork during 2015-2016, I have repetitively requested to be

introduced to some of their experimental programs, but my GDDOHRSS contact had been reluctant to do so, in sharp contrast to the Guangdong Department of Education (GDDOE)'s reactions to my similar requests, as well as what the GDDOHRSS themselves did regarding my other requests. While I was fortunate enough to get access to the Toyota case via my other networks, the GDDOHRSS officials' unusual quiescence about their apprenticeship reform had confused me until Ms. Chen, Director of Internet of Things Association of Guangdong Province (GDIOT), revealed the following story to me:

> The GDDOHRSS issued a subsidy policy, but no firm has applied for the funding. The department director was very concerned. We communicated a couple weeks ago, and they asked what problems their policy has that no single firm has sent in their proposal. The policy is simply rendered meaningless now. None of the five experimental firms had applied for the money. They were so anxious that they came and asked us how to adjust their policy to make it more acceptable (IV: 2).

Apparently, the GDDOHRSS officials were very unconfident and discontented with the progress of their apprenticeship reform in Guangdong.

Clearly, a lesson for them to learn here is that their top-down approach indeed had failed to motivate employers that are potentially most interested – small firms and start-ups that have rapidly growing needs for high-skilled workers but themselves, however, typically lack the capacity to provide systematic training for the workforce. The GDIOT has a membership of over 600 start-ups and established firms in the IT industry in Guangdong. This association has indeed been running an apprenticeship-like training program with effective coordination among its member firms, well understanding these firms' needs for skilled workers in the sector. They have been self-funding this, and expecting support from the local government throughout years, but the MOHRSS's reform eventually excluded them from the subsidy. Ms. Chen continued the conversation:

> So now they told us that they have realized the importance of small and medium-sized firms. Those five experimental firms they selected are all large ones, none of which are very cooperative with them. Small and medium-sized firms should indeed be central to apprenticeship training, and they should highlight our employer associations' role. The government does not give a shit, but only focus on those big firms, and do individual firm-school training (IV: 2).

In other words, the MOHRSS could have been more successful in its apprenticeship reform if it had not used a rigid state top-down model of institution building, but sought to integrate such well-established existing programs into its own system like what the MOE has done with its own apprenticeship reform, to which I now turn.

MOE: Collaborative Model

On the contrary, the MOE's apprenticeship reform has demonstrated a much more satisfactory scenario. The MOE initiated its apprenticeship reform in August 2014, and formally announced a list of experimental programs a year later – only two months earlier than the GDDOHRSS. But their achievements in Guangdong by mid-2016 had been much more successful as summarized in Table 12.

Different from the MOHRSS, the MOE has generally adopted a collaborative approach to its reform. A centerpiece of this approach is decentralization and diffusion of state authority to non-state actors, encouraging these actors' active participation in the reform process instead of simply following state-issued guidelines. The MOE's August 2015 "Notification" regarding apprenticeship reform, for example, has stipulated only four general principles that require experimental programs to establish their own roadmaps and guidelines and "put them on record of local education departments." This leaves great autonomy for firms and training institutes to work out their own programs based on their specific circumstances.

In Guangdong, the GDDOE also follows this rationale of collaboration and leaves it to non-state actors to develop their own programs. They established a special advisory committee at the provincial level with experts, scholars, and practitioners. The chair of the committee, Zhao, is one of my key informants. He is a successful vocational school president and an expert in apprenticeship training for many years. The school under his leadership has been experimenting with apprenticeship programs ever since 2009, way before the central reform initiatives. I worked closely with this advisory committee that he leads and therefore was able to observe the way they work and interact with schools and firms, which is in general, very non-interventionist. Major responsibilities of this committee is providing expertise and advice to programs whenever necessary, and annually reviewing the progress of each program as a soft monitoring mechanism.

In addition, the MOE's subsidy policy is very flexible. While the MOHRSS requires firms to make a detailed individual-trainee based budget, and reimburse only 60% of the total costs afterwards, the MOE disburses a lump-sum subsidy of 500,000 yuan (for the first cycle participants, and 100,000 for participants that joined from the second cycle) to each individual program beforehand, without requiring programs to propose detailed budgets. A program – a vocational school and a collaborative firm – has full autonomy to use this money to cover various costs shared between them and apprentices. Although nearly all interviewed schools and firms claimed that it is insufficient to cover all the costs, especially those that started from the second cycle, they did appreciate the freedom granted to them in using the money.

These flexible central policies have laid the foundation for the MOE's collaborative strategy, i.e. legitimizing existing training programs within schools and firms and incorporating them into the formal apprenticeship system. Indeed, most, if not all, GDDOE's experimental

apprenticeship programs originated from vocational schools and firms' unconscious institutional preparation overtime under what I call the "training for a targeted brand" model.

Training for a targeted brand: The successful outcomes of the MOE's apprenticeship reform rely on continuous experiments of non-state actors – most relevant here being schools and firms – with various innovative formats of collaborative training. This firm-school collaboration prevalently exists in both manufacturing and service sectors in China, especially in areas like Guangdong where major industries are clustered but faced with local market labor shortage nowadays. I have documented in detail in another paper (Ch.3) that the skilled labor shortage and decentralized VET system in China have together resulted in a de facto apprenticeship training model in Chinese vocational schools way before the recent apprenticeship reform was initiated by the central government. This model features a shift of traditionally firm-based skill training to the pre-employment phase of workers' skill development process, mostly based in schools, via firms' strategic collaboration with partner schools. Due to the absence of effective civil society governance in China, however, such collaborative training is exclusively instituted at the individual school-firm level, which is a key difference from Western apprenticeship systems that typically have certain forms of industry-level (or regional industry-level) or multi-employer coordination – thus "training for a targeted brand" only.

The MOE's experimental apprenticeship programs have been transformed from these existing targeted training programs. Given the space constraints here, I will only detail an auto-sector program as a comparison with the MOHRSS's Toyota case, as well as use some supplementary data from the beauty sector. For a full elaboration of "training for a targeted brand" practices in the beauty and robot industries, see Ch.3.

GDMEC – Jaguar-Land Rover apprenticeship: Guangdong Mechanical and Electrical College (GDMEC) has engaged in education and training for the auto sector for over 50 years. It has maintained long-term collaboration with auto firms like VW and Jaguar Land Rover over years. Its collaborative program with Jaguar-Land Rover dated back to 2012. The two have engaged in activities including co-building a practical center, curriculum and textbook development, teacher training, and firm dispatching of trainers to work fulltime at the school. The GDMEC – Jaguar-Land Rover case here represents a typical state-legitimized model of institution building where non-state players fit their originally legally murky[24] training activities under the "training for a targeted brand" model into a new reform agenda of the state.

In 2015, the GDMEC and Jaguar-Land Rover simply transformed their existing collaborative program into an apprenticeship program, as one of the MOE's first-cycle experimental programs in Guangdong. A class of 30 apprentices were recruited in the same year, to enroll in a three-year program with curricula as following: First year – classroom-based general skills training of 900 hours; Second year – on-campus practical center-based vocation and firm-specific skills training of 486 hours; Third year – firm-based job-specific skills training of 1,020 hours (internship). The program director, Professor Yu explained the change:

> It was transformed from the old program. The only difference is that before, firms selected from these apprentices and employed them as formal workers later. But now they have to decide whom they want at the beginning, and then we train them together (II: 103).

Apprentices that I interviewed generally expressed their satisfaction with the program. When asked what he appreciates most about this program, an apprentice said:

[24] In the current Chinese VET system, it is unclear if public schools are justified to engage in this kind of targeted training for specific firms without having the latter bear significant costs. A full discussion of this see, (Zhang, 2017 manuscript).

> We in our first year studied a wide range of things. So when it comes to the second year, we must focus on a specific brand's car models. We should not be like, seemingly to know of many cars, but indeed unfamiliar with any. We have to be specific if we want to be an expert. This program provides such an opportunity, and has rich contents. It gives us a deeper understanding of a specific brand (II: 107-114).

Jaguar-Land Rover's management also had positive evaluation on this collaborative training. The program has continued for six years if including the pre-2015 period, and in the summer of 2016, the newly named "apprenticeship program" recruited its second cycle of apprentices. Every year, the firm invites school teachers to pay three to four training tours at the Jaguar-Land Rover headquarter in Shanghai, as well as regular visits to their 4S stores in China to update their skills.

Apparently, auto employers in Guangdong welcome the MOE's apprenticeship reform. Five of the 51 experimental programs in Guangdong fall into the Auto sector. But in my other paper, I have shown that this "training for a targeted brand" model also prevalently exists in the beauty as well as the emerging robot manufacturing sector, where likewise a shortage of skilled labor co-exists with decentralized VET institutions.

Over-focusing on specific skills: Prevalently using this "training for a targeted brand" model renders skill development in public schools over-focused on firm-specific needs, however, especially given that schools now enjoy nearly full autonomy in developing their own curricula according to collaborative employers' needs under the current MOE's apprenticeship reform. In order to get a sense of this situation, I conducted a systematic study of ten major training programs for beauty workers under the Guangdong Health Vocational Education Association (GHVEA). It turned out that all of the ten schools have their collaborative beauty firms that to varying extents dominate their curriculum development and training processes.

As a result, trainings in these programs in general lean toward specific skills that individual collaborative firms needs. I have coded curricula of the ten training programs. As

shown in Figure 3 in the previous chapter, all of the programs focus their curricula on firm-specific skills or skills with limited transferability. More relevant to the discussion here is that three of the ten programs have engaged in experimental apprenticeship training – including one that had been included in the GDDOE's apprenticeship experimentation. As highlighted in Figure 3, these programs are even more over-focused on specific skills than the other seven. And as I have noted in the previously chapter, this inconsistency across curricula of training programs for the same occupation has led to incoherent skill structures of the workforce within the local industry.

In light of this, even though firms and schools, and frequently apprentices themselves, are quite satisfied with the training under the "training for a targeted brand" model, negative impacts can be huge. Over-focusing on firm-specific skills in workforce's training, especially during the pre-employment phase, not only undermines workers' employability across the local industry, and therefore their labor market mobility, but also increases retraining costs of firms – further aggravating the skilled labor shortage that they are commonly faced with. While systemically estimating the level of these impacts is beyond the scope of this study, they have been well demonstrated by Western countries' experience. And I simply lay out these hypotheses here for future research to test. All in all, the MOE's reform has largely failed to address Problem III in my three-level collaborative model.

Discussion

With the central state recently shifting its reform focal point toward supply-side labor market policies, both the MOHRSS and the MOE have embarked on tremendous efforts to

reform vocational schools within their own jurisdictions by introducing the apprenticeship system, under an overall agenda of promoting skill upgrading of the Chinese workforce. Although this process of apprenticeship reform has been preceded almost simultaneously in each case, by mid-2016, the MOE had established 51 experimental programs in Guangdong, while the MOHRSS only five. More importantly, the MOE had overridden the MOHRSS regarding employer satisfaction – a crucial indicator of a successful skill development system. Most MOE's programs had started to recruit a second cycle of apprentices by mid-2016, whereas none of the MOHRSS's programs had finished their first cycle apprentice admission – Employers were reluctant to progress this reform. How, then, can we explain this significant variation between the two ministries' similar reform agendas that are enforced at the same time? Why is the MOE's reform able to generate more desirable outcomes than the MOHRSS? And what are the implications for understanding the Chinese economic reform in general?

My answer to the first question is simple: The MOE has employed a collaborative model of skill development while the MOHRSS has adopted a top-down approach to its reform. But why collaboration is desirable – and indeed necessary – in skill development and potentially other arenas? I contend that collaborative institution building can address three key theoretical problems in skill development – the collective action problem, the accommodation of industry needs, and the balance between general and specific skills – and therefore deliver favorable outcomes. Skill development, as a result, entails effective collaboration among the state, civil society actors, and individual firms and schools. I have developed a three-level collaborative model to illustrate this ideal scheme as shown in Figure 4.

I find that in the Chinese apprenticeship reform, the MOE has been able to solve the first two problems, but by and large failed in the third. Due to the absence civil society governance in

China, collaboration in the MOE's apprenticeship programs are instituted at the very decentralized individual school-firm level, which is derived from the "training for a targeted brand" model that has been long rooted in the Chinese VET system. The MOE's programs are thus rendered over-focused on specific skills needed only by individual firms in collaboration. The MOHRSS, in contrast, has failed to resolve all of the three problems, adopting a state top-down approach to its reform that embodies very limited collaboration with non-state actors. I discuss these three problems here in turn in a comparative perspective.

Regarding the collective action problem, the state in both top-down and collaborative models has the potential to solve the collection problem. But in some cases the state's centralized policies may conflict with certain local policies, undermining their effects in solving the collective action problem. As I have shown in the MOHRSS's apprenticeship reform, the central government subsidizes about 60% of the training costs for firms, which indeed conflicts with Guangdong's existing local policy that already subsidizes 100% of such training. This means that firms enrolled in this project are indeed paying more than what they would have done otherwise – The centralized subsidization policy has become a de facto disincentive to firm participation in Guangdong. The three indicators I used to estimate employer participation – the number of programs established, the number of firms and schools involved, and the number of apprentices trained – all indicated that the MOE's apprenticeship system has achieved better performance than the MOHRSS's in this regard.

Regarding the accommodation of industry needs, my findings suggest that collaboration with non-state actors will generate better outcomes as it better caters to employer needs. Here I used the sustainability of a program and employer feedback as indicators of employer satisfaction. It turned out that the MOE's apprenticeship programs have overridden the

MOHRSS's with regard to both measures. This popularity of the MOE's programs is derived from the schools' ability to customize their curricula according to whatever a collaborative employer needs. The MOHRSS's reform, in contrast, does not allow that flexibility. It requires firms to purchase trainings based on the centrally standardized NVCS, which has proven to be unable to accommodate regional and industrial needs. The "triple complaints" from employers and the local government demonstrated the rigidity of this centralized approach.

Last, regarding the balance between general and firm-specific skills, both the MOE and the MOHRSS have generated unsatisfactory outcomes for different reasons. The top-down model of the MOHRSS tends to over focus on general skills, which partly explains why it often fails to satisfy employers. The MOE's collaborative model is faced with a seemingly insurmountable obstacle, i.e. the absence of civil society governance in China that is crucial to the success of the German apprenticeship system at suggested by the literature. As I have shown, the MOE's apprenticeship programs are based on collaboration between individual employers and individual schools without effective coordination across programs, rendering these programs over-focused on specific skill needs of collaborative firms at work. My comparison of the curricula of ten major programs in the beauty sector including three currently under the MOE's reform experiment has provided support for this argument.

The three-level collaborative model holds important implications for understanding and furthering the current skill development reform in China. The literature on the Chinese reform has focused on either a top-down or a bottom-up approach. The former is by and large derived from the developmental state theory, ascribing the Chinese "economic miracle" to the state's leading roles in all socio-economic aspects (see, Howell 2006 for a review). There has been, however, a relatively small but growing literature that highlights the role of grassroots and

private players – individuals, private firms, and other organizational entities – in initiating, coordinating, and implementing reforms in various arenas (Zhou 1996; Nee and Opper 2012). While these players often lack necessary political resources to effect a wider scope of change, they are found to have used informal institutions and networks to realize some of their goals (K. Tsai 2006; L. Tsai 2002, 2007). My study enters this debate by suggesting a three-level collaborative model of reform. This is not simply suggesting that both state and private players are important. They are certainly important, to be sure, but should engage in active collaboration with an appropriate division of labor and authority diffusion among the state, civil society actors, and individual players. In the skill development arena in particular, the state should assume an important role in solving the collective action problem, mainly through policy making and provision of financial support. Civil society actors' roles should be focused on coordinating diversified interests across individual employers, establishing industry-level skill standards, and licensing other bodies to carry out related qualification processes (or themselves doing so).

The absence of civil society governance in China, however, has rendered the current apprenticeship training either over-centralized or over-decentralized, trapping the Chinese state in a decentralization dilemma. It is now either the state or individual employers that are guiding the development of training programs, whereas this process should have been taken over by civil society actors. The two ministries' reform models have generated drastically different outcomes, but neither is ideal. The MOHRSS case suggests that state centralization with regard to skill development is likely to fail, as it is often unable to accommodate regional and industrial specificities. The MOE case, in contrast, goes to the other extreme of over decentralization, as training processes are now geared toward individual employers' short-term skill development agendas. While this market logic can at times encourage firm participation and increase their

satisfaction, it often fails to act on the best interests of the society. An ideal skill formation scenario entails a long-term and societal-level planning, but individual employer-dominated processes tend to focus on their own short-run specific skill needs.

The Chinese state faces a decentralization dilemma in not only the skill development, but also the employment relations arena. The official union, the All-China Federation of Trade Unions (ACFTU) has tremendous influence within the central state in labor policy making, but the collective bargaining system it enforces is by and large instituted at the very decentralized individual firm level. Managements have incorporated firm-level unions in most Chinese enterprises, rendering most firm-level bargaining ineffective and meaningless (Kuruvilla and Zhang 2016). While the Western experience suggests that relatively centralized multi-employer bargaining is crucial to solving this problem, the absence of capable industry-level unions and employer associations in China has served as a major obstacle to the recent recentralization efforts of the ACFTU. This failure in turn has forced the state and the ACFTU to themselves assume an even bigger role, and enforce even stronger labor protective legislations, e.g. the Labor Contract Law in 2007, to directly intervene and centralize labor standards, many of which indeed should have been better negotiated at the regional industry or individual workplace level. The Labor Contract Law and several following central regulations have received a lot of criticisms about their rigidity in labor standards. One policy implication here is that the Chinese government should focus on capacity building of relevant civil society actors and have them assume certain roles that are now taken by either the state itself, or uncoordinated individual private actors in which case, enforcement failure and short-term behaviors often ensue.

Conclusion

In this paper, I have compared and evaluated the early outcomes of two ongoing apprenticeship reform efforts by the MOHRSS and the MOE in China. I have shown that the collaboration with non-state actors allows the MOE's apprenticeship programs to 1) address the "collective action problem" in skill development, i.e. successfully engaging firms in the pre-employment skill formation process, and 2) better accommodate industry needs through legitimizing existing "training for a targeted brand" programs in vocational schools that are based on individual school-firm partnerships. The MOHRSS's top-down approach, on the other hand, has failed to either encourage employer participation or cater to their specific skill needs. That being said, without effective civil society governance in China, both ministries' reforms are unable to secure a balanced delivery of general and specific skills. The MOHRSS's state centralization renders training programs over-focused on general skills, whereas the MOE's programs based on individual school-firm collaboration tend to go to the other extreme, i.e. over-focusing on individual employers' specific skill needs but overlooking necessary general skills training. I hence argue that the Chinese state has been trapped in a decentralization dilemma with regard to skill development reform. Until effective civil society governance emerges and functions to coordinate the training process, the VET system is unable to deliver ideal skill development outcomes – presenting a challenge to the state's long-term upskilling agenda.

It is worth emphasizing that although Guangdong is an information-rich case for us to understand these reform dynamics, it is by no means representative. While the two ministries generally follow drastically different approaches elsewhere too, the way their different reform models are played out may vary across regions with very different local political economic

contexts. In the Yangtze River Delta area, for instance, local firm networks are more developed than those in Guangdong, and employer associations are known to be relatively active in certain centralized collective bargaining arrangements (Friedman 2014a). While the absence of civil society governance, as shown, has become a major obstacle to the MOE's collaborative model in generating ideal outcomes, cases in the Yangtze River Delta area may show a different, and potentially more coordinated scenario. Future research is therefore encouraged to explore these processes in various other political-economic settings.

CHAPTER 5

CONCLUSION

In this dissertation, I argue that in its attempts to reform the vocational education and training (VET) system, the Chinese state has become trapped in a dilemma. The state's goal is to upskill the Chinese workforce during the coming decades, but it is attempting to accomplish this without including in the process effective private governance. Private governance should play a larger role in the process. Employer associations, for example, could help coordinate the development of coherent skill agendas at the industry level. The state initiated major decentralization reform during the mid-1980s, but currently the Chinese state has largely withdrawn from the daily operations of vocational schools. Consequently, employers concerned about the shortage of skilled labor have stepped in and taken over the VET process.

The result is that individual schools enjoy nearly full autonomy to devise training agendas based on whatever collaborative firms need, and there is little industry-level coordination and no state-imposed skill standards. While a certain level of decentralization is desirable in VET (which inherently has to be market oriented), the peculiar and key problem of the Chinese VET's decentralization process is its over-decentralization and, thus, its disorganization. Both western experience and my own empirical findings suggest that when effective private governance mechanisms that coordinate employers' diversified interests at a broad scale are not present, individual employer-dominated training will over-emphasize the specific short-term skills that employers need and under-emphasize industry-transferable skills. The recent apprenticeship system reform has already shown a drastic contrast between two state ministries' institution-building models. On the one hand, the Ministry of Education (MOE) has

continued with a decentralized and disorganized approach. On the other hand, the Ministry of Human Resources and Social Security (MOHRSS) has sought to recentralize the system through enforcement of its National Vocational Certificate System (NVCS), but it has faced major resistance from employers. This skill formation dilemma, I predict, over the long term will confound the Chinese states' upskilling agenda, which is designed to facilitate industry upgrading.

Lai and Lo (2006) have documented the Chinese state's attempt to decentralize the VET system since the mid-1980s, and they predict a failed decentralization reform by the turn of the new century. In my Introduction chapter, I note that until now this decentralization reform has been successfully enforced because the state has granted vocational schools unprecedented autonomy over specialty establishment, student admission and qualification, and curricula development. Taking this decentralized status quo as a starting point, the three following chapters provide evidence that this decentralization has progressed in a disorganized way and that this disorganization has generated various problems. Specifically, I find that: 1) partly due to decentralization, vocational schools have been characterized by substantial variation in their skill development patterns (Ch.2); 2) motivated by a skilled labor shortage, employers have dominated the vocational school training processes and have shifted part of their traditionally firm-based training to the VET process (Ch.3); and 3) the state is trapped in a skill formation dilemma and, consequently, in the absence of effective civil society governance, neither a decentralized model nor a recentralized reform approach has delivered ideal skill development outcomes (Ch.4).

These findings hold important implications for ongoing Chinese VET system reform. The skill formation dilemma demonstrates that neither a top-down nor an over-decentralized

approach to VET is ideal. The latter sufficiently satisfies employers' skill needs, but it tends to focus on their short-term specific skills only. The over-decentralized approach likely undermines workers' employability and self-learning capacity, reduces labor market flexibility, and increases employers' retraining costs, which further aggravates the skilled labor shortage that stands in the way of Chinese industry restructuring and upgrading. To more successfully pursue long-term upskilling of the Chinese workforce, therefore, the state should engage in civil society building. In particular, it should seek to activate the role of official employer associations, strengthen the self-organizing capacity of employers, and provide an effective institutional framework to coordinate industry-level skill development agendas. The Chinese state rarely lacks the capacity to initiate innovative reform agendas at the central level. When there is a problem in reform agendas it very often lies in the weak enforceability of central policies at the grassroots level, which is due in part to the "appropriated representation" of both workers (Friedman 2014b) and employers. With regard to workers, the state is concerned about the threat presented by the potential uncontainable force of collective labor. But skill development is of less concern: indeed, the importance of skill upgrading for both labor and capital is not controversial. I do hope that, given the pressure it suffers to upgrade industry and develop a sustainable and growing economy, the Chinese state will decide in the near future to loosen its control over civil society actors who are working to facilitate skill development.

APPENDIX: INTERVIEW LIST

#	Organization	Title	Name	Time
	State Organizations			
I: 1	Ministry of Education (MOE)	Deputy department head	Anonymous	November-15
I: 2	Ministry of Human Resources and Social Security (MOHRSS)	Deputy department head	Anonymous	February-16
I: 3	MOE and MOHRSS	Former official	Chen Yu	February-16
I: 4	MOHRSS - Occupational Skill Testing Authority	Former director	Chen Lixiang	May-16
I: 5	Guangdong Department of Education (GDDOE)	Official	Zhan Zongchao	November-15
I: 6	GDDOE	Department head	Wu Nianxiang	March-16
I: 7	GDDOE	Department head	Wu Nianxiang	March-16
I: 8	Guangdong Department of Human Resources and Social Security (GDDOHRSS)	Bureau head	Zhang Guangli	December-15
I: 9	Shunde Bureau of Education (SDDOE)	Deputy head	Huang Xiangting	January-15
I: 10	SDDOE - Office of School Affairs	Official	Zhou Liangliang	January-15
I: 11	Dongguan Bureau of Administration	Office head	Zeng Lijing	May-16
I: 12	SDDOE - Special Committee for the Promotion of Vocational Education	Official	Mr. Li	January-15
I: 13	Guangdong Academy of Education (GDAE) - VET Institute	Director	Li Haidong	January-16
I: 14-16	GDAE - VET Institute	Deputy director Official Director	Du Yiping Huang Wenwei Li Haidong	January-16
I: 17	GDAE - VET Institute	Deputy director	Mr. Deng	January-16
I: 18	GDAE - VET Institute	Official	Huang Wenwei	January-16
I: 19	GDAE	Deputy head	Lao Hansheng	March-16
I: 20	GDAE - VET Institute	Director	Li Haidong	March-16

I: 21-25	GDAE - VET Institute	Consultant	Zhao Pengfei	March-16
		Official	Huang Wenwei	
		Consultant	Mark	
		Consultant	Andre	
		Consultant	Liu Qin	
I: 26	GDAE - VET Institute	Official	Huang Wenwei	March-16
I: 27	GDDOE - Special Committee for Modern Apprenticeship	Director	Zhao Pengfei	May-16
I: 28	Guangzhou Bureau of Human Resources and Social Security - Occupational Skill Testing Authority	Former director	Li Zongguo	April-16
	Schools			
II: 1	Guangzhou Institute of Technology （GZIT）	President	Fan Zhigang	December-14
II: 2	GZIT	Official	Mr.Zhang	December-14
II: 3	GZIT - Employment Promotion Center	Director	Li Renxuan	January-15
II: 4-6	Guangdong Industry Polytechnic (GDIP) - Personnel Department	School president	Lin Runhui	November-13
		Head	Chen Dongmei	
		Deputy head	Li Guojie	
II: 7	GDIP	Deputy president	Lin Runhui	January-15
II: 8	GDIP - Department of Mechatronics	Chair	Mr. Jie	April-15
II: 9	GDIP	Deputy president	Lin Runhui	April-15
II: 10	GDIP - Office of International Affairs	Director	(Unknown)	April-15
II: 11	Shunde Liangqiuju Vocational and Technical School (SDLVTS)	President	Huang Ruixiing	January-15
II: 12	Guangdong Construction Polytechnic (GDCP)	President	Zhao Pengfei	December-15
II: 13	GDCP	Provost	Zhang Zhi	December-15
II: 14	GDCP	Vice president	Zhao Huilin	March-16
II: 15-21	GDCP	Vice president	Zhao Huilin	March-16
		President	Zhao Pengfei	
		Visitor	Zhao Qiongmei	
		GDDOE official	Wu Nianxiang	

		GDAE official	Lao Hansheng	
		GDAE official	Li Haidong	
		Teacher	Wei Gan	
II: 22-44	GDCP	Teachers and students	(23 people)	March-16
II: 45-46	GDCP	Teacher	Wei gan	March-16
		President	Zhao Pengfei	
II: 47	GDCP	President	Zhao Pengfei	May-16
II: 48	Qingyuan Polytechnic (QYP) - Department of Beauty	Director	Wu Qiong	December-15
II: 49	QYP	Provost	Feng Xiaojun	December-15
II: 50	QYP	Official	Liu	December-15
II: 51	QYP	Provost	Feng Xiaojun	December-15
II: 52	QYP - Department of Beauty	Teacher	Wang Jingya	December-15
II: 53-55	QYP - Department of Beauty	Teacher	Wang Jingya	December-15
		Teacher	Ms. Huang	
		Chair	Wu Qiong	
II: 56-57	QYP - Department of Beauty	Chair	Wu Qiong	March-16
		Former school president	Zhao Pengfei	
II: 58-64	Guangzhou Health Science College (GZHSC)	Association official	Li Zhi	December-15
		Peer school official	Zhu Honghua	
		Program director	Li Huaying	
		Peer school official	Wu Qiong	
		Firm representative	Gong Lei	
		Association official	Ye Qiuling	

		Firm representative	Su Chaoming	
II: 65	GZHSC - Department of Medical Technology	Beauty program director	Li Huaying	January-16
II: 66	GZHSC - Department of Medical Technology	Deputy director	He Bing	January-16
II: 67-74	GZHSC	Association official	Li Zhi	January-16
		Program director	Li Huaying	
		Peer school official	Ms. Huang	
		Firm representative	Gong Lei	
		Assistant president	Ye Qiuling	
		Peer school official	Mu Dan	
		Natural Beauty manager	(unknown)	
		Department chair	He Bing	
II: 75	GZHSC - Department of Medical Technology	Beauty program director	Li Huaying	May-16
II: 76	GZHSC - Department of Medical Technology	Beauty program director	Li Huaying	May-16
II: 77	GZHSC	Vice president	Xia Jinhua	May-16
II: 78	GZHSC	Graduate	(anonymous)	May-16
II: 79	Guangzhou Railway Polytechnic (GZRP) - Department of Information Engineering	Director	Wang Jinlan	December-15
II: 80	GZRP - Department of Information Engineering	Deputy director	(unknown)	December-15
II: 81-84	GZRP	Students	Li Li Du Yuechuan	December-15

			Lu Zijian (Unknown)	
II: 85	GZRP	Teacher and class advisor	Cao Lingli	December-15
II: 86-87	GZRP	Students	Li Li Chen	December-15
II: 88	Guangdong Communication Polytechnic (GDCP) - School of Automobile Application	Director	Guo Hailong	March-16
II: 89-90	GDCP - School of Rail Transit	Students	(two people)	March-16
II: 91-92	GDCP - School of Transportation Management	Students	(two people)	March-16
II: 93	Guangzhou Panyu Polytechnic (GZPYP)	Party secretary	Meng Yuanbei	March-16
II: 94	GZPYP	President	Zhou Hua	March-16
II: 95-97	GZPYP - Official of International Affairs	Director	Song Meimei	March-16
		Official	Zhou Hua	
		Teacher	Lu Feiyue	
II: 98-101	GZPYP	Students	Wang Huadong Liu Rutian Su Guoliang Chen Jianchang	March-16
II: 102	GZPYP	Official	He	March-16
II: 103	Guangdong Mechanical and Electrical College (GDMEC) - School of Automobile	Deputy dean	Mr. Yu	March-16
II: 104	GDMEC - School of Automobile	Deputy dean	Mr. Yu	March-16
II: 105	GDMEC - School of Automobile	Teacher	Mr. Wang	March-16
II: 106	GDMEC - School of Automobile	Teacher	Mr. Deng	March-16
II: 107-114	GDMEC - School of Automobile	Students	(eight people)	March-16
II: 115	Guangdong Polytechnic of Science and Technology (GDPST) - Guangzhou College	Director	Zhang Bo	March-16

II: 116-117	GDPST - School of Mechatronics	Assistant president	Wang Hongmei	March-16
		President	Chen Douxue	
II: 118	GDPST	Vice provost	Zhu Xiaoping	
II: 119	GDPST	Vice president	Ma Guangzhi	
II: 120-123	GDPST	Students	(four people)	March-16
II: 124-129	GDPST	President	Chen Douxue	March-16
		Vice provost	Zhu Xiaoping	
		Vice president	Ma Guangzhi	
		Teachers	(three people)	
II: 130	GDPST	Student	Luo Weijian	April-16
II: 131-137	GDPST	Students	(seven people)	April-16
II: 138	Guangdong Vocational College of Post and Telecom (GDVCPT)	Vice provost	Dai Hao	March-16
II: 139	GDVCPT - Department of Economics and Business	Chair	Tan Suifeng	March-16
II: 140	GDVCPT	President	Chen Yuhuan	March-16
II: 141-143	GDVCPT	Vice president	Chen Zhangnan	March-16
		Assistant president	Jiang Wenli	
		Official	Chen Dongming	
II: 144-148	GDVCPT	Vice president Department chair	Chen Zhangnan Tan Suifeng	March-16
		Program director	Kuang Canbin	
		Teachers	(two people)	
II: 149-152	GDVCPT	Consultant	Mark	March-16
		Consultant	Andre	
		State official	Zhao Pengfei	

		State official	Li Haidong	
II: 153	Shunde Vocational and Technical School (SDVTS) - Department of Automobile	Teacher	Ma Tao	April-16
II: 154	Guangzhou Vocational School of Light Industry (GZVSLI)	President	Feng Suixin	April-16
II: 155	GZVSLI - Department of Auto Manufacturing	Chair	Mr. Liang	April-16
II: 156-59	GZVSLI	President	Feng Suixin	April-16
		Department chair	Mr. Liang	
		Officials	(two people)	
II: 160	Shenzhen Polytechnic (SZP) - School of Applied Chemistry and Biotechnology	Vice dean	Lin Feng	May-16
II: 161	SZP - School of Applied Chemistry and Biotechnology	Vice dean	Lin Feng	May-16
II: 162	SZP - School of Management	Student	(unknown)	May-16
II: 163	Dongguan Electromechanics Engineering School (DGEES)	Vice president	Huang Yutang	May-16
II: 164	DGEES	Provost	Zhang Junrong	May-16
II: 165	DGEES - Institute of Robots	Teacher	Wei	May-16
II: 166	Zhuhai Health School (ZHHS)	Teacher	Ms. Li	January-16
II: 167	ZHHS - Department of Beauty	Chair	Zhu Honghua	January-16
II: 168	Zhaoqing Medical College (ZQMC) - Department of Nursing	Chair	Chen Xiaoxia	January-16
II: 169	ZQMC - Department of Beauty	Teacher	(unknown)	January-16
II: 170	Zhanjiang Health School (ZJHS) - Department of Beauty	Teacher	Ms. Pan	January-16
II: 171	ZJHS - Department of Beauty	Teacher	Ms. Pan	January-16
II: 172	Guangzhou Conghua Technical School (GZCHTS)	President	Wu Jingping	January-15
II: 173	GZCHTS	Vice president	Huang Wei	January-15

II: 174	Guangdong Lingnan #1 Technical College of Industry and Commerce (GDLNCIC) - Department of Mechatronics	Former chair	Zhang Songwen	April-16
II: 175	GDLNCIC - Department of Automobile	Director	Li Baoquan	April-16
II: 176	GDLNCIC - Department of Interior Design	Student	(unknown)	April-16
II: 177-179	GDLNCIC - Department of Mechatronics	Students	(three people)	April-16
II: 180-181	GDLNCIC - Department of Mold Manufacturing	Students	(two people)	April-16
II: 182-184	GDLNCIC	Parents	(three people)	April-16
II: 185	GDLNCIC	Prospective student	(unknown)	April-16
II: 186	Guangzhou Technician College (GZTC)	President	Li Zongguo	April-16
II: 187	GZTC - Center of Occupational Skill Trainig and Testing	Director	Chen Haixia	April-16
II: 188	GZTC - Department of Automobile	Chair	Cai Yifan	April-16
II: 189	Guangdong Machinery Technician College (GDMTC)	Vice president	Liu Hailin	April-16
II: 190	GDMTC	WorldSkills Competition Champion	Zhong Shixiong	April-16
II: 191	Baiyun Technician College of Business and Technology (BYTCBT) - VET Institute	Director	Zhao Shunling	April-16
II: 192	BYTCBT - Department of Tourism	Vice chair	Chen Yu	April-16
II: 193	BYTCBT - Department of Mechatronics	Chair	Mo Xingsheng	May-16
II: 194	BYTCBT - Department of Mechatronics	Teacher	Mr. Zeng	May-16
II: 195	BYTCBT - Department of Mechatronics	Program director	Mr. Shen	May-16
II: 196	BYTCBT - Department of Mechatronics	Career advisor	Wang En	May-16
II: 197	BYTCBT - Department of Architecture	Student	(unknown)	May-16
II: 198	BYYCBT	Dormitory houseparent	(unknown)	May-16

II: 199	Beijing Union Cadre School (BJUCS)	Vice president	Guo Feng	November-15
II: 200	BJUCS	Teacher	Fan Lina	November-15
		Firms		
III: 1	Gree Electric Appliances, Inc.	Recruiting manager	Xie Zhongshuai	January-15
III: 2-3	Hong Kong Yagelo Cosmetics Group	President	Ye Qiuling	December-15
		General manager	Gong Lei	
III: 4	Horizontal Information Technology, Inc.	Chief engineer	Miao Huaqiao	January-16
III: 5	Natural Beauty Group	Firm teacher	Ms. Li	January-16
III: 6-8	Hong Kong Yagelo Cosmetics Group	President	Ye Qiuling	January-16
		General manager	Gong Lei	
		Training institute director	Shen Zeyu	
III: 9	Ellehuis, Co., Ltd. - Training Center	Director	Fu Runhong	January-16
III: 10-12	Ellehuis, Co., Ltd.	Class advisor	Chen Min	January-16
		Salon manager	Yao Liangtao	
		Worker	Lin Yaqiong	
III: 13	Ellehuis, Co., Ltd.	Salon manager	Chen Min (another)	January-16
III: 14	Ellehuis, Co., Ltd.	Class advisor	Chen Min	January-16
III: 15	Ellehuis, Co., Ltd.	President	Yao Wenfeng	March-16
III: 16-18	Ellehuis, Co., Ltd.	President	Yao Wenfeng	March-16
		Vice president	Wen Jian	
		CHO	Fu Runhong	
III: 19	Ellehuis, Co., Ltd.	Salon manager	Yao Liangtao	March-16
III: 20	Ellehuis, Co., Ltd.	Worker	Lin Yaqiong	March-16
III: 21	Ellehuis, Co., Ltd. - Training Center	Deputy director	Liao Meiling	March-16
III: 22	Ellehuis, Co., Ltd.	Worker	Su Jielan	March-16

III: 23-24	Ellehuis, Co., Ltd.	Workers	(two people)	March-16
III: 25-26	Ellehuis, Co., Ltd.	CHO	Fu Runhong	March-16
		Collaborative school president	Zhao Pengfei	
III: 27	Guangzhou Otis, Inc.	Former HR director	Cheng Weiji	March-16
III: 28	Tiandi Huayu Logistics Group	HR director	Liu Gang	March-16
III: 29	Tiandi Huayu Logistics Group	HR officer	(unknown)	March-16
III: 30	Zhongtian Group #7 Construction Corporation	General engineer	Chen Ning	March-16
III: 31	Zhongtian Group #7 Construction Corporation	Manager	Wu Shaoping	March-16
III: 32-38	Zhongtian Group #7 Construction Corporation	Workers	(seven workers)	March-16
III: 39	Guangzhou Seagull Kitchen and Bath Products Co., Ltd.	HR manager	Teng Chuntang	March-16
III: 40	Guangzhou Seagull Kitchen and Bath Products Co., Ltd.	Training manager	Ms. Yang	March-16
III: 41	Guangzhou Seagull Kitchen and Bath Products Co., Ltd.	Trainer	Mr. Zhu	March-16
III: 42-43	Guangzhou Seagull Kitchen and Bath Products Co., Ltd.	HR manager	Teng Chuntang	March-16
		Training manager	Ms. Yang	
III: 44	Zhuhai Europe-Asia Auto Tech Co., Ltd.	Vice president	Mi Tianxiang	March-16
III: 45	Zhuhai Europe-Asia Auto Tech Co., Ltd.	President	Liu Xiaobing	March-16
III: 46-47	Zhuhai Europe-Asia Auto Tech Co., Ltd.	President	Liu Xiaobing	March-16
		Vice president	Mi Tianxiang	
III: 48-53	Zhuhai Europe-Asia Auto Tech Co., Ltd.	Industrial association officials	(three people)	April-16
		Industrial association official	Wei Tongwei	

		President	Liu Xiaobing	
		Vice president	Duan Haifeng	
III: 54	Guangdong STS Telecom Tech, Inc.	Manager	Chen Qun	March-16
III: 55	Guangzhou Telecom 10000, Inc.	Training manager	Zhong Xuxia	March-16
III: 56-61	Guangzhou Telecom 10000, Inc.	Manager	(unknown)	March-16
		Training manager	Zhong Xuxia	
		School official	Tan Suifeng	
		Workers	(three people)	
III: 62-64	Guangzhou Telecom 10000, Inc.	Training manager	Zhong Xuxia	March-16
		School president	Chen Zhangnan	
		Manager	(unknown)	
III: 65	Guangzhou Telecom 10000, Inc.	Training manager	Zhong Xuxia	April-16
III: 66	Guangxin Communications Services Co., Ltd.	Manager	Zhu Wanfang	March-16
III: 67	Jabil Electronics (Guangzhou), Inc.	HR manager	Xian Xingxian	March-16
III: 68	FAW-VW Automotive (Foshan) Co., Ltd	Workshop head and union committee member	Kong Degao	April-16
III: 69	FAW-VW Automotive (Foshan) Co., Ltd	Workshop head and union committee member	Kong Degao	April-16
III: 70-72	Lenuan Heating Appliances Co., Ltd.	Vice president	Tian Guangfa	April-16
		Factory head	Kong Xinhua	
		Assistant president	Wang Xufang	
III: 73	Guangzhou Radio Group	Union chair	Yang Guohua	April-16
III: 74	GAC-Toyota Motor Co., Ltd.	HR official	(anonymous)	April-16
III: 75	Guangzhou Jiehe Electric Tech, Inc.	General manager	Li Yiqi	May-16

III: 76	Guangzhou Jiehe Electric Tech, Inc.	Sales manager	Tan Deting	May-16
III: 77	Guangzhou Jiehe Electric Tech, Inc.	Technician	(unknown)	May-16
III: 78-79	Dongguan Janus Co., Ltd	Training center director	Hu Bo	May-16
		Training center manager	Hu Shifei	May-16
		Other Organizations		
IV: 1	Internet of Things Association of Guangdong	Training center director	Chen Yuqi	December-15
IV: 2	Internet of Things Association of Guangdong	Training center director	Chen Yuqi	March-16
IV: 3	Chinese Academy of Labor and Social Security - Vocational Training Department	Research associate	Chen Yujie	December-15
IV: 4	Chinese Academy of Labor and Social Security - Vocational Training Department	Director	Xu Yan	February-16
IV: 5	Beijing Normal University - Institute of Vocational and Adult Education	Professor	Zhao Zhiqun	December-15
IV: 6	Beijing Normal University - Institute of Vocational and Adult Education	Professor	Zhao Zhiqun	May-16
IV: 7	Guangdong Health Vocational Education Association	President	Li Zhi	December-15
IV: 8	Shunde Association for the Promotion of Vocational Education	Deputy secretary general	Zhang Juncheng	January-16
IV: 9	Huizhou Beauty and Cosmetic Association	President	Ye Qiuling	January-16
IV: 10	South China University of Technology	Professor	Li Min	March-16
IV: 11	Guangzhou Federation of Trade Unions	Former chair	Chen Weiguang	March-16
IV: 12	British Council (Beijing)	Educational project manager	Liu Qin	March-16
IV: 13	British Council (Guangzhou)	Educational project manager	Lin Xiao	April-16

IV: 14	Shunde E-Commerce Association	Department manager	Chen Zhaoyong	April-16
IV: 15	Guangdong Enterprise Confederation - Employer Service Department	Deputy director	Li Baifan	April-16

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