Journal of Chinese Tax & Policy

中国税收与政策

(2021) Vol 11 No.1

JOURNAL OF CHINESE TAX AND POLICY

SUBSCRIPTION

Months of Distribution: February and August
Current Edition: 2021 Issue 1
ISSN: 1839-065X (Online)
2205-2550 (Print)

For information relating to the submission of articles, visit the JCTP website at:
https://openjournals.library.sydney.edu.au/index.php/JCTP

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ABOUT THE JOURNAL

The importance of China on the global economic stage cannot be ignored, and its unique legal and tax systems are of great inters to international scholars and business people alike. China's tax system is acquiring western features while remaining entrenched in its rich cultural and historical roots. This makes for interesting study, analysis and comparison as its laws are becoming more accessible.

The Journal of Chinese Tax & Policy focuses on the policy, administrative and compliance aspects of the Chinese tax system. It also welcomes comparative studies between China and other countries. The Journal is an internationally peer-reviewed scholarly publication.

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Editorial

The 2021, Vol. 11 Issue 1 of the *Journal of Chinese Tax and Policy* features recent articles on taxation; on the legislations themselves, on specific issues which have arisen, and regarding possibilities for further reform and development.

Shaoxin Wang, Jun Zhao and Xi Nan's *The Source of Tax Law in the PRC: Legislative Organs and their Legal Documents* highlighted that it is difficult for the public to understand each law and regulatory documents being proposed in making reasonable decisions via their interpretations in China. This paper finds out that it is both an urgent and highly beneficial affair to build an regulatory framework such as the public rulings in Australia in China.

Weiqun Xi's *Study on the Taxation Problems and Strategies of Digital Commodities in E-Commerce* has firstly highlighted issues including the contrasting legal categorisations of digital commodities, the differing jurisdictional implementations of tax law, and the diverse justifications underlying these tax law implementations. Upon this basis, following an identification of the challenges and conflicts which have arisen — such as disputes on the applicability of the tax principles surrounding goods turnover taxes, and the disagreements to the jurisdiction to tax; some possibilities for reforming the legal framework have been proposed, and the benefits of these possible reforms articulated.

Zhaohui Long and Hongyi Liu's *Research on the Reform of Tax Collection and Management for the Innovative Development of Blockchain in the Guangdong-Hong Kong-Macao Greater Bay Area* has first comprehensively assessed the blockchain technology's historic development alongside the surrounding theories and applications, as reinforced by financial and non-financial case studies. Atop these analytical foundations, and with an examination also of the strengths and issues surrounding the Guangdong-Hong Kong-Macao 'Greater Bay Area', the feasibility of applying blockchain technology has been articulated, with reference to its advantages and several key areas for blockchain's possible utility — particularly in improving informational clarity and resolving concerns of informational asymmetry for tax collection and management overall.

Eva Huang
Sydney, October 2021

The Source of Tax Law in the PRC: Legislative Organs and Their Legal Documents

Shaoxin Wang, Jun Zhao and Xi Nan[☆]

Abstract: In the comparison of the source of tax law between Australia and China, it is difficult for the public to understand each law and regulatory documents being proposed in making reasonable decisions via their interpretations in China. This paper would introduce the tax administrative power of the ATO and the tax advice system in Australia, especially the ruling system. This paper finds out that it is both an urgent and highly beneficial affair to build an advice framework such as the public rulings in Australia in China.

Keywords: Public Rulings, Taxation Policy, Source of Taxation Law

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I. Introduction

The Chinese government implemented a new round of individual income tax reform at the end of 2018. The new *Individual Income Tax Law* went into force on the first day of 2019, where the tax-free threshold was changed from 3,500 to 5,000 RMB per month and six special additional deductions were added. In practice, every taxpayer could file individual income tax return and deductions through the State Taxation Administration's (also known as STA, previously known as State Taxation Administration of The People's Republic of China) new official app named Individual Income Tax.[1]

Numerous questions were raised in regard to the details of filing taxable income and individual's deduction applications[2], and when taxpayers are confused, they search the internet for answers. However, information on the internet may not be reliable. But nonetheless, it is unreasonable to require a taxpayer without a professional tax background to fully understand the relative laws. Additionally, the State Taxation Administration (STA) publishes many documents every year, and it is hard to identify the legal effect of each document as the STA, unlike Australia which only has administrative power, has both delegated legislative power and administrative power.[3] This paper aims to clarify the source of law for taxation in China. By introducing the special design of the Australia tax system in providing advice to individuals as a taxpayer, this paper aims to provide a possible avenue for the Chinese individual income tax reform.

II. Tax Administrative Power of the ATO in Australia

The filing practices of individual income tax has become relatively developed in Australia. The Commissioner of Taxation is Australia's statutory administrator in the Australia Tax Office (ATO). In general, advice from the Australia Tax Office (ATO) are only administratively binding rather than legally binding. The ATO provides advice through manuals, booklets, schedules, fact sheets, press releases, interpretative decisions, taxpayer alerts and TaxPack. Whilst none of these mechanisms are not legally binding, however as mentioned prior, some advice is treated as administratively binding. This mean the Tax Office will not apply penalties or interest if the advice is wrong, while other advice will only provide protection from penalties.[4]

The ATO provides taxpayers and practitioners with three types of advice. This includes public rulings, private rulings and oral rulings.[5] Rulings from the

[1] 中国新闻网，《官方个税手机APP要来了！2019年1月1日发布!》Chinanews, 'The Official Individual Income App is landing on 1st January 2019', *Chinanews*, 24 December 2018, <http://www.chinanews.com/cj/2018/12-24/8711136.shtml>

[2] The main reason is because before this reform, tax claim is always done by their employers.

[3] 《中华人民共和国立法法》*Legislation Law of the People's Republic of China* 2015 （National People's Congress), Ch IV, s 2 规章

[4] Rulings and other Tax Office advice ,<https://treasury.gov.au/publication/p2004-aspects-income-tax-self-assessment/chapter-2-rulings-and-other-tax-office-advice>(16 Dec. 2004).

[5] ATO, 'ATO Advice Products - Rulings', *ATO*, online <https://www.ato.gov.au/General/ATO-advice-and-guidance/ATO-advice-products-(rulings)/(20 July, 2020)

Commissioner are only legally binding on the Commissioner, not on taxpayers. If a taxpayer disagreed with a private ruling, they could appeal the ATO's decision to the Administrative Appeals Tribunal (AAT) and the Federal Court.[6]

Private rulings are normally applied to a specific scheme or circumstance, and they are usually made in response to a specific application from an entity.[7] Since public consequentially the public facing advice, it is the focus of this paper.

2.1 Public Rulings

Paragraph 38 *TR 2006/10* stated that public rulings determine the tax liability, amount or entitlement for taxpayers and deal with matters of administration, procedure, collection or any other matter involved in the application of a relevant provision.[8] Division 357 of Schedule 1 of the *Taxation Administration Act* (1953) contains the general provisions for Rulings. S170BA (3) of the *Income Tax Assessment Act 1936 (Cth)* provides the binding effect of a public ruling:

> *"Subject to sections 170BC and 170BDA, if:*
>
> *(a)there is a public ruling on the way in which an income tax law applies to a person in relation to an arrangement ('ruled way'); and*
>
> *(b)that law applies to a person in relation to that arrangement in a different way; and*
>
> *(c)the amount of final tax under an assessment in relation to that person would (apart from this section and sections 170BC and 170BDA) exceed what it would have been if that law applied in the ruled way;*
>
> *the assessment and amount of final tax must be what they would be if that law applied in the ruled way."*

The Public Rulings system is detailed in *TR 2006/10*. There are seven types of public rulings, including *Taxation Rulings (TR), Income Tax Rulings (ITR), Goods and Services Tax Rulings (GSTR), Taxation Determinations (TD), Goods and Services Tax Determinations (GSTD), Class rulings (CR) and Product rulings (PR)*.

Public Rulings are legally binding on the Commissioner of Taxation (the Commissioner), however, it is not legally binding on the taxpayers.[9] As public rulings, Taxation Rulings do not have the force of law. If the court believes the ruling is incorrect, the ruling could not be applied to the taxpayer and the Commissioner

[6] *Rulings The history of rulings* (House of Representatives Committees), Online < http___www.aphref.aph.gov.au_house_committee_jcpaa_taxation06_report_chap4%20(2).pdf> Art 4.8.
[7] Above note 4.
[8] *TR 2006/10*, Para 38
[9] Submission Responding to Questions Taken on Notice at the Joint Committee of Public Accounts and Audit Public Hearings - 'Range of Taxation Matters' And 'Biannual Hearing With The Commissioner Of Taxation' On 20 April 2007 And Supplementary Questions, Chapter 1

would not be punished. This unique design protects taxpayers and the Commissioner as well, leaving the Commissioner with only administrative power not delegated legislative power.

As the withdrawn Taxation Commissioner IT 2500 emphasised that Taxation Rulings are not applied when taxpayers use a Taxation Ruling for tax avoidance or regulators believe the taxation ruling is clearly against the law.[10]

Bellinz Pty Ltd v Commissioner of Taxation (Cth) is a good example of showing the relationship among the court, taxpayers and the Commissioner. In *the case*, the issues were raised from the unclear definition of "owned" in s 54(1) of the *Income Tax Assessment Act 1936* (Cth).

There are three issues in this case:

> *"1. Was the Lessor Partnership the owner of the plant for the purposes of s 54(1) of the ITAA and, if so, does Part IVA of the ITAA apply to the leveraged lease arrangements?*
>
> *2. Was the Commissioner required to treat the Lessor Partnership as the owner of the plant by reason of his public rulings (TR 95/30, TD 94/20 and TD 93/187) which were said to be binding pursuant to s 170BA of the ITAA?*
>
> *3. Did the Commissioner fail to comply with his practice and rulings in respect of leveraged leasing and, if so, did that failure constitute an abuse of power reviewable by the Court?"*[11]

The applicant was renting the plant and equipment and wanted to claim depreciation as the owner of the plant and equipment; however, it is not clearly identified in the *Income Tax Assessment Act 1936* (Cth) that if a lessee is entitled to claim depreciation. In practice, the Commissioner allowed "hirees and lessees to the depreciating plant to be acquired under an option to purchase"; however, there was no such plant in this case. The applicant believed the Commissioner should be bound by the previous public rulings because every taxpayer is equal.

It should be highlighted that in this case, the Court emphasised that the Commissioner should make private rulings or public rulings based on law rather than practice. Public rulings are not law, and hence a practice could not be used as a reference in making rulings.

Thus, the application was dismissed by the court. As the judgment highlights, a public ruling should correspond with the Income Tax Assessment Act 1936 (Cth), rather than adopted practices.[12]

[10] Taxation Ruling IT 2500: Taxation Ruling System: Policy Governing Issue of Income Tax Rulings: Status of Rulings; Advance Opinions, Canberra, 18 August 1988 (withdrawn 5 February 2001)
[11] *Bellinz Pty Ltd v Commissioner of Taxation* (1998) 84 FCR 154, 41-44.
[12] Ibid.

The court would ask the Commissioner to reconsider a public ruling only when the taxpayers have "good and substantial reasons", which are correspondingly "confined to situations".[13]

There are some decisions from the taxation Board of Review and the courts dismissing Public Rulings, as noted in *Carey v Field (Cth).* Product Rulings is a type of Public Rulings, which only apply to some specific investment product, including forestry schemes, agribusiness projects and financial products.[14]

In *Carey v Field (Cth),* There were 94 investors, of which 87 were individuals, subscribing funds to seven partnerships, each of which was formed to carry on business as a commercial grower of olives in the Grampians region in Victoria on different parts of a property known as "Arizona". The business carried on by the seven partnerships was referred to in the Product Ruling as "Grampians Olive Project 2001" ("the Olive Project").

While *PR 2001/92* was withdrawn, the tax outcomes of these investors would be substantially different, therefore the applicant argued that the Commissioner made a procedural and substantive error.

On 12 December 2001, the ATO issued a notice of Withdrawal of PR 2001/92. The notice states:

> *"Notice of Withdrawal*
>
> *Product Ruling PR 2001/92 is withdrawn with effect from today.*
>
> *We have reviewed the Grampians Olive Project 2001 and determined that the arrangement, as implemented, is materially different from that described in the Ruling on the following grounds:*
>
> *the Project arrangement as implemented involved seven separate partnerships which entered into separate sets of agreements, and*
>
> *work to be completed by 30 June 2001 under the Planting Agreement and the Construction of Water Facilities Agreement was not completed by that date.*
>
> *As a result, there is no class of persons to whom the Ruling applies."*

[13] Scolaro, D. (2006). Tax Rulings: Opinion or Law? The Need for an Independent "Rule-Maker." Revenue Law Journal, 16(1), 7.

[14] ATO, 'What is a product?', *ATO*, online <https://www.ato.gov.au/General/ATO-advice-and-guidance/ATO-advice-products-(rulings)/Product-rulings/What-is-a-product> (20 July 2020)

Hence, the applicant (Shane Cary) brought an action against the Assistant Commissioner of Taxation of the Commonwealth of Australia to set aside the withdrawal of *PR 2001/92*.

In the judgment, Merkel J highlighted the Commissioner did not define "material difference". Under this notice, *PR 2001/92* would not apply to any class of persons. It is against the TAA. s 14 ZAAK (1) of the *TAA* provides:

> *"(1)A public ruling that is wholly withdrawn:*
>
> *(a)continues to apply to arrangements begun to be carried out before the withdrawal; and*
>
> *(b)does not apply to arrangements begun to be carried out after the withdrawal.*
>
> *(2)A public ruling that is withdrawn to an extent:*
>
> *(a)continues to apply wholly to arrangements begun to be carried out before the withdrawal; and*
>
> *(b)does not apply to that extent to arrangements begun to be carried out after the withdrawal."*

Referring to Lord Fraser in *Attorney-General of Hong Kong v Ng Yuen Shiu*[15], the court highlighted the importance of procedure in tax administration, where he emphasized:

> *"... when a public authority has promised to follow a certain procedure, it is in the interests of good administration that it should act fairly and implement its promise, ... "*
>
> *Based on these facts, Merkel J believed that the Commissioner did not make a substantial error but made a procedural error*[16]*. The Commissioner did not act fairly he did not follow the required procedure; hence, the court orders:*
>
> *"1. The decision of the Commissioner of Taxation of the Commonwealth of Australia ("the Commissioner") to withdraw Product Ruling PR2001/92 ("the Product Ruling") be set aside.*
>
> *2.The question of whether the Product Ruling should be withdrawn, wholly or to an extent, be remitted to the Commissioner to be determined in accordance with law.*
>
> *3.The respondent pay 80% of the applicant's taxed costs of and incidental to the proceeding."*

[15] *General of Hong Kong v Ng Yuen Shiu* [1983] 2 AC 629, 638。
[16] *Carey v Field* (2002) 122 FCR 538, 63-65.

It is clear and established that taxpayers could question a public ruling in court when they hold reasonable grounds. And when the Commissioner is unsuccessful in court, the government may subsequently amend the law in response. For example, in *Commissioner of Taxation v La Rosa*, La Rosa was sentenced to 12 years in prison for importing heroin, the possession of heroin and amphetamines, and their distribution via the Internet. There was also $220,000 cash buried in his yard, which eventually was stolen. At first instance, La Rosa claimed that that the money was not his income. This argument was rejected by the Commissioner of Taxation and the Administrative Appeals Tribunal (AAT) held it is taxable income. The AAT also stated that the lost money could be deducted. Based on this decision, the ATO appealed to the Federal Court but were unsuccessful. The Federal Court upheld the AAT's ruling on the deduction. The federal government had to amend the *Income Tax Assessment Act 1997* to prevent similar deductions being made. Right now, the *Income Tax Assessment Act 1997* clearly points out that the expenditure (loss or outgoings) relating to illegally gained income are not deductible. Sec 26-54 requires:

***"26-54** Expenditure relating to illegal activities*

*(1) You cannot deduct under this Act a loss or outgoing to the extent that it was incurred in the furtherance of, or directly in relation to, a physical element of an offence against an *Australian law of which you have been convicted if the offence was, or could have been, prosecuted on indictment.*

(2) Despite section 170 of the Income Tax Assessment Act 1936, the Commissioner may amend your assessment at any time within 4 years after you are convicted of the relevant offence for the purpose of giving effect to subsection (1) of this section."

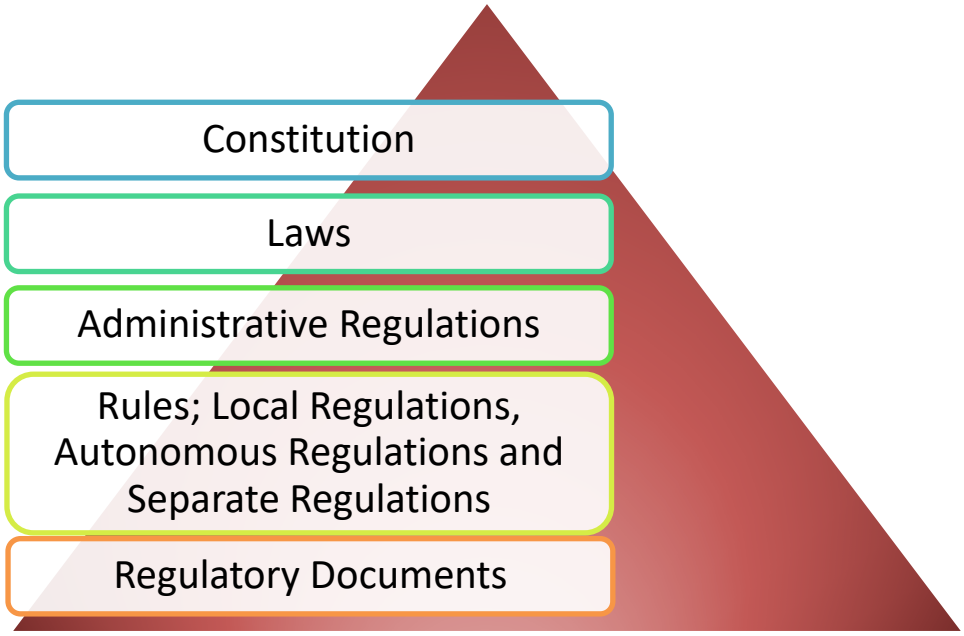
III. Source of tax law in China[17]

Since China is a civil law country, the source of law would only come from its statute. In China, the source of law contains five levels: the *Constitution*, laws, administrative regulations, rules and regulatory documents. The legal effects of the aforementioned sources of law decrease in priority. When they are conflicted, legal documents with lower legal effect are required to be amended or repealed to be in accordance with higher-level norms.[18]

In China, a document's legal effect is highly dependent on its promulgating organs. The PRC's tax laws are drafted according to the nation's *Constitution* and other legislative instruments, but the legal sources of its taxes are peculiar when considered from a western angle. Legally, taxes in the PRC can be classified according to two

[17] Eva Huang, Chapter II, *Fiscal Considerations for Sustainable Public Funding of Urban Old-Age Pensions in the People's Republic of China* (PhD Thesis, The University of Sydney, 2016).
[18] 《中华人民共和国立法法》*Legislation Law of the People's Republic of China* 2015 (National People's Congress), art 72.

special typologies: by distinguishing formal taxes, Sundry Levies and hidden taxes[19] and also by distinguishing central and local taxes. [20]



3.1 The Constitution and the National People's Congress or its Standing Committee

In China, the National People's Congress or its Standing Committee (NPC) are the sole body that exercise legislative power [21], and consequentially other legislative entities can only make delegated legislation.

For tax, the *Constitution* states:

> "It is the duty of citizens of the People's Republic of China to pay taxes in accordance with law."[22]

Hence, if a taxpayer refuses to pay taxes or evades paying tax, irrespective of other laws, the taxpayer has breached the *Constitution*.

Delegated by the National People's Congress and its Standing Committee (NPC), the State Council has the power to interpret tax laws.[23] The interpretation has the same legal effect as the laws itself.

[19] Yang B & Huang E, 'China's major tax system: Characteristics and Development Directions', in *Other Governance: Business Regulation in China*, 2010 (Sydney, 2010), 13-33.
[20] Ibid.
[21] 《中华人民共和国宪法》 *The Constitution of the People's Republic of China* (2018) (National People's Congress) . Art 58
[22] Above note 20, art 56.
[23] Above note 20, ch 3, s 3.

3.2 Laws and the National People's Congress or its Standing Committee

As the main legislative entity, all legislation in China should be enacted and amended by the National People's Congress or its Standing Committee (NPC). The *Legislation Law of the People's Republic of China 2015* (*Legislation Law)* requires:

> *"Laws shall be made in accordance with the statutory limits of power and procedures, on the basis of the overall interests of the State and for the purpose of safeguarding the uniformity and dignity of the socialist legal system."* [24]

Laws could only be promulgated by the NPC after passing the relevant legislation procedures. A legal document, hence, could become law only when its promulgating institution is the NPC with the corresponding legislation procedure already performed. The details of the legislation procedure are listed in Section 3 of the *Legislation Law of the People's Republic of China 2015* (*Legislation Law)*.

According to the *Legislation Law*, the legislative institution of basic taxation systems could only be governed by law.[25] For example, these include but are not limited to: the *Law of the People's Republic of China on Individual Income Tax*,[26] the *Law of the People's Republic of China on Enterprise Income Tax*,[27] the *Law of the People's Republic of China on Tax Collection Management* [28] and the *Environmental Protection Tax Law Of The People's Republic Of China.*[29]

The *Law of the People's Republic of China on Individual Income Tax* was introduced by the NPC on 31 August 2018. Since 1980, it has been amended seven times. The relevant act provides several definitions, which include identify what consists an individual as the taxpayer, which types of income as individual income, what the applicable tax rate is, which forms of income are exempt, how to calculate as well as deductions for individual taxable income.

Alternatively, the *Law of the People's Republic of China on Enterprise Income Tax* was introduced by the NPC on 29 December 2018. This law regulates which enterprise should pay tax in China, which types of enterprise income should be

[24] Above note 17, art 4.
[25] Above note 17, art 8 (6).
[26] 《中华人民共和国个人所得税法》 *Law of the People's Republic of China on Individual Income Tax,(*Standing Committee of the National People's Congress) Promulgated on January 1994，Amended on 31 August 2018
[27] 《中华人民共和国企业所得税法》 *Law of the People's Republic of China on Enterprise Income Tax ,(*Standing Committee of the National People's Congress) , Promulgated on 16 March 2007, Amended on 29 December 2018
[28] 《中华人民共和国税收征收管理法》 *Law of the People's Republic of China on Tax Collection Management, (*Standing Committee of the National People's Congress) , Promulgated on 4 September 1992, amended on 24 April 2015.
[29] 《中华人民共和国环境保护税法》 *Environmental Protection Tax Law of the People's Republic of China* 2016 *(* Standing Committee of the National People's Congress).

considered as taxable income and which are exempt, as well as relevant deductions of enterprise tax.

The *Law of the People's Republic of China on Tax Collection Management* was introduced by the NPC on 24 April 2015. This provides the procedure law, mainly containing the administrative process and powers regarding tax collection by the tax authorities.

The *Environmental Protection Tax Law of the People's Republic of China* was introduced by the NPC on 25 December 2016 and went into force on 1 January 2018. This law is legislated for protecting the environment by creating policies reducing pollutant emission and promoting the construction of ecological conservation.

It should be highlighted that any interpretations of a law published by the NPC has the same binding effect as the law itself.[30]

3.3 State Council and Administrative Regulations

The State Council is then delegated with legislative power to build a basic taxation system to actualise the legal framework provided by the People's Congress and its Standing Committee.[31] The legal documents produced by them are called administrative regulations, its legal effect being lower than any law passed by the People's Congress or its Standing Committee. There are some types of tax designed by the State Council, such as value-added tax, deed tax and stamping tax. Their corresponding legal documents are *Interim Regulations of the People's Republic of China on Value-added Tax, Interim Regulations of the People's Republic of China on the Deed Tax* and *Interim Regulations of the People's Republic of China on Stamp Duty* respectively. It is not a coincidence that these documents include "interim" in their name, with the reason being these documents have not passed the relevant legislative procedure. They are still classified as administrative regulations.

Except designing the type of tax, the State Council also promulgates administrative regulations for supplementing the current law. For example, the *Law of the People's Republic of China on Individual Income Tax* requires the deduction of special additional deductions in calculation of the taxable individual income tax. Instead of the amending the *Law of the People's Republic of China on Individual Income Tax,* the details of special additional deductions are listed in the *Interim Measures for Special Additional Deductions for Individual Income Tax.* Similarly, this document is also named an "interim measure", hence it has a similar legal effect as administrative regulations.

Similar to the interpretation of a law from the NPC, interpretations of administrative regulations from the State Council has the same corresponding legal effect. The *Regulations on the Issuing of Administrative Regulations* requires:

[30] Above note 17, art 50.
[31] Above note 17, art 9.

> *"Article 31 An administrative regulation shall be interpreted by the State Council under any of the following circumstances:*
>
> *(1) where the specific meaning of an administrative regulation needs to be further clarified;*
>
> *(2) where there is a new situation after the enactment of an administrative regulation, the basis for the application of the administrative regulation needs to be clarified.*
>
> *The Legislative Affairs Department of the State Council shall study and draw up the draft interpretation of administrative regulations, which shall be published by the State Council or by the relevant departments of the State Council authorized by the State Council, after being submitted to the State Council for approval."*

And also according to the *Legislation Law*:

"Administrative regulations shall be promulgated by Order of the State Council signed by the Premier of the State Council."[32]

Take the *Interim Measures for Special Additional Deductions for Individual Income Tax* as an example. Though it was drafted by the organs directly under the State Council, its legal effects belong to the level of administrative regulations instead of rules because it has been introduced and passed by the State Council rather than organs directly under the State Council.

3.4 Rules

3.4.1 Local People's Congresses or Their Standing Committees (including the National Autonomous Areas) and Local Regulations

In terms of legal effect, local rules rank behind the *Constitution*, laws and administrative regulations. There are two circumstances that allow the Local People's Congress or their Standing Committees (LPC) to promulgate local rules.

Firstly, the Local People's Congress or their Standing Committees (LPC) operate on the provincial level (this includes 23 provinces, five autonomous regions and four municipalities directly under the central government) and have the delegated legislative power to levy non-national, local taxes in accordance with the specific circumstances and needs of their respective local economic developments.[33] These local taxes cannot violate overarching national tax laws, affect central government's fiscal revenue or hinder the national market.

The promulgation of local tax rules as well as initialising and ceasing tax collection categories are uniformly prescribed by the provincial People's Congress and its Standing Committee. Before the tax law is implemented, it will be reported to the

[32] Above note 17, art 70.
[33] Above note 17, art 72.

State Council for administrative record-keeping. The legislative power of levying local tax only belongs to the LPC on the provincial level and the delegated government on the provincial level. This legislative power cannot be further delegated to lower level organs.

Applicable tax rules are only implemented within their respective provinces (or autonomous region or municipality directly under the central government). The tax rate applied to air and water pollutants illustrate a good case study. Though the legislation creating tax for air and water pollutants is national in nature rather than provincial, the tax rate is decided by the LPC.[34] The Standing Committee of Guizhou Province People's Congresses sets the air pollutant tax standard at 2.4 RMB per pollution equivalent and the standard of water pollutant tax is 2.8 RMB per pollution equivalent.[35] Comparatively in Zhejiang Province, the tax standards of air pollutant and water pollutant are 1.2 and 1.4 RMB respectively (inclusion of heavy metal contaminants are an exception)[36].

Secondly, according to the *Legislation Law*:

> *"Article73 Local regulations may be formulated to govern the following matters:*
>
> *(1) matters requiring the formulation of specific provisions in light of the actual conditions of a respective administrative area for implementing the provisions of laws or administrative regulations; and*
>
> *(2) matters of local character that require the formulation of local regulations.*
>
> *In respect of any matters other than those prescribed by Article 8 herein for which the State has not yet formulated any law or administrative regulations, a province, autonomous region or municipality directly under the Central Government, a city with districts or an autonomous prefecture may first formulate local regulations in light of its specific circumstances and actual needs. After applicable laws or administrative regulations formulated by the State come into effect, any provision in the local regulations that is in conflict with the laws or administrative regulations shall be invalid, and the organs*

[34] Above note 28, art 6.

[35] 《贵州省人民代表大会常务委员会关于大气污染物和水污染物环境保护税适用税额的决定》*Decision of the Standing Committee of Guizhou Provincial People's Congress on the Applicable Tax Amount of Environmental Protection Tax on Air Pollutants and Water Pollutants* 2017 (Standing Committee of the 12th people's Congress of Guizhou Province) <http://www.shui5.cn/article/f4/116688.html>

[36] 《浙江省人民代表大会常务委员会公告第 71 号 关于大气污染物和水污染物适用税额的决定》*Decision on the Applicable Tax Amount of Air Pollutants and Water Pollutants -- Announcement No. 71 of the Standing Committee of the Zhejiang Provincial People's Congress* 2017 (Standing Committee of the 12th people's Congress of Zhejiang Province) <http://www.shui5.cn/article/e7/116755.html>

> *formulating the local regulations shall promptly revise or repeal such provisions*
>
> *Local regulations formulated by a city with districts or an autonomous prefecture under Paragraph 1 or Paragraph 2 of this Article shall be limited to matters prescribed by Paragraph 2 of Article 72 herein."*

A province, autonomous region or municipality directly under the Central Government, a city with districts and an autonomous prefecture all theoretically have delegated legislative power on unregulated matters.

3.4.2 Departments Directly Under the State Council and Rules

According to the *Constitution*, delegated organs and departments under the State Council could promulgate rules in accordance with the provisions of laws and administrative regulations.[37] The major financial and taxation departments under the State Council are the Ministry of Finance, the State Taxation Administration, the General Administration of Customs and the Tariff Commission of the State Council. The competent departments under the State Council could issue rules and normative documents on tax matters within the scope of its authority, including orders, notices, announcements and other forms of documents. It should be noted that their level of legal effect dictated the document names. In comparison, it is also worth noting that the rules promulgated by the STA is different from the Public Ruling issued by the ATO as the prior has legislative power.

According to delegative State Council policies, the aforementioned State Council departments have both interpretative and rule-making power to formulate a detailed implementation of tax regulations.[38]

The *Legislation Law* also stipulates:

> *"Article 80 The ministries and commissions of the State Council …… may, in accordance with the laws as well as the administrative regulations, decisions and orders of the State Council and within the limits of their power, formulate rules*
>
> *…… Without the bases prescribed by laws or the administrative regulations, decisions or orders of the State Council, department rules shall not contain provisions that reduce the rights or increase the obligations of citizens, legal persons and other organizations, and shall not contain provisions that enhance the power or reduce the statutory duties of the department concerned.*
>
> *Article 81 With regard to a matter that falls within the limits of power of two or more departments under the State Council, the*

[37] Above note 20, art 90.
[38] Above note 20.

State Council shall be requested to formulate administrative regulations, or the departments concerned under the State Council shall jointly formulate rules."

3.5 Regulatory documents

According to the *Administrative Measures for the Formulation of Tax-related Regulatory Documents,* tax-related regulatory documents are defined as the documents which are promulgated by the relevant delegated power under required procedures and would influence the counterparties to tax administration by taxation authorities above the county level.[39] Taking Henan Province as an example, until l8 November 2019, there are more than 100 regulatory documents.[40] A tax-related regulatory document will be interpreted by the document-formulating authority, and it can only be used as a basis for law enforcement when introduced as an announcement.[41] Though the legal effect of regulatory documents is limited; it still has significant consequences on taxpayers as it is legally binding.

IV. Conclusion

The source of taxation law in China organises itself as a five level hierarchy, stemming from the *Constitution*, laws, administrative regulations, rules and regulatory documents. The current advice system surrounding taxation is neither clear nor complete. Except formal legal documents, there is no detailed design or accessible avenues to provide general advice to the public. Whilst regulatory documents are legally binding for Chinese taxpayers, it remains difficult for the public to understand each law being proposed in making reasonable decisions via their interpretations. Consequentially, building an advice framework such as the public rulings in Australia is both an urgent and highly beneficial affair in China.

[39] 《税务规范性文件制定管理办法》*Administrative Measures for the Formulation of Tax-related Regulatory Documents* 2019 (State Taxation Administration), art 2

[40] 税屋《国家税务总局河北省税务局现行有效的税务规范性文件目录（截至 2019 年 11 月 18 日）》Shuiwu, *The Content Of The Current Valid Taxation Regulatory Documents In State Administration Of Taxation Hebei Taxation Bureau (Until 18 November 2019)* <http://www.shui5.cn/article/48/133819.html>

[41] Above note 38, art 28.

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Tax Problems and Countermeasures of Digitalized Goods in E-commerce

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Abstract: With the rapid development of e-commerce, the transaction scale of data-based commodities is expanding day by day. However, there are many difficulties in tax treatment of data-based commodities. There are no consistent views on the attributes of tax objects, the definition of tax jurisdiction, tax collection and management mechanism and other issues. Based on analysing the disputes in various countries, combined with the existing problems in China's current tax treatment, the paper suggests that the Chinese government timely revise the tax policy on data products and make it clear that data products belong to services or intangible assets. For cross-border online sales of digitalized goods, tax shall be levied in accordance with the principle of place of consumption (recipient) and the concept of virtual permanent establishment shall be adopted. For B2B transactions, reverse taxation mechanism shall be adopted, while for B2C, a third-party tax collection mechanism shall be adopted. For domestic data commodity transactions, the mechanism of the provider declaring and paying taxes by itself is implemented.

Keywords: Digital Commodities; Tax Jurisdiction; The principle of levying tax

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With the development and application of internet technology, more and more goods and services rely on Internet transaction, forming a rapid development of e-commerce. E-commerce transactions can be divided into online transactions and offline transactions. Online transaction refers to the delivery of goods or services to provide all the transaction links, are completed through the Internet e-commerce transactions.

The key to realize such a transaction is that the seller provides the buyer with intangible goods and services that can be directly transmitted through the network (i.e., digitalized goods), including electronic books, newspapers and periodicals, audio and video works, software and various technical services or information products that can be sent or downloaded through the network. Offline transactions is the process of negotiation, signing, issuing of documents and payment sent by network, but the transactions of its tangible goods or services should be completed by sending through the traditional means of transportation, mailing and site offers.

Since there is no essential difference between offline transaction and traditional transaction in e-commerce, all countries basically follow the principle of not imposing new taxes and collect valued-added tax or consumption tax according to traditional sales. Although there are still many problems, the tax treatment progress is relatively fast. In contrast, the processing of the taxation of data-based goods is relatively slow. There are fierce debates on the attributes of tax objects, the definition of tax jurisdiction, and the tax collection and management mechanism.

I. Debate and suggestions on the attributes of data-based products

1.1 The international dispute on the attribute of data commodity

There have always been differences on the attributes of data-based goods, which should be confirmed as a category for selling goods, or a category for selling services, or a category for providing intangible property. Countries have relatively large differences based on their own interests.

The United States hold different opinions with this issue in the domestic and international. In the Chinese law, the digital goods can be classified as *information* or *similar products* categories instead of a *goods* category. However, in international negotiations, the United States insisted that digital products belong to the *Goods* for its economic and political needs. The reason is the spirit of the liberalization of trade embodied in *the General Agreement on Tariffs and Trade* says that electronic transmission products trade should be included in the trade of goods, at the same time, the tariffs of electronic transmission should be canceled permanently[1].

But some countries and regions, led by the European Union, insist that the digital products should be classified as *service*. As early as 1998,in the report *communication, e-commerce and indirect taxes* published by the European Commission and *the No. 6 directive to amend the value-added tax* for Council of the

[1] Xiaodan Shi. American digital commodity tax revenue model and Its Enlightenment to China. Law Science journal.2015 (3): 121-128.

European Union, it is clear that the action of providing others some kind of product in the form of data through the electronic network should be considered as a service provided by the value-added tax.… …Some products belong to the goods in the sense of value- added tax in its physical form, but it should belong to the labor in the sense of value- added tax when sand electronically[2].Council of the European Union adopted to *the No. 6 directive to amend the value-added tax* on May in 2002. According to this directive, providing web site , web site host and the remote maintain program and equipment, as well as providing software, games, video, data ,database using online, belong to *electronically services*[3] .Switzerland and Singapore also consider that digital goods should be characterized as *services*[4].*The Electronic Commerce Tax Framework Conditions* pasted by The Ottawa Ministerial Conference in 1998 also clear that: "based on the purpose of consumption tax, providing data products should not be regarded as providing goods .

However, it claims that the digital commodities should be treated differently in Canada, Japan and Brazil, some of them are identified as *service*, and a few digital commodities should be identified as *providing intangible assets*[5]. If the someone the copyright of data transmits the relevant data to others through the network and permits the other party to use its data products to a certain extent under the condition of paying consideration, the nature of such transaction lies in the grant of the right to use data. Therefore, it should be defined as "transferring or licensing the use of intangible property.

1.2 Discussion and suggestions on the attributes of data-based goods in China

In China, although the policy of replacing business tax with value-added tax was fully implemented on May 1, 2016, it is stipulated that all sales of goods, services and intangible assets are subject to VAT, but their applicable tax rates are different. If it belongs to the general taxpayer to sell goods, including the sale of audio and video products, electronic magazines, the applicable tax rate of 13%, other applicable tax rate of 17%; The tax rate applies to cultural and creative services, research and development technology services, information technology services and authentication services, and sales of intangible assets. Therefore, how to define the attributes of data goods is still very important.

So far, Chinese scholars hold different opinions about this. Yixin Liao(2005) advocated all digital commodities belong to providing services[6] .However in

[2] EC, Communication, E -Commerce and In direct Taxation.
[3] Council Directive 2002/ 38/ EC amending and amending temporarily Directive 77/ 388/ EEC as regards the value-added tax arrangements applicable to radio television broadcasting services and certain electronically supplied services.
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[6] Yixin Liao,The theory of the legal attribute of turnover tax in electronic commerce transaction, Law Science ,2005(3):109-114.

Yingying Chen's opinion, it should be treated differently. Formulating the standards according to the nature of the transaction:(1)If the purchase of electronic books, newspapers, magazines, music, video, software and other digital online products gets the right of goods without ownership, it should be regarded as a sale of goods which is same as traditional tangible commodity trading;(2)If the purchase of the use of data goods with the ownership of the goods, then it should be recognized as the franchise transfer.(3)Accepting online services of the financial, legal, medical, design and other remote should be regarded as providing services[7].This proposal are more close to the rules of the value-added tax revised after completing "replacing business tax with a value-added tax(VAT)".Literally, it seems to be feasible according to this standard , but it may be difficult to grasp in practice. For example as the paper magazine and the electronic magazine, consumers can only browse the relevant content of the magazine when buying paper magazines, but if consumers buy an electronic magazine online, they can not only browse the relevant content of the magazine recently but also get the relevant background information's link service, and can even discuss and exchanges ideas with the editors and other readers online about the relevant issues instantly. It is usually hard for Paper magazine to provide these services. Therefore, if it can maintain the same level of tax burden as paper magazine sales which the electronic magazines belong to the "sale of goods" and apply to 13% tax rate, but that may cause the dispute between the taxpayers and the tax authorities.

Therefore, in line with the principle of easy operation and considering the main trend of coordinated development of international taxation, it is suggested to revise the provisions of value-added tax and classify the sales of data-based goods as "providing services" or "selling intangible assets". If the seller often imposes various restrictions on the use and disposal of the digital goods by the buyer while providing the digital goods to the buyer, for example, the digital goods can only be copied and used within a certain period by the buyer and cannot be used for commercial sale, which has obvious rights and licensing characteristics, it shall be classified as *selling intangible assets.* For example, online technology, trademark, copyright, online game virtual prop transfer. The provision of other digital goods belongs to "providing services", which can be divided into research and development technical services, information technology services, cultural and creative services, logistics auxiliary services, authentication consulting services, etc., depending on the nature of the business. At the same time, it can accept the suggestion of WTO e-commerce plan and stipulate that data-based commodities enjoy national treatment under the framework of GATT, to facilitate the liberalization of e-commerce.

[7] Yingying Chen, Discussion on tax issues of electronic commerce in China, Review of Economic Research，2014（42）：52-58.

II. Disputes and countermeasures on taxation principles of data-based commodity turnover tax

2.1 Discussion on the tax principle of digital products' turnover tax in various countries

Each country collects the circulation tax such as value added tax, consumption tax to taxpayer, generally take place of supply, place of labor service, place of consumption as tax principle. In traditional transactions, the principles of taxation are generally easy to judge and less controversial. However, the materialization, virtualization and internationalization of data-based commodities make it difficult to determine the location of tax payment. For example, if A in country A buys A digital product from A server site in country B and downloads it to his computer, which country will impose the tax? If country B considers the transaction to have occurred in its own country based on "the standards of the country where the server website is registered", it will impose VAT; If country A sticks to the "country of provider" standard, country A will also impose VAT on Country A. When VAT is levied in both countries, it violates the practice that turnover taxes are levied on only one side of the transaction, leading to double taxation. On the other hand, if A and B hold opposite views, there will be no taxation in both countries, resulting in the loss of tax revenue.

To solve this problem, developed countries are actively negotiating. The Organization for Economic Cooperation and Development (OECD) has held several consultations and discussions. For example, the Ottawa conference in 1998 issued the consumption tax problem of electronic commerce; Working Group IX of the OECD separately issued the T*ax Commission the Development of International Standards and Recommendations* in February 2001; *Guidance on International VAT/GST* issued in February 2006; And in January 2008, it issued guidelines on the *Collection of Consumption Tax on International Remote Online Sales Services and Intangible Assets*. The OECD countries then agreed that the tax should be levied in the country where the consumer is based, as current cross-border transactions of digital goods cannot be taxed in the traditional way by customs.[8]

Value added tax reform program is also complied with the *Principle of Consumption Place Levying Tax* by European Union countries in February,2008, it is considered that e-commerce, satellite TV, telephone network and other commercial activities will no longer be levied by the "service provider registered" country but will be taxed by the country where the consumer is located. In order to coordinate the interests between low tax countries(such as Luxembourg) and regions, the countries where service providers located still have the right to preserve a certain proportion VAT of the actual service consumption countries. From January 1, 2015 to December 31,

[8] OECD, Centre for Tax Policy and Administration, 2008, Consumption Tax Guidance Series: Paper No. 3, Electronic Commerce: Verification of Customer Status and Jurisdiction, OECD.

2016, the proportion was 30%, and thereafter decreased by 15% per year, will be abolished completely until January 1, 2019[9].

2.2 Provisions and problems of current tax principles of digital commodities' turnover tax in China

After replacing the business tax with a value-added tax, China further clarified the place where the taxable activities of value-added tax occurred, stipulating that services (excluding leased real estate) or intangible assets (excluding the right to use natural resources) that are sold or purchased within China are incurred within China. If the goods are sold and the place of shipment or location of the goods is within the territory of China, the goods are sold within the territory of China and VAT is levied by the Chinese tax authorities. For traditional transactions, such rules are not difficult to enforce, but for digital goods, the same is not true.

As mentioned above, there is no clear regulation in China that data goods do not belong to the category of *Goods* at present. Sales of electronic magazines are still handled according to the category of *Selling Goods*. However, it is difficult to determine the place of shipment or location of goods in the transaction of data goods like traditional goods. If the digitalized goods are sent, transmitted, and received through the network, the buyer can click the website of the seller to download the purchased digitalized products directly after the payment is confirmed by the Seller or relevant intermediary agencies, or the Seller can send the digitalized products to the receiving system or terminal designated by the Buyer through the network. The digital goods may be stored on the same server as the seller's web site or in a third-party data warehouse. In this case, can we judge the place of shipment or location of goods by comparing with traditional goods? And if so, how? Is the place of shipment of digitalized products the location of the seller's main business organization, the location of the server where the seller's business website is located, or the location of the third-party digitalized warehouse storing digitalized products? These problems are difficult to grasp in current policies. Moreover, even if it clears that shipment of goods is the place of seller's main operating agency or the place which seller set the operating site of business site, however, the customs cannot levy import VAT by controlling customs area in technology[10], because the digital goods is delivered and transmitted through the network. Buyers can easily evade the import VAT of digital goods if levied forcibly, as a result of the sale of digital commodities whose subject of the transaction is virtual and hidden.

[9] VAT Package: Commission Welcomes Adoption by the ECOFIN Council of New Rules on the Place of Supply of Services and a New Procedure for VAT Refunds, http://ec.europa.eu/taxation_customs/taxation/vat/key_documents/legislation_recently_adopted/index_en.htm.

[10] For traditional goods which the oversea sellers sell to the buyer in the territory of China directly, although it does not belong to selling goods in the territory of China, because of its place of loading or location outside Chinese territory. However, the export countries in order to encourage exports, implement the value-added tax zero tax rate or export tax rebates generally, so in accordance with Chinese existing VAT regulations and international practice, Chinese customs shall levy import VAT when import goods sanded into the customs territory.

2.3 Suggestions

In order to avoid unnecessary disputes with the place of the data commodity turnover tax, Chinese government should revise the VAT law:

(1) It should be clear that the data commodities are not belonged to *Goods*, but *Services* or *Intangible Assets*.

(2) It is clearly stipulated that cross-border online sales of digitalized goods shall be taxed in accordance with the principle of *the Place of Consumption (receiving party)*. The *Provider* principle should be abolished, because the *Place of Consumption* principle is widely practiced in most developed countries. If the *Provider Principle* is retained, there may be double taxation on domestic enterprises selling digital goods abroad. Currently, domestic companies and individuals provide qualified services abroad at a zero-tax rate or exemption, which avoids this phenomenon. However, if the location principle of the recipient is directly clarified, there will be no need for zero tax rate or exemption. And the place of acceptance herein refers to the place where the receiving party uses or utilizes the digital commodities if the services provided by overseas enterprises and individuals for domestic units and individuals for consumption abroad are conducted abroad. Meanwhile, the tax law is further clarified according to different forms of data-based commodity trading: For B2B data-based commodity transactions, the place of commercial existence of the recipient (buyer) of the data-based service is the place of acceptance; for B2C online data-based service transactions, the habitual residence of the recipient is the place of acceptance, which can be judged according to the place of ordering, place of payment or designated consumer bank. However, if for the purpose of tax avoidance, the parties to the transaction first set up business offices or places in tax havens or areas with low tax burden to accept online sales of data services, and then provide free of charge to the domestic affiliated enterprises for actual use, this is an exception. In this case, the place of acceptance shall still be the place of the enterprise or individual using or utilizing the relevant digitalized commodities within China.

(3) For sales of digitalized commodities and other e-commerce activities within China, the principle of the location of the provider is still applied, but not the principle of the l*ocation of the receiver*, to simplify tax collection and administration and improve the efficiency of tax collection. As for the uneven distribution of tax revenue caused by the unbalanced development of e-commerce in different regions, it should be solved by changing the VAT sharing mode and perfecting the transfer payment system. Of course, with the improvement of collection and management technology, it can also be considered that the domestic sales of digitalized goods can apply the principle of the *location of the recipient* in the future.

Meanwhile, it should be done to perfect the e-commerce duty clause. Although there still exists much bifurcation with digital cross-border e-commerce in the main developed countries such as Europe and the United States, it is consistent with exempting digital cross-border e-commerce tariff. As a developing country, China should not only promote e-commerce tariff sovereignty actively for its own stage of development of e-commerce, but also should fully consider the fact which Chinese ability level of the existing tax collection is unable to implement transnational digital commodities' trading ineffectively. Hence, on the one hand, we should add tax

provisions on cross-border e-commerce in the tariff policy, and make tax obligations of cross-border E-commerce clearly; on the other hand, we could retain the right of levying tax, and suspend or postpone the imposition of tariffs on cross-border data goods. After the maturation of tax collection and the criterion of identification of source of income become clear, and then considering the collection of taxes.

III. Tax jurisdiction and response of data commodity income tax

Generally, to protect its tax interests as much as possible, a country often combines resident jurisdiction with regional jurisdiction to determine the subject and source of income when collecting income tax. The exercise of regional jurisdiction is judged mainly by *the location of the permanent establishment*. The exercise of residents' jurisdiction is mainly determined by determining the judgment standards of *residents*, among which the judgment of resident enterprises is not only the registration place standard, but also the actual and effective management organization standard. In traditional transactions, the judgment of *permanent institutions* and *actual effective management institutions* can often be divided by physical existence or human factors. However, in e-commerce, especially the intangible and hidden nature of the transaction of data-based commodities, this physical existence is not necessary. Therefore, how to effectively determine the definition of the source of income and resident of e-commerce transactions and safeguard the interests of all countries has become the focus of international tax coordination.

3.1 The concept of permanent institutions still cannot meet the needs of data-based commodity trading

For a long time in the international tax coordination, the *permanent institution* refers to a fixed place or business agent for all or part of the business of an enterprise. With the rapid development of e-commerce, different countries hold different opinions on whether to revise the judgment criteria of permanent organizations. The United States believes that there is no essential difference between e-commerce activities and traditional business activities in commercial activities, but only in the way of activities. It is therefore argued that the existing concept of permanent institutions can still be applied to transnational electronic commerce activities. Australia is opposed to this proposition, arguing that if the concept of permanent establishment is not amended, it will lead to tax loss of the country of origin and international tax avoidance, and many permanent institutions that previously adopted the traditional business form will avoid the definition of permanent establishment by adopting the form of e-commerce.

To adapt to the development of electronic commerce, international organizations cope actively. It is specified in section 42.1-42.10 of Article 5 of the OECD Model Tax Agreement and the United Nations Model Notes that a server can be classified as a permanent institution. According to this provision, the server or web site constitutes a permanent establishment must meet the following conditions: ①It is the business premises where the enterprise carry out business activities; ②It must be fixed in space and time; ③The activities must be the business activities outside the preparatory or auxiliary activities .

However, it is still very difficult to identify the way of permanent organization, there are many problems: for example, no employees, only server or website automatically complete business activities constitute a business place; Whether the functions of sending and receiving advertisements, placing orders, receiving payments, storing and sending digital data automatically completed by servers and web sites are preparatory or ancillary activities; Server or web site in space and time fixed how to judge. Moreover, even if a server is judged to be a permanent establishment, it is difficult for the country of origin to tax a non-resident enterprise through the server. Because enterprises can put their servers in tax havens or countries with low tax burden, they can achieve tax avoidance by remotely controlling the contents of the servers, which is still a serious tax avoidance phenomenon. Although in some cases, the enterprise to consumers can quickly download digital products and so on, also in the source countries rent or own the server, but still can arrange it through certain business in overseas, the main business activities and source server only subjunctive or the preparatory activities, to avoid standing body.

3.2 The concept of actually effective governance is challenged

Resident tax jurisdiction refers to that a sovereign state established the tax jurisdiction in accordance with the global jurisdiction. According to this jurisdiction, as long as the resident income, whether it is from domestic or overseas countries can be levied tax. The judgment of the enterprise mainly depends on the *place of registration* and the *actual and effective management organization*; Individuals are identified primarily based on *domicile* and *length of residence criteria*. However, the virtualization of e-commerce activity space has weakened the role of these standards, and the virtualization and decentralization of regulatory institutions has become possible. But the virtualization of e-commerce activity space impairs the effect of the standards, and it is possible that the management mechanism become virtualization and decentralization. Any person or enterprise without the approval of the business sector, as long as pay a registration fee, can get a special domain name on the Internet and arrange commercial activities without tax registration. And there is no need to send senior management, of course, does not need business place and even the board of directors and the shareholders meeting will be held by video conference. As for the accounting books and meeting minutes are electronic, do not need places to store paper. In addition, enterprise production, management and financial departments may belong to different countries. The virtual places of e-commerce activity have increased the recognition difficulty of the management control center, it may exist in many countries, also may not exist in any country. It makes the tax authority difficult to define whether a company is native resident, so that the resident tax jurisdiction loses its meaning.

3.3 China's response

Despite China's information technology developing rapidly, has surpassed the United States in 2004, emerged as a major exporter of the world's leading information technology products, but on the whole, as a developing country, should emphasize on the regional tax jurisdiction, therefore, the maintenance, the tax revenue jurisdiction to cross-border digital goods should mainly focus on the cognizance of the category of *executive agencies*.

At present, China's current enterprise income tax law clearly lists five criteria for recognizing non-resident enterprises as *institutions or establishments* and considers entrusted business agents as institutions or establishments established in China. However, these regulations are mainly formulated according to the definition of permanent organization in the traditional business environment in the United Nations model and OECD model, which is not suitable for the current e-commerce transaction environment. Therefore, many scholars suggest that China should add the standard of e-commerce permanent establishment in the current income tax law, and clearly identify the conditions for establishing permanent establishment of Internet service providers such as servers and websites according to the principle of substance over form. However, as 3.1 analysis points out, this provision is still difficult to grasp in practice.

To solve the problem of permanent establishment identification effectively, this paper proposes to consider it in combination with the taxation principle of e-commerce turnover tax. Since it is suggested in the VAT that cross-border online sales of digitalized goods should be taxed according to the principle of *the place of consumption (receiving party)*, this principle should also be used to identify permanent institutions in the income tax, and sales standards can be set in advance: When the sales volume of data products of a non-resident enterprise in China reaches a certain scale, it can be considered that it has established a permanent establishment in China. At the same time, it is stipulated that the enterprise income tax shall be levied on cross-border data goods in the form of withholding income tax. Such treatment not only reflects the consistency of the tax law, but also improves the possibility of practical operation.

As for the cross-border business income that non-resident taxpayers obtain through the traditional business transactions, it continues to adopt the existing concept of the permanent body and determined by the physical presence or human factors.

IV. Discussions and suggestions on the mechanism of tax collection and management about data goods

4.1 Discussion on the tax collection and management mechanism of data goods

It is very important to determine which kind of the tax collection and management mechanism should be used to adapt to the need of the principle of *receiving party*, which used by cross-border digital goods. The ninth working group of the economic cooperation committee has discussed several kind of the tax collection mechanism:(1) The way of reverse taxation, that is, the receiving party should determine the taxable amount of data services or intangible property in accordance with the law and report to the local tax authorities. (2) Non-resident enterprise tax registration form. In this tax collection mechanism, non-resident enterprises overseas that provide online data goods should go to the tax authorities in the recipient country for tax registration. When trading data commodities, non-resident enterprises should collect the tax payable of the receiving party to pay the tax bureau in accordance with the tax law and tax rates of the recipient country. (3) Withholding at source and transferring payment. The exporting data-service country provides that domestic enterprises

which selling data commodity to non-resident overseas should collect VAT or consumption tax and pay the collected taxation to the local tax bureau, then the latter pay to the consumer's tax authorities by the international transfer payment mode.(4) Tax collected and remitted by the third party. This kind of collection requires that the third party (such as a bank or credit card companies and so on) responsible for collect taxes during handling fund payment between the party and the receiving party of the data produces and pay to the tax authorities in the consumption country[11].

At present, OECD recommended that the reverse taxation be adopted for B2B in the cross-border data based commodity trading, B2C takes the non-resident enterprise registration. Practice of some EU Member States shows that, the reverse taxation is feasible and effective. As for the non-resident enterprise registration, it is also feasible if the provider with the words. But the problem is that the tax department within the territory is difficult to control, if foreign companies do not cooperate. Therefore, in practice, the difficulty of collection may be far more than expected. The application of transfer payment collection mode after source withholding depends on the international agreement between the data commodity supplier and recipient countries and the basis of effective international tax assistance, otherwise, it cannot be implemented smoothly. In reality, if the accepted country and provided country have a large gap in the information industry development, the international agreement is difficult to reach and the international tax assistance arrangements are also very difficult. Relatively, if the mechanism which tax collected and remitted by the third party can get a third party's (such as Alipay, bank and other platforms) help, design corresponding software and implant related payment software, so as to realize the payment and withholding taxes at the same time. Then this way is effective and feasible. Of course, the tax authorities should pay fees to the third party payment platform.

4.2 Suggestions

Combined with the situation of China, this paper believes that reverse taxation mechanism can be adopted for B2B cross-border data-based commodity trading. It is stipulated that domestic receiving enterprises that purchase digitalized commodities are obliged to pay corresponding value-added tax when they pay the price abroad, and the qualified taxes are allowed to be deducted as input taxes. As the domestic recipient enterprise is within the supervision scope of territorial tax registration of the Chinese tax authority, and the corresponding value-added tax paid is allowed to be deducted as input tax, the domestic enterprise has the motivation to fulfill the obligation of paying value-added tax.

The mechanism which tax collected and remitted by the third party is adopted to B2C. The expenses of consumer payment are listed in two parts: the actual price and payable tax, and then the third party platform will pay taxes and dues to the state tax authorities. This process can also be used by technical means on the network platform in real time, the specific process can be reflected in the following chart. As for B2B of the domestic data commodity trade, the mechanism which the provider

[11] Liao Yixin, the problem of remote online sales in China, *Law Reach,* 2012(2):71-83.

file a return and pay tax himself is still adopted. As the fast development of technology, C2C of the domestic data goods and electronic commerce tangible products may carry out the third party payment mechanism.

Of course, to ensure the normal operation of the third party payment mechanism, the tax authorities must establish a cooperative relationship with the bank and the third party payment platform, establish the system of payment. The bank, the third party payment platform and the other government departments actively cooperate with the tax authorities to link the bank, the third party payment platform, the data sharing center to the tax management information system. The Central Bank have strict supervision of the third party payment platform, determine the establishment of access and control agencies numbers, and regularly review the third party platform qualification to provide transaction information integrity, authenticity and validity, so as to ensure the tax work carried out smoothly. A connection interface must be established between the tax information system of tax authorities and third party payment platform, to achieve the function of automatic calculation taxation and tax deduction.

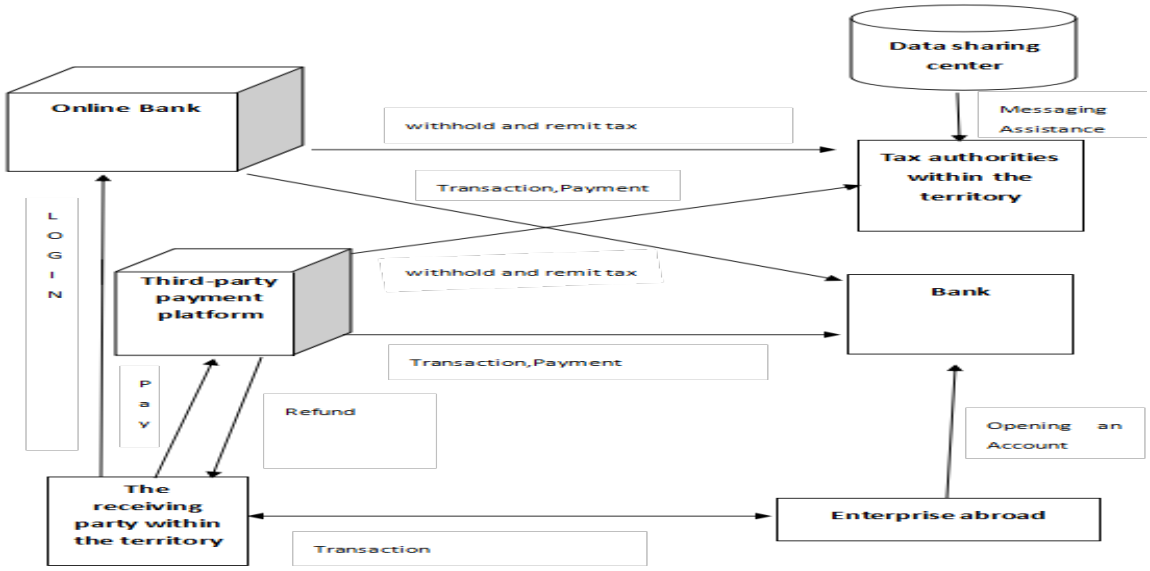

Chart: The B2C collection process of digital cross-border commercial

V. Conclusions

Based on the above analysis, in order to adapting to the development of online data commodity trade, China should respond actively and adjust the relevant tax policies:

(1) It must be clear that the data commodities are not goods, but services or intangible assets.

(2) It is clearly stipulated that cross-border online sales of digitalized goods shall be taxed in accordance with the principle of *the place of consumption (receiving party)*. For B2B data-based commodity transaction, the place of commercial existence of the receiving party (buyer) of the data-based service is the place of acceptance; for

B2C online data-based service transaction, the habitual residence of the receiving party is the place of acceptance. However, if for the purpose of tax avoidance, the parties to the transaction first set up business offices or places in tax havens or areas with low tax burden to accept online sales of data services, and then provide free of charge to the domestic affiliated enterprises for actual use, this is an exception.

(3) It still applies to use the principle of *providing place* for digital goods and services in China. With the improvement of tax collection and management technology, it can also be considered to apply the principle of *receiving party* principle to the sale of goods inside in the future.

(4) For those who sell digitalized commodities and other e-commerce activities within China, the principle of *location of provider* still applies at the present stage. With the improvement of collection and management technology, the principle of *location of receiving party* may be considered in the future.

(5) The reverse taxation mechanism can be used to B2B in the cross-border data exchange. The mechanism which tax collected and remitted by the third party is adopted for B2C. As for B2B of the domestic data commodity trade, the mechanism which the provider file a return and pay tax himself is still adopted. As the fast development of technology, C2C of the domestic data goods and electronic commerce tangible products may carry out the third-party payment mechanism.

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Research on The Reform of Tax Collection and Management for The Innovative Development of The Block Chain in Guangdong-Hong Kong-Macao Greater Bay Area

Zhaohui Long and Hongyi Liu[☆]

Abstract: In recent years, blockchain technology has been highly concerned by countries all over the world and has caused major changes in many industries. Starting with digital currency, blockchain technology has deeply penetrated into the financial field, affected many tax related fields, and promoted the reform of tax collection and management means. Starting from the application of blockchain theory and blockchain technology, this paper analyzes the application of blockchain in financial and non-financial fields through cases, and puts forward the feasibility of applying blockchain technology to the reform of tax collection and management in Guangdong-Hong Kong-Macao Greater Bay Area under the background of the innovative development of blockchain in the Greater Bay Area, combined with the current situation and existing problems of tax collection and management in Guangdong, Hong Kong and Macao, Put forward the specific system design scheme.

Keywords: Guangdong-Hong Kong-Macao Greater Bay Area, Block Chain Technology, Tax Collection and Management

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On January 1st, 2006, Wang Zhenyao, the Director of Relief Agency at the Ministry for Civil Affairs (MCA), has launched an 'experiment' of donating 5 hundred yuan, aiming to target the reform of charities in China. When asked by reporters in disaster mitigation center during an exclusive interview, Wang said, "Who would have thought that it has taken two months, with ten bureaucratic procedures just to cut a fifty-yuan tax?" In 2012, when Zhang Wangchen, a researcher in Research Center of Social Work and Volunteer Service at the Beijing Normal University, has done a survey on permanent residents aged over 18 in Mainland China by means of multistage sampling, it has found that when asked about whether they had ever gotten a tax discount certificate, over half of the respondents who had donated to charity in 2010 said that they haven't requested for it. Along with respondents who have not known about this policy, 91% of all individuals have never received a certificate.[1] From May to July in 2013, when the People's Daily Online launched a survey on the public perceptions and attitudes towards charities in China, the results have also demonstrated that 70% of the interviewees have thought that the level of development of China's charity is inferior to that of developed countries. with more than 90% of interviewees also knowing little about the tax deduction policies for donations in China.

In recent years, charities in China have developed rapidly. The Wenchuan Earthquake in 2008 has greatly aroused the charitable consciousness of society, with 70 billion yuan raised in assistance of the disaster-affected regions, and with many enterprises also making large donations.[2] However, this also raises several questions; what is the status quo of personal charitable donations in China? Which income tax discounts are available for personal charitable donations? What are the incentive effects of the discounts for personal charitable donations? Does the bureaucratic procedures for the individual income tax management affect personal charitable donations? These questions will all be discussed in this paper.

I. Preface

1.1 Background and significance of the topic

In 2009, Nakamoto published the white paper on bitcoin. Bitcoin is gradually understood and accepted by the society. Blockchain technology, the underlying technology of bitcoin, has gradually attracted the attention of the whole world. Internet, banking, logistics and other industries have begun to study and use blockchain technology. It is innovative to introduce this new technology into the field of taxation.

At present, many domestic industries have a lot of research literature on blockchain technology, but there are few relevant literatures in the field of taxation. Therefore, there is a large exploration space to bring tax management into the research scope of blockchain.

[1] Zhang Wangcheng, "An Empirical Study on Contemporary Donation Management and its Problem in China", *China Soft Science,* VIII (2013), 163-169.
[2] http://www.charity.gov.cn/fsm/sites/newmain/preview1.jsp?ColumnID=286&TID=20101223162824828646847.

The Chinese government attaches certain importance to blockchain. In 2016, the State Council of China issued the 13th five year plan for national informatization. The plan reveals the prediction of global informatization development: IOT, cloud computing, big data, artificial intelligence, machine deep learning, blockchain, biological genetic engineering and other new technologies drive the evolution of cyberspace from the interconnection of everyone to the interconnection of everything. Digital, networked and intelligent services will be everywhere. The real world and the digital world are increasingly converging, and the global governance system is facing profound changes."[3]

Recently, China's State Administration of Taxation has also expressed its attention to blockchain technology. Director Wang Jun mentioned at the national tax work conference held in January 2018 that blockchain technology has been studied. In fact, as early as 2017, the Department of collection, management and science and technology development of the State Administration of Taxation has established a blockchain research team.

In Guangdong-Hong Kong-Macao greater bay area, blockchain technology has been attached great importance. On November 9, 2018, Guangzhou Huangpu District and Guangzhou Development Zone established Guangdong-Hong Kong-Macao greater bay area blockchain alliance. Guangzhou Nansha District government also tried out blockchain government affairs to promote multi sectoral resource sharing of government services. In 2019, The opinions of the CPC Central Committee and the State Council on supporting Shenzhen to build a leading demonstration area of socialism with Chinese characteristics proposes to support innovative applications such as digital currency research and mobile payment in Shenzhen. Among them, the underlying technology of digital currency is highly related to blockchain technology.

Therefore, it is of great practical significance to study the combination of blockchain technology and tax collection and management, comply with the trend of the times and the development needs of the country, and comply with the attention paid by Guangdong-Hong Kong-Macao greater bay area to the development of blockchain technology.

1.2 Literature Review

1.2.1 Domestic research

Domestic research on blockchain technology appears relatively late and there are few literatures. The existing research literature mainly includes two types: one is from the perspective of economics or finance to explore how to combine blockchain technology with a certain financial and economic field; the other is from the perspective of computer technology to explore blockchain technology itself or around the development of blockchain technology application.

[3] “十三五”国家信息化规划, The Thirteenth Five-year Plan on National Informatisation, <http://www.gov.cn/zhengce/content/2016-12/27/content_5153411.htm>.

Literature related to blockchain Technology

Tang Wenjian and LV Wen (2016) published how blockchain will redefine the world. The book introduces the origin and development of blockchain, the economic thought behind blockchain, the technical principles and characteristics of blockchain, the application prospect of blockchain, etc. at the same time, the author lists a number of research and application cases of blockchain in various fields.

Zhang Rui (2016) Based on the discussion in the banking industry, he believes that blockchain technology will have a subversive impact on traditional finance, reduce the operating costs of banking financial institutions and make banking institutions more compliant. In addition, blockchain may have a revolutionary impact in many aspects, such as cost control and transaction Anti-violation. He also predicts that digital currency will replace paper money in the future. Both system and macro-control will have a potential impact.

Liu Yuheng, Zhou Shaqi (2017) analyzed the securities field. They believe that as an emerging technology, the characteristics of blockchain are consistent with the development needs of the securities market. Blockchain technology has application space in securities issuance, registration and custody, clearing and settlement, but in practical application, supervision must be strengthened to prevent risks. In addition, we should pay attention to handling the relationship between traditional securities institutions and blockchain securities.To ensure the healthy and sound development of blockchain technology in the securities field.

The Ministry of industry and information technology, together with China blockchain technology and Industry Development Forum (2016), released the white paper on China's blockchain technology and application development, analyzed the current situation and trend of blockchain development, sorted out and summarized its core technologies and typical application scenarios, and provided suggestions on China's blockchain Technology development route, blockchain technology standardization and other issues.

The Key Laboratory of big data strategy (2017) conducted a detailed analysis on the concept of sovereign blockchain and believed that sovereign blockchain can ensure that data and behavior are subject to national supervision on the basis of retaining the existing advantages of blockchain technology, and has broad development space in the future.

In addition, in the scheme design of blockchain system, Dong Youkang and other scholars (2017) proposed the electronic voting system of the board of directors based on blockchain technology; Wang Litong (2017) proposed the scheme of rural financial information sharing platform based on blockchain technology; Yang Huiqin and other scholars (2018) proposed the scheme of applying blockchain to the construction of supply chain information platform; Xue Tengfei and other scholars(2017) proposed a medical data sharing model based on blockchain technology; Xu Yue and other scholars (2016) designed a comprehensive evaluation system of student behavior based on blockchain.

Relevant literature in the field of Taxation

The State Council (2015) published the action platform for promoting the development of big data, which puts forward the development situation and significance, guiding ideology, overall objectives, main tasks and policy mechanisms of big data. In the platform, it clearly requires all social parties to cooperate to promote the development of big data in taxation.

Ou Ge and Jin Xiaoxi (2017) analyzed the advantages and disadvantages of the Golden Tax phase III project in data utilization, discussed and provided suggestions on the application of big data in the Golden Tax phase III Management.

Jia Yizheng (2017) put forward some problems and reasons in tax management under the background of big data, and gave some policy suggestions.

Ma Lie (2017) analyzed the problems of big data in the field of tax risk management and put forward suggestions to improve the problems from four aspects: building the foundation of the rule of law, management platform, institutional mechanism and talent security system.

Long Zhaohui and others (2017) put forward the concrete suggestions for the construction of the Internet plus Electronic Taxation Bureau by analyzing the situation and problems of the tax authorities at various levels in the current stage.

1.2.2 Foreign research and application development of blockchain Technology

In 2008, Satoshi Nakamoto published a groundbreaking paper, "bitcoin: a point-to-point electronic information system", which first proposed the concept of blockchain and proposed a digital money system based on blockchain technology - bitcoin.

Melanie Swan (2015) published blockchain: Blueprint for a new economy, which analyzes the main application fields of blockchain and its three stages of application, namely blockchain 1.0: digital currency stage, blockchain 2.0: smart contract stage and blockchain 3.0: expanding application in various fields.

By building a payment platform based on blockchain technology, ripple labs, a San Francisco start-up, obtained a financing of US $30 million in 2015. Ripple platform can realize rapid exchange and remittance between different accounts and currencies, successfully saving users high handling fees and a lot of time costs.

In 2015, ascribe, Germany, designed a copyright trading system using blockchain technology, so that a large number of intellectual property transactions involving low value can be carried out safely, efficiently and at low cost.

In 2015, wave, an Israeli enterprise, said that it would take advantage of the openness, transparency and distrust of blockchain technology to optimize the current supply chain management mode and set off a digital revolution in the transportation industry.

In 2017, the Australian Stock Exchange announced that the blockchain system will replace the original traditional securities trading system. The new system will use

smart contract technology to automatically manage the clearing and settlement procedures of securities trading.

In 2018, Softbank group of Japan developed a credit system based on blockchain technology to manage personal financial information. The system can obtain the borrower's rental payment history information and property information, and provide the information to the lender to assess the borrower's payment ability. This system simplifies a time-consuming risk assessment process and can help the lender quickly assess a large number of risks of Low credit

1.3 Research ideas and methods

Starting from the basic concept of blockchain, this paper first analyzes its core technology and characteristics, and then analyzes the application cases of blockchain technology in various fields. On this basis, combined with the current problems faced by China in tax management, based on the existing application cases, this paper analyzes the application mode of blockchain in the tax collection and management of Guangdong-Hong Kong-Macao greater bay area, and provides specific schemes.

1. Comparative analysis method. This paper will compare the research and application status of blockchain at home and abroad, and then clarify the role of blockchain technology in various fields through the comparison before and after blockchain application.

2. Interdisciplinary analysis method. This paper uses the interdisciplinary research methods of finance, economics and public finance to analyze the application of blockchain in the field of tax collection and management in Guangdong-Hong Kong-Macao greater bay area.

3. Case analysis method. This paper will integrate the application cases of blockchain in reality, and explore the possibility and specific application direction of blockchain in the tax collection and management of Guangdong-Hong Kong-Macao greater bay area.

II. Theory and application of blockchain technology

2.1 Blockchain technology theory

Blockchain is a technical solution to collectively maintain a reliable database by means of decentralization and trust. One of the common forms is taken as an example below:

In a blockchain system, the central server for keeping data does not exist. The blockchain system is composed of multiple nodes (can be understood as participants), and each node has the same status in the system. Whenever the data changes, each node can participate in the process of recording data, i.e. bookkeeping, which is determined by the system and select the best one. The system will enter the content generated by the best, and submit the results to everyone for backup.

2.1.1 The core technology of blockchain

Asymmetric encryption algorithm

In the blockchain system, asymmetric encryption algorithms are widely used, such as elliptic curve algorithm, Merkel tree algorithm, etc.

The basic process of asymmetric encryption algorithm to realize confidential information exchange is that party a first generates a pair of keys (public key and private key). After receiving the public key, Party B can use the public key to encrypt the information to be transmitted. After the encrypted information reaches Party A, Party A will decrypt the received encrypted information with the previously generated private key.

In the traditional symmetric encryption algorithm, both sides of the information transmission need to transmit the key used for decryption while transmitting the information. In the asymmetric encryption algorithm, both sides do not need to transmit all the keys, and the private key is only in the hands of one party, which greatly reduces the risk of cracking after the information is intercepted. Even if the public key is intercepted on the Internet, the interceptor cannot control the public keyDecrypt the key.

Using asymmetric encryption algorithm can ensure that the blockchain system has high security and non-cracking.

Figure 1 briefly describes the asymmetric encryption model in a graphical manner:

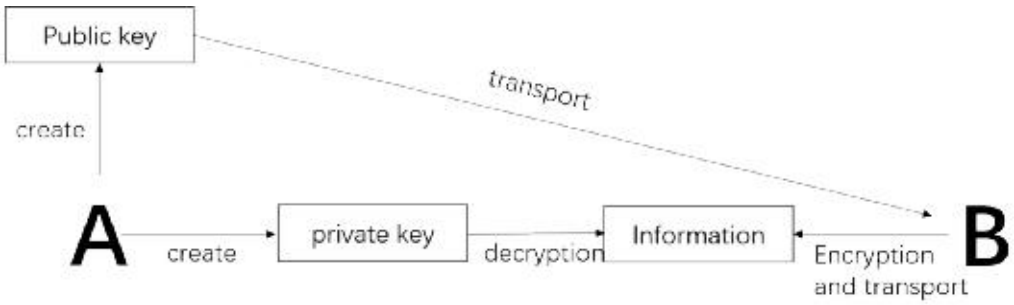

Figure 1 asymmetric encryption model

Distributed block chain structure

In the blockchain system, data is divided into different blocks. Blocks are generated one by one in chronological order, recording all value activities during the creation period. Each block is stamped with a time stamp and connected with the previous block. Through this sequential structure, a complete database structure is finally generated. This structure enables all data to be stored on the blockchain. At the same time, it can trace the source of each data in the system to verify its accuracy.

Through the distributed block chain structure, the decentralization and traceability of the blockchain system are realized, which is a means to ensure that the information in the blockchain cannot be easily modified.

Consensus mechanism

The consensus mechanism solves the problem of how the blockchain achieves consistency in the distributed scenario (i.e. the scenario where there are countless nodes in the decentralized system). It is one of the keys of the blockchain system. The consensus mechanism solves the possible "inconsistency" among groups: the system selects the best "ledger" through the strength of the group and solidify it to ensure the organic unity of the overall "ledger" content through distributed maintenance.

2.1.2 Feature analysis of blockchain Technology

Decentralization.

The traditional database is centralized. There is a central organization (server) to manage the data, uploading and modification can be interfered by the central organization.

Based on blockchain technology, distributed storage after data encryption can be realized without centralized management on the system and hardware facilities. Due to the distributed structure, in a blockchain system, the status of any node is completely the same, and there is no centralized organization with core power and core obligations in the whole system but depends on joint maintenance to maintain the operation of the system. Figure 2 compares the centralized structure with the decentralized structure.

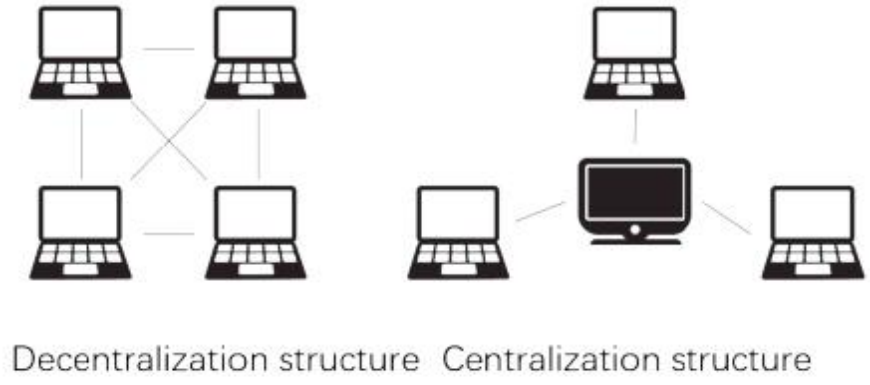

Figure 2 structure diagram of centralization and decentralization

Non-tamperable (Security)

Due to the existence of the blockchain consensus mechanism, each participant will get a copy of the complete database. If a single node modifies the data, it will have no impact on the whole database because it cannot affect the contents saved by other nodes. Therefore, the more nodes participating in the system, the higher the system's ability to prevent malicious tampering and the higher the data security.

Traceability

Due to the existence of distributed block chain structure, the blockchain can record every modification in history, so it can trace the origin of every data in the system. In a blockchain system, every behavior is recorded and traceable.

To trust

Due to the transparent operation of the whole system in the blockchain system, the data cannot be tampered with and traced, and nodes cannot deceive other nodes. Therefore, data exchange between nodes does not require mutual trust or the participation of trusted third-party intermediaries. This feature makes blockchain technology often used in anonymous and untrusted environments such as black-market transactions.

2.1.3 Classification of blockchains

Public chain

Most of the well-known blockchain products (such as bitcoin) are public chains. Public chains are blockchain systems that anyone can join. Public chains have obvious decentralized characteristics. All nodes enjoy the same power and jointly manage the same "public account", and their trust mechanism is "workload proof".

Private chain

Unlike the public chain, the write permission of the private chain is only controlled internally, while the read permission of the data can be selectively opened to the outside world. Although the decentralization of the private chain is weak, it still has the structure of multi-node operation of the blockchain.

Alliance chain

Alliance chain system is a network that can only be joined and exited after authorization. In real alliance chain applications, there are usually entity organizations corresponding to each node one by one, and each organization forms an interest related alliance to jointly maintain the healthy operation of the blockchain system.

The overview of the three types of blockchains is shown in the table below:

Name	Decentralization	Participant	Trust Mechanism	Excitation Mechanism	Data Writing
Public chain	strong	anybody	Proof of workload	need	3-20Times / S
Private chain	weak	Within the organization	Self-endorsement	No need	＞1000 times / S
Alliance chain	Optional	Agreement crowd	Collective endorsement	Optional	＞1000 times / S

2.2 Application of blockchain technology

As mentioned above, because the blockchain has the characteristics of decentralization, non-tampering, traceability, and trust, it can construct a good environment for economic activities to develop smoothly under the asymmetric and uncertain environment. Therefore, in theory, blockchain technology can be applied to all areas that need intermediary, such as payment, securities, logistics, audit work, taxation, etc.

In his book Blockchain-Blueprint for a New Economy, Melanie Swan describes the main application areas of the blockchain and the three phases of its application.

2.2.1 Currency (digital currency stage)

This stage can also be called "programmable currency".

The blockchain digital currency represented by bitcoin is by far the most well-known application of blockchain technology and the most perfect technical system. The decentralized feature ensures that the blockchain currency does not need any endorsement from the central bank and other institutions, which also makes the "currency de nationalization". This assumption is possible. In addition, the characteristics of non-tamperable and traceability make the blockchain currency extremely safe, and the de trust makes it available in a large number of non-trust environments. Therefore, the blockchain currency may have a subversive impact on the existing monetary system.

2.2.2 Contracts (smart contract phase)

This stage can also be called "programmable finance."

Blockchain Revolution: How the technology behind Bitcoin is changing money, business, and the world The book gives the basic theory of smart contracts: smart contracts are computer-processed trading protocols that automate contract terms. Its purpose is to automate the processing of a large number of special-purpose general contract conditions, reduce reliance on third-party intermediaries, and reduce contract disputes. Its economic goal is to reduce various potential costs in the transaction process, including losses caused by malicious behavior such as fraud, arbitration costs and execution costs.

This concept was proposed in 1994, but the lack of a technical means to protect the contract existing in the computer cannot be modified, it is difficult to protect the legal effect of the contract. The birth of the blockchain made smart contracts possible. Blockchain technology is the most effective way to implement smart contract assumptions, because blockchains are traceable and irreversible, and with certain code, contract conditions, contract signers and other important information can be permanently "engraved" It cannot be tampered with in the database so that its effectiveness can be determined. As a result, smart contracts can effectively automate various types of agreements in the case of non-trust, while eliminating third-party intermediaries, reducing the large cost of contract signing and execution.

Through intelligent contract technology, in theory, financial markets can establish a distributed credit system, and all financial activities with contract functions are included in this system. At present, typical applications of smart contracts include: Wall Street Bank is planning to build industry standards for blockchain, improving the efficiency of bank settlement payments, and reducing the cost of cross-border payments; some stock exchanges apply blockchain technology to securities clearing and settlement, etc.

2.2.3 Justice applications beyond currency, economics, and markets

The author mentioned that blockchain technology is a new and efficient organizational activity model. Based on the characteristics of trust, information transparency, blockchain has potential applications in social governance, industry, culture and art. In this part, the author conceived the application direction of many blockchain technologies and constructed a society connected by blockchain technology, but the assumptions are all floating in the “imagination” stage, without giving specific theoretical guidance.

The following case discussion focuses on two phases of digital currency and smart contracts, and less on the third phase.

III. Application of blockchain Technology case study

3.1 Financial field

3.1.1 Optimize clearing and settlement: payment platform Ripple

Ripple is a successful case of blockchain technology in the payment field. This platform is mainly used for different types of currency exchange and remittance, users connect and use the entire Ripple network through the gateway. Each gateway modifies the "General Ledger" through a consensus mechanism to securely process each transaction.

The main way to cross-border remittances in the traditional way is through international settlement centers. In the case of SWIFT, in the process of cross-border remittances, the SWIFT organization charges for each fund settlement, and it takes a long time (usually more than 24 hours) for the funds to arrive.

The advantages of the Ripple platform over traditional means are:

Fast processing speed

The nodes reach a consensus with each other, and the essence is peer-to-peer communication (P2P technology) in Internet communication. This process is extremely efficient. The traditional clearing process takes 3-5 days, and with the blockchain system, the entire process takes only 4 seconds.

High security

The Ripple Gateway Protocol is not subject to personal control. The protocol runs on all relevant devices, and all devices maintain a complete "shared ledger". Every few seconds, the equipment running the agreement will reach a consensus on the "book", which confirms the four states of payment processing, balance correction, transaction execution, and transaction completion. Through common maintenance, the "book" is extremely secure, and it is impossible to invade and modify the "book" unless it controls most of the devices in the entire system at the same time (in fact, this situation is almost impossible in a large Ripple system).

Ripple's innovations in the field of payment can be summarized as follows: under the premise of ensuring transaction security, automatic settlement of deductions, saving manpower and material costs and time costs.

3.1.2. Smart contracts in the securities industry: Australian Stock Exchange

The "Application of the Securities Blockchain Exploration, Problem Challenges and Supervision Countermeasures" mentioned that the traditional securities settlement method and the development of the handling procedures have the following defects: the securities clearing and settlement cycle is long and complicated, and the clearing and settlement links need to be in error. Manual intervention; cost is huge (including securities clearing and payment, collateral management, custody business, etc.); the uniformity of clearing and collecting is not high, and it is scattered among various institutions.[4]

Based on the blockchain technology, the use of smart contracts to automatically execute securities settlements can help save manpower, save intermediate costs, and simplify procedures.

The Australian Stock Exchange (ASX) announced in December 2017 that it would replace the original CHESS system with a blockchain system (distributed ledger, DLT). As Australia's leading exchange, this move has made ASX stand on the front line of securities industry innovation.

According to a report from coindesk.com, ASX CEO, Dominic Stevens said:

"We believe that using DLT instead of CHESS will enable our customers to develop new services and reduce their costs, and it will put Australia at the forefront of innovation in financial markets. While we have a lot more work still to do, today's announcement is a major milestone on that journey."[5]

To put it simply, ASX replaces the old system with DLT technology for securities data records, and uses smart contracts to automatically manage the clearing and

[4]刘瑜恒, 周沙骑《证券区块链的应用探索、问题挑战与监管对策》, Liu Y & Zhou S, 'The Application of Blockchain to Security Markets: Exploration, Challenges and Regulatory Responses' (2017) 4 *Financial Regulation Research* 89-109.

[5] coindesk.com, ASX Says Yes：Stock Market to Settle Trades with DLT

settlement of securities transactions. Blockchain securities systems can handle large volumes of data transmission and transaction processes at lower cost and with greater efficiency than traditional securities trading methods.

3.1.3 Low-cost credit data management: Japan Softbank Group

In the contemporary financial system, banks are a typical "centralized" institution. In the process of managing customer property, banks need to spend a lot of manpower and resources to build a database for customers, maintain, update and protect the data system, and evaluate the customer's information. With the increasing amount of data in the centralized database, the investment of the bank has gradually increased, and the operating costs have increased.

In addition, with the development of society, economic and ideological changes, people's demand for small loans and credit card consumption is gradually increasing, which is also a challenge to the labor cost of banks.

With the help of blockchain technology, the cost of information management and information evaluation can be greatly reduced. In the following, credit management is taken as an example to analyze the typical example of putting blockchain technology into data management.

Japan Softbank Group has developed a blockchain system for managing personal financial information. The system is able to retrieve borrower information from Insite in Tokyo. Lenders can use this information to help determine the borrower's ability to pay, simplifying a time-consuming process of data management and user evaluation.

According to cryptovest.com, the Softbank Group's blockchain-based system provides lenders with access to the borrower's credit history and real estate ownership. Its database will add approximately 170,000 records per month.

"Softbank Technology's blockchain-based system will offer financial institutions the access to customer's credit history and real-estate ownership. Its database is adding about 170,000 records each month."[6]

The advantages of this system are:

1. Reduce the manpower and material resources for manual data collection and manual credit evaluation. For large-scale microfinance needs, such credit systems have significant cost and efficiency advantages.

2. Access to third-party organizations and credit evaluation through indirect data can solve the problem that the credit information of general lending platforms is difficult to collect.

[6] cryptovest.com, Japan's SoftBank Developed a Blockchain-Based Consumer Data Management System

3.2 Non-financial field

3.2.1 Copyright transaction: ascribe

In the field of copyright transactions, Ascribe Germany opened its doors in 2015. The core design of Ascribe's copyright trading system is the use of blockchain technology to time mark intellectual property and create sustainable ownership for art and other digital media. This system enables a large number of intellectual property transactions involving lower value to be carried out safely, efficiently and at low cost. In essence, the automatic copyright trading system still belongs to the category of smart contracts.

It should be noted that a smart contract is essentially a type of program text, not a legal contract or agreement. However, a smart contract can be used as evidence for a contract or agreement, or a way to automate the contract. It should be noted that smart contract is essentially a kind of program text, not a legal contract or agreement. However, smart contracts can be used as evidence of contract or agreement signing, or as a way to automatically execute contracts.

3.2.2 Supply chain management: wave

Israeli company Wave CEO Gardy Ruschin said in 2015 that the financial industry has undergone major changes, but the supply chain management model is still more traditional, because of the apparent lack of trust between international document systems. Wave attempts to take advantage of the open, transparent, de-trusted nature of blockchains to create a digital revolution in the transportation industry.

Wave drives the digitization of its supply chain business through blockchain technology. An article entitled "Israel Enterprise Wave uses blockchain technology to transform international shipping" provides an analysis: “All payments or documents must be agreed by the parties, and any changes made during the period can be measured immediately. Like electronic documents such as PDF can Copying countless times, the document agreed by the blockchain is unique because it requires electronic “signatures” from all parties involved. By sending the bill of lading in this way, all security and data concerns can be eliminated, eliminating the lengthy bill of lading. ”[7]

IV. Application of block chain technology and tax collection and management in Guangdong-Hong Kong-Macao greater bay area

As has been analyzed above, on the premise of high security, blockchain technology shows strong advantages in automatic settlement, information collection, information management, automatic contract, etc. based on the previous research and combined with the characteristics of blockchain, this chapter will explore the

[7]《以色列企业 Wave 利用区块链技术改造国际海运》‘Israeli Company Wave Uses Blockchain Technology to Transform International Shipping’ (2016) 6 *Financial Computerising* 10.

necessity and feasibility of applying blockchain technology to the tax collection and management reform of Guangdong-Hong Kong-Macao greater bay area.

4.1 Application of block chain technology in Guangdong-Hong Kong-Macao greater bay area

As one of the fourth largest Bay Area in the world, Guangdong-Hong Kong-Macao greater bay area has obvious advantages in comprehensive strength, openness and regional vitality, as well as in the application of blockchain technology.

In terms of policy, local governments strongly support the development of blockchain technology related industries. On November 3, 2016, the Financial Development Service Office of Shenzhen government issued the 13th five year plan for the development of Shenzhen's financial industry, support financial institutions to strengthen the research and exploration of blockchain, digital currency and other emerging technologies. On November 9, 2018, Guangzhou Huangpu District and Guangzhou Development Zone established the Guangdong-Hong Kong-Macao greater bay area blockchain alliance. Chancheng District of Foshan also created a blockchain government application innovation platform.

In terms of economic and industrial conditions, Guangdong-Hong Kong-Macao greater bay area has the highest GDP in the country, developed information technology industry, rich reserves of relevant talents, and has high-quality soil and leading conditions to take the lead in developing blockchain industry. At present, many enterprises in Guangdong-Hong Kong-Macao greater bay area have made full exploration and breakthroughs in blockchain technology. For example, the development of Tencent headquartered in Shenzhen "Zhixin chain" has been recognized by the highest court. The underlying technology of blockchain electronic invoice is also provided by Tencent and has been widely used. Huawei released Huawei cloud blockchain service (baas) platform in early 2018.

4.2 Tax system and collection and management in Guangdong-Hong Kong-Macao greater bay area

At the beginning of the year 2019, China issued the outline of the development plan of Guangdong-Hong Kong-Macao greater bay area. So far, the construction of Guangdong-Hong Kong-Macao greater bay area has risen to a national strategy. Due to the differences in economic model, tax system and cultural environment, Guangdong-Hong Kong-Macao greater bay area have the characteristics of "one country, two systems and three tax areas", which hinders the flow of production factors among regions and affects the development of economic integration.

At present, due to the conflict between tax system and tax collection and management, there are the following problems in Guangdong-Hong Kong-Macao greater bay area:

① The difference of tax burden leads to capital flow. Due to the low tax burden in the design of tax system in Hong Kong and Macao, it leads to the problem of cross-

border transfer among Guangdong, Hong Kong and Macao, and a large number of funds flow to Hong Kong and Macao.

② The conflict of tax jurisdiction leads to double taxation. The conflict between regional tax jurisdiction and resident tax jurisdiction in Guangdong, Hong Kong and Macao leads to double taxation in Guangdong-Hong Kong-Macao greater bay area.

③ The conflict of tax collection and management leads to tax disputes. There are great differences in tax collection and management among Guangdong-Hong Kong-Macao greater bay area. The conflict and contradiction of tax collection and management system lead to a large number of tax disputes in Guangdong-Hong Kong-Macao greater bay area.

Therefore, regional tax coordination is the inevitable requirement of the economic integration of Guangdong, Hong Kong and Macao. It is very necessary to drive the integrated development of Guangdong, Hong Kong and Macao through the innovation in the field of tax collection and management

4.3 Feasibility of applying blockchain technology in tax collection and management in Guangdong-Hong Kong-Macao greater bay area

4.3.1. Apply blockchain technology to improve the data management level of tax departments

Although the existing Golden Tax phase III project has improved the management and application of tax data to a certain extent, it is still difficult to control the quality of data. Ou Ge and others pointed out that in the application of big data, tax managers need to process a large amount of information. At present, the Golden Tax phase III system still has problems such as insufficient data collection, low degree of data information collection and data analysis problems affecting data quality and data application, such as imperfect standards and poor data application level.[8]

These problems make it difficult for the tax authorities to grasp the accurate financial status and income of taxpayers, resulting in incomplete and asymmetric information, which leads to moral hazard and adverse selection. Taxpayers have a greater tendency to arrange accounting matters, avoid tax obligations, and cause tax loss.

With the wide application of big data and information technology in tax work, tax management has higher and higher requirements for tax related information data support, which also tests the data management ability of tax departments, and the application of blockchain technology can improve the data management level of tax departments.

[8]欧舸，金晓茜，《浅谈税收大数据时代的金税三期工程》，Ou Ge, Jin Xiaoqian, 'Discussion on the Third Phase of Golden Tax project in the era of tax big data,' *China management informatization* 2017 (01):136-137.

4.3.2 Apply blockchain technology to solve the problem of information asymmetry in tax work

At present, the problem of tax information asymmetry is mainly manifested in two aspects:

First, the information asymmetry between tax authorities. At present, although the tax data provided by the Golden Tax phase III project is helpful for data communication and data retrieval between different authorities, in essence, the data still exist in the form of departmental possession. The barrier free sharing of tax information data has not been achieved. The traditional thinking of "each doing his own thing" and the imperfect information sharing mechanism will lead to duplication, contradiction and confusion in tax work.

The second is the asymmetry of information between tax collectors and payers. At present, when tax authorities use the information management system, there are three sources of data collection and call: information stored in the tax collection and management system, information from external tax departments and the Internet, and information provided by taxpayers. Except that the information in the system is reliable, the information from the other two sources is difficult to obtain and guarantee its reliability.

The problem of asymmetric information between tax collectors and payers mainly leads to two problems: ① non-compliance of tax payment. When the transparency of tax related data of taxpayers is insufficient, taxpayers may tend to evade tax obligations for their own interests. ② low efficiency of tax collection and management. Some enterprises have imperfect internal management and nonstandard tax processes, which makes tax collection and management more difficult and difficult. The application of blockchain technology can solve the problem of information asymmetry in tax work.

In addition to the above two functions, through the consensus mechanism of blockchain technology, we can also build an integrated tax collection and management and tax service platform for Guangdong, Hong Kong and Macao, improve the sharing ability of tax related data, help reduce various tax collection and management problems caused by tax system conflicts, and promote the integrated development process of Guangdong, Hong Kong and Macao.

V. Application of blockchain technology in tax collection and management scheme of Guangdong-Hong Kong-Macao greater bay area

5.1 Taxation Agency Business Information Sharing System Based on Alliance Chain

5.1.1 Overview

Referring to the design case of the alliance chain system mentioned above, combined with the needs of business information sharing between tax departments, this paper

designs a tax collection and management scheme for the application of blockchain technology in Guangdong-Hong Kong-Macao greater bay area, which mainly meets the following three requirements:

High quality and standardization of data.

If the system is established and improved, the tax authorities in Guangdong-Hong Kong-Macao greater bay area need to use the system to retrieve massive data. Due to certain differences in business execution and reports between departments in different regions and at different levels, it is necessary to standardize the information uploaded to the system to make the understanding of information highly consistent among departments.

Exclusivity of internal systems

Since the system is only used in relevant tax departments and has certain exclusivity, there must be restrictions on the access qualification of the system. In fact, there has long been a consensus that "public chain is used for public platforms, alliance chain is used for cross departmental platforms, and private chain is used for internal confidential information".

In order to ensure the exclusivity of the system, the inter department business information sharing system is designed in the form of alliance chain.

Convenience of operation

At the application level, strong operability should be ensured to ensure that any staff can carry out basic operation in line with work needs after simple training, so as to ensure that this system can be popularized in daily tax work.

5.1.2 System mode

Establish quality standards for uploaded information (including content accuracy, content format, classification standards, etc.)To ensure high quality and high availability of information in the system. If each business information is uploaded in real time by the staff in charge of the business, the information quality may be uneven due to everyone’s different understanding of the standard of information and different summary of work information. Therefore, in the implementation, each node should arrange special personnel to review and collect the information to ensure the integrity and authenticity of the information conform to the format and upload regularly.

The blockchain system adopts the form of alliance chain. Each qualified Department of the tax authorities in Guangdong-Hong Kong-Macao greater bay area has an alliance node. Each alliance node realizes direct docking, shares data and updates the same "general ledger" in real time.

During the establishment of the system, a professional blockchain system architecture team is responsible for the design to ensure strong operability of the system application layer, meet the operational needs of daily work and reduce the use threshold of the blockchain system.

The following figure shows the information sharing system:

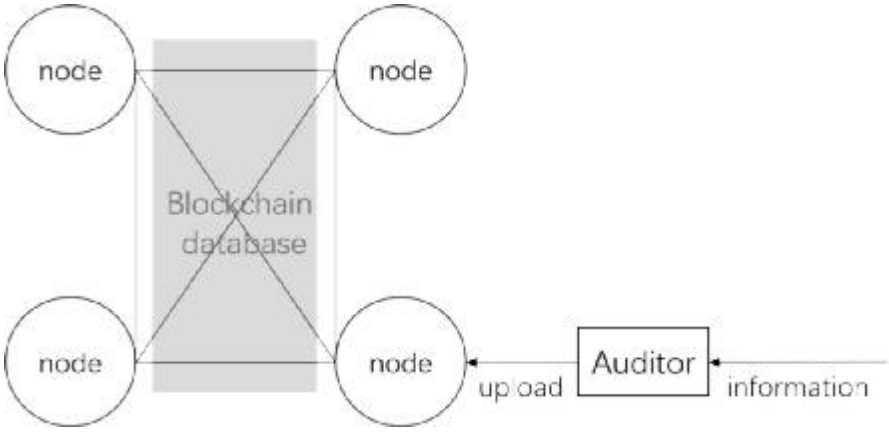

Figure 3: interdepartmental information sharing system

5.1.3 Operation process

First of all, the staff responsible for each business will upload the work information to the Department intranet and provide it to a specially assigned person for review. After confirming that a group of business information is true and standardized, the information will be classified and uploaded on the system node dedicated to the Department, and all other nodes will update the uploaded information in real time. When other institutions have the ability to query the business plan, business standard and implementation status. In case of requirements such as situation, you only need to enter keywords in the intranet to extract information from the alliance chain node of the received department in real time. The system operation flow is as follows:

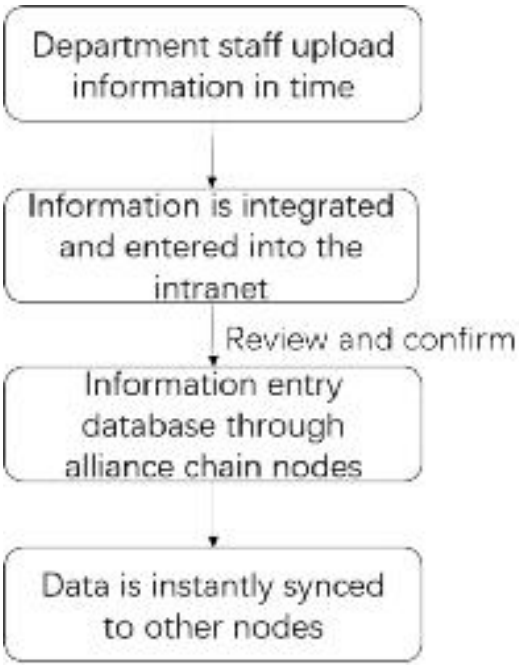

Figure 4: operation flow of inter department information sharing system

5.1.4 Evaluation

Since the rights of each node in the blockchain system are equal, the information between departments is symmetrical. At the same time, each node updates data in real time, so there is no "information barrier" between departments. The cooperation among tax authorities in Guangdong-Hong Kong-Macao greater bay area is more efficient, and effectively reduces duplication, contradiction, confusion and other problems in tax work.

This system can first be established within the tax authorities of the Pearl River Delta, and then be expanded to the tax cooperation between Guangdong, Hong Kong and Macao when it is mature, so as to improve the level of cooperation among the three places. Through the sharing of tax related information among Guangdong, Hong Kong and Macao, it can ensure the consistency of data and avoid being "loopholes" by taxpayers; it can also jointly carry out risk control and avoid the waste of resources caused by separate assessment.

5.2 Design of tax related information collection system based on sovereign chain

5.2.1 Overview

As mentioned earlier, there are three main sources of tax related information for the tax department: information stored in the tax collection and management system, information from third-party institutions and information provided by taxpayers. In addition to the information stored in the tax collection and management system, the other two information are inefficient and low data quality.

If the tax department can apply blockchain technology in the field of tax related information management, it can connect with third-party institutions (such as banks, housing and Urban Rural Development Bureau and other institutions with certain financial information), obtain a large amount of transaction information, income status and other relevant information and classify them into data sets, so as to carry out information management efficiently and reduce the cost of a large number of collection and sorting work and tax compliance cost.

Therefore, referring to the attempt of Softbank group of Japan to combine blockchain with credit management and other application schemes of blockchain technology in the field of information management, the following aspects should be considered in the design of information management system:

The system is regulated and controlled by the government

The standard blockchain system is decentralized. Although the decentralized mechanism has many advantages, this characteristic makes it difficult to supervise

and control at the governance level. Therefore, in order to ensure that tax information is under control, this paper introduces the concept of "sovereign blockchain".[9]

There are many technical similarities between the sovereign blockchain and the conventional blockchain system. For example, they all belong to a distributed structure and have the characteristics of de trust, non-tampering, openness and transparency, collective maintenance, etc. However, there are also essential differences between the two: the sovereign blockchain is not decentralized, but decentralized and polycentric; the sovereign blockchain technically provides the integration of regulatory nodes. Therefore, the sovereign blockchain is more suitable for areas that need to be strictly controlled by the state.

Therefore, in order to ensure that the tax related information management system can give full play to the advantages of blockchain technology under controlled and regulated conditions, it should be constructed based on the sovereign blockchain model.

Efficient automatic collection of tax related information

Due to the complex sources and huge magnitude of tax related information, we should pay attention to the comprehensiveness and accuracy of information in the collection of information, and ensure the low cost and high efficiency of the collection process.

In the case of Softbank group in Japan, one advantage of Softbank group's credit system is that it directly collects financial related information by accessing third-party institutions, so as to reduce the complex information collection links.

Referring to this principle, if each taxpayer is filed separately in the system and a large number of third-party institutions involving financial information are connected to the system as nodes, the third-party tax related information can be collected as completely as possible.

Automatic evaluation of tax related information

On the premise of complete collection of tax related information, the functions of automatic analysis of common indicators and automatic generation of evaluation reports can be realized by using the intelligent contract mechanism and preset code logic, so as to form a dynamic and visual tax related data analysis and display system.

Focus on information protection

In the system design, we should make full use of asymmetric encryption mechanism to ensure the security of information transmission and storage, so as to ensure that important tax related information will not be disclosed and utilized.

[9]大数据战略重点实验室,《重新定义大数据》, Key Strategic Laboratory of Big Data, Redefining Big Data, (Beijing: China Machine Press, 2017).

5.2.2 System mode

Based on the above key issues, the tax information management platform adopts the form of connection between public chain and private chain based on sovereign chain, as shown in the figure below:

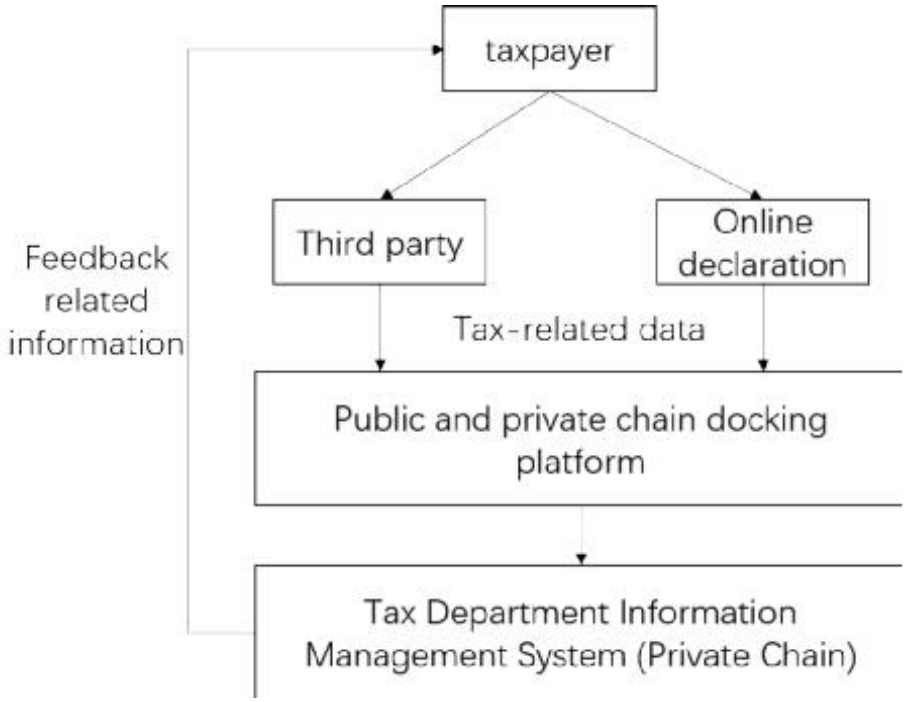

Figure 5: construction scheme of tax information management platform

The financial related behaviors of taxpayers are recorded in various third-party institutions and tax related functional platforms. These institutions report the data to the corresponding nodes according to the specific data reporting format, which together constitute a public chain system.

At the same time, taxpayers themselves can also conduct online tax declaration and online audit in this system, and the audited tax related data will also be entered into the tax information system.

The above behaviors occur in the public chain outside the tax information system. The information in the public chain is entered into the private chain part through the public-private chain docking platform, that is, in the tax related information system within the tax authorities, to file and save data for taxpayers and conduct automatic evaluation.

In the process of tax related information collection, the system has the following ideas on how to improve information transparency and collection efficiency:

① Apply blockchain technology to the whole business process of the enterprise to improve the transparency of tax related data. For example, when each transaction between enterprises is generated, both serve as nodes to upload the contract, execution order and other information of the transaction to form a smart contract.

After payment, the payment platform will automatically synchronize the transaction completion information, automatically generate blockchain electronic invoices and record them into the tax information system. This process greatly improves the efficiency and accuracy of enterprise financial work, and also greatly improves the efficiency of tax related information collection. By combining the invoice information with the actual transaction records, it can better improve the efficiency of tax supervision and eliminate the illegal act of falsely issuing and falsely offsetting VAT invoices.

② With the Chinese central bank's digital RMB, we can more accurately grasp the economic activities of taxpayers and improve tax compliance.

The Chinese central bank's digital RMB, as a digital currency whose issuance and circulation are under the supervision of the state, in its circulation, each transaction can trace the identity and transaction amount of both sides. At present, the central bank has completed the development of digital RMB and gradually started the pilot promotion. On March 3, 2021, the Ministry of Commerce issued the overall plan for comprehensively deepening the innovation and development of service trade, which mentioned that the digital RMB pilot should be carried out in Beijing, Tianjin and Hebei, the Yangtze River Delta, Guangdong-Hong Kong-Macao greater bay area and qualified pilot areas in the central and western regions. As of July 2021, the digital RMB pilot has been orderly expanded to "10 + 1", that is, "10 cities + 1 Winter Olympic scene". This means that in the near future, Chinese residents are expected to fully use digital RMB for payment.

The promotion of digital RMB will have a very significant impact on China's tax work. Due to the strong traceability of digital RMB in circulation, with the cooperation of digital RMB payment tools, the flow and stock tax related information such as taxpayer income, expenditure, property, behavior and monetary funds can be fully and accurately mastered by the tax authorities.

③ Based on the taxpayer's business behavior data, a taxpayer compliance evaluation model is established to automatically identify and warn the risk.

Tax non-compliance behavior is mainly reflected in the taxpayer's default, false declaration and other behaviors in the reporting and payment links. Although these behaviors are complex and diverse, their essence is that the capital flow and business behavior cannot correspond. n order to effectively identify risks, on the premise of collecting sufficient tax related data, with the help of machine in-depth learning, continuously learn the behavior characteristics of taxpayers'; malicious behavior, and form a tax compliance evaluation model. Focus on the taxpayers with low tax compliance estimated by the model, and feedback the results to the model, so as to continuously adjust the accuracy of the model. On this basis, tax compliance is expected to be greatly improved and tax management costs will be significantly reduced.

5.2.3 Evaluation

This system can improve the efficiency of tax related information collection and reduce a lot of human and material resources consumption. At the same time, it fully

exerts the superiority of Internet technology and accords with the development requirement of "Internet plus tax bureau". This system can serve as the foundation of the Internet plus tax bureau, and provide a basic support for a series of electronic tax functions for taxpayers and tax cadres. This system can also be established within the tax authorities in the Pearl River Delta first, and then expanded to the tax cooperation between Guangdong, Hong Kong and Macao when it is mature, so as to further improve the level of cooperation among the three places.

In operation, the system will have the following advantages:

1. Based on the principle of "sovereign chain", the whole tax information system is under the supervision of the government, which can ensure that the system is controlled by the state and avoid the "anarchism" tendency of conventional blockchain technology.

2. Under the extensive collaboration of a large number of third-party institutions, the role of smart contract technology and the supervision of digital RMB on funds, each financial data of taxpayers is highly transparent and the data in the tax information system is highly complete, which is of great help to the government's collection, management and audit work and can significantly improve tax compliance.

3. It can realize the automatic evaluation of tax related information and greatly improve the efficiency of tax data management.

4. Based on the principle of public chain, each taxpayer node forms a distributed account book. IN case of attack, the control of the whole system can be realized only by controlling more than 50% of the nodes. The number of taxpayer nodes is extremely large, and it is impossible to control more than half of the nodes, which effectively protects the authenticity and transparency of tax related data and cannot be destroyed and tampered with.

5. Based on the principle of alliance chain, the pilot of digital RMB is carried out in combination with the Guangdong-Hong Kong-Macao greater bay area, which improves the efficiency of tax related data and information exchange among Guangdong, Hong Kong and Macao. Combined with big data analysis, we can have a clearer understanding and judgment on the tax system and tax policies of the Guangdong-Hong Kong-Macao greater bay area, so as to promote the tax coordination of the Guangdong-Hong Kong-Macao greater bay area and promote the integrated development of the Guangdong-Hong Kong-Macao greater bay area.

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