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<div align="center">学位論文及び審査結果の要旨</div>

<div align="right">横浜国立大学</div>

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論文の要旨

In the last decades, income distribution problems attracts more and more attention from worldwide. Theoretical and empirical literature on income distribution emerged in large number, which focused on indexes describing income distribution and relationship between them and economic growth or other social issue, for example, crime rate. Income distribution problems could be described by income inequality and polarization.

The discussion about inequality is from Lorenz curve, while the discussion about polarization is from "middle-class empty" in 1980s. Inequality and polarization are different concertually, and significant economically. Scholars have different methods to measure them, and focuse on the effect of inequality and polarizaiton on growth and social stability. The chapter 1 of this paper summarizes the commonly used calculation methods, and illustrates the

differenc between inequality and polarization. Income polarization means the frequency of observations is concentrated on several extreme values, formating fault between groups. With two or more groups, polarization increases when intragroup inequality is reduced.

The relationship between income distribution and economic growth is one of important issues of economics research in recent decades. The theoretical literature has proposed numerous transmission channels through which income distribution may affect growth both positively and negatively. The effects of inequality and polarization on growth are discussed in chapter 2 empirically, based on China's data. GINI coefficient is used as inequality index, while ER index is used in issue of China, because "urban-rural" dual development form in China provide a natural condition of polarization.

According the literatures, inequality is not only a result but also a reason of economic growth. Scholars try to explain the channels of inequality-growth interaction by accumulation, skills differences and argumets of political economy, stability or credit constraints. Various economic theories suggest that a stable and sizable middle class is a source of new entrepreneur, by increasing saving and promoting human capital, and creating demand for quality consumer goods. Therefore, polarization may affect growth in a negative way. From the geographical and sequential position and correlation of GINI and ER data of provinces in 2010 and their correlation coefficients, distributions of GINI and ER are not totally same regionally. The panel data of 24 provinces from 1996 to 2010 is used in empirical research, and GMM method is adopted.As the result of empirical research, the impact of inequality on economic growth is positive and

the impact of urban-rural polarization on economic growth is negative. The results of ER and GINI are significant in both annual and 3-year time interval, meaning that intra-provincial inequality is good for regional development while urban-rural income polarization is an obstacle of economic growth.

The effects of inequality and polarization in urban are discussed in chapter 3 and chapter 4. That the past decades have witnessed a shrap increase in technological innovation which is a major driving force for economic development, particularly for developing countries. Innovation not only plays a role in the economic development, but can also impact income inequality. There are four mechanism to explain the relation between inequality and innovation through impact of innovation on skill premia. According cities and the creative theory, social assets, human capital and regional inclusiveness are main conditions of innovation in an area. Income distribution of labors have a close relationship with concentration and immigration of skilled-labors.

In chapter 3, we try to search the impact of inequality and polarization on innovation empirically. The innovation index is described by binary variable whether local enterprises launch new products, which measures innovation in a micro level from Enterprise Survey 2012 by the World Bank. Meanwhile, inequality and polarization-discribed by GINI and DER (0.5) coefficients are computed by wage date in province level, from Urban Household and Expenditure Survey (UHIES) by the National Bureau of Statistics (NBS) of China. From the GINI and DER data, distributions of GINI and DER are not totally same regionally. Other indicators of characters of regions and enterprises are also used as independent variables.

Refer to the dependent variable taking on only two values as a choice between two alternatives, binary regressions with probit and logit specifications are adopted. The effects of DER (0.5) is significant and negative, while the coefficient of GINI are significant and positive. Income inequality between high-skilled labors and low-skilled labors could encourge innovation, while polarization act as an obstacle to innovation.

Since 1970s, there are lots of empirical researches about effect of inappropriate income distribution on social unrest springing in worldwide. In the circumstance with rapidly rising economic growth, various social problems are propagated. Some of these problems are accompanied by not appropriate income distribution, for instance, social unrest, rising crime, moral degradation, corruption, and regional conflict. In case of China, rapid economic growth coincides with swift social changes. Negative changes are prominent and are evolving into a major great threat to the country's further development, social stability, and harmony. The impact of income inequality or polarization on crime is researched in chapter 4. Economic model of crime suggests that crime can be affected by socio-cultural factors, crime deterrence policy factors and economic inequality. According to this approach, the decision to commit a crime is determined by the expected returns and opportunity cost of crime. Therefore, in region with serious income inequality, expected returns that would be gained from committing the crime can encourage the poor to engage in crime rather than marketing dealing.

In this study, crime is described in an economical perspective. Data from Enterprise Survey 2012 by the World Bank is adopted, by the question that "To

what degree is Crime, Theft and Disorder an obstacle to the current operations of this establishment?" It is compiled in the form of 1 to 5 (means"no obstacle, minior obstacle, moderate obstacle, major obstacle, very severe obstacle") ordered discrete data with sample size of 1409, which probably include the direct and in direct cost of enterprises and subjective feeling of managers. The original data used to caculate DER (0.5) and GINI in this chapter is disposable income of household, while wage level is used in chapter 3. Other indicators of characters of regions and enterprises are also used as independent variables. As a result of empirical research in this paper, the coefficient of the DER (0.5) is found to be significant and positive, while the coefficient of the Gini is found to be significant and negative. The result is robust to different specifications and it can be concluded that what can lead to loss of crime is regional polarization rather than inequality.

This study focused on the difference of inequality and polarization, and try to find the relationship between them and economic growth, innovation and crime. Different indicators are used to exprss inequality and polarization in empirical part in each chapter, in order to fit the models and economical explaination. As the empirical research based on China' dataset, the impact of inequality on economic growth is positive and significant while the impact of polarization on economic growth is negativein and significant in both short-term model and long-term model. Intra-provincial inequality is a factor to promot economic growth, but the gap of "urban-rural" is harmful. The "urban-rural" development struction should be changed in the future, and the lives of labors who are from rural region should be improved. And in urban regions, inequality and

polarization are effecting on innovation and crime. For a region, not only the proportion of high-skilled labors but also diversity should be kept to promote innovation. Decreasing population of low-leve income is a more efficient way than increasing income of low-level class to stimulate innovation. What can lead to loss of crime is regional polarization rather than inequality. Government should not only make effort to increase overall income, but more importantly, to reduce the grouping and stratification of income. And economic growth should be transformed to social welfare effectively in order to reducing the motive for the crime of the poor class.

審査結果の要旨

　チャン・チャオナン氏の学位請求論文は、中国の所得分配の不平等と分極化と経済成長・イノベーション・犯罪との関連に関するものである。所得分配の分極化とは、集団内では所得の不平等度が小さいが、集団間では所得の格差が大きい複数の集団に社会が分かれていることを意味している。本研究は、分極化と不平等を区別した上で、中国における所得分配と経済成長、イノベーションおよび犯罪との関連を分析している。

　第１章は、先行研究にしたがって、まず分極化と不平等について概念を整理し、両者を測定するための統計的指標を紹介し、GINI 係数等の不平等指標では分極化を測定できないこと、両者を区別することの重要性を紹介している。

　第２章では、中国の省パネルデータを用いた所得分配と経済成長についての実証分析であり、中国の各省における都市・農村間の所得分極化と省内の不平等と経済成長の関係を実証分析している。分極化の指標としては ER 指数、不平等の指標としては GINI 係数を用いている。結果として、GINI 係数の経済成長率に与える影響は有意にプラスであるのに対し、ER 係数の影響は有意にマイナスであるという結果が得られ、不平等は経済成長に有意な正の効果があるのに対し、分極化は有意な負の効果があることが示され、分極化と不平等は経済成長への影響が全く異なることが示唆されている

　第3章は、中国の都市家計調査UHESと世界銀行のChina Enterprise Surveyのデータを組み合わせ、中国のイノベーションと都市における所得分配の分極化・不平等の間の関係を分析している。分極化の指標としては、事前のグループ分けを前提としないDER係数を用いている。UHESの個標データから計算された週当たり賃金のGINI係数とDER係数を用い、イノベーションの指標としては、China Enterprise Surveyの過去3年間に新製品を導入したかについての各企業の回答を用い、企業の属性、立地している省のGINI係数、DER係数およびその他のコントロール変数を説明変数として、プロビットモデル、ロジットモデルを推定する。その結果、イノベーションと地域の不平等は正の相関があるが、分極化は負の相関がある。この分析結果は、地域の不平等と分極化はイノベーションとの関係が逆であることを示した点において、非常に興味深い結果であると評価できる。

　第４章は、同じくUHESと世界銀行のChina Enterprise Surveyのデータを用いて、社会安定性の尺度としての犯罪と都市における所得分配の不平等・分極化の間の関係を分析している。China Enterprise Surveyの、犯罪・盗難の企業経営への障害程度についての１～５のまでの回答につい

て、企業が立地している省の可処分所得のGINI係数とDER係数、各企業の属性、DER係数やその他の省の特性を説明変数として、順序ロジット回帰を行い、GINI係数は有意に負、DER係数は有意な正であることを示している。その他の地域変数としては、立地している省への他省からの働流入が有意な正、省のGDP成長率が有意に正、企業属性としては女性経営者ダミーが有意な正であるという結果が得られている。すなわち、犯罪の深刻度と地域の不平等は正の相関があるが、分極化は負の相関があることが示されている。この分析結果は、通常考えられているような不平等ではなく、分極化が社会安定性に大きなマイナスの影響を持つことを示したものであり、非常に興味深い結果であると評価できる。

　以上、中国における所得分配について、これまで中国では研究がほとんど行われていなかった所得分配の分極化に注目し、不平等との違いを考慮した上で、不平等と分極化が経済成長や社会安定性とどのような関係にあるのかを分析し、経済社会にとって分極化と不平等のどちらがより深刻な問題であるかを明らかにしようとしており、その問題意識は高く評価できる。理論的な基礎付け、因果関係の識別など今後の課題とすべき点は残されてはいるが、当該分野における優れた貢献である。審査基準③に照らして、学位（博士(経済学)）授与に値すると判断する。