



The Illicit Distribution of Precursor Chemicals in China: A Qualitative and Quantitative Analysis

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Abstract

China has been marked as a source country from which large volumes of precursor chemicals are shipped to foreign drug markets for synthetic drug production. However, the basic patterns of illicit distribution remain unclear. Data from closed criminal cases were extracted from legal files to develop an objective understanding of illicit distribution patterns in China. The sample consisted of 534 illicit supply cases involving 1481 individuals, three groups of precursor chemicals and 102 chemical manufacturing companies. The offenders could be categorised as lower-class offenders, occupational offenders and corporate offenders based on their profiles and criminal behaviours. Significant differences between the three groups of offenders and their specific patterns of chemical supply suggest a diverse, dynamic and complex nationwide supply network. To better understand this phenomenon in China's rapidly transitioning society, we provide a description of cultural, legal and political backgrounds, which may provide some explanations at the macro level.

Keywords

Drug production; illegal drugs; illicit supply; precursor chemicals.

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Introduction

In recent research and official documents, China has been regarded as a source country from which a large volume of precursor chemicals is transported to foreign countries for synthetic drug production (EMCDDA 2016; King and Kicman 2011; Norman, Grace and Lloyd 2014; Seddon 2014). This is plausible to foreign scholars and governments because hundreds of metric tonnes of precursors, confiscated by foreign law enforcement agencies, are shipped by legitimate enterprises in China to other countries (EMCDDA 2017). Is this a truth based on findings in certain cases or simply a social stigma based on the large amount of seizures? Answers to this question should be based on evidence from the illicit distribution network of precursor chemicals in China. However, this network has remained hidden.

The brief history of the illicit production and distribution of controlled chemicals in China dates back to the early 1980s, when the country introduced economic market structure reforms, opening its borders to the world. With these reforms, synthetic drugs from the Golden Triangle and Golden Crescent were smuggled into China for the first time (Chu and Levy 2005; Lu, Fang and Wang 2008; Zhao et al. 2004). Simultaneously, the reforms also opened the illicit supply of precursor chemicals for the production of amphetamine-type stimulants (ATS) from China to other countries and districts, particularly those in the Golden Triangle. However, this illicit supply of precursor chemicals for local drug production was not exposed until 1991, when the first synthetic drug production facility in Guangdong province, one of the most open and developed districts in China, was dismantled. Subsequently, the distribution networks of precursor chemicals became more diverse and complex, even as authorities imposed controls on illicit drug distribution. In fact, China's trafficking of precursor chemicals to local and foreign drug producers and the smuggling of synthetic drugs to China are widely acknowledged to have developed into a stable and bidirectional cycle (Chen and Huang 2007).

Geographically, the production and smuggling of precursor chemicals is concentrated in border provinces, including Xinjiang in the north and Yunnan and Guangdong in the south, which are directly related to Afghanistan and the Golden Triangle, respectively (Clarke 2008). Approximately 98.8 per cent of ephedrine seized while being smuggled into other countries in 2000 came from Yunnan province; 66.5 metric tonnes of acetic anhydride being smuggled into Afghanistan were confiscated by law enforcement agencies in Xinjiang in the same year (NNCCC 2000). From 2005, trafficking routes became more complex and diverse in response to regulatory controls over ephedrine through a series of special campaigns against the illicit distribution of ephedrine in these border provinces. As a result, drug producers and dealers turned to inland provinces with fewer or no anti-ephedrine activities to collect the herbal precursors for ephedrine extraction. Trafficking routes at this stage were characterised by extensive acquisition of ephedra plants from remote provinces including Shanxi, Hebei and Inner Mongolia, to be sold to both local and foreign producers in Burma and the Golden Triangle. Most recently, with drug producers discovering new ways to synthesise ephedrine from precursor chemicals, illicit chemical production facilities have spread quickly, particularly in Chinese suburbs and rural areas, which may indicate that the illicit supply of chemicals has overcome geographical constraints.

Additionally, to exploit the differing legal status of chemicals, drug producers adopted innovative, alternative methods to synthesise drugs from various legal chemicals, thereby circumventing the law. In the early 2000s, ephedrine was the main precursor for producing methamphetamine, the most common drug in China's drug markets. After the stringent control of ephedrine and ephedra plants, synthesising ephedrine from legal chemicals such as α -Bromopropiophenone¹ had been the primary method for methamphetamine production (NNCCC 2015). Moreover, some chemical and pharmaceutical companies further attempted other innovations to synthesise pre-precursors and precursors from various kinds of medicines and legal chemicals and continued selling their products to local and foreign drug producers for the production of ATS and new psychoactive

substances (NPS). This appeared to be legal, or at least not criminal, and it was easy to accrue wealth within a brief period.

Similarly, some individuals with specialised knowledge of chemicals, such as chemists and mid-level employees of chemical and pharmaceutical enterprises, were involved in these parallel markets to earn money easily and quickly, which diversified distributors' backgrounds. This pattern was quite different from those noted by early research, which described most drug traffickers as poorly educated people with few employable skills or alternatives for making money (Chin and Zhang 2012).

It is notable that there remains an increasing trend of gun-violence involvement in drug trafficking in 29 provinces (NNCCC 2017), but few signs of such violence were reported in early research on illicit chemical distribution networks (Miao and Zhang 2002; Qin and Fang 2006; Yang and Tian 2000). In the early 1980s, when there were no ATS production facilities in China, chemicals intended for smuggling to the Golden Triangle and Golden Crescent were concealed by changing the packaging, relabelling, mixing with legitimate products and cloaking in frontier trades (Chen and Huang 2007; Yao 2015). With the increasing demand for ATS in mainland China in the 1990s, foreign criminal organisations started building facilities in southern provinces for drug production, concealed under the name of foreign investments, to take advantage of abundant sources of ephedra plants and chemicals through covert and nonviolent means (NNCCC 2000). The most recent research and official documents from closed cases show that violent resistance extended towards the downstream drug sale network and endpoint of consumption (NNCCC 2017) rather than upstream illicit activities such as precursor chemical production and distribution.

Existing research has captured and summarised some patterns of illicit distribution activities such as trafficking routes, specific chemicals frequently involved and the Internet usage in supply chains (Qin 2011; Zhang and Liu 2014; Zhao 2010). However, the evidence used to reach these conclusions has not been voluminous enough to definitively support them, and supply patterns still require timely updates. As noted by Moore (1990), to improve supply reduction efforts and accomplish drug policy objectives, we must identify the key factors of production and distribution in long-term supply, and address these factors.

The primary aim of this research is to describe and summarise the key patterns of the illicit supply of precursor chemicals with reliable information from sentencing files in China. This is followed by a macro-level analysis of the phenomenon by referring to the penetration of market economies into other institutions under institutional anomie theory (IAT), which was developed by Messner and Rosenfeld (2012). A core argument of IAT is that institutional arrangements in which the market economy is allowed to dominate without restraints from other institutional spheres, comprise an 'institutional imbalance of power', which further generates deviance at a macro level. With regard to modern Chinese society characterised by rapid transition, many changes caused by the development of the market economy have been noticed. It appears that the economy is allowed to penetrate other institutions, such as culture, polity and law. This subsequently results in an imbalance between different institutions and imposes general strains on certain groups in society. As Liu (2004) noted, the transition from state socialism to a market economy in China has been a fundamental social change that has resulted in increased crime. Therefore, it seems that there are many inherent inconsistencies between the IAT and Chinese transitional society. However, it should be considered that the IAT was developed using the United States (US) as a basis. The US is quite different from China in terms of culture, economy, education and family. Thus, the theory cannot be applied in entirety to explain the causes of crime in Chinese society. Based on these considerations, rather than exhausting all institutional arrangements, we only focus on the *penetration* of the market economy into the cultural, political and legal contexts relevant to the behaviours of the three categorised offenders. This may contribute substantially

to an improved understanding of the relationships between the illicit supply of chemicals and economic, cultural, legal and political contexts.

Method

To address the central research concern—the illicit supply of precursor chemicals in China—this study was primarily based on a quantitative and qualitative analysis of sentencing files. The quantitative analysis focused mainly on statistical features regarding the profiles of offenders, types of chemicals and relationships between different variables in sentencing files. Simultaneously, a qualitative analysis was conducted to extract key information on how and why these differences and associations exist. All sentencing files were imported in NVivo and broadly coded in the first phase. Particular fragments of confessions and legal facts were linked to topics and discourses. After processing all materials, the ‘nodes tree’, the result of the initial coding, was reviewed. During the revision, separate nodes were analysed. The content of each node was compared with that of other nodes to improve categorisation and links to quantitative results and literature. Both methods were utilised to derive a description of key patterns in the supply chain, including profiles of offenders, distribution routes, specific chemicals involved and illicit business operation modes.

Data

Closed criminal cases of illicit supply (production, distribution, trafficking, transporting and smuggling) in the past six years (2012–2017) in China were collected from an official database,² China Judgment Online, which was established and maintained by the Supreme People’s Court of the People’s Republic of China in 2013.³ Given the aim of this research—to describe basic supply patterns in China—we only focused on cases that were brought to trial according to Article 350⁴ of the criminal law. Notably, this step narrowed our search scope and excluded some potential cases. This is because providing illicit supplies of precursor chemicals is regarded as a drug offence if offenders acknowledge that the chemicals they provide is to be used for drug production. We also limited the types of legal documents to judgments and excluded conciliations, criminal rulings and orders. Moreover, we set no limit on court level. We conducted the database search process on 1 January 2018 with the following settings: 1) criminal category; 2) conviction based on Article 350 of criminal law; 3) occurred between 1 January 2012 and 31 December 2017; and 4) keywords include precursor chemicals and raw materials. The search process captured 534 closed cases, of which 522 cases involved the illegal production of and dealing in precursor chemicals; 12 cases involved smuggling precursor chemicals.

Variables and analysis process

To present objective supply patterns, the following offender variables were collected: number of members, men, women, highest education background, occupation, young adults and criminal record. Specifically, the number of members refers to the number of individuals in each case, which was further divided into three scales: scale 1 (S1), scale 2 (S2) and scale 3 (S3), corresponding to 1–3, 4–6 and 7 or more members, respectively. Men and women refer to the number of males and number of females in the cases. Highest education background means the highest education level completed by all offenders in each case; this was coded as 0 = illiterate, 1 = elementary school, 2 = high school, 3 = bachelor’s degree and above, and 4 = unknown. Occupation refers to the number of individuals belonging to the three groups of occupations in accordance with their social and economic status; the first group (O1) comprised peasants, unemployed and self-employed individuals; the second group (O2) consisted of administrative staff, chemical experts and other employees in chemical companies; and the third group (O3) comprised general managers and legal representatives of chemical companies. Young adults refers to the number of individuals aged 18–40 years in accordance with the scope of youth defined by the All-China Youth Federation. Criminal record means the number of individuals who had previously committed criminal offences.

The sum of these variables, including men, women, occupation, young adults and criminal record was calculated in all cases. At the same time, the frequency of highest education background was recorded.

Chemical variables consisted of chemicals, quantity and company involvement. Chemicals were divided into three groups according to their practical use: C1 = ephedrine and input chemicals, for the production of methamphetamine; C2 = hydroxylamine hydrochloride and input chemicals, for the production of ketamine; and C3 = other chemicals (such as hydrochloric acid and sulphuric acid). Quantity is the amount of chemicals in each case; it was coded as 1 = 1–100 kg; 2 = 101–1,000 kg; 3 = 1,001–5,000 kg; and 4 = 5,001 kg and above. Company involvement refers to the extent to which chemical manufacturing companies were involved: no involvement, passive involvement and positive involvement. No involvement means chemicals were illicitly supplied by offenders in O1, passive involvement means chemicals were illicitly supplied by employees of chemical manufacturing companies (i.e., offenders in O2), and positive involvement refers to corporate crimes committed by offenders in O3. On this basis, all cases were divided into three groups: group 1 (G1), no involvement; group 2 (G2), passive involvement; and group 3 (G3) positive involvement.

Chi-squared and one-way ANOVA tests were conducted between G1, G2 and G3 to measure the statistical differences and relations between company involvement and other variables. Subsequently, we conducted further tests among the three different groups to measure potential relationships between variables.

Results

We collected the key factors of 534 sentencing files, from 2012–2017. As shown in Table 1 below, the number of cases was quite limited in 2012, but increased dramatically in the following two years, reaching its peak in 2014. There were 1,481 individuals involved in the illegal supply of controlled chemicals. Most were male (96.6 per cent) and self-employed businesspeople, peasants and unemployed individuals (82.5 per cent). A total of 157 staff members were involved in cases and most of them were concentrated in 2013–2015. Only 102 managers were involved in the illicit supply of chemicals. The number of individuals with prior criminal records was 74 and mainly concentrated in 2014–2016. The chemicals were divided into three groups, of which ephedrine and input chemicals accounted for 46.4 per cent, followed by other chemicals, comprising 40.8 per cent of cases. Hydroxylamine hydrochloride and input chemicals only accounted for 12.8 per cent.

Table 1: Individuals involved in the illegal supply of controlled chemicals 2012-2017. Total = 1,481

<i>Variables in statistics</i>							
Year							
	2012	2013	2014	2015	2016	2017(Jan-Sep)	Total
Young adults	-	59	147	159	111	39	515
Men	2	171	506	457	223	72	1431
Women	0	8	20	11	7	4	50
Lower-class individuals	1	133	437	393	196	62	1222
Staff	1	26	51	50	21	8	157
Managers	0	20	39	25	12	6	102
Criminal Record	0	6	16	23	19	10	74

Tests between the three groups, including G1, G2 and G3, were conducted. As shown in Table 2, statistically significant differences were found between groups with respect to the number of members, men and women. There were also statistical differences between the groups regarding chemicals, highest educational background and quantity.

Table 2: Statistical differences between groups.

		Number of members			Gender		Education					Occupation			Chemicals			Quantity			
		S1	S2	S3	Men	Women	0	1	2	3	4	O1	O2	O3	C1	C2	C3	1	2	3	4
Chemical company involvement	G1	288	64	27	962	25	1	30	238	14	96	987	0	0	225	62	92	83	172	56	68
	G2	73	12	4	228	5	0	1	48	6	34	130	103	0	14	3	72	5	29	21	34
	G3	45	12	9	241	20	0	0	27	10	29	105	54	102	7	3	56	4	7	13	42
Total		406	88	40	1431	50	1	31	313	30	159	1222	157	102	246	68	220	92	208	90	144

Tests comparing the scale of members (S1, S2 and S3) and other variables within the three groups suggested that, in G1, there were significant differences regarding young adults ($F[2,233] = 218.105$, $p < 0.01$), women ($F[2,376] = 5.723$, $p < 0.01$), and criminal records ($F[2,376] = 3.834$, $p < 0.01$) between different scales. The Bonferroni post-hoc test revealed that women in S1 (0.04 ± 0.19) were significantly lower than they were in S2 (0.16 ± 0.51 , $p < 0.01$). However, there were no significant differences between other groups. The test also suggested that criminal records in S1 (0.12 ± 0.37) were only significantly lower than they were in S3 (0.37 ± 1.01 , $p < 0.01$). In G2, there was a statistically significant difference in criminal records ($F[2, 86] = 4.125$, $p < 0.01$) between different scales. The criminal records in S1 (0.07 ± 0.25) were significantly lower than they were in S2 (0.42 ± 0.90 , $p < 0.01$). However, such a difference was not observed between S1 and S3 or between S2 and S3. In G3, the number of young adults in S3 (6.17 ± 5.26) was significantly higher than it was in S1 (0.88 ± 0.99 , $p < 0.01$) and S2 (2.20 ± 2.05 , $p < 0.01$). Such a difference was not found between S1 and S2.

Categorised offenders

Given the statistical differences and prominent features regarding criminals and criminal behaviours between groups, we tried to develop a typological construction consisting of lower-class offenders, occupational offenders and corporate offenders.

Lower-class offenders

Offenders in G1, including self-employed businesspeople, peasants and unemployed individuals, were categorised as lower-class offenders. As shown in Table 2, profiles of offenders and supply patterns in this group, including men, women, number of members, highest educational background, chemicals and quantity were significantly different from the other two groups. The most frequent response among them for highest education was high school; the proportion with a higher education background was quite limited, which suggests a low education level among members. The occupations of offenders in this group reflect relatively lower social status and unstable income. Such profiles are consistent with early research that argued that most drug traffickers were farmers, businesspeople and workers who were male, poor and not well educated (Chen and Huang 2007; Huang et al. 2012; Qin 2011).

The scale of the members in this group showed no significant difference compared to G2 and G3. However, between the scales within the group, there were some significant differences. As suggested by the results, in this group, women were more likely to engage in medium scales with 4–6 members compared to S1 and S3. The number of members with criminal records seemed to be distributed evenly across the three scales. The structure of members in the three scales is difficult to measure through statistical analysis. However, the qualitative analysis indicated that there were always relationships between members (i.e., through friendships, neighbourhoods, native place and kin). Such relationships brought them together with relatively high trust, but provided no foundation for a hierarchical order among members. As several offenders convicted in the sentencing files noted, ‘I join them for help and to a less extent, for some money’; ‘we are friends, he wants to rent my farm, and I do not care what he do with it’; and ‘if I know it is crime, I never help him’.⁵ Therefore, the groups were not stable, and might have disbanded when they finished their business.

Most crimes committed by these offenders were related to the illicit supply of ephedrine, which is a precursor for methamphetamine. Ephedrine was frequently noted as being produced in workshops⁶, laboratories and even kitchens in the countryside.⁷ For example:

*Case 1:*⁸ On 15 April 2015, defendants Chen and Hua conspired to produce ephedrine. Chen contacted his friend, defendant Ye, to help him search for a hidden location to produce ephedrine. With the help of Ye, Chen leased a hogger in Xishan Village, Tong’an District for 10 days at a rent of RMB 30,000. Ye received RMB 10,000 from Chen. Later, Chen and Hua called on their friends, the other three defendants, to buy tools and raw materials needed to manufacture ephedrine. They also called on a number of masters to hike up the mountain with them, and began to produce ephedrine.

In some cases, legal medicines—such as Contac NT—purchased on the Internet from chemical companies and pharmacies in rural areas where use of ephedrine was unsupervised, were also used as raw materials to produce ephedrine. The knowledge and methods for manufacture were learned from, and developed through, the Internet. Instant messaging software like QQ and WeChat and the Internet forums like Tianya and Baidu were used to share information on precursor chemicals and substitutive pre-precursors (Hao and Zhao 2012).

All smuggling cases in our database were committed by lower-class individual groups. There were two basic smuggling routes: South Asia—China—South-East Asia, and South Asia—China—Oceania. The smuggling of ephedrine from South Asia via China to South-East Asia was quite fixed, which supports the findings of earlier research on the stability of the transportation of chemicals from Tibet to Yunnan and finally to the Golden Triangle (Qin and Fang 2006). New Zealand and Australia were also export destinations. To some extent, these smuggling cases supplied evidence that China was not only a source country, but also a transit country for worldwide chemical distribution.

Occupational offenders

Occupational crimes are ‘offences committed by individuals for themselves in the course of their occupation’ and ‘offences by employers against their employees or the corporation’ (Quinney 1964). On this basis, occupational offenders in this research are individuals who commit occupational crimes. Offenders in G2 were categorised as occupational offenders because they were employees in chemical, pharmaceutical and biotech companies who violated legal codes in the course of activity in legitimate occupations to sell chemicals for their own interests (Ward 1994). The profiles of occupational offenders were distinguished from the other two groups in terms of number of members, men, women, highest educational background, chemicals and quantity. Although the most frequently reported education level was high school, the proportion of individuals with higher education was greater. Most cases in this group engaged in supplying other chemicals, such as hydrochloric acid and sulphuric acid, which were used in manufacturing

units rather than for drug production. However, there were also 39 cases in which occupational offenders illicitly sold ephedrine and hydroxylamine hydrochloride for methamphetamine and ketamine production, respectively. The quantity of chemicals involved seemed to be larger than in G1 but smaller than in G3.

The scales in this group showed no significant differences compared to the other two groups. However, unlike with lower-class offenders, relationships between members in this group appeared more likely to be business partnerships based primarily on the common goal of monetary gain. Existing relationships such as friendships and kinship might provide added value to a partnership, but the most important concern was money. Like occupational crimes in other fields, embezzlement was also commonly committed by employees and unqualified purchasers (Qin and Fang 2006)—namely, by insiders and by insider/outsider partnerships (Ward 1994). Embezzlement took two forms. One epidemic practice was that insiders advertised their products on websites to attract outsiders who have difficulty applying for purchasing licenses.⁹ After establishing partnerships, a common practice was ‘excessive compensation’ for insiders who took advantage of their occupations to broker transactions between chemical companies and outsiders by providing false licences for company leaders and regulators. In this case, neither company leaders nor licence regulators could recognise the illicit activities based on the documents presented. These transactions ostensibly appeared to be normal business activities between companies and their buyers. Therefore, it is unsurprising that such illicit transactions were difficult to detect. The other insider/outsider deal was that insiders directly embezzled and sold chemicals to outsiders. Both practices were commonly observed in the cases collected.

Corporate offenders

Corporate crimes are ‘offences committed by corporate officials for their corporation and offences of the corporation itself’ (Ward 1994). On this basis, in G3, corporate offenders refers to representatives and their employees within medical, chemical and biotech companies. Some of them produced chemicals legitimately but deliberately engaged in the illicit supply of chemicals. There were also some companies established to illegitimately produce and sell chemicals without approval licences (Wang 2014; Zhang and Liu 2014).

As demonstrated in the results, offender profiles for this group were quite different from the other two groups. The most noticeable differences were the higher education backgrounds and occupations, both suggesting relatively high social status and income. Another significant difference was noticed between the three scales regarding young adults. For example, the number of young adults in S3 was significantly higher than in S1 and S2, which may suggest that the large scale of members is quite attractive to young adults in this group. In the collected cases, 102 companies were involved in the illicit supply of controlled chemicals. Among them, the most frequent chemicals supplied were hydrochloric acid and sulphuric acid, followed by ephedrine and hydroxylamine hydrochloride. There were two types of transactions between corporations and their clients. One was to produce chemicals legitimately but sell them illegally, while the other was to produce and sell chemicals illegally. Both were conducted in many forms. For example, corporations might advertise their products on websites to attract local and international clients, while in other cases, purchase orders noting the specific chemicals needed were sent to chemical companies in advance. After receiving them, corporations would produce chemicals that were subsequently transported through logistics companies. The illicit activities were normally conducted by company executives or representatives, and the illegitimate business activity was well known to most staff members. Essentially, in such cases, it is the company itself colluding with its clients, which poses considerable challenges to chemical regulation and drug supply reduction.

Unlike lower-class offenders and occupational offenders, another feature of corporate offenders was the hierarchical structure among members, which was measured by the following facets.

First, the division of labour was markedly different from the temporary and unclear division of labour in G1 and G2. In this group, the roles of different members were quite clear and routinised. The managers or representatives were responsible for decision-making regarding company operations, while employees performed their functions of developing new substances, communicating with clients and transporting chemicals. Second, the structure based on the bureaucracy embedded in the internal structure of the companies was stabilised. This appears to be similar to the bureaucracy model of criminal organisations, which are characterised by a single leader, a defined hierarchy, an extensive division of labour, rigidity, impersonality and various subordinate roles (Le 2012). For example:

*Case 2:*¹⁰ *During September and November 2013, the deputy general manager of the defendant asked the representative for consent to sell chemicals to another company that had no purchasing licences. With the approval, the deputy general manager supervised and urged employees in the quality, marketing and administrative departments to close the deal. A total of 90.3 tonnes of mixed xylene were sold.*

Discussion

The significant differences among the three groups of offenders and their specific patterns regarding the supply of chemicals suggest a diverse, dynamic and complex chemical supply network in China. Many Chinese scholars have argued that monetary gain is these offenders' primary motivation (Huang et al. 2012; Yang and Tian 2000; Yao 2015), which provides some reasonable explanations for the prevalence of lower-class offenders in the supply chains. However, this perspective has limitations for understanding the involvement of staff and representatives who have relatively high social status and stable incomes. For example, why do staff and managers risk their lives and reputations to pursue more profit by supplying chemicals illicitly? To understand the behaviours of the three types of offenders, we refer to the penetration of the market economy into cultural goals, regulation system and polity, which generates value orientations that emphasise efficiency norms at the expense of moral considerations. This produces weak noneconomic institutions that are less capable of providing stakes in conformity in the form of meaningful social roles (Savolainen 2000).

Cultural goals

Relative importance has been attached to the status symbols of money and personal, family or business reputations to understand criminal behaviours in different social classes (Clinard, Quinney and Wildeman 2014; Messner and Rosenfeld 2012). Two important goals are closely related to money and reputation in Confucianism: wealth and nobility.¹¹ Wealth refers to material success, while nobility means spiritual success and includes high virtue and prestige. In traditional Confucianism, wealth and nobility are not closely related. However, there are some changes regarding the two goals because of the penetration of the rapidly developing market economy. First, wealth has been greatly emphasised in the market economy. For example, after the Great Leap Forward in the 1960s, China was in extreme poverty. Therefore, along with the 'open door' policy, the ideology of 'first rich and common rich'—which reflects a belief that some people should become rich first to help the region and other individuals become commonly rich—has been greatly advanced (Cheng and Liu 2012). Accruing wealth is not only the aim of individuals; it is also a national goal. Therefore, there were few regulations on economic and financial activities in the early 1990s, even though some of the activities were illicit (Liu 2007). The benefits of this lack of regulation are obvious, as the number of wealthy people has increased,¹² but the remaining individuals have not been similarly developed. Therefore, it is possible that some lower-class individuals are culturally motivated to become rich to sustain a better life. As suggested by Huang et al. (2012), an offender's occupation is significantly associated with all drug offences. In particular, being a farmer increases both odds for smuggling and transporting drugs due to the low income of that occupation.

The second change is that there appears to be close relationships between wealth and nobility, and even a shift from 'wealth and nobility' to 'wealth is noble'. In this case, some individuals may not be satisfied with their material lives; rather, they might also want to be noble, which can be achieved in modern culture through greater wealth (Shen 2000). Thus, modern Chinese values seem to promote personal economic ambition, material achievement and individualism (Liu 2004), which encourages individuals to pursue greater wealth to fulfil the foremost goal. As a result, the goal of wealth overwhelms other goals and becomes the principal measuring rod for achievements (Messner and Rosenfeld 2012). This motivates individuals to turn to other legitimate, or illegitimate but efficient, ways to become rich. Additionally, current legal markets for business have been monopolised by state enterprises, millionaires, some government officials and their privileged generations (Chu and Jin 2015; Li 2016; Wei and Liu 2014). This further limits the availability of legitimate means for entrepreneurs, and even more for individuals, to realise their goals. Hence, as supported by both quantitative and qualitative results, staff, managers and representatives are more frequently related to the illicit supply of other chemicals for production needs rather than to precursor chemicals for drug production. In their opinion, the illicit supply of chemicals is regarded as 'not morally wrong', a 'grey area', an 'easy way', involving 'less risk', and 'an efficient way to make more money to be nobility'.¹³ As suggested by Clinard, Quinney and Wildeman (2014), occupational offenders do not usually conceive of themselves as criminals; they accept conventional values and attempt to seek a greater share of the rewards in the conventional world.

Regulation system

In the early 1990s, with the aim of accelerating economic development, many priorities, such as location advantages, policy support and tax incentives, were allocated in the chemical manufacturing industry. Due to the reordered priorities, there were few regulations on the supply of chemicals, with the exception of the illicit supply of acetic anhydride, ether, chloroform and any other raw material or elixir for drug production that was criminalised by law in 1997. As a result of these incentives from national and local authorities, and fewer interventions in the market, the last decade has witnessed a steady rise in the market scale (from ¥ 1.62 trillion to ¥ 8.77 trillion) and in the number of producers, such as enterprises above designated size, small and medium-sized enterprises (SMEs) and individual producers. Thus, the chemical industry has been one of the Chinese economy's pillar industries. However, there have been many problems concerning the regulation of production and usage. For example, the pattern of growth in the chemical production industry is extensive rather than intensive, in particular for SMEs and individual producers, which poses many risks for the diversion of the chemicals. By 2005, China had produced or imported more than 45,000 kinds of chemicals, some of which have been banned or severely restricted internationally and in developed countries, but are still produced and used domestically (CCICED 2006). In response, the Regulation on the Administration of Precursor Chemicals, the first systematic regulation for normalising the production, operation, purchase, transport, import and export of chemicals, was enacted in 2005 to prevent the diversion of chemicals to drug production. It established an administrative approval system for the production, operation, purchase, transport, import and export of controlled chemicals. Violation of the regulation is punishable under criminal law. Since then, 27 chemicals have been banned at the national level.

However, the penetration of the market economy into the regulation system has generated weak regulations on normalising supply behaviours (Messner and Rosenfeld 2012). First, the market economy requires a free enterprise system in which goods and services are exchanged freely in an open market, while regulation, to a large extent, limits the operation of chemical manufacturing companies through a strictly administrative approval system. For example, under the system, all producers need approved licenses for chemical production. However, Qin and Zhao (2007) found that many chemical producers find the approval system strict, cumbersome and

bureaucratic, which, in turn, affects the autonomy and flexibility of the operations of their companies. As a result, some chemical, pharmaceutical and biotechnological companies, especially individuals and small companies encountering difficulties in applying for licences in local administrative departments, may continue to produce and sell chemicals without licences. This may contribute to a rapid increase in the number of chemical-related cases (from 140 in 2004 to 504 in 2005), and in the number of chemical companies on which administration penalties were imposed (Qiu 2006).

Second, the market economy encourages greater supply when there is demand, while the regulation system emphasises strict management in the entire production process and consequently limits the supply. Therefore, unqualified purchasers have no legal channels to obtain chemicals, while chemical manufacturing companies have many products in stores. As a result, some staff and experts in chemical companies with a lack of management in storage may be attracted by the profits and sell chemicals to unauthorised individuals and companies. Such conflict seems to be relevant to the cases in G2, in which producers have licences but there is a lack of regulation governing storage, sales and transportation. As a result, chemicals are sold by staff, which indicates passive involvement of the companies themselves. Thus, conflicts between the market economy and the regulation system suggest that it is the regulation system that 'creates' delinquency and 'forces' the involvement of chemical companies in the supply patterns (Qin and Fang 2006).

Political contexts

In contrast to the highly centralised political system of the People's Republic of China, the central government began to decentralise the fiscal system in 1980, so that central and local governments could share fiscal revenues to motivate local officials to lend a 'helping hand' in advancing local economic growth (Jin, Qian and Winegast 2005). With the deepening market economy, political institutions, especially local governments, were further penetrated and deeply affected by economic institutions. Since 1990, local government officials have increasingly played various active roles in building local infrastructure, encouraging local businesses and attracting foreign investment to develop the local economy. Many scholars have noted that the readiness of the Chinese central government to reward or punish local officials is mainly based on how their economic performance motivates them to promote the local economy (Blanchard and Shleifer 2001; Li and Zhou 2005). Consequently, local economic development has been closely linked with the promotion system, and has correspondingly become a main concern for local officials (Yu 2015). This creates a dilemma regarding economic development and the regulation of chemical enterprises. As responses, local officials prefer to use fewer administrative regulations to provide more space for companies and their business activities to develop (Yu 2016). Subsequently, local economies develop, revenues grow quickly and local officials have increased opportunities for promotion (He and Sun 2012), which appears to be mutually beneficial.

However, after China's regulation of precursor chemicals in 2005 and subsequent amendments in 2016 and 2017, substantial amounts of precursor chemicals have been rejected for export due to the absence of licences and the diversion of chemicals into drug production. According to a recent report, the chemicals rejected by Chinese authorities for export increased from 569,000 kg in 2006 to 2,562,000 kg in 2016 (NNCCC 2017). It is possible that the regulation system largely damages local revenue growth and hinders the promotion of local officials further. Therefore, local officials, while showing enthusiasm for implementing the drug policy and using law enforcement to crack down on illicit supply cases, conversely, may allow the operation of chemical companies even when they have committed unit crimes. This may partly explain why some managers and representatives in the cases examined committed an offence related to the illicit supply of precursor chemicals and were sentenced to jail, but the companies they represented remained in operation.

Conclusion

Our study demonstrated that the frequent involvement of occupational offenders and chemical companies in the illicit distribution of precursor chemicals makes the chemical supply pattern diverse and complex. However, certain fixed patterns have been identified through this research. First, ephedrine was the most frequent precursor chemical in the collected cases, which is consistent with methamphetamine being the most commonly used drug in China. Second, lower-class individuals comprise the majority of offenders and are more closely involved with ephedrine, while chemical companies are commonly involved with hydrochloric acid and other chemicals. This suggests that members of the lower class and small-scale producers may be the primary chemicals suppliers for drug production. Finally, China is not only a source country, but also a key transit nation for certain chemicals. Based on an aspect of IAT—the penetration of the market economy into other institutions generating deviance for certain groups of individuals—this research further reveals the imbalance between the economy and culture, polity and law at a macro level. This may provide some foundations for understanding this phenomenon.

This study has several limitations. The first concerns the database we used and the cases we collected. The database, China Judgments Online, was established by the Supreme People's Court of the People's Republic of China in 2013 and is maintained by the court. Although most effective judicial documents are uploaded into the database, not all documents are. Meanwhile, we limited our cases to two offences—illicit transaction in and the smuggling of precursor chemicals—which did not capture the cases that were labelled as drug-related crimes under paragraph 2¹⁴ Article 350 of the criminal law. Therefore, the data collected was not exhaustive. It is also worth noting that the three groups of chemicals in closed cases should not be considered indicators of the most recent supply patterns because they only represented some common chemicals in the input market. Many precursor chemicals used for NPS were not included. The results should be understood as minimum values in terms of the number of categorised distributors, types of chemicals and existing supply routes because the data were drawn from court files instead of from the law enforcement monitoring system. Finally, the application of market economy penetration under IAT has not been fully tested in Chinese society. Future research can do more to measure economic, cultural, political and legal contexts at both macro and micro levels in China.

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¹ It was not controlled until 2014 in China.

² Article 4 of The Provisions of the Supreme People's Court on the Issuance of Judgments on the Internet by the People's Courts (2013) states that:

An effective judicial document of a people's court should be issued on the Internet, except under any of the following circumstances: (1) It involves any state secret or individual privacy; (2) it involves juvenile's crimes; (3) mediation cases; (4) others that are not appropriate to be issued on the Internet.

- ³ The database was established in 2013. Since then, all new sentencing files have been uploaded into the database. However, there are also sentencing files from 2012, which were also uploaded by some courts. Therefore, with the aim of including most cases, we collected all cases from 2012 to September 2017.
- ⁴ Article 350 of the *Criminal Law* states: 'Whoever, in violation of the provisions of the state, illegally produces, trades in, transports or carries into or out of China acetic anhydride, ethyl ether, chloroform, or other raw materials or auxiliary materials that can be used for manufacturing drugs shall be sentenced to imprisonment of not more than three years, criminal detention or surveillance in addition to a fine if the circumstances are relatively serious; if the circumstances are serious, be sentenced to imprisonment of not less than three years but not more than seven years in addition to a fine; or if the circumstances are especially serious, be sentenced to imprisonment of not less than seven years in addition to a fine or forfeiture of property. Whoever, being obviously aware that someone else is manufacturing drugs, produces, trades in or transports the articles as provided for in the preceding paragraph for the said person shall be punished as an accomplice to the crime of drug manufacturing'.
- ⁵ Case references: (2014) 鄂刑初字第80号 and (2015) 汀刑初字第221号.
- ⁶ Case reference: (2015) 顺刑初字第3号.
- ⁷ Cases reference: (2014) 赣刑初字第57号, (2015) 鄂茅箭刑初字第00145号.
- ⁸ Cases reference: (2016) 闽0212刑初234号.
- ⁹ Case reference: (2014) 温乐刑初字第739号.
- ¹⁰ Case reference: (2015) 临刑初字第75号.
- ¹¹ The Master said, 'Riches and nobility are what men desire. If they cannot be obtained in the proper way, they should not be held. Poverty and meanness are what men dislike. If they cannot be avoided in the proper way, they should not be avoided' (Confucian Analects).
- ¹² China has the second-most millionaires worldwide after the United States. What makes this even more astonishing is how quickly the number of Chinese millionaires has increased. However, poverty is still a pressing issue for China and one of the major concerns of the Chinese government (Wildau and Mitchell 2016).
- ¹³ Case references: (2014) 三刑初字第00137号; (2016) 苏0582刑初633号; (2015) 锡法刑初字第00507号.
- ¹⁴ Translation: Whoever smuggles, traffics, transports or manufactures the substances mentioned in the preceding paragraph, while clearly knowing that the person manufactures narcotic drugs, shall be regarded as a joint offender in the crime of manufacturing narcotic drugs and punished as such.

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