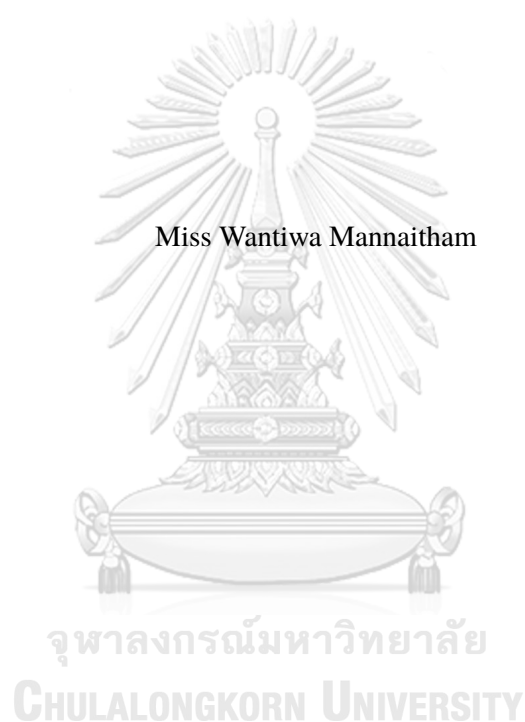


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Middle Class and Democratization under Capital and Land Inequality: A Theoretical
Approach



A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Art Program in International Economics and Finance Field of
Study of International Economics
Faculty of Economics
Chulalongkorn University
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ชนชั้นกลางกับการกลายเป็นประชาธิปไตย ภายใต้ความเหลื่อมล้ำของเงินทุนและที่ดิน: แบบจำลอง
ทฤษฎี



วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาศิลปศาสตรมหาบัณฑิต

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วรรณทิวา หมั่นในธรรม : ชนชั้นกลางกับการกลายเป็นประชาธิปไตยภายใต้ความเหลื่อมล้ำของ
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งานวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาความสัมพันธ์ของชนชั้นกลางกับการกลายเป็นประชาธิปไตยและ
 ความเหลื่อมล้ำ งานวิจัยฉบับนี้ใช้แบบจำลองทฤษฎีของ Acemoglu และ Robinson 2006 เพื่อแสดง
 อิทธิพลของชนชั้นกลางต่อการกลายเป็นประชาธิปไตยภายใต้เงื่อนไขความเหลื่อมล้ำของเงินทุนและที่ดิน
 งานวิจัยชิ้นนี้มีการขยายชนชั้นทางสังคมจาก 2 ชั้นเป็น 3 ชั้นประกอบไปด้วยชนชั้นกลาง ชนชั้น
 ระดับ บนและชนชั้นล่าง นอกเหนือจากนั้นงานวิจัยฉบับนี้ได้มีการอธิบายผลกระทบของความเหลื่อมล้ำ
 ทางด้านเงินทุนและที่ดินต่อการกลายเป็นประชาธิปไตย การศึกษาความสัมพันธ์ระหว่างชนชั้นกลางและ
 กระบวนการกลายเป็นประชาธิปไตยงานวิจัยฉบับนี้ได้แบ่งกรณีศึกษาออกเป็น 3 กรณี (1) ความเหลื่อมล้ำ
 ทางด้านเงินทุนและที่ดิน (2) ความเหลื่อมล้ำของเงินทุน และ (3) ความเหลื่อมล้ำของที่ดิน

ผลจากการศึกษาพบว่าชนชั้นกลางไม่ได้สนับสนุนประชาธิปไตยเสมอไป กรณีการศึกษาที่แบบ
 จำลอง สมมติให้ทุกชนชั้นถือครองที่ดินเท่ากัน ผลจากการศึกษาแสดงให้เห็นว่าชนชั้นกลางที่รวยขึ้นมี
 ความต้องการในเชิงนโยบายคล้ายคลึงกับชนชั้นนำซึ่งทางชนชั้นกลางและชนชั้นนำมีความกลัวในการกระ
 กระจายรายได้ภายใต้ระบอบประชาธิปไตยเต็มใบ นอกเหนือจากนี้ในแบบจำลองขยาย ที่มีการสมมติว่าคนรวย
 ละชนชั้นกลางมีสิทธิ์ถือครองเงินทุนเท่ากันเพื่อที่จะทดสอบความเหลื่อมล้ำของที่ดิน งานวิจัยฉบับนี้พบ
 ว่าตัวแปรรายได้ของชนชั้นกลางมีค่าความสัมพันธ์เป็นลบกับกระบวนการกลายเป็นประชาธิปไตย เพราะ
 ว่าการที่ชนชั้นกลางมีรายได้ลดน้อยลงก็จะยิ่งทำให้ชนชั้นกลางต้องการการกระจายรายได้จากคนรวยมาก
 ขึ้น เช่นการเก็บภาษีจากที่ดินเพิ่มขึ้น ดังนั้นประชาธิปไตยจึงไม่ใช่ทางเลือกที่ชนชั้นนำสนใจถ้าประเทศเป็น
 ระบบเศรษฐกิจแบบเกษตรกรรม แต่อย่างไรก็ตามผลการศึกษาได้แสดงให้เห็นว่าบทบาทของชนชั้นกลางใน
 ฐานะทุนมนุษย์มีความสำคัญต่อการกลายเป็นประชาธิปไตย เพราะว่าเมื่อระบบเศรษฐกิจพึ่งพาทุนมนุษย์
 เป็นส่วนใหญ่จะทำให้สังคมนี้มีความเป็นประชาธิปไตยมากขึ้น

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The study revisits the relationship between the middle class, transition to democracy and inequality. This paper uses mathematical methodology to represent the role of the middle class on democratization under capital and land inequality based on Acemoglu and Robinson 2006 models. This paper extends social class from two to three class models including the rich, the middle class and the poor. Moreover, the paper also describes how capital and land inequality affect democratization. To test an impact of the middle class on democratizing process under capital and land inequality conditions, this study divides into three cases ; (1) capital and land inequality , (2) capital inequality and (3) land inequality.

The results show that the middle class does not always support democracy. To test an effect of the middle class on democratization under capital inequality, the models give the rights to own an equal amount of land to every social class. As a result, the richer middle class has more similar preference to the elites which make they have more fear of the future income redistribution under full democracy. Hence, capital intensive society is more likely to be partial democracy. In addition, the extended models also assume the rich and the middle class have the rights to own an equal amount of capital to test land inequality. The study finds an income of the middle-class variable has a negative impact on transition to democracy. Because the poorer middle class demand higher land redistribution which is costly to the elites, democratization is not attractive to the elites. Thus, land abundant countries seem to be less democratic. However, the results do show a significant role of the middle class as human capital on democratization. When the middle class become dominant to an economy, this economic

structure is called human capital intensive societies and they are more likely to be democratic.

Field of Study : International Economics Student’s Signature
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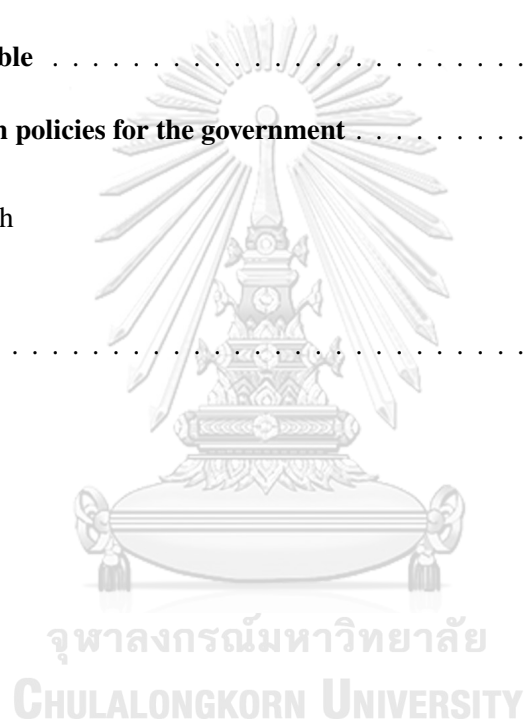


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CHAPTER I

INTRODUCTION

Does the middle class drive democracy? According to Modernization Theory, it states that the more well-to-do a nation, the greater the chances that it will sustain democracy. In other words, more developed countries tend to be more democratic because the strong middle class believe in an equal political right and also believe that democracy helps to stimulate an economy (Lipset 1959). There are two main roles of the middle class on democracy. First, a sufficiently strong middle class may lead to democratization (Moore, 1966). Secondly, the middle class helps to consolidate democracy (Huntington, 1991). It is because the middle class can be a buffer between the rich and the poor in which help to decline social conflicts (Chun, Hasan, Rahman, & Ulubasoglu, 2015). It is obvious that when social conflicts decrease, political system becomes more stable (Benito & Bartolucci, 2012). As the survival of democracy depends on an income redistribution, the greater income redistributive rates make political system less democratic. In general, the government tax on the rich and give to the poor. This action is known as an income redistribution. When the poor is relatively poorer, they demand higher income redistribution from the rich. Tax burden of the rich rises and they do not want to pay higher tax. Therefore, social conflicts between these two groups tend to increase and make democratic system unstable (Acemoglu & Robinson, 2006). The middle class is a group of people who neither rich nor poor (Carles, 2009). Even though they can depend on themselves, they still require some income redistribution from the government. It is because the middle class has to pay tax also, so higher taxation is costly to them. In democracy, if the middle class is a median voter, they have an authority to vote for their most preferred tax rate which is not too high for the rich and not too low for the poor (Acemoglu & Robinson, 2006). Hence, they help to reduce social conflicts through a decrease in income redistribution. Lower redistributive rates eventually lead democracy to be more consolidated (Benito & Bartolucci, 2012). Moreover, according to modernization theory, an increase in an economic development generates higher productivities and income distribution in societies. It results in an expansion of the middle class and an improvement of democratic system (Lipset, 1959). There is an evidence of an increase in the middle class income creates better economic development through international trade and finance and improving government policies. Moreover, an impact size of middle class on democracy is greater than lower poverty

rate, lower income gap or higher GDP per capital. As more people become the middle class, they are pleased by social policies from the government. Hence, democratic system is more stabilized with more affluent societies. (Loayza, Rigolini, & Llorente, 2013).

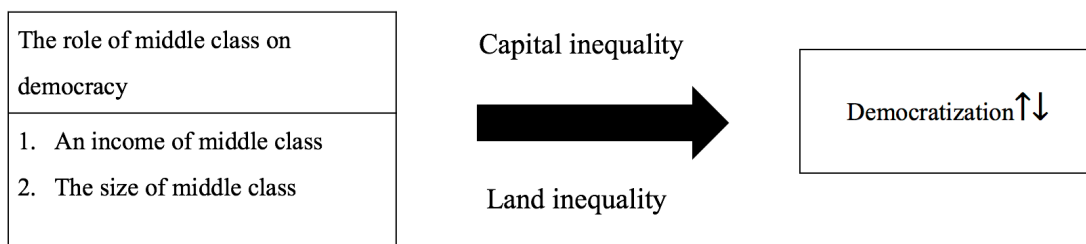
However, nowadays the middle class does not always support democracy. So, there is another theory that can explain better in the relationship between middle class and democracy known as Contingent Theory. It states that The middle class does not always support democracy once they feel satisfied in an authoritarian system (Adisa, 2014). In China, the greater size of middle class does have an impact more on an economic reform than the future political reform such as democratization. Not similar with the modern western theory that the middle class has a pivotal role of driving democratization. The middle class in (Dix, 1994) China may not want to promote democratization. Under communist dictatorship, the higher growth rate of Chinese middle class is created by public sector from the government policies. An increase of middle class in China by the central government lead to higher purchasing power and better economic development. With a better economic development, it creates the new Chinese middle class, so their standard of living is improved by the central government. Once the middle class is satisfied with nondemocratic system, the probability of promoting democratization or political reform is less attractive to this type of middle class (Chen, 2013). Moreover, under nondemocratic system the middle class and the poor may join together to make a revolution and chance the political system to democracy. To stop revolution, the elites can extend the political rights to the middle class. Once again when the middle class and the elites hold political power, it is obvious that the middle class benefit from this system. Therefore, as the middle class feels satisfied in not full democratic system, they do not have incentive to promote full democracy. (Acemoglu & Robinson, 2006).

What makes the middle class turn against democracy? According to literature reviews, there are two main factors that make the middle class prefer less democratic which are land inequality and capital inequality. Firstly, a higher capital inequality makes political system less democratic. Heckscher-Olin theory states that after a trade openness the returns to capital increase while returns to labor decline in capital intensive societies. Because the rich are the owners of capital and the poor are labor, an increase in international trade causes a greater gap of income between the rich and the poor (Bougheas R, 2006). Moreover, as capital can be accumulated from this generation to next generation, it also causes higher wealth inequality as a result democratic system becomes unstable (Milanovic, 2015). In general, to reduce wealth inequality the government might tax on capital and redistribute to the poor. However, because under

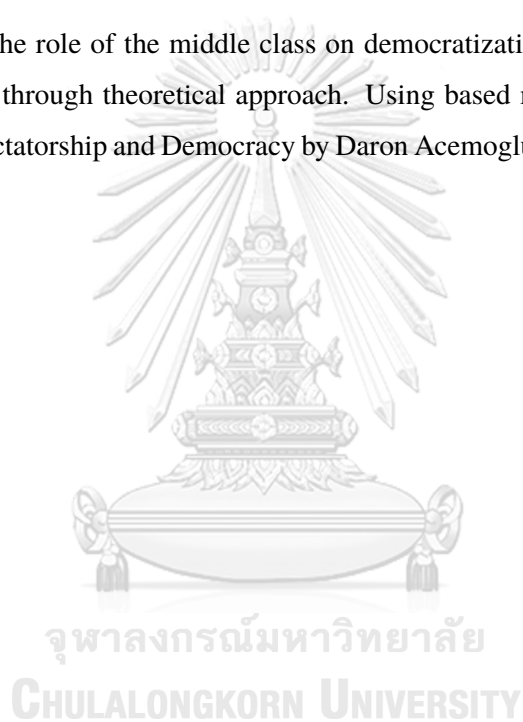
trade openness capital may fly from high to low tax on capital countries. So, heavy tax on capital causes an economic distortion (Acemoglu & Robinson, 2015). Moreover, the government cannot do capital redistributive policy because the rich are more efficient to hold capital and generate income than the poor. Therefore, to reduce capital inequality the government should encourage investors to invest in human capital (Justino, 2004). Human capital worker as the middle class earn higher income than wage of unskilled labor (the poor). As the size of human capital increases, an income distribution in the society also increases resulting in less social conflicts (Acemoglu & Robinson, 2006). Secondly, the greater land inequality also causes less democratic (Samuels, 2015). The elites have higher amount of land holding than the poor. Under democracy, majority voters can vote for their favour policy. Of course, the poor are majority group of people who always win in an election (MOYO, 2018). They can vote for land redistributive policy so that the government have to set high tax on land holding and transfer money to the poor as an income redistribution. However, when the landowners realise that they have to face high democratic redistributive rate, they prefer less democracy. As a result, an increase in land inequality make the elites have a fear of land redistribution in democracy (Acemoglu & Robinson, 2006). Democratic system is less attractive to the elites when wealth inequality increase (Islam, 2017).

This paper uses theoretical approach because an empirical data can interpret only the positive or negative effect between the middle class and democracy, it cannot show how the middle class play an important role on transition to democracy. Whereas the theoretical approach can explain how people make political decision through game theory. The mathematical models can expand into three social class which are the rich, the middle class and the poor, and they also can add wealth inequality variables. This study extends based model from two classes of the structure of economy into three classes under wealth inequality conflicts using fundamental of political conflicts from Acemoglu and Robinson (2006). The reasons why this study chooses the basic models from Democracy Economic Origins of Dictatorship and Democracy textbook because the models approach economic theory and emphasise economic incentives of people that have an impact on political views. They explain individual's political decision-making through game theory. Moreover, the based models highlight a major factor of social conflicts because people have different interests in the government policies resulting in different political outcomes.

1.1 Objective of the study



To represent the role of the middle class on democratization under capital and land inequality condition? through theoretical approach. Using based model from Democracy Economic Origins of Dictatorship and Democracy by Daron Acemoglu and James Robinson (2006).



CHAPTER II

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

This paper divides theoretical frameworks into three groups; (1) theoretical framework of the relationship of middle class and democracy, (2) an effect of an economic structure on democracy, (3) the impact of capital and land inequality on democratization and (4) an influence of globalization on democratic system

2.1 Does the middle class drive democracy?

An impact of middle class on democratization is still ambiguous. On one hand, according to modernization theory, more developed countries tend to be more democratic. Because more developed economies create the greater size of middle class, democracy is more consolidated. (Schmidt, 2015). The middle class as educated people earned higher return to skills after industrialization in Western countries. As people became relatively richer, they seem to prefer democratic system (Korosenyi, et al., 2016). Most people believe the result of an economic development is from democracy. It is because democracy provides guarantee of copy rights and property rights that create an incentive of inventors to invent new technology (Loayza, et al., 2013). With better technology, economic productivities increase dramatically resulting in better standard of living. The size of middle class increase and they help to consolidate democracy. In other words, democracy has positive relationship with an increase in income per capita (Lipset, 1959). Hence, the middle class prefer democracy to an authoritarian system in modernization theory.

On the other hand, contingency approach, It suggests that middle class does not always promote democracy when it benefits from the authoritarian system (Adisa, 2014). In China, most of the Chinese middle class works in the government sector and earn high wages than work with private sectors. Moreover, an entrepreneur gains from lower wages in the private sector. As Chinese middle class feel satisfied with an authoritarian regime, they have no incentive to support democratization (Wang, 2014). The middle class in the West and in China is different.

While the new Chinese middle class has been heavily depending on the government policies to survive and become relatively richer under nondemocratic system, the western middle class advantages from higher level of an economic development in which resulting from democracy (Chen, 2013). The Chinese middle class prefer an authoritarian while the western middle class encourages democracy. Hence, it is still debatable that the middle class may or may not support democratic system.

Modernization Theory	Contingent approach
<ul style="list-style-type: none"> • As an income distribution increases, the size of middle class is greater which increase probability of transition to democracy • In developed countries, the middle class always support democracy (Lipset, 1959) 	<ul style="list-style-type: none"> • The middle class does not always encourage democracy once they feel satisfied in an authoritarian system (Chen, 2013)

Figure 2.1: The disagreements of an impact of middle class on democratization

2.2 The relationship between an economic structure and democracy

According to Acemoglu's model, The key of democratic survival is the level of income distribution. Each social class has different sources of income because they have different endowments of properties such as capital stocks, productive land, labor and human capital. It suggests that an economic structure have an effect on democracy through an income distribution. In two class model, the rich are the owners of capital stocks and productive land whereas the poor are working class. There is a trade off between nondemocracy and democracy via the cost of political violences; repression, coups and revolution. Unstable political situation creates negative impact on economy because the costs of coup and repression are costly as it destroys resources of production and damages economic growth. Therefore, political stability is more important to capitalist production than agricultural products. It is because capitalist sectors require good economic relations and depend more on investments in skills than agricultural sectors. In more developed countries, they have relative higher capital endowments, so the costs of political violences are greater than developing countries. Hence, democracy is more attractive to the rich people in relative higher capital intensive societies. In this model, it assumes that the government

have balance budget meaning their revenues are from impose taxes on the rich then redistribute to the poor. According to an economic theorem, lower redistributive rate generate higher utility to the elites while higher redistributive rate increase the citizens' utility. In democratic system, majority voters can vote for their most preferred tax rates. The poor as majority group, they can impose high tax rates on landowners because land is easier to reform and impossible to avoid paying tax. But, the poor cannot impose high tax rate on capital because it can flee away to another country in which has lower tax on capital and cause economic distortions. Thus, an economic structure might create social conflicts and unconsolidated democracy through redistributive rates. For example, in democracy, landowners have to pay high tax rate that make the cost of coup relatively lowers. Hence, they prefer coup to democracy as a result higher tax rate on land make the cost of democracy greater and eventually leads to political uncertainty. This example implies that the elites who earn more return on land are more likely to fight for changing political system from democracy to nondemocracy than the owner of capital. In contrast, if there is more amount of capital endowment, tax rate in this society will be low to avoid economic distortions from capital move to invest in another lower tax country. In relative capital abundance, the owner of capitalist production pay low redistributive rate, so the cost of democracy is quite low to capital owners. As a result, they prefer democracy to coup and it creates more consolidated democracy. It suggests that an economic structure has an effect on driving democracy through the costs of repression and coup. Political conflicts between the elites and the citizens tend to increase in relative higher land intensity because landowners are forced to pay high tax on their land. In nondemocratic land abundant, the elites own greater amount of land than capital and they might realise that democratic system is costly. Thus, democracy is less attractive to the elites in nondemocratic land intensive society. In nondemocratic system, the elites have political power to set their favourable redistributive rate ,so the citizens have more incentive to revolt because they are excluded from political system and not satisfy with low redistributive rate. Once the threat of revolution occur, the elites have to choose either repression or democratization to stop a revolution from the poor. It is obvious that landowner prefer repression to democratization as the costs of repression is relatively lower comparing to democratic tax rate. Therefore, the probability of transition to democracy is lower in relatively higher land intensive societies.

The original model explains the conflicts between the rich and the poor. In this research, it expands social class into three groups including the rich , the middle class and the poor. Similarly, the rich own both capital and productive land, middle class as human capital and the poor are working class. The middle class is educated and skilled worker who stands between working

class and upper class. As human capital becomes more important to an economic structure in more developed economy, democracy is more attractive to the elites. There is a positive relationship between economic development and democracy as stated in 'modernization theory' such that less developed countries are less likely to be democratic. Modernization is Westernization, Urbanization and Industrialization. There are more productive and people are more educated, healthier and longer life expectancy in modernized society. In history, after traditional process of production changed to industrialization that using more machines to produce. As a result, the transitional process from small to large scale of productions as an economic development. It is obvious that transformation of an economic structure from agriculture to industrialization creates higher national income, and emerging greater size of the middle class income. Then, later they require more stabilized political system. Therefore, modernized societies not only creates an increase in income per capita but also improve political standard and make it much more stable. "The more well-to-do a nation, the greater the chances that it will sustain democracy" (Lipset 1959, 75). Some social Requisites of Democracy: Economic Development and political Development is the first provided theoretically relationship between the level of economic development and probability of democratization by Lipset hypothesize. His paper emphasized an effect of an increase in income per capital resulting from an economic development on democracy. In westernization, the middle class plays a pivotal role of driving democratization. With higher amount of human capital, particularly higher level of education, in developed countries those educated works prefer more democratic. This paper emphasizes on the role of middle class as human capital on transition. Acemoglu and Robinson (2006) explained a pivotal role of human capital that human capital intensive structure creates higher probability of democratization. Also, once political institution is democratic, it tends to be stabilized in relatively higher human capital intensive society. Intuitively, human capital is skilled and educated labor. It is clear that human capital labor is easier to be destroy, injures or get killed than land and machines during political turbulence. It expects that human capital factor of production suffers the most and generates highest cost under political instability such as repression and revolution. Human capital makes the cost of making repression, coup and revolution greater. In addition, it is impossible to the government to redistribute skills of human capital to other groups and also collect tax on returns to skill of human capital is difficult and costly to monitor each skill labor efforts. The tax burden is not high in human capital intensity: in other words; the elites prefer democratization to repression. Once political system is democracy, it becomes more democratic when human capital is main resources of national production. Thus, relatively higher human capital intensity has an influence on political decision making of the elites as the probability of choosing democ-

ratization is greater than repression or higher probability of choosing democracy than a coup. Therefore, an increase in number of the middle class generates relatively higher ratio of human capital to unskilled labor. When the size of the middle class increase, human capital becomes more significant to an economic structure which creates lower redistributive rate in democracy and make repression or coup less attractive to the elites.

According to Empirical studies and Researches, The larger middle class have a positive impact on political system. According to modernization theory, an increase in economic development generate higher income in societies in which expands the size of middle class group. Not only a higher number of middle class concern more on social policies such as education and health care but also reduces social conflicts through lower income redistribution. Therefore, richer societies trend to have more consolidated democratic system. They found an evidence of an increase in the middle class income creates better economic development through international trade and finance and improving government policies. Moreover, an impact size of middle class on democracy is greater than lower poverty rate, lower income gap or higher GDP per capita. As more people become the middle class, they are pleased by social policies from the government. Hence, democratic system is more stabilized with more affluent societies.(Loayza, et al., 2013). The poverty rates around the world decrease as a result from an increase of income distribution and economic development. The higher rate of middle class population generates better economic growth and more stabilized political institution. According to modernization theory and democratic domino theory, there is a positive relationship between the size of middle class and economic and political systems. As people earn higher income, their standard of living improve that lead to higher demand for better democratic system. Another theory to support an influence of middle class on democracy is the democratization domino theory, the middle class from neighboring countries also have an impact on democracy in a country. Therefore, the middle class motivates modernization and democratic domino. In other words, joining the middle class in its own and neighboring countries create a larger size of the group that creates higher demand for international product with better quality as people's income change, their consuming preferences also change. With a higher rate of integrating of the middle class across countries, an economic development improves and political system trend to be more democratic. According to an evidence, the size of the middle class in a country is more significant to democratization than neighboring middle class income. Obviously, the size of the middle class has a positive effect on economic growth and political institution through higher GDP per capita and less political class conflicts(Chun, et al., 2015). There is a relationship between the level of income and degree of democracy according to modernization theory (Lipset,1959). Under

linear regression across countries based on historical data, the correlation the level of income on democracy is very strong positive. Intuitively, as a share of income in societies increase, the level of democracy is greater. With more flexible non-linear regression the positive correlation between income and democracy is vanished. In other words, a probability of transition to democratic system is higher with better rate of economic growth. Comparing linear and non-linear regression, in poorer income countries with unstable political system have a greater effect when there is a change in the level of income while in richer income countries have more consolidated democratic system when there is a change in income (Benito, et al., 2012). An economic development trends to have positive impact on the level of democracy by Lipsett hypothesis. Also an increase in level of education with larger middle class are an important keys of democratic system. For instance, with higher size of human capital, people have more power and ability to fight against the rich. Furthermore, the consolidation of democracy become stronger when the standard of living improves (Barro, 1999). In contrast, in China, the greater size of middle class does have an impact more on an economic reform than the future political reform such as democratization. Not similar with the modern western theory that the middle class has a pivotal role of driving democratization. The middle class in china may not want to promote democratization. Under communist dictatorship, the higher growth rate of Chinese middle class is created by public sector from the government policies. An increase of middle class in China by the central government leads to higher purchasing power and better economic development. With a better economic development, it creates the new Chinese middle class, so their standard of living is improved by the central government. Once the middle class is satisfied with nondemocratic system, the probability of promoting democratization or political reform is less attractive to this type of middle class. (Chen, 2013)

2.3 An impact of capital and land inequality on democratization

Wealth inequality that have negative impact on democratization through economic freedom, the protection of property rights and level of trade liberalization. As wealth inequality is higher it resulting in lower level of democracy (Islam, 2017). An inequality of wealth includes capital and land inequality. This section focuses on the relationship between land inequality and democratization. There are three main reasons why an increase in land inequality has negative influence on a decision of democratization from the elites which are a threat of higher future redistribution from the poor, limiting level of education and fear of losing political of the elites? power through land redistribution. The first reason is that the elites as landowners have more fear of future wealth redistribution in democracy if land inequality increases (Samuels, 2015). When

an economic structure becomes relatively greater land intensive, it makes the cost of repression relatively lower to the land owner. It is because the majority voters may vote for imposing high tax on land or the government makes land reform policy which takes land from the landowners and redistribute to the poor. As land is immobile asset, the elites cannot avoid tax or land reform policy. Hence, democratic system is costly to the landholders. Secondly, when the elites hold greater amount of land, an income distribution to the poor declines (MOYO, 2018). The poor becomes relatively poorer and it limits their education levels. This causes a decline in number of middle class people. It is clear that when people have low working skills, they earn low income and depend more on public services. According to modernization theory, more developed countries is more likely to be democratic. Therefore, lower size of middle class represents less developed and political system results in less democratic (Schmidt, 2015). Another reason is that land holding represents political power. In hierarchy system, because the rich are richer than the poor, they have power to control other poorer people. When the elites hold higher amount of land, they have more political power to set their most preferred policies (ZIBLATT, 2008). Moreover, land inequality increases the elites' income whereas the middle class becomes relatively poorer. Revolution against the elites is less attractive the relatively poorer middle class. It is because middle class loses political power. With lower opportunity to win in revolutionary process, the middle class will not choose to revolt against the rich (Bledsten, et al., 2001). Land reform policy not only redistributes wealth but also extends political power from the rich to the poor. The landowners have more to lose in democracy resulting in democratization is less attractive. Hence, as land inequality increases, democratization is less likely to occur. In conclusion, the probability of transition to democracy is lower in greater land inequality societies. As the landlord hold an initial political power, they concern more redistributive rates from majority voters in democracy. An increase in land inequality increase an income distribution of landowners and it makes cost of democracy relatively higher. Hence, an opportunity of making democratization decision from the landlord becomes lower as the level of land inequality is greater.

2.4 How an open economy affects democratic system?

Globalization of international economy also has an influence on democracy via factors prices channel. Acemogle and Robinson (2006) explains three types of globalization namely, an increase in international trade, an increase in financial integration and an increase in political integration. Democratic stability depends on the level of income redistribution. Factor prices represents income levels of each social class. It indicates that factor prices in domestic coun-

tries adjust to the global market. If international market prices are higher than domestic prices, domestic factor prices will increase and adjust to the world market. As a result, income distribution in domestic countries tend to be greater. First dimension of globalization is an increase in international trade. Developing countries are labor abundant where they have relatively higher labor factor of endowment. They can produce labor intensive goods with lower cost than the world. Heckscher Ohlin theory states that after economic openness, labor abundance can export more labor intensive goods because they sell at lower prices than the international market. Labor intensive sectors gains from trading, and due to limited resources of production in long run if they want to expand their productions, they will have to pay higher wages for labor to work in extra hours. As a result, an international trade helps to reduce an income gap and social conflicts between the rich and the poor. In other words, as the poor become wealthier in post-trade, they depend less on redistributive rate from the rich. When the rich pay less tax in democracy, coup is less attractive to them. Thus, an increase in international trade help to stabilize democracy. Second type of globalization is an increase in financial integration. It allows capital flows in from foreign to domestic countries or capital flows out from domestic to foreign countries. Capital-owners can choose to invest in countries that have less tax or non tax on return to capital. To avoid an economic distortion form capital outflow, in democracy the citizens cannot impose heavy tax on capital. An financial integration limits the citizens to set up their most preferred redistributive rate on the elites. With less tax on capital, democracy is more attractive to the rich as the cost of coup is relatively greater. Therefore, an increase in financial integration creates more stable democracy. Final type of globalization is an increase in political integration. Each country opens economy and makes trade partnership among nations. They not only trade productions but they also exchange their ideas of polity. In Eastern European nations, people share the concepts of smooth way to democratization and they prefer democratic certainty. Once Communist countries get closer to Western ideas in post globalization and their political freedom tend to increase as they adopt the ideas of democracy from western people. The cost of political violences against democracy is greater in an increase in political integration. The reason is that in more democratic countries the cost of coup is higher and it damages their productivities. Nondemocratic countries prefer less to coup or repression because political instabilities creates negative impact on trade relationship with democratic countries. Thus, globalolization increase political integration between nondemocratic and democratic nations resulting in nondemocratic countries become more democratic as the cost against democracy rises. To summarize, globalization has an effect on democracy through three channel namely an international trade, financial integration and political integration. It suggests that these three dimensions of globalization cre-

ates lower rates of redistribution that reduce the cost of democracy to the elites, and also make the cost of coup or repression increase among nations. Therefore, democratic system is expected to be more consolidated after globalization.

In this study, it includes human capital as the fourth factor of production into the based model that has three factors of production: capital, land and labor. The middle class as human capital earns return to skill. “Why human capital helps to consolidate democracy or create democratization”. The reason is that the middle class as skilled labor earns higher income in an increase in international trade. There is a positive relationship between an increase in level of income and democracy. In developed countries, most people are educated and earn higher income than developing countries, so in richer countries tend to have more democratic system (Lippset,1959). After industrialization and opening an economy, a country that have relatively higher human capital endowment receives higher return to skill. An increase in international trade with developing of technology creates more demand of skilled labor. In other words, as the size of middle class is greater and they becomes median vote, democratic system becomes stronger due to less tax burden to the elites. Moreover, in the opinion of modernization theory, the middle class in nondemocratic countries might learn smooth way of transition to democracy from neighbouring democratic countries in post-trade. Because human capital is easier to get killed and suffers the most in political violences, political disturbance is very costly to the middle class. Thus, the middle class makes coup and repression less attractive to the elites. To conclude, after an international trade in human capital abundant, an income of middle class increases from more favourable to skilled labor in the global market. The middle class in human capital intensive societies is a majority voter who has an authority to set their most preferred tax rate in democracy. Comparing pre and post trade, as the middle class become richer, they demand lower redistributive rate form the elites. The cost of paying democratic redistributive rate is less that make democracy are more preferable to the rich.

According to empirical researches, trade openness trends to increase the skill premium of workers resulting in an increase in an income of skilled workers. As relative wage of educated labor increase comparing to unskilled labor, more workers want to become skilled labor. Following Heckscher-Ohlin Theory, labor sector gains from trade when a country is relative labor abundance because labor abundant countries are specialized in producing labor intensive goods. Human-capital is an accumulated factor of production that produce skill-intensive goods while labor produces labor intensive goods and assuming factor supply of labor to be fixed. Because skill intensive sector is more efficient than labor intensive sector, skilled and unskilled worker

earn different wage rate. Post trade opening give the benefit to both groups. If there is a large number of skilled workers, then unskilled labor also earns higher gain from trade as relatively scarce resources. Hence, trade openness creates a different level of income (Aure, 2015). Opening economy also creates a decrease in the marginal utility of income when a relative autarky price is higher than world prices. Hence, trade declines social welfare. Assuming human capital produce a high-tech good X while labor produce a primary commodity good Y. Under free trade, two countries trade when they have different human capital endowments meaning they have not the same autarky human capital prices. The country with specialization of producing a high tech good X has low price of good X, so this country can export more human capital products. According to human capital factor price equalization, domestic human capital price is adjusting to the world prices. Therefore, human capital sector receives higher wage from free trade (Bougheas R, 2006). There is a positive impact of international business activities on the size of middle class income. These two variables have a reaction loop to each other. A change in positive way of political system creates an increase in an international trade resulting in the emerging middle class as an income per capital is greater. Later, an increase in the growth rate of middle class stimulates a higher demand for better international products. As the emerging market across countries increase, the new middle class appears with the new demand of international goods. The first state of political system is an authoritarian system in which has less impact on an international business decision. The state of transition to democracy becomes important after the emerging international business activities such as international trade, capital inflow-outflow and foreign direct investment. Because the level of political freedom has an important effect of making decision to invest, private property rights and more efficient allocating resources of production is higher under democratic system. It can be said that the spread of democracy increase after the emerging middle class who receive higher income in post global business. The reason behind transition into democratic system is that by providing the citizens political freedom, it can guarantee or higher protection of private property rights which create better location for investments resulting in an economic development and political stability. In addition, democracy is not significant to emerging markets in the beginning. However, as an increase in level of economic development, political freedom became more concerned. The positive results of economic development and political economy come from a higher growth rate of middle class (Kandogan, et al., 2015). Moreover, the role of state on economy decline from market integration across countries. Globalization has an impact on the income distribution to middle class as human capital. Even though an income of return to human capital increase from higher demand in skilled labor in an opening economy, an income inequality between skilled

and unskilled labor become higher. The skilled labor group has more concerned on an economic environment than unskilled labor, so they support market reform that reduce the role of state in an economy and provide more political freedom to people. Because the middle class group earn higher wage from an increase in international trade in which increase from more political freedom (Birdsall, et al., 2000). Each country has different in the cost of human capital, so these different wages generates comparative advantage in producing human-capital products. Trade always increase overall social welfare but not all group gain from trade. Furthermore, after trade liberalization, the relative price of human-capital products increase resulting in an increase in the amount of human capital in human capital abundant countries. (Unel, 2015). Therefore, trade has a positive effect on an income distribution of human capital that creates more incentive to people to become skilled labor.



CHAPTER III

CONCEPTUAL FRAMEWORK

The two key factors of democratization are an economic structure and globalization. There are three conceptual frameworks in this paper. Firstly, the conceptual framework for explaining an impact of an economic structure on democratization. Next, this paper separates three impacts of globalization on democratization namely an increase international trade, an increase in financial integration and an increase in political integration.

3.1 An influence of an economic structure on democratic system

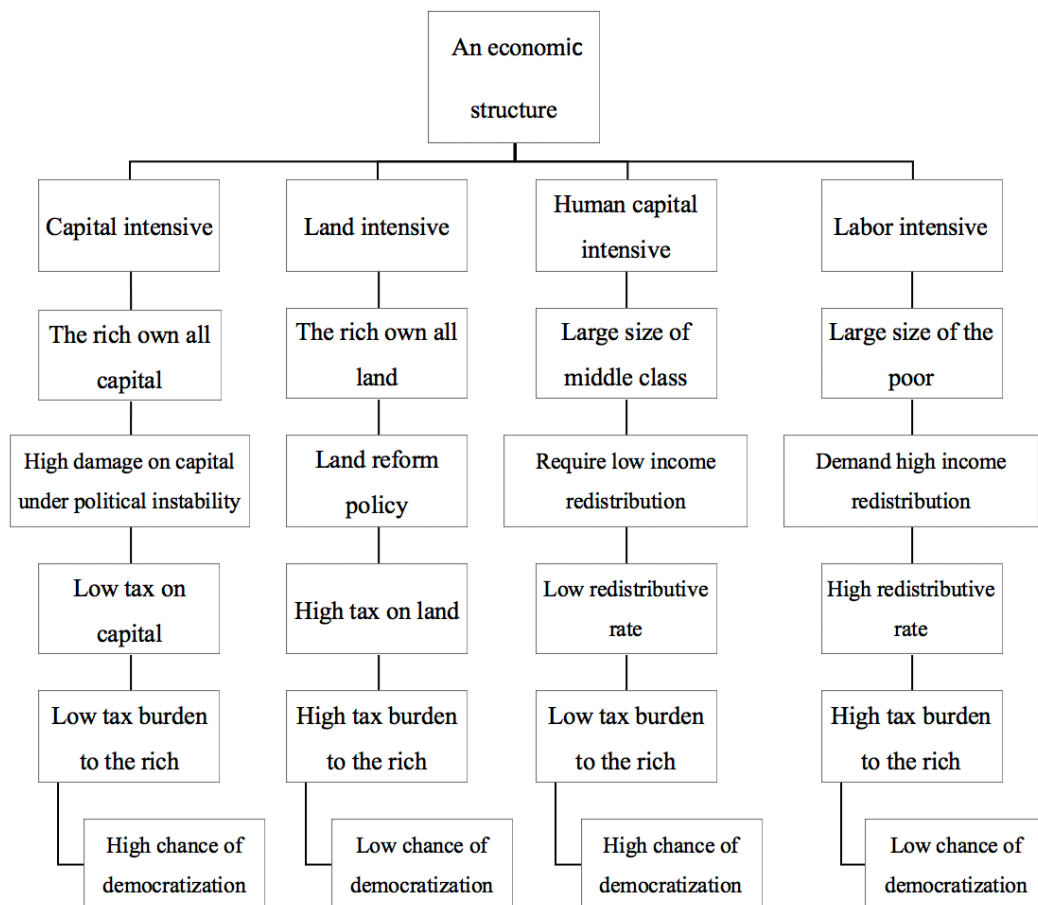


Figure 3.1: The structure of economy and democratization

The Figure 3 represents an effect of an economic structure on democracy. The fundamental models assumes each group has different factors of endowment that the rich own capital and land, the middle class as educated labor and the poor are unskilled labor. To begin with the first line, When capital become dominant to an economic structure, this society is considered as capital intensity. In capital abundance, there is lower level of tax rates than land abundant countries. The reasons are that firstly capital stocks are easier to be damages than land under political violent circumstances, so the cost of against democracy is relatively higher. Secondly, if there is heavy taxation on capital ,the capital-owners may choose to invest in another country in which has lower or non tax on capital stocks resulting in a decline in economic growth. Lastly, in democracy it is difficult to redistribute capital stocks because it is not efficient to hand those capital to people who do not have skill to manage as a result redistribution of capital may hurt national productivity. With these reasons, in relatively higher capital intensive societies the elites are more likely to choose democratic system. Hence, democracy in relatively higher capital abundant is more consolidated.

Next, the second line indicates that when land becomes the most important factor of production, this country is relatively land abundant. In democracy, majority voters can vote for imposing high tax rates on land because the land owners cannot move their land to another countries to avoid paying high taxes. Moreover, it is not difficult for the government to do land reform policy in which redistribute land from the rich to the poor. Because the landowners have more to lose in democracy, they prefer nondemocracy in other words coup or repression is more attractive in relatively higher land intensive societies. Therefore, democratic system in this economic structure is less consolidated.

The third line shows an impact of the middle class on democracy. When the middle class is majority group, this economic structure is human capital intensive. Considering middle class is educated and skilled labor who earn higher return to skills than unskilled labor because their productivities is greater. Skilled labor suffers the most under political violences because they can get killed or injure easily. Thus, the costs of fighting against democracy such as coups and repression are greater in relatively human capital intensive societies. Moreover, it is difficult to the government to account an effort of skilled labor. This implies that it is very costly to the government to collect tax on human capital. The government cannot provide policy of redistribution skills in democracy, so democratic system is not costly to the middle class. In addition, as median voters are richer, democratic redistributive rate is lower in other words tax burden of the elites decline in this society. The elites prefer democracy to nondemocracy. Therefore,

democracy tends to be more consolidated when the middle class as human capital are majority group of people.

Finally, the last line represents labor abundant countries where there are relatively higher proportion amount of labor endowment. The citizens are considered as unskilled labor who earn the lowest income. In the basic models, it assumes that the poor do not have to pay tax rates, so the higher tax rates increases the utilities of the poor as they receive higher income redistribution. Generally, the poor are majority group of people, so they can vote for high tax rate in democracy. If this labor abundant country is nondemocracy, the elites become fully fear of high democratic redistributive rate. When the citizens choose to make a revolution for democracy, the elites prefer repression to democracy. Another case is that if this labor abundant country is democratic and the poor relatively poorer because the rich become richer, the poor demand for higher an income redistribution. The elites face higher tax burden in democracy, coup is more attractive as the cost of coup is relatively lower. Therefore, in poorer societies there is higher level of political instability, and they become less democratic.

To summarize, the level of consolidated democracy is greater with less redistributive rates in capital and human capital intensive societies. In more developed countries, majority voters are richer than developing countries, so they can take care of themselves and do not have to rely much on the government policies. Tax burden of the elites declines creates more attraction of democratic system. This paper emphasizes when the size of middle class increases as people are getting richer, human capital become more significant to an economic structure. Thus, the elites prefer democracy to nondemocracy as the costs of action against democracy are relatively higher.

3.2 The relationship between an international trade and democracy

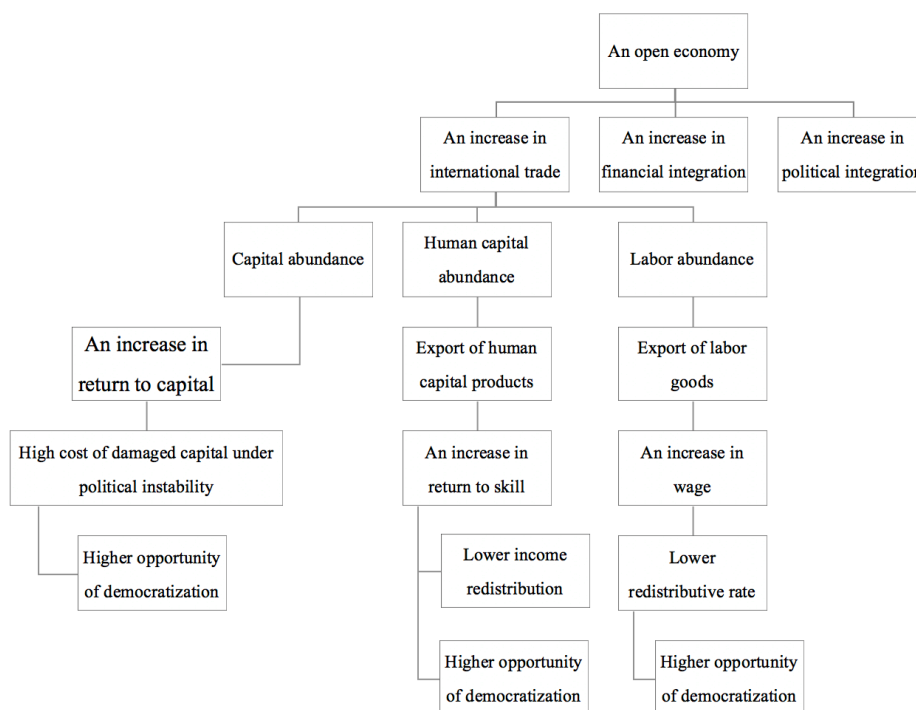


Figure 3.2: An impact of an international trade on democracy

The Figure 4 represents first impact of globalization on democracy such that an increase in international trade help to consolidated democracy through factor prices channel. Trade openness has an impact on an economic institution and then indirectly affects democracy system. According to Factor prices equalization theorem, countries export products that they can produce most efficiently. Then, the domestic factor prices are adjusted until equal to the world prices. In capital abundant countries, they can export more capital products after free trade because they have an economic of scales of producing capital intensive goods. Then, the owners of capital earn higher return to capital as their factor prices increase to the world prices. To maximize profits, as an income of capital owners increases, they can invest in new machines to produce more capital intensive goods. The marginal productivity of labor is greater when the amount of capital increases. When the productivities of countries depend more on capital, it is costly to the capital owners under political violent situations. Because political conflicts have a negative effect on foreign investment, the elites prefer smooth transition to democracy in other words later democracy is more attractive.

The second line represents human capital abundances, these countries export more human

capital products after an increase in international trade because they have relatively higher human capital endowment to produce human capital with lower costs than the world prices. The price of human capital increases to the world prices. As the world market demand more human capital products, the domestic human capital prices increase to adjust to the world demand. In long run, due to the limited resource of production, if human capital sectors want to increase their revenues after free trade, they have to pay more wages of skilled labor to work in extra hours. An increase in wages of skilled labor stimulates more people to entry this sector. Moreover, skilled labor are more preferable in the global market. In other words, the middle class becomes richer and their sizes increase in human capital abundances after trade openness. In the fundamental model, it assumes that middle class has to pay tax rates, and they require an income redistribution from the rich x in democracy. With more affluent middle class, the democratic redistributive rate declines because the richer middle class can rely more on themselves. Therefore, greater return to skill of human capital after an increase in international trade makes the cost of democracy decreases to the elites. As a result, democracy tends to be more consolidated in relatively higher size of skilled labor. In addition, in relatively greater human capital societies create higher probability of transition to democracy in smooth way.

The right line shows in labor abundant countries there are higher fraction of labor endowment than an amount of capital. As they can produce labor intensive goods with lower prices, after trade openness they can export more labor intensive products resulting in an increase in income distribution in labor sectors. The poor are considered as unskilled labor who work in labor sectors. Because they are the poorest group, they depend more on the government policies. In other words, in democracy if the poor are majority group then they have an authority to vote for high redistributive rate when they are relatively poorer. When the poor become richer in post-trade, they demand less income redistribution which makes democracy is less cost to the elites. Hence, the stability of democracy increases after an increase in international trade.

In conclusion, an increase in international trade raises an income distribution of relative factor endowment as domestic factor prices increase to equal to the world prices. In developed countries, they depend more on capital productions in which they make the cost of political instability relatively greater. People in richer countries tend to prefer more consolidated democracy. On the other hand, in developing countries when majority group becomes rich after trade opening, they prefer less redistributive rate. Considering skilled labor increases represent the greater size of the middle class. They are getting richer in post-trade. The richer middle class prefer lower tax rate than in pre-trade, and they also make the cost of coup or repression increase. In

this case, an international trade help to reduce tax burden of the elites. Consequently, the elites are more likely to choose democratic system. Moreover, there is higher opportunity of non-democratic countries to transform to democracy after trade openness as the cost of democracy is lower. It suggests that democracy are more consolidated in relatively richer countries. If an international trade generates higher income inequality, the poor might prefer revolution whereas the rich prefer coup if democratic redistributive rate is very high. However,there is a chance that after trade openness political conflicts become worse. So, this study exam an impact of an international trade on democracy through factor prices channel whether it generated positive or negative effect on democratization.

3.3 An effect of an increase in financial and political integration on democracy

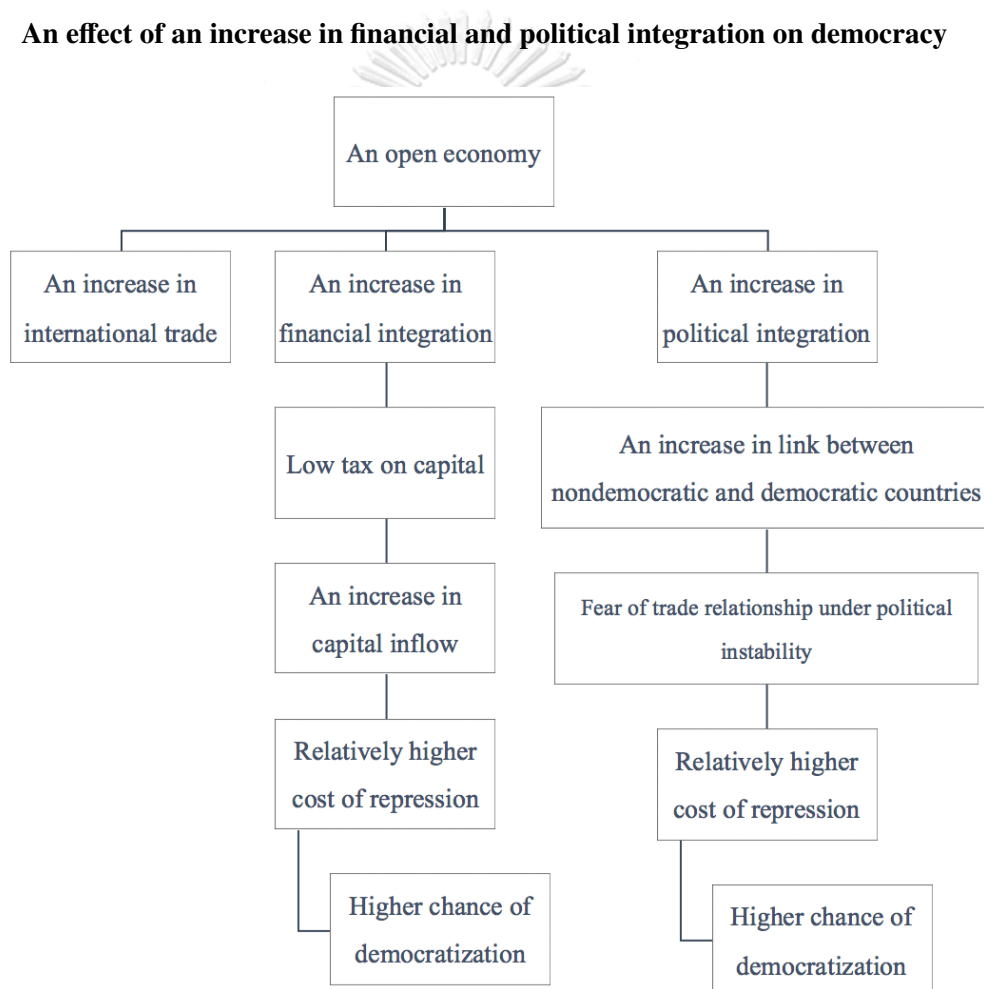


Figure 3.3: An impact of financial and political integration on democracy

The Figure 5 illustrates how financial and political integration has an influence on democracy. Firstly, an increase in financial integration (the blue line) make capital freely move across

countries. It is obvious that in countries that impose lower tax on capital is more attractive to global capital owners. Because capital stocks are important resources of an economic development, to avoid capital outflow in democracy the citizens cannot set high tax on capital owners. When a domestic country set less tax on capital, capital inflow increases from other countries. As a result, the elites as capital owners pay less tax on return to capital in an increase in financial integration, so they prefer more democracy. Moreover, political instability has negative impact on capital stocks. For example, foreign investors may feel less confident to invest in a country that has political violent situations. In other words, the cost of fighting against democracy is relatively greater after financial institution across countries become more connected. Hence, the consolidation of democracy tend to increase after an increase in financial integration.

Secondly, an increase in political integration stimulates political institution to be more democratic. After globalization, closed countries open trade to connect with the world market. Because an international trade increases national income, trade relationship across countries is very significant. It implies that when nondemocratic countries trade with democratic countries, there is higher probability of these countries to change their political system to democracy. Political conflicts destroy trade partnership resulting in a decline in trade and investment. Moreover, democratic countries can force nondemocratic countries to become more democratic because they may prefer to trade among democratic countries. Therefore, the cost of stopping democracy become greater meaning that democratic system is more stable after an increase in political integration.

CHAPTER IV

MATHEMATICAL MODEL

4.1 Mathematical model

4.1.1 Acemoglu's fundamental model

In this section, it introduces basic mathematical models based on economic and democratic theories to see how each social class makes political decision-making. It begins with aggregated social preferences via Single-Peaked Preferences to show that majority voters always win in democratic system. The main political disagreement is the level of redistributive rate because not all groups gain from income redistribution. In other words, the rich lose their interests from paying redistributive rate while the poor gain from receiving income redistribution in democracy. The models explains why the rich prefer nondemocracy whereas the poor prefer democracy by comparing indirect utilities between each political decision. Finally, it explains an important role of middle class in democratic system. The size and level income of the middle class have an influence on transition to democracy and later they help to consolidate democracy via the cost of repression, coup and revolution.

To understand how democratic politics work we use Single-Peaked Preferences and the Median Voter Theorem to explain about the aggregation of all individual preferences into social choices. According to maximization utility theory, people consume all their income for maximizing their utilities. To reach a goal of optimal income, they have to choose policy (tax rate) which provide them higher income to spend and with the law of diminishing marginal utility, so our utilities function is single-peaked. Let q denotes as the a policy choice such as tax rates (high or low tax rates), $Q \rightarrow \mathbb{R}$ is a set of policy choices to reach optimal value of utility, $V^i(q)$ represents the indirect utility function of each individual i . We can determine the most preferred point as the ideal point q^i then $V^i(q^i) \geq V^i(q)$. If $q'' < q' < q^i$ or $q'' > q' > q^i$, then $V^i(q'') \leq V^i(q')$ Therefore, the single-peaked policy preferences of voter i is concave.

The Median Voter Theorem (MVT) was created by Black (1948), let the median voter denotes as M and q^M is the ideal point of median voters where $q^i > q^M$ and $q^i < q^M$ (assuming

people have single-peaked preference). Theoretically, people spend all their income to achieve maximization of utilities through consuming over goods. The indirect utility function is referred to each individual voting for their policy choice (tax rate) that provide them highest income to spend. In democratic decision, the median voters always win because they are majority group of people.

Political conflicts between the rich and the poor occurs because they have different preferences. For assumption of Acemoglu and Robinson (2006) model, in two class model show variables as the following:

let voter i = the rich (r) and the poor (p) has income equal to y^i where $i \in [r, p]$, tax rate denotes as $\tau \geq 0$. The average national income is \bar{y} .

$$v^i = \hat{y}^i(\tau) = \text{post-tax income}$$

$$\hat{y}^i(\tau) = \text{income} - \text{pay tax} + \text{transfer from the government}$$

$$\hat{y}^i(\tau) = y^i - \tau y^i + (\tau - C(\tau))\bar{y}$$

Here, an income of individual i denotes as y^i , τy^i is after-tax income, $(\tau - C(\tau))\bar{y}$ is the transfer from the government. The fundamental model assumes that the government has a balance budget. It means the government give all revenues from collecting tax to the poor as an income redistribution.

$$\hat{y}^i(\tau) = (1 - \tau)y^i + (\tau - C(\tau))\bar{y} \quad (4.1)$$

To derive the indirect utility function, $V(y^i | \tau)$ is the indirect utility considering only one policy τ . According to economic theory, people are always rational to choose ideal tax rate for maximization their utilities. Next, using the derivative of $V(y^i | \tau)$ with respect to τ and set $\frac{dy^i}{d\tau} = 0$. to find optimal tax rate for individual i . The first order condition for optimal tax rate is:

$$\frac{y^i}{\bar{y}} = 1 - C'(\tau^i) \quad (4.2)$$

Now considering, there are three group of people: the fraction of the rich is δ^r , the middle

class is δ^m , and the poor is δ^p . This model normalize the total population is equal to one $\delta^r + \delta^m + \delta^p = 1$ and assuming $\delta^p > \delta^m > \delta^r$. Each group i has a share income of total national income denotes as θ^i which $\sum_i \theta^i = 1$. Because the rich are richer than the middle class and the middle class is richer than the poor, so $y^r = \frac{\theta^r}{\delta^r} \bar{y} > y^m = \frac{\theta^m}{\delta^m} \bar{y} > y^p = \frac{\theta^p}{\delta^p} \bar{y}$. The most preferred tax rate for each group is written as $\tau^i \geq 0; i \in [r, m, p]$ where $\tau^r < \tau^m < \tau^p$. We can rewrite the first order condition for maximization indirect utility by finding optimal tax rate for individual i as:

$$\left(\frac{\delta^i - \theta^i}{\delta^i} \right) - C'(\tau^i) = 0 \quad (4.3)$$

According to The Median Voter Theorem (MVT), democratic policies depend on the median voters always win and have an authority to choose their most preferred tax rate. There are two case that we consider as the following;

1. $\delta^p \geq 1/2$; the majority group of people are the poor who determine democratic policy rate τ^p .
2. $\delta^p < 1/2$; the poor are no longer majority voter which mean the middle class is the median voter with their most preferred tax rate τ^m .

To explain two cases above, if the majority group is the poor ($\delta^p \geq 1/2$) then policy rate is set by the poor which is τ^p . What matter is an income redistribution in democratic system. A share income of the poor (θ^p) has a huge impact on setting policy rate (τ^p). As the poor are relatively poorer, they demand higher tax rate for increasing income redistribution. Mathematically, $\frac{d\tau^p}{d\theta^p} < 0$ as $\theta^p \downarrow \Rightarrow \tau^p \uparrow$. Now let consider if the middle class is the median voter ($\delta^p < 1/2$) with their most preferred policy rate τ^m . A share income of the middle class has an important effect on democratic political system. If the middle class is getting richer then the median voter requires less policy rate. Mathematically, $\frac{d\tau^m}{d\theta^m} < 0$ as $\theta^m \uparrow \Rightarrow \tau^m \downarrow$. Obviously, the middle class demands less tax rate than the poor because the middle class is richer than the poor, so $\tau^m < \tau^p$. As a result, the costs of democracy is lower when the richer middle class is the median voters which create a higher level of stabilization on democracy.

The Middle Class and Democracy

In three class model, the middle class is a group of people who have income below the rich but above the poor. The middle class has to pay tax rate, and they also require income redistribution from the government. The rich have to pay taxes in democracy, but they actually do not want any income redistribution from the government because they can take care of themselves while the poor do not have to pay any tax rate, so they require high income redistribution. The political conflicts occur because each group has different preference. The middle class stands in the middle between the rich and the poor. Therefore, the creation of democracy depends on an income and a number of the middle class.

1. The Creation of Partial Democracy

An initial state of political system is nondemocracy where de jure power belongs to the elites. To reach maximization of the elites' utilities, the authoritarians might set their most preferred tax rate equal to zero ($\tau^r = 0$) or very low rates. When tax rate under nondemocracy ($\tau^{ND} = \tau^r$) is not sufficient for the middle class and the poor to survive, they might choose to make revolution against the rich. In this model, the revolution is always successful and lead to full democracy. If people in a country are relatively poor, full democracy is costly to the elites. To stop the revolution from the middle class and the poor, the rich have to choose a choice which is Repression, Partial Democracy, Full Democracy or Promise of set new tax rate. Choosing partial democracy means that the elites extend political system to the middle class by giving them their most preferred tax rate ($\tau^{PD} = \tau^m$). The payoffs of each group under revolution are:

$$V^p(R, \mu) = V^m(R, \mu) = \frac{(1 - \mu)\bar{y}}{\delta^p + \delta^m}, V^r(R, \mu) = 0 \quad (4.4)$$

where μ is the fraction of damaged resources (the cost of revolution), $(1 - \mu)$ is a proportion of remaining resources after revolution, δ^i is the size of each group $\sum_i \delta^i = 1$ (δ^r is the rich, δ^m is the middle class and δ^p is the poor) and \bar{y} is a national average income.

In nondemocracy, each individual ($i \in [p, m, r]$) receive the payoffs with the probability of promising new tax rate (p):

$$V^i(N, \tau^N) = y^i + p(\tau^N(\bar{y} - y^i) - C(\tau^N)\bar{y}) \quad (4.5)$$

The middle class choose not to join revolutionary action with the poor if the promise of tax rate is sufficient for them as $V^m(N, \tau^m) \geq V^m(R, \mu)$ resulting in the political system remains nondemocracy.

$$\begin{aligned}
y^m + p[(\tau^m - C(\tau^m))\bar{y} - \tau^m y^m] &\geq \frac{(1-\mu)\bar{y}}{(\delta^p + \delta^m)} \\
\frac{\theta^m}{\delta^m} \bar{y} + p[(\tau^m - C(\tau^m))\bar{y} - \tau^m \frac{\theta^m}{\delta^m} \bar{y}] &\geq \frac{(1-\mu)\bar{y}}{(\delta^p + \delta^m)} \\
\frac{(\delta^p + \delta^m)}{\delta^m} [\theta^m + p(\tau^m(\delta^m - \theta^m) - \delta^m C(\tau^m))] &\geq 1 - \mu \\
\mu^* = 1 - \frac{(\delta^p + \delta^m)}{\delta^m} [\theta^m + p(\tau^m(\delta^m - \theta^m) - \delta^m C(\tau^m))] &\quad (4.6)
\end{aligned}$$

where μ^* is a critical point of the middle class that make them feel indifferent between nondemocracy with the promise of new income redistributive rate and revolution.

To explain an impact of an income of the middle class on the decision of making revolution, we use total differentiation of a critical point(μ^*) respect to a share income of the middle class(θ^m).

$$\frac{d\mu^*}{d\theta^m} = -\frac{(\delta^p + \delta^m)}{\delta^m} [1 - p\tau^m + ((\delta^m - \theta^m) - \delta^m C'(\tau^m)) \frac{d\tau^m}{d\theta^m}] < 0$$

The above total differentiation shows negative relationship between a critical point and a share income of the middle class ($\frac{d\mu^*}{d\theta^m} < 0$) because $(1 - p\tau^m)$ is positive, $((\delta^m - \theta^m) - \delta^m C'(\tau^m))$ is equal to zero from the first order condition and the relationship between tax rate and income is always negative ($\frac{d\tau^m}{d\theta^m} < 0$).

$$\therefore \frac{d\mu^*}{d\theta^m} < 0 \Rightarrow \theta^m \uparrow \Rightarrow \mu^* \downarrow \Rightarrow \text{P(Revolt)} \downarrow$$

Intuitively, with the promise of income redistribution, the middle class receives higher income under nondemocracy resulting in the middle class feel indifferent between nondemocracy and revolution. Therefore, they choose not to revolt against the elites.

The condition for the middle class to revolt is $V^m(R, \mu) > V^m(N, \tau^N)$. Another way to exclude the middle class from the process of revolution, the rich might choose partial democratization which extends political power to the middle class by setting tax rate equal to τ^m as the rate that make the middle class reach their maximization of utilities. The values of partial

democracy is written as:

$$V^i(PD) = y^i + (\tau^m(\bar{y} - y^i) - C(\tau^m)\bar{y}) \text{ for } i \in [p, m, r] \quad (4.7)$$

Therefore, $V^m(PD, \tau^m) \geq V^m(R, \mu)$ Partial democracy can prevent revolution from the middle class. However, the threat of revolution from the citizens is still possible when an income distribution is not enough. Post-Revolution the rich and the middle class gain nothing as $V^r(R, \mu) = V^m(R, \mu) = 0$ while the citizens have $V^p(R, \mu) = \frac{(1-\mu)\bar{y}}{\delta^p}$. The citizens make a revolution if there is:

$$\begin{aligned} V^p(R, \mu) &> V^p(PD) \\ \frac{(1-\mu)\bar{y}}{\delta^p} &> y^p + (\tau^m(\bar{y} - y^p) - C(\tau^m)\bar{y}) \\ \mu &< 1 - \theta^p - (\tau^m(\delta^p - \theta^p) - \delta^p C(\tau^m)) \end{aligned}$$

Hence, the constraint of revolution for the citizens is $\mu < 1 - \theta^p - (\tau^m(\delta^p - \theta^p) - \delta^p C(\tau^m))$. It means when the poor is poorer ($\theta^p \downarrow$), the cost of revolution is relatively lower ($\mu \downarrow$). We can simply say that as the poor is poorer, the probability of making revolution is higher. In partial democracy, the middle class can promise to set tax rate higher than τ^m as $\tau^{PD} > \tau^m$ to prevent the threat of revolution from the citizens. However, the promise of the middle class ($\tau^{PD} > \tau^m$ or $\tau^{PD} = \tau^p$) and the elites are not creditable because they have a chance to reset tax rate ($\tau^{PD} = \tau^m$) with probability $(1-p)$. The payoffs to three class model with the promise of redistribution (p) and a chance to reset tax rate is written as:

$$V^i(PD, \tau^{PD}) = y^i + p(\tau^{PD}(\bar{y} - y^i) - C(\tau^{PD})\bar{y}) + (1-p)(\tau^m(\bar{y} - y^i) - C(\tau^m)\bar{y})$$

where $i \in [p, m, r]$

The key point is to find the critical point μ^* that make the citizens feel indifferent between Revolution and Partial Democracy (Note that the critical point μ^* is a point where tax rate is sufficient to prevent the threat of revolution from the poor).

$$V^p(PD, \tau^{PD} = \tau^p) = V^p(R, \mu^*)$$

$$y^p + p(\tau^P(\bar{y} - y^p) - C(\tau^P)\bar{y}) + (1 - p)(\tau^m(\bar{y} - y^p) - C(\tau^m)\bar{y}) = \frac{(1 - \mu^*)\bar{y}}{\delta^p}$$

$$\therefore \mu^* = 1 - \theta^p + p[\theta^p + \tau^p(\delta^p - \theta^p) - \delta^p C(\tau^p)] + (1 - p)[\theta^p + \tau^m(\delta^p - \theta^p) - \delta^p C(\tau^m)] \quad (4.8)$$

Intuitively, when the middle class prefers higher redistributive rate ($\tau^m \uparrow$), an indifferent point between revolution and partial democracy of the citizens decline ($\mu^* \downarrow$) or we can simply say that with more redistributive rate lead to lower probability of revolution.

2. The Creation of Full Democracy

Another way for the elites to stop the revolutionary action from the middle class and the poor is to include both groups into political system resulting in the creation of full democracy. The payoffs of democracy depends on the majority voter. From previous cases, the majority group could be either the middle class or the citizens. Therefore, tax rates of democracy (τ^D) is τ^p or τ^m .

$$V^i(D) = y^i + (\tau^D(\bar{y} - y^i) - C(\tau^D)\bar{y}); i \in [p, m, r] \quad (4.9)$$

An income distribution in democratic system depending on which group is majority (the citizens (τ^p) or the middle class (τ^m)).

1. $\delta^p \geq 1/2$; The citizens are majority group of people ($\delta^p > \delta^m + \delta^r$). Hence, the cost of full democracy is higher than partial democracy to the elites because the citizens require higher level of income distribution than the middle class ($\tau^p > \tau^m$). The elites feel worse off under full democracy.

$$V^r(ND, \tau^{ND} = \tau^r) > V^r(PD, \tau^m) > V^r(D, \tau^D = \tau^m)$$

$$\tau^r < \tau^m < \tau^p$$

2. $\delta^p < 1/2$; The middle class is median voter, democratic tax rate is the middle class's most preferred tax rate ($\tau^D = \tau^m$). Then, the elites feel indifferent between Partial and Full

Democracy as:

$$V^r(PD, \tau^m) = V^r(D, \tau^D = \tau^m)$$

$$\tau^{PD} = \tau^D = \tau^m$$

$$V^r(D) = y^r + (\tau^m(\bar{y} - y^r) - C(\tau^m)\bar{y}) \text{ is equal to } V^r(PD) = y^r + (\tau^m(\bar{y} - y^r) - C(\tau^m)\bar{y})$$

In other words, the more number of middle class creates more opportunity for the elites to choose democratization. Because the middle class is richer than the poor ($y^m > y^p$), the cost of democracy is lower to the elites ($\tau^m < \tau^p$). However, it is not always for the middle class to choose full democratization with the poor

3.Repression:Remaining in Nondemocracy

Another choice for the elites to avoid a revolution from the poor is to make a repression. The main question is how do we know when the elites prefer repression to democratization. In this section, the rich have four options to prevent a revolution which are Partial Democratization, Full Democratization, the promise of new tax rate under Nondemocracy or Repression. A buffer between the rich and the poor is the middle class who help a country to keep away from repression. Theoretically, the elites weigh the costs of repression and democracy to make a decision. For example, if the middle class is relatively rich, the costs of partial or full democracy is lower. The values of repression under three class model ($i = p, m, r$) are:

$$V^i(R) = (1 - \kappa)y^i \tag{4.10}$$

Where R is repression, κ is the costs of repression and y^i is an income of individual i ($i = p, m, r$).

3.1) The elites are indifferent between repression and the promise of providing higher redistributive rate ($\tau^N = \hat{\tau}$) if there is:

$$V^r(R) = V^r(N, \tau^N = \hat{\tau})$$

$$(1 - \kappa)y^r = y^r + p[\hat{\tau}(\bar{y} - y^r) - C(\hat{\tau})\bar{y}] \text{ where } y^r = \frac{\theta^r \bar{y}}{\delta^r}$$

$$(1 - \kappa) \frac{\theta^r \bar{y}}{\delta^r} = \frac{\theta^r \bar{y}}{\delta^r} + p[\hat{\tau}(\bar{y} - \frac{\theta^r \bar{y}}{\delta^r}) - C(\hat{\tau})\bar{y}]$$

$$\therefore \hat{\kappa} = \frac{p}{\theta^r} [\delta^r C(\hat{\tau}) - \hat{\tau}(\delta^r - \theta^r)] \quad (4.11)$$

where $\hat{\kappa}$ is an indifference between repression and the promise of redistribution to the elites. If $\kappa < \hat{\kappa}$ then repression is better than the promise of redistribution to the elites. Because in relative poorer society, the elites have to promise higher tax rate. Hence, the elites prefer to use repression.

3.2) An indifference between democratization and repression to the rich denotes as $\tilde{\kappa}(\tau)$ where the values of tax rate depending on which group is majority $\tau = \tau^D (\tau^D \in [\tau^m, \tau^p])$ or $\tau = \tau^{PD} = \tau^m$ as:

$$V^r(R) = V^r(D)$$

$$(1 - \tilde{\kappa}(\tau)) \frac{\theta^r \bar{y}}{\delta^r} = \theta^r + p[\hat{\tau}(\delta^r - \theta^r) - \delta^r C(\hat{\tau})]$$

$$\therefore \tilde{\kappa}(\tau) = \frac{p}{\theta^r} [\delta^r C(\hat{\tau}) - \hat{\tau}(\delta^r - \theta^r)] \quad (4.12)$$

If $\kappa < \tilde{\kappa}(\tau)$, then the elites choose to repress because the cost of repression is lower than a critical point. The function of repression depending on an income of the middle class. Obviously, the richer middle class ($\theta^m \uparrow$) requires lower tax rate ($\tau^m \downarrow$) which make the rich prefer democratization to repression ($\tilde{\kappa}(\tau) \downarrow$) to avoid revolution.

4. Coup: Changing from Democracy to Nondemocracy

In democracy, a political power belongs to the majority group ($\delta^m + \delta^p > \delta^r$) that mean they can choose their most preferred tax rates (τ^D could be either τ^m or τ^p). However, if the median voter is relatively poor, the redistributive rate is high which cost more to the elites. The elites might coup and take back the political power. Once the coup occurs the political system transfers from democracy to nondemocracy. Then, the elites hold political power again. The values of coup for the elites, the middle class and the poor are:

$$V^i(C, \varphi) = (1 - \varphi)y^i$$

where φ is the cost of coup, y^i is an income of individual i , $i \in r, m, p$

The coup is chosen when $V^r(C, \varphi) > V^r(D, \tau^D)$.

$$(1 - \varphi)y^r > y^r + (\tau^D(\bar{y} - y^r) - C(\tau^D)\bar{y})$$

$$(1 - \varphi)\frac{\theta^r \bar{y}}{\delta^r} > \frac{\theta^r \bar{y}}{\delta^r} + (\tau^D(\bar{y} - \frac{\theta^r \bar{y}}{\delta^r}) - C(\tau^D)\bar{y})$$

$$\therefore \varphi < \frac{1}{\theta^r} (C(\tau^D)\delta^r - \tau^D(\delta^r - \theta^r)) \quad (4.13)$$

An equation above shows that the middle class has an important effect on the elites' decision of making coup. If the middle class is a median voter then $\tau^D = \tau^m$ that less cost to the elites.

$$\varphi < \frac{1}{\theta^r} (C(\tau^m)\delta^r - \tau^m(\delta^r - \theta^r))$$

$$\therefore \theta^m \uparrow \Rightarrow \tau^m \downarrow \Rightarrow \varphi < [\frac{1}{\theta^r} (C(\tau^m)\delta^r - \tau^m(\delta^r - \theta^r))] \downarrow \Rightarrow P(\text{Coup}) \downarrow$$

Hence, the middle class reduces tax burden of democracy and creates more stabilized democratic system. There is a way to avoid a coup from the rich, the middle class and the citizens might give the rich a promise of new lower redistributive rate ($\tau^D = \tilde{\tau} < \tau^m < \tau^p$) with probability p . Similarly, the promise is imperfect because they just promise to prevent a coup. Once the rich decide not to coup, the middle class and the poor have a chance not to do what they promise to do with probability $(1-p)$. With this promise of new redistributive rate each group for $i \in [r, m, p]$ receives payoffs as:

$$V^i(D, \tau^D) = y^i + p(\tau^D(\bar{y} - y^i) - C(\tau^D)\bar{y}) + (1 - p)(\tau^D(\bar{y} - y^i) - C(\tau^D)\bar{y})$$

Therefore, the political system remains democracy with sufficient tax rate:

$$V^r(D, \tau^D = \tilde{\tau}) \geq V^r(C, \varphi)$$

$$\therefore \varphi \leq \frac{p}{\theta^r} [C(\tilde{\tau})\delta^r - \tilde{\tau}(\delta^r - \theta^r)] + \frac{(1-p)}{\theta^r} [C(\tau^m)\delta^r - \tau^m(\delta^r - \theta^r)]$$

The stability of democratic system depending on the level of tax rate that the elites. As the richer middle class wants less tax rate, the rich prefer democracy to coup. However, if the poor

is a majority group, they will vote for high tax rate which cost more to the rich. The elites prefer to coup resulting in unstable democratic system. Obviously, the number of the middle class(δ^m) and the level of the middle class income(θ^m) have an impact on consolidation of democracy.

4.1.2 Method of the Study

4.1.2.1 Extending Acemoglu's model

The fundamental models emphasise the key survival of democracy is the redistributive rates. They assume that the government have balance budget. They earn revenue from taxing on the rich then give all amount of tax collecting to the poor. Political conflicts increase when the majority voters are very poor, they require higher redistributive rate from the elites. Greater level of income redistribution causes political instability because it encourages the rich to avoid democracy. On the other hand, an increase in level income of majority voters reduce tax burden to the rich in other words richer societies tend to be more democratic. This paper studies an influence of the middle class on transition to democracy under capital and land inequality.

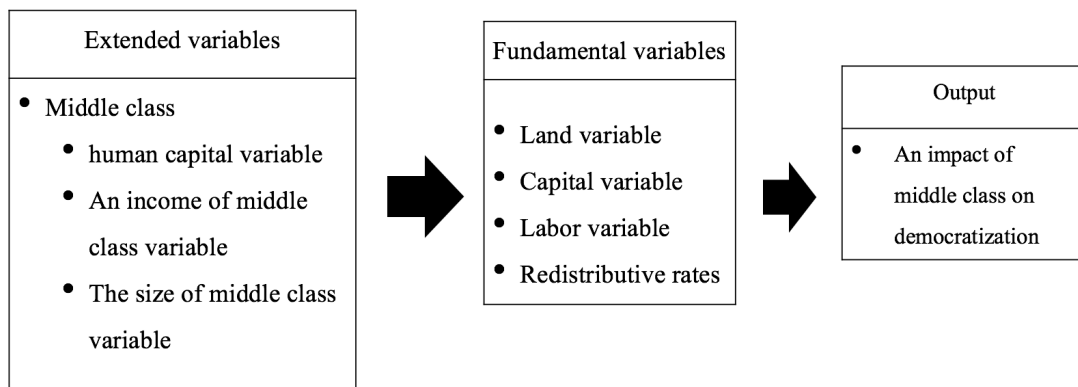


Figure 4.1: Introducing the middle class as human capital into the fundamental model

The based production function model provides the rich and the poor with three factors of input. It is written as $Y = F(K, L, N)$ where K is capital stock, L is productive land and N is labor. This study introduces the middle class as human capital(H) into a production function to examine an impact of the middle class on democratization. The extended production function is $Y = F(K, L, H, N)$. The middle class might help to increase the probability of democratization or they may prefer more nondemocratic system to democracy.

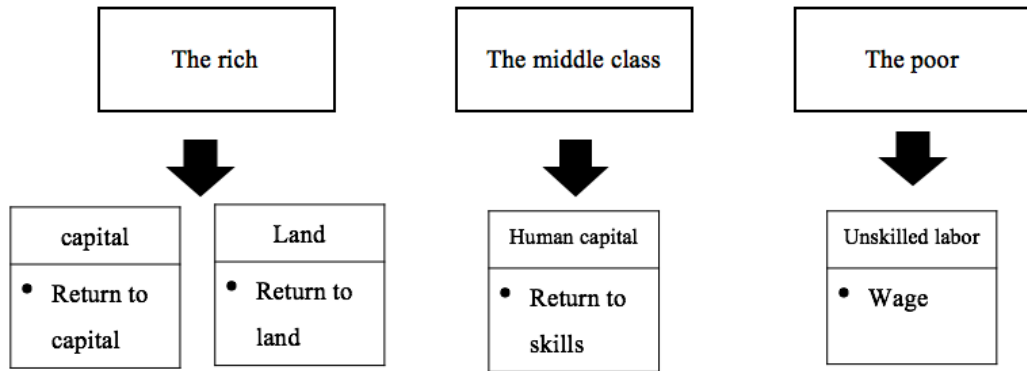


Figure 4.2: An economic endowment of each group in the three-class model

Each group own different economic resources meaning they have different level of marginal productivities that represent their income. There are three group of people. First is the rich are the owners of capital and productive land and they earn the return to capital and land. Secondly, the middle class is human capital labor and they earn return to skilled. Lastly, the poor are unskilled labor who earn lowest income.

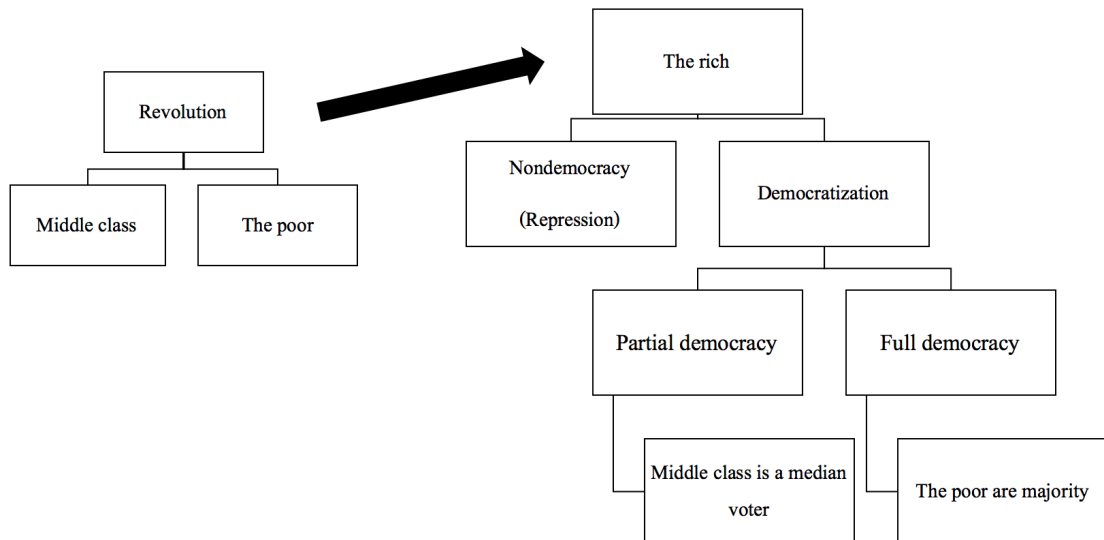


Figure 4.3: Game Theory of Political Decisions

The figure above represents political decisions of the rich. An initial political power be-

longs to the rich. Threat of revolution is made by the middle class and the poor who are excluded from a political institution. To stop revolutionary process, the rich have to choose either repression or democratization. There are two types of democratization which are partial and full democracy. Partial democracy includes the middle class into political system whereas full democracy extends political power to the middle class and the poor. The cost of democracy is taxation on income for the government to redistribution. It is obvious that democratic system is more consolidated in richer societies as it cost less to the rich. In the case that the middle class is median voter, it requires lower rate of income redistribution than when the poor are majority voter. Because the middle class has better education and richer the poor, democratic redistributive rates is less and the rich feel indifferent between partial and full democracy when they are median voters. Thus, an opportunity of transition to democracy increase in relatively richer societies. However, if the poor are majority voters, the elites realize high taxation on their wealth under democracy, they prefer repression to democracy.

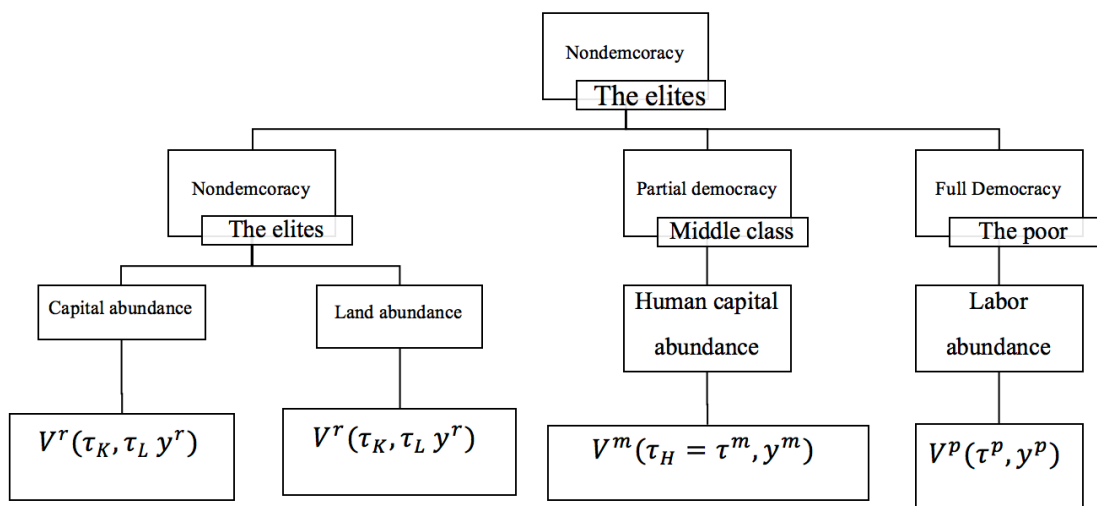


Figure 4.4: Game Theory of Political Decisions

The Figure 10 represent how each individual i makes political decision by using game theory to explain. $V^i(\tau, y^i)$ is an indirect utility of individuals where $i = r, m, p$. In nondemocracy, the rich have political power to set their most preferred tax rates which is $\tau^{ND} = \tau^r$. Intuitively, it is because the rich can take care of themselves, they want to set the lowest redistributive rate for maximizing their utilities. So, in nondemocracy they earn the highest indirect utilities as $V^r(\tau^{ND} = \tau^r, y^r) > V^r(\tau^{PD} = \tau^m, y^r) > V^r(\tau^D = \tau^p, y^r)$. Because the middle class

and the poor are excluded from political system, when an income redistribution is not sufficient, revolution is more attractive to them. To stop revolution, the rich have to compare their indirect utilities between repression and democratization. If the middle class is a median voter, the rich might choose partial democratization that includes the middle class into political system and let the middle class set their most preferred tax $\tau^{PD} = \tau^m$. As the middle class is richer than the poor, they prefer lower redistributive rate $\tau^m < \tau^p$. Moreover, it is difficult to the government to impose tax on the middle class as human capital because the cost of monitoring the effort of skilled workers are very high. Partial democratization is more attractive to the rich. If the poor are majority voters and they set their most wanted redistributive rate $\tau^D = \tau^p$, then in democracy the rich have to pay higher redistributive rate resulting in lower indirect utilities of the rich as $V^r(\tau^D = \tau^p, y^r) < V^r(\tau^{PD} = \tau^m, y^r)$. Theoretically, as the size of human capital labor increases, the probability of transition to democracy is higher.

4.1.2.2 How the rich make political decisions?

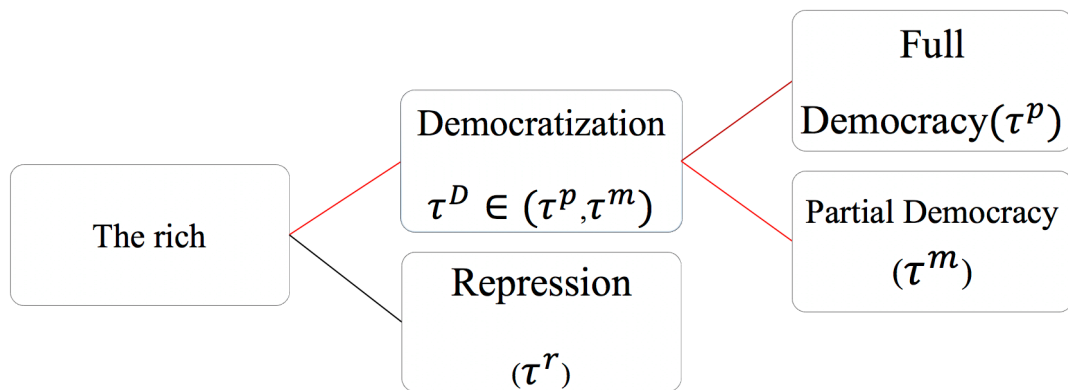


Figure 4.5: Political decisions of the rich

How the rich make their political decisions at an initial state? At an initial state Based on Acemoglu's models, political power belongs to the elites. When the elites give low transfer to the middle class and the poor, they might choose to make a revolution against the elites. To stop revolution, the elites have to choose either democratization or repression. If the elites realize that the poor are majority group, in democracy the poor as majority voters have a right to vote for their most preferred tax rate (τ^p) which is costly to the elites. In this case repression is more attractive. When the elites choose democratization? there are two types of democracy (1) Full democracy

means that every groups are included in political system and political power belongs to majority people (2) Partial democracy means political power belongs to the elites and the middle class. The elites choose partial democracy when the middle class become relatively richer ($\theta^m \uparrow$). Because the richer middle class prefer lower redistributive rate ($\tau^m \downarrow$), their preferred tax rate is getting closer to the rich. Partial democracy is more attractive to the elites because the elites extent political power to the middle class to set their most preferred redistributive rate (τ^m). When the middle class feel satisfied in partial democracy, they do not have an incentive to join the poor making revolution. On the other hand, if the number of middle class increases until they become median voters, the middle class is the leader of the poor. The middle class as a median voter have power to set their most preferred redistributive rate under democracy. Therefore, a large size of middle class makes the elites feel indifferent between full and partial democracy. In other words, an increase of middle class's size increases the opportunity of full democratization. In this section, it introduces basic mathematical models based on economic and democratic theories to see how each social class makes political decision-making. It begins with aggregated social preferences via Single-Peaked Preferences to show that majority voters always win in democratic system. The main political disagreement is the level of redistributive rate because not all groups gain from income redistribution. In other words, the rich lose their interests from paying redistributive rate while the poor gain from receiving income redistribution in democracy. The models explains why the rich prefer nondemocracy whereas the poor prefer democracy by comparing indirect utilities between each political decision. Finally, it explains an important role of middle class in democratic system. The size and level income of the middle class have an influence on transition to democracy and later they help to consolidate democracy via the cost of repression, coup and revolution.

To understand how democratic politics work we use Single-Peaked Preferences and the Median Voter Theorem to explain about the aggregation of all individual preferences into social choices. According to maximization utility theory, people consume all their income for maximizing their utilities. To reach a goal of optimal income, they have to choose policy (tax rate) which provide them higher income to spend and with the law of diminishing marginal utility, so our utilities function is single-peaked. Let q denotes as the a policy choice such as tax rates (high or low tax rates), $Q \rightarrow \mathbb{R}$ is a set of policy choices to reach optimal value of utility, $V^i(q)$ represents the indirect utility function of each individual i . We can determine the most preferred point as the ideal point q^i then $V^i(q^i) \geq V^i(q)$. If $q'' < q' < q^i$ or $q'' > q' > q^i$, then $V^i(q'') \leq V^i(q')$ Therefore, the single-peaked policy preferences of voter i is concave.

The Median Voter Theorem(MVT) was created by Black(1948),let the median voter denotes as M and q^M is the ideal point of median voters where $q^i > q^M$ and $q^i < q^M$ (assuming people have single-peaked preference). Theoretically, people spend all their income to achieve maximization of utilities through consuming over goods. The indirect utility function is referred to each individual voting for their policy choice(tax rate) that provide them highest income to spend. In democratic decision, the median voters always win because they are majority group of people.

Political conflicts between the rich and the poor occurs because they have different preferences.For assumption of Acemoglu and Robinson (2006) model, in two class model show variables as the following:

let voter i = the rich(r) and the poor(p) has income equal to y^i where $i \in [r, p]$, tax rate denotes as $\tau \geq 0$.The average national income is \bar{y} .

$$v^i = \hat{y}^i(\tau) = \text{post-tax income}$$

$$\hat{y}^i(\tau) = \text{income} - \text{pay tax} + \text{transfer from the government}$$

$$\hat{y}^i(\tau) = y^i - \tau y^i + (\tau - C(\tau))\bar{y}$$

Here, an income os individual i denotes as y^i , τy^i is after-tax income , $(\tau - C(\tau))\bar{y}$ is the transfer from the government. the fundamental model assumes that the government has a balance budget. It means the government give all revenues from collecting tax to the poor as an income redistribution.

$$\hat{y}^i(\tau) = (1 - \tau)y^i + (\tau - C(\tau))\bar{y} \quad (4.14)$$

To derive the indirect utility function, $V(y^i | \tau)$ is the indirect utility considering only one policy τ . According to economic theory, people are always ration to choose ideal tax rate for maximization their utilities. Next, using the derivative of $V(y^i | \tau)$ with respect to τ and set $\frac{dy^i}{d\tau} = 0$. to find optimal tax rate for individual i.The first order condition for optimal tax rate is:

$$\frac{y^i}{\bar{y}} = 1 - C'(\tau^i) \quad (4.15)$$

Now considering, there are three group of people: the fraction of the rich is δ^r , the middle class is δ^m , and the poor is δ^p . This model normalize the total population is equal to one $\delta^r + \delta^m + \delta^p = 1$ and assuming $\delta^p > \delta^m > \delta^r$. Each group i has a share income of total national income denotes as θ^i which $\sum_i \theta^i = 1$. Because the rich are richer than the middle class and the middle class is richer than the poor, so $y^r = \frac{\theta^r}{\delta^r} \bar{y} > y^m = \frac{\theta^m}{\delta^m} \bar{y} > y^p = \frac{\theta^p}{\delta^p} \bar{y}$. The most preferred tax rate for each group is written as $\tau^i \geq 0; i \in [r, m, p]$ where $\tau^r < \tau^m < \tau^p$. We can rewrite the first order condition for maximization indirect utility by finding optimal tax rate for individual i as:

$$\left(\frac{\delta^i - \theta^i}{\delta^i} \right) - C'(\tau^i) = 0 \quad (4.16)$$

According to The Median Voter Theorem (MVT), democratic policies depend on the median voters always win and have an authority to choose their most preferred tax rate. There are two case that we consider as the following;

1. $\delta^p \geq 1/2$; the majority group of people are the poor who determine democratic policy rate τ^p .
2. $\delta^p < 1/2$; the poor are no longer majority voter which mean the middle class is the median voter with their most preferred tax rate τ^m .

To explain two cases above, if the majority group is the poor ($\delta^p \geq 1/2$) then policy rate is set by the poor which is τ^p . What matter is an income redistribution in democratic system. A share income of the poor (θ^p) has a huge impact on setting policy rate (τ^p). As the poor are relatively poorer, they demand higher tax rate for increasing income redistribution. Mathematically, $\frac{d\tau^p}{d\theta^p} < 0$ as $\theta^p \downarrow \Rightarrow \tau^p \uparrow$. Now let consider if the middle class is the median voter ($\delta^p < 1/2$) with their most preferred policy rate τ^m . A share income of the middle class has an important effect on democratic political system. If the middle class is getting richer then the median voter requires less policy rate. Mathematically, $\frac{d\tau^m}{d\theta^m} < 0$ as $\theta^m \uparrow \Rightarrow \tau^m \downarrow$. Obviously, the middle class demands less tax rate than the poor because the middle class is richer than the poor, so $\tau^m < \tau^p$. As a result, the costs of democracy is lower when the richer middle class is the median voters which create a higher level of stabilization on democracy.

The Middle Class and Democracy

In three class model, the middle class is a group of people who have income below the rich but above the poor. The middle class has to pay tax rate, and they also require income redistribution from the government. The rich have to pay taxes in democracy, but they actually do not want any income redistribution from the government because they can take care of themselves while the poor do not have to pay any tax rate, so they require high income redistribution. The political conflicts occur because each group has different preference. The middle class stands in the middle between the rich and the poor. Therefore, the creation of democracy depends on an income and a number of the middle class.

1. The Creation of Partial Democracy

An initial state of political system is nondemocracy where de jure power belongs to the elites. To reach maximization of the elites' utilities, the authoritarians might set their most preferred tax rate equal to zero ($\tau^r = 0$) or very low rates. When tax rate under nondemocracy ($\tau^{ND} = \tau^r$) is not sufficient for the middle class and the poor to survive, they might choose to make revolution against the rich. In this model, the revolution is always successful and lead to full democracy. If people in a country are relatively poor, full democracy is costly to the elites. To stop the revolution from the middle class and the poor, the rich have to choose a choice which is Repression, Partial Democracy, Full Democracy or Promise of set new tax rate. Choosing partial democracy means that the elites extend political system to the middle class by giving them their most preferred tax rate ($\tau^{PD} = \tau^m$). The payoffs of each group under revolution are:

$$V^p(R, \mu) = V^m(R, \mu) = \frac{(1 - \mu)\bar{y}}{\delta^p + \delta^m}, V^r(R, \mu) = 0 \quad (4.17)$$

where μ is the fraction of damaged resources (the cost of revolution), $(1 - \mu)$ is a proportion of remaining resources after revolution, δ^i is the size of each group $\sum_i \delta^i = 1$ (δ^r is the rich, δ^m is the middle class and δ^p is the poor) and \bar{y} is a national average income.

In nondemocracy, each individual ($i \in [p, m, r]$) receive the payoffs with the probability of promising new tax rate (p):

$$V^i(N, \tau^N) = y^i + p(\tau^N(\bar{y} - y^i) - C(\tau^N)\bar{y}) \quad (4.18)$$

The middle class choose not to join revolutionary action with the poor if the promise of tax rate is sufficient for them as $V^m(N, \tau^m) \geq V^m(R, \mu)$ resulting in the political system remains nondemocracy.

$$y^m + p[(\tau^m - C(\tau^m))\bar{y} - \tau^m y^m] \geq \frac{(1-\mu)\bar{y}}{(\delta^p + \delta^m)}$$

$$\frac{\theta^m}{\delta^m} \bar{y} + p[(\tau^m - C(\tau^m))\bar{y} - \tau^m \frac{\theta^m}{\delta^m} \bar{y}] \geq \frac{(1-\mu)\bar{y}}{(\delta^p + \delta^m)}$$

$$\frac{(\delta^p + \delta^m)}{\delta^m} [\theta^m + p(\tau^m(\delta^m - \theta^m) - \delta^m C(\tau^m))] \geq 1 - \mu$$

$$\mu^* = 1 - \frac{(\delta^p + \delta^m)}{\delta^m} [\theta^m + p(\tau^m(\delta^m - \theta^m) - \delta^m C(\tau^m))] \quad (4.19)$$

where μ^* is a critical point of the middle class that make them feel indifferent between nondemocracy with the promise of new income redistributive rate and revolution.

To explain an impact of an income of the middle class on the decision of making revolution, we use total differentiation of a critical point(μ^*) respect to a share income of the middle class(θ^m).

$$\frac{d\mu^*}{d\theta^m} = -\frac{(\delta^p + \delta^m)}{\delta^m} [1 - p\tau^m + ((\delta^m - \theta^m) - \delta^m C'(\tau^m)) \frac{d\tau^m}{d\theta^m}] < 0$$

The above total differentiation shows negative relationship between a critical point and a share income of the middle class ($\frac{d\mu^*}{d\theta^m} < 0$) because $(1 - p\tau^m)$ is positive, $((\delta^m - \theta^m) - \delta^m C'(\tau^m))$ is equal to zero from the first order condition and the relationship between tax rate and income is always negative ($\frac{d\tau^m}{d\theta^m} < 0$).

$$\therefore \frac{d\mu^*}{d\theta^m} < 0 \Rightarrow \theta^m \uparrow \Rightarrow \mu^* \downarrow \Rightarrow \text{P(Revolt)} \downarrow$$

Intuitively, with the promise of income redistribution, the middle class receives higher income under nondemocracy resulting in the middle class feel indifferent between nondemocracy and revolution. Therefore, they choose not to revolt against the elites.

The condition for the middle class to revolt is $V^m(R, \mu) > V^m(N, \tau^N)$. Another way to exclude the middle class from the process of revolution, the rich might choose partial democratization which extends political power to the middle class by setting tax rate equal to τ^m as the rate that make the middle class reach their maximization of utilities. The values of partial

democracy is written as:

$$V^i(PD) = y^i + (\tau^m(\bar{y} - y^i) - C(\tau^m)\bar{y}) \text{ for } i \in [p, m, r] \quad (4.20)$$

Therefore, $V^m(PD, \tau^m) \geq V^m(R, \mu)$ Partial democracy can prevent revolution from the middle class. However, the threat of revolution from the citizens is still possible when an income distribution is not enough. Post-Revolution the rich and the middle class gain nothing as $V^r(R, \mu) = V^m(R, \mu) = 0$ while the citizens have $V^p(R, \mu) = \frac{(1-\mu)\bar{y}}{\delta^p}$. The citizens make a revolution if there is:

$$\begin{aligned} V^p(R, \mu) &> V^p(PD) \\ \frac{(1-\mu)\bar{y}}{\delta^p} &> y^p + (\tau^m(\bar{y} - y^p) - C(\tau^m)\bar{y}) \\ \mu &< 1 - \theta^p - (\tau^m(\delta^p - \theta^p) - \delta^p C(\tau^m)) \end{aligned}$$

Hence, the constraint of revolution for the citizens is $\mu < 1 - \theta^p - (\tau^m(\delta^p - \theta^p) - \delta^p C(\tau^m))$. It means when the poor is poorer ($\theta^p \downarrow$), the cost of revolution is relatively lower ($\mu \downarrow$). We can simply say that as the poor is poorer, the probability of making revolution is higher. In partial democracy, the middle class can promise to set tax rate higher than τ^m as $\tau^{PD} > \tau^m$ to prevent the threat of revolution from the citizens. However, the promise of the middle class ($\tau^{PD} > \tau^m$ or $\tau^{PD} = \tau^p$) and the elites are not creditable because they have a chance to reset tax rate ($\tau^{PD} = \tau^m$) with probability $(1-p)$. The payoffs to three class model with the promise of redistribution (p) and a chance to reset tax rate is written as:

$$V^i(PD, \tau^{PD}) = y^i + p(\tau^{PD}(\bar{y} - y^i) - C(\tau^{PD})\bar{y}) + (1-p)(\tau^m(\bar{y} - y^i) - C(\tau^m)\bar{y})$$

where $i \in [p, m, r]$

The key point is to find the critical point μ^* that make the citizens feel indifferent between Revolution and Partial Democracy (Note that the critical point μ^* is a point where tax rate is sufficient to prevent the threat of revolution from the poor).

$$V^p(PD, \tau^{PD} = \tau^p) = V^p(R, \mu^*)$$

$$y^p + p(\tau^P(\bar{y} - y^p) - C(\tau^P)\bar{y}) + (1 - p)(\tau^m(\bar{y} - y^p) - C(\tau^m)\bar{y}) = \frac{(1 - \mu^*)\bar{y}}{\delta^p}$$

$$\therefore \mu^* = 1 - \theta^p + p[\theta^p + \tau^p(\delta^p - \theta^p) - \delta^p C(\tau^p)] + (1 - p)[\theta^p + \tau^m(\delta^p - \theta^p) - \delta^p C(\tau^m)] \quad (4.21)$$

Intuitively, when the middle class prefers higher redistributive rate ($\tau^m \uparrow$), an indifferent point between revolution and partial democracy of the citizens decline ($\mu^* \downarrow$) or we can simply say that with more redistributive rate lead to lower probability of revolution.

2. The Creation of Full Democracy

Another way for the elites to stop the revolutionary action from the middle class and the poor is to include both groups into political system resulting in the creation of full democracy. The payoffs of democracy depends on the majority voter. From previous cases, the majority group could be either the middle class or the citizens. Therefore, tax rates of democracy (τ^D) is τ^p or τ^m .

$$V^i(D) = y^i + (\tau^D(\bar{y} - y^i) - C(\tau^D)\bar{y}); i \in [p, m, r] \quad (4.22)$$

An income distribution in democratic system depending on which group is majority (the citizens (τ^p) or the middle class (τ^m)).

1. $\delta^p \geq 1/2$; The citizens are majority group of people ($\delta^p > \delta^m + \delta^r$). Hence, the cost of full democracy is higher than partial democracy to the elites because the citizens require higher level of income distribution than the middle class ($\tau^p > \tau^m$). The elites feel worse off under full democracy.

$$V^r(ND, \tau^{ND} = \tau^r) > V^r(PD, \tau^m) > V^r(D, \tau^D = \tau^m)$$

$$\tau^r < \tau^m < \tau^p$$

2. $\delta^p < 1/2$; The middle class is median voter, democratic tax rate is the middle class's most preferred tax rate ($\tau^D = \tau^m$). Then, the elites feel indifferent between Partial and Full

Democracy as:

$$V^r(PD, \tau^m) = V^r(D, \tau^D = \tau^m)$$

$$\tau^{PD} = \tau^D = \tau^m$$

$$V^r(D) = y^r + (\tau^m(\bar{y} - y^r) - C(\tau^m)\bar{y}) \text{ is equal to } V^r(PD) = y^r + (\tau^m(\bar{y} - y^r) - C(\tau^m)\bar{y})$$

In other words, the more number of middle class creates more opportunity for the elites to choose democratization. Because the middle class is richer than the poor ($y^m > y^p$), the cost of democracy is lower to the elites ($\tau^m < \tau^p$). However, it is not always for the middle class to choose full democratization with the poor

3.Repression:Remaining in Nondemocracy

Another choice for the elites to avoid a revolution from the poor is to make a repression. The main question is how do we know when the elites prefer repression to democratization. In this section, the rich have four options to prevent a revolution which are Partial Democratization, Full Democratization, the promise of new tax rate under Nondemocracy or Repression. A buffer between the rich and the poor is the middle class who help a country to keep away from repression. Theoretically, the elites weigh the costs of repression and democracy to make a decision. For example, if the middle class is relatively rich, the costs of partial or full democracy is lower. The values of repression under three class model ($i = p, m, r$) are:

$$V^i(R) = (1 - \kappa)y^i \tag{4.23}$$

Where R is repression, κ is the costs of repression and y^i is an income of individual i ($i = p, m, r$).

3.1) The elites are indifferent between repression and the promise of providing higher redistributive rate ($\tau^N = \hat{\tau}$) if there is:

$$V^r(R) = V^r(N, \tau^N = \hat{\tau})$$

$$(1 - \kappa)y^r = y^r + p[\hat{\tau}(\bar{y} - y^r) - C(\hat{\tau})\bar{y}] \text{ where } y^r = \frac{\theta^r \bar{y}}{\delta^r}$$

$$(1 - \kappa) \frac{\theta^r \bar{y}}{\delta^r} = \frac{\theta^r \bar{y}}{\delta^r} + p[\hat{\tau}(\bar{y} - \frac{\theta^r \bar{y}}{\delta^r}) - C(\hat{\tau})\bar{y}]$$

$$\therefore \hat{\kappa} = \frac{p}{\theta^r} [\delta^r C(\hat{\tau}) - \hat{\tau}(\delta^r - \theta^r)] \quad (4.24)$$

where $\hat{\kappa}$ is an indifference between repression and the promise of redistribution to the elites. If $\kappa < \hat{\kappa}$ then repression is better than the promise of redistribution to the elites. Because in relative poorer society, the elites have to promise higher tax rate. Hence, the elites prefer to use repression.

3.2) An indifference between democratization and repression to the rich denotes as $\tilde{\kappa}(\tau)$ where the values of tax rate depending on which group is majority $\tau = \tau^D (\tau^D \in [\tau^m, \tau^p])$ or $\tau = \tau^{PD} = \tau^m$ as:

$$V^r(R) = V^r(D)$$

$$(1 - \tilde{\kappa}(\tau)) \frac{\theta^r \bar{y}}{\delta^r} = \theta^r + p[\hat{\tau}(\delta^r - \theta^r) - \delta^r C(\hat{\tau})]$$

$$\therefore \tilde{\kappa}(\tau) = \frac{p}{\theta^r} [\delta^r C(\hat{\tau}) - \hat{\tau}(\delta^r - \theta^r)] \quad (4.25)$$

If $\kappa < \tilde{\kappa}(\tau)$, then the elites choose to repress because the cost of repression is lower than a critical point. The function of repression depending on an income of the middle class. Obviously, the richer middle class ($\theta^m \uparrow$) requires lower tax rate ($\tau^m \downarrow$) which make the rich prefer democratization to repression ($\tilde{\kappa}(\tau) \downarrow$) to avoid revolution.

4. Coup: Changing from Democracy to Nondemocracy

In democracy, a political power belongs to the majority group ($\delta^m + \delta^p > \delta^r$) that mean they can choose their most preferred tax rates (τ^D could be either τ^m or τ^p). However, if the median voter is relatively poor, the redistributive rate is high which cost more to the elites. The elites might coup and take back the political power. Once the coup occurs the political system transfers from democracy to nondemocracy. Then, the elites hold political power again. The values of coup for the elites, the middle class and the poor are:

$$V^i(C, \varphi) = (1 - \varphi)y^i$$

where φ is the cost of coup, y^i is an income of individual i , $i \in r, m, p$

The coup is chosen when $V^r(C, \varphi) > V^r(D, \tau^D)$.

$$(1 - \varphi)y^r > y^r + (\tau^D(\bar{y} - y^r) - C(\tau^D)\bar{y})$$

$$(1 - \varphi)\frac{\theta^r \bar{y}}{\delta^r} > \frac{\theta^r \bar{y}}{\delta^r} + (\tau^D(\bar{y} - \frac{\theta^r \bar{y}}{\delta^r}) - C(\tau^D)\bar{y})$$

$$\therefore \varphi < \frac{1}{\theta^r} (C(\tau^D)\delta^r - \tau^D(\delta^r - \theta^r)) \quad (4.26)$$

An equation above shows that the middle class has an important effect on the elites' decision of making coup. If the middle class is a median voter then $\tau^D = \tau^m$ that less cost to the elites.

$$\varphi < \frac{1}{\theta^r} (C(\tau^m)\delta^r - \tau^m(\delta^r - \theta^r))$$

$$\therefore \theta^m \uparrow \Rightarrow \tau^m \downarrow \Rightarrow \varphi < [\frac{1}{\theta^r} (C(\tau^m)\delta^r - \tau^m(\delta^r - \theta^r))] \downarrow \Rightarrow P(\text{Coup}) \downarrow$$

Hence, the middle class reduces tax burden of democracy and creates more stabilized democratic system. There is a way to avoid a coup from the rich, the middle class and the citizens might give the rich a promise of new lower redistributive rate ($\tau^D = \tilde{\tau} < \tau^m < \tau^p$) with probability p . Similarly, the promise is imperfect because they just promise to prevent a coup. Once the rich decide not to coup, the middle class and the poor have a chance not to do what they promise to do with probability $(1-p)$. With this promise of new redistributive rate each group for $i \in [r, m, p]$ receives payoffs as:

$$V^i(D, \tau^D) = y^i + p(\tau^D(\bar{y} - y^i) - C(\tau^D)\bar{y}) + (1 - p)(\tau^D(\bar{y} - y^i) - C(\tau^D)\bar{y})$$

Therefore, the political system remains democracy with sufficient tax rate:

$$V^r(D, \tau^D = \tilde{\tau}) \geq V^r(C, \varphi)$$

$$\therefore \varphi \leq \frac{p}{\theta^r} [C(\tilde{\tau})\delta^r - \tilde{\tau}(\delta^r - \theta^r)] + \frac{(1-p)}{\theta^r} [C(\tau^m)\delta^r - \tau^m(\delta^r - \theta^r)]$$

The stability of democratic system depending on the level of tax rate that the elites. As the richer middle class wants less tax rate, the rich prefer democracy to coup. However, if the poor

is a majority group, they will vote for high tax rate which cost more to the rich. The elites prefer to coup resulting in unstable democratic system. Obviously, the number of the middle class(δ^m) and the level of the middle class income(θ^m) have an impact on consolidation of democracy.

4.1.3 Method of the Study

4.1.3.1 Extending Acemoglu's model

The fundamental models emphasise the key survival of democracy is the redistributive rates. They assume that the government have balance budget. They earn revenue from taxing on the rich then give all amount of tax collecting to the poor. Political conflicts increase when the majority voters are very poor, they require higher redistributive rate from the elites. Greater level of income redistribution causes political instability because it encourages the rich to avoid democracy. On the other hand, an increase in level income of majority voters reduce tax burden to the rich in other words richer societies tend to be more democratic. This paper studies an influence of the middle class on transition to democracy under capital and land inequality.

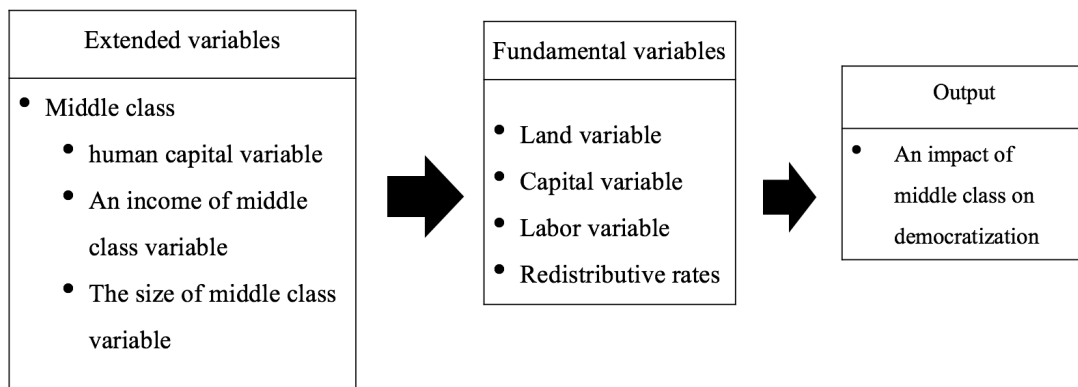


Figure 4.6: Introducing the middle class as human capital into the fundamental model

The based production function model provides the rich and the poor with three factors of input. It is written as $Y = F(K, L, N)$ where K is capital stock, L is productive land and N is labor. This study introduces the middle class as human capital(H) into a production function to examine an impact of the middle class on democratization. The extended production function is $Y = F(K, L, H, N)$. The middle class might help to increase the probability of democratization or they may prefer more nondemocratic system to democracy.

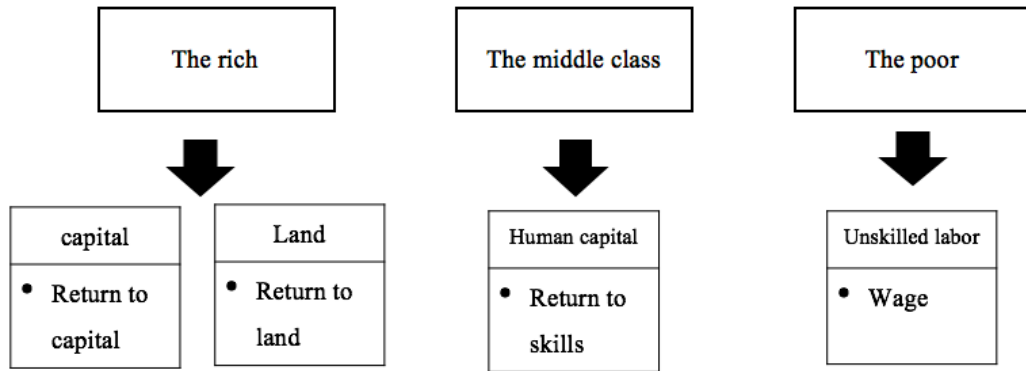


Figure 4.7: An economic endowment of each group in the three-class model

Each group own different economic resources meaning they have different level of marginal productivities that represent their income. There are three group of people. First is the rich are the owners of capital and productive land and they earn the return to capital and land. Secondly, the middle class is human capital labor and they earn return to skilled. Lastly, the poor are unskilled labor who earn lowest income.

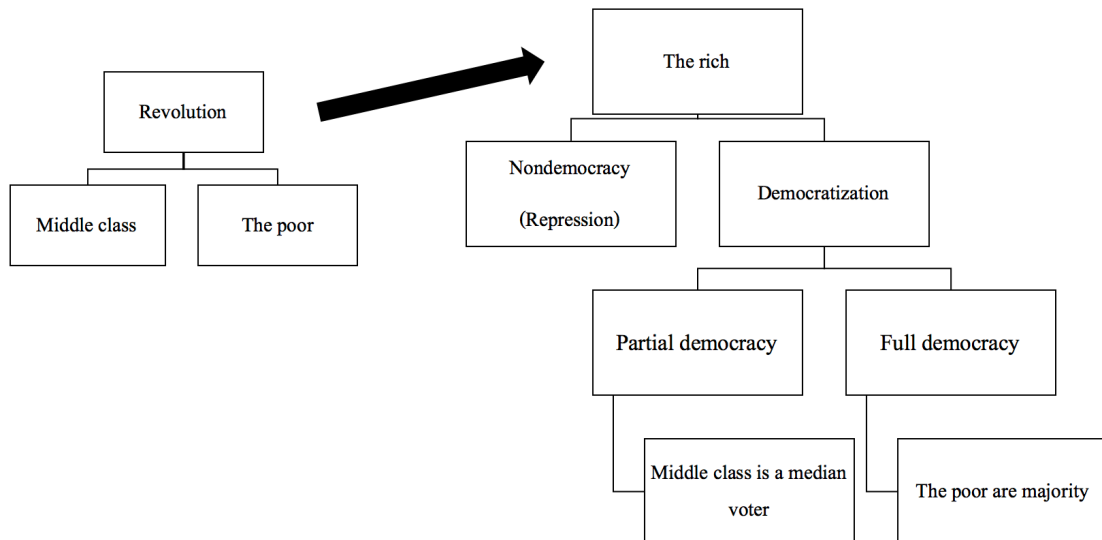


Figure 4.8: Game Theory of Political Decisions

The figure above represents political decisions of the rich. An initial political power be-

longs to the rich. Threat of revolution is made by the middle class and the poor who are excluded from a political institution. To stop revolutionary process, the rich have to choose either repression or democratization. There are two types of democratization which are partial and full democracy. Partial democracy includes the middle class into political system whereas full democracy extends political power to the middle class and the poor. The cost of democracy is taxation on income for the government to redistribution. It is obvious that democratic system is more consolidated in richer societies as it cost less to the rich. In the case that the middle class is median voter, it requires lower rate of income redistribution than when the poor are majority voter. Because the middle class has better education and richer the poor, democratic redistributive rates is less and the rich feel indifferent between partial and full democracy when they are median voters. Thus, an opportunity of transition to democracy increase in relatively richer societies. However, if the poor are majority voters, the elites realize high taxation on their wealth under democracy, they prefer repression to democracy.

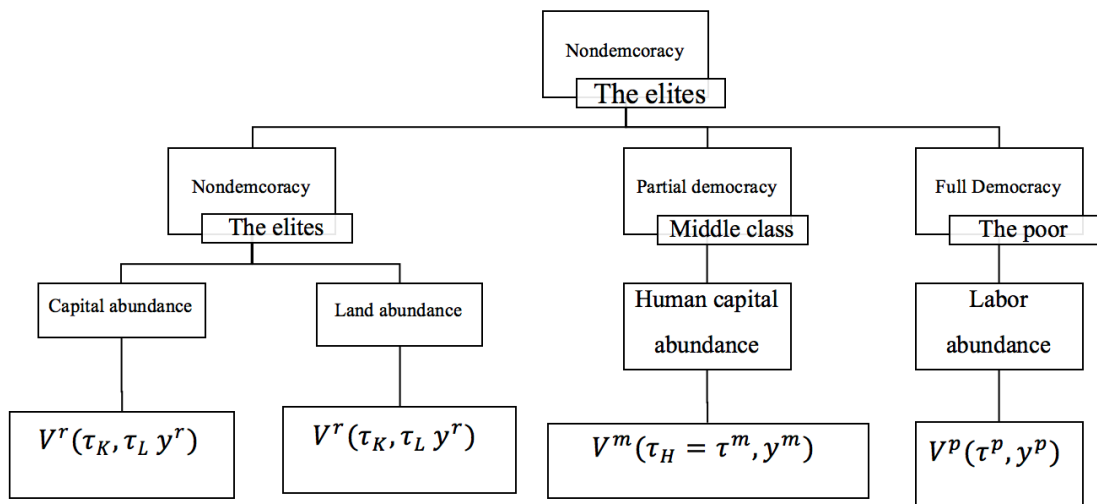


Figure 4.9: Game Theory of Political Decisions

The Figure 10 represent how each individual i makes political decision by using game theory to explain. $V^i(\tau, y^i)$ is an indirect utility of individuals where $i = r, m, p$. In nondemocracy, the rich have political power to set their most preferred tax rates which is $\tau^{ND} = \tau^r$. Intuitively, it is because the rich can take care of themselves, they want to set the lowest redistributive rate for maximizing their utilities. So, in nondemocracy they earn the highest indirect utilities as $V^r(\tau^{ND} = \tau^r, y^r) > V^r(\tau^{PD} = \tau^m, y^r) > V^r(\tau^D = \tau^p, y^r)$. Because the middle class

and the poor are excluded from political system, when an income redistribution is not sufficient, revolution is more attractive to them. To stop revolution, the rich have to compare their indirect utilities between repression and democratization. If the middle class is a median voter, the rich might choose partial democratization that includes the middle class into political system and let the middle class set their most preferred tax $\tau^{PD} = \tau^m$. As the middle class is richer than the poor, they prefer lower redistributive rate $\tau^m < \tau^p$. Moreover, it is difficult to the government to impose tax on the middle class as human capital because the cost of monitoring the effort of skilled workers are very high. Partial democratization is more attractive to the rich. If the poor are majority voters and they set their most wanted redistributive rate $\tau^D = \tau^p$, then in democracy the rich have to pay higher redistributive rate resulting in lower indirect utilities of the rich as $V^r(\tau^D = \tau^p, y^r) < V^r(\tau^{PD} = \tau^m, y^r)$. Theoretically, as the size of human capital labor increases, the probability of transition to democracy is higher.

4.1.3.2 How the rich make political decisions?

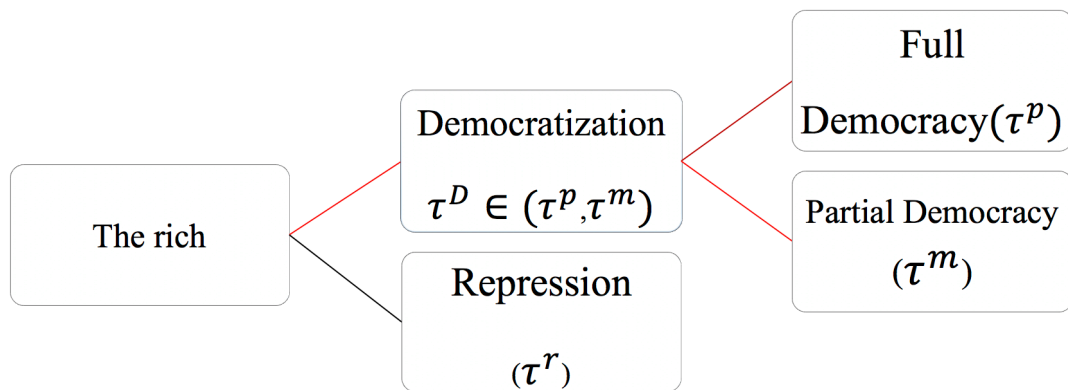


Figure 4.10: Political decisions of the rich

How the rich make their political decisions at an initial state? At an initial state Based on Acemoglu's models, political power belongs to the elites. When the elites give low transfer to the middle class and the poor, they might choose to make a revolution against the elites. To stop revolution, the elites have to choose either democratization or repression. If the elites realize that the poor are majority group, in democracy the poor as majority voters have a right to vote for their most preferred tax rate (τ^p) which is costly to the elites. In this case repression is more attractive. When the elites choose democratization? there are two types of democracy (1) Full democracy

means that every groups are included in political system and political power belongs to majority people (2) Partial democracy means political power belongs to the elites and the middle class. The elites choose partial democracy when the middle class become relatively richer ($\theta^m \uparrow$). Because the richer middle class prefer lower redistributive rate ($\tau^m \downarrow$), their preferred tax rate is getting closer to the rich. Partial democracy is more attractive to the elites because the elites extent political power to the middle class to set their most preferred redistributive rate (τ^m). When the middle class feel satisfied in partial democracy, they do not have an incentive to join the poor making revolution. On the other hand, if the number of middle class increases until they become median voters, the middle class is the leader of the poor. The middle class as a median voter have power to set their most preferred redistributive rate under democracy. Therefore, a large size of middle class makes the elites feel indifferent between full and partial democracy. In other words, an increase of middle class's size increases the opportunity of full democratization.



CHAPTER V

INTRODUCING THE MIDDLE CLASS INTO ACEMOGLUE'S PRODUCTION FUNCTION

5.1 Introducing the middle class into Acemoglu's production function

In this section, this paper expands two social class model into three class model including the rich the poor and the middle class. It begins with adding the middle class variable as human capital into the based production function. The extended production function includes four factors of input is written as:

$$Y = F(K, L, H, N)$$

where Y is output , K is capital stock, L is productive land H is human capital, N is unskilled labor.

Deriving the aggregate production as the special Cobb-Douglas model.

$$Y = (K + \sigma L)^{\theta^r} (H + \beta N)^{\theta^m + \theta^p} \quad (5.1)$$

where θ^i is shared income of each individual i, $\sum \theta^i$ is 1, $\sigma > 0$, and $i \in [p, m, r]$. Intuitively, The rich hold capital and land with greater level of substitution between capital and land. When the share of capital income increases, an income share of land declines. The middle class as skilled labor is more efficient in producing higher level of production than unskilled labor. $\beta \in (0, 1)$ is the parameter of distribution for controlling intensity between skilled and unskilled labor in the process of production. Because $\sum \delta^i$ as total population is equal to 1, the average national income is written as $\bar{y} = (K + \sigma L)^{\theta^r} (H + \beta N)^{\theta^m + \theta^p}$.

Assuming competitive market that each factor of production is paid by their marginal products. Each factor price is expressed as:

$$\frac{\partial Y}{\partial K} = \theta^r \frac{(K + \sigma L)^{\theta^r - 1}}{K + \sigma L} (H + \beta N)^{\theta^m + \theta^p} = \text{return to capital}(r)$$

$$\frac{\partial Y}{\partial L} = \theta^r \sigma \frac{(K + \sigma L)^{\theta^r}}{K + \sigma L} (H + \beta N)^{\theta^m + \theta^p} = \text{return to land}(v)$$

$$\frac{\partial Y}{\partial H} = (\theta^m + \theta^p)(K + \sigma L)^{\theta^r} \frac{(H + \beta N)^{\theta^m + \theta^p}}{(H + \beta N)} = \text{return to skill}(s)$$

$$\frac{\partial Y}{\partial N} = \beta(\theta^m + \theta^p)(K + \sigma L)^{\theta^r} \frac{(H + \beta N)^{\theta^m + \theta^p}}{(H + \beta N)} = \text{wages}(w)$$

The citizen as unskilled labor earn only wage, let y^p denotes as the income of unskilled labor:

$$y^p = \frac{wN}{\delta^p} = \beta(\theta^m + \theta^p)(K + \sigma L)^{\theta^r} \frac{(H + \beta N)^{\theta^m + \theta^p}}{(H + \beta N)}$$

$$y^p = \beta \frac{(\theta^m + \theta^p)}{(H + \beta N)} \bar{y} \quad (5.2)$$

where w is wage, N is δ^p and it is known as the size of the poor, σ is an elasticity of substitution between capital and land, K is capital, L is land, β is an elasticity of substitution between skilled and unskilled worker, θ^i is an income of individual $i \in r, m, p$, \bar{y} is an average national income.

The elites are the owners of capital and land, the income of the rich is denoted as y^r :

$$y^r = \frac{rK + vL}{\delta^r} = \theta^r \frac{(K + \sigma L)^{\theta^r}}{K + \sigma L} (H + \beta N)^{\theta^m + \theta^p}$$

$$y^r = \frac{\theta^r}{\delta^r} \bar{y} \quad (5.3)$$

where y^r is an income of the rich, δ^r is the size of the rich, r is return to capital, v is return to land, K is capital, L is land, σ is an elasticity of substitution between capital and land, β is an elasticity of substitution between skilled and unskilled worker, θ^i is an income of individual $i \in r, m, p$, \bar{y} is an average national income.

The middle class is a skilled labor, the income of skilled worker is y^m :

$$y^m = s = (\theta^m + \theta^p)(K + \sigma L)^{\theta^r} \frac{(H + \beta N)^{\theta^m + \theta^p}}{(H + \beta N)}$$

$$y^m = \frac{(\theta^m + \theta^p)}{(H + \beta N)} \bar{y} \quad (5.4)$$

where y^m is an income of the middle class, s is return to skills, K is capital, L is land, σ is an elasticity of substitution between capital and land, β is an elasticity of substitution between skilled and unskilled worker, θ^i is an income of individual $i \in r, m, p$, \bar{y} is an average national income.

The fundamental model assumes that the income of the rich is more than the average income and the income of the poor is less than the average income. It can be expressed as $y^r > y^m > y^p$. Since an income of each group is known, the most preferred tax rate of individual i can be determined as $\tau^r < \tau^m < \tau^p$. Because the poor have the lowest income, they demand the highest redistributive rate τ^p . In democracy, the poor as majority voters can vote for the party that providing high income redistribution at rate (τ^p). However, the rich can pay for their health, educations and basic needs which mean the rich prefer less redistributive rate (τ^r). When the rich realize that in democracy they have to pay high tax on their income, they have more fear of the future income redistribution. Consequently, the rich prefer authoritarianism to democracy. In this circumstance, the middle class play an important role on political system. The middle class is neither rich nor poor, so the most preferred tax rate of the middle class is between the rich and the poor ($\tau^r < \tau^m < \tau^p$). On one hand, if the middle class become relatively richer, their most preferred tax rate are getting similar to the rich. This situation makes the richer middle class prefer less democratic. Therefore, the middle class does not always support democracy (Chen,2013).The next chapter will show the role of middle class on democratization.

CHAPTER VI

THE ROLE OF MIDDLE CLASS ON DEMOCRATIZATION UNDER CAPITAL AND LAND INEQUALITY

6.1 The role of middle class on democratization under capital and land inequality

This study separates the role of middle class on democratization into three cases which are:

- (1) An impact of land and capital inequality on democratization (extreme case)
- (2) An effect of capital inequality on democratization (redistribute land equally)
- (3) An effect of Land inequality on democratization (redistribute capital equally)

6.1.1 An impact of land and capital inequality on democratization (extreme case)

In this section, it begins to show how the role of middle class effects political decisions of the elites under land and capital inequality. The first case assuming that only the elites have the rights to own capital and land. The middle class is human capital and the poor are unskilled labor. There are four inputs of production function including capital (K), land (L), human capital (H) and unskilled labor (N). The aggregate production function is:

$$Y = (K + \sigma L)^{\theta^r} (H + \beta N)^{\theta^m + \theta^p} = \bar{y} \quad (6.1)$$

where Y is total output, K is capital, L is land, H is skilled labor (the middle class), N is unskilled labor (the poor), \bar{y} is an average national income, σ is an elasticity of substitution between capital and land, β is an elasticity of substitution between skilled and unskilled labor, θ^i is a share income of an individual i ; $i \in r, m, p$.

An indirect utility of the elites under repression is $V^r(R)$. When the elites choose to

repress, they have to take costs of repression into their account as κ where κ_k , κ_L and κ_H are the fraction of damaged on capital, land and human capital respectively.

$$V^r(R) = \frac{\theta^r}{\delta^r} ((1 - \kappa_k)K + \sigma(1 - \kappa_L)L)^{\theta^r} ((1 - \beta)(1 - \kappa_H)H)^{\theta^m} (\beta N)^{\theta^p} \quad (6.2)$$

where θ^i is a share income of an individual i ; $i \in r, m, p$, δ^r is the size of the rich, K is capital, L is land, H is human capital, N is unskilled labor, κ_k is the cost of capital under repression, κ_L is the cost of destroyed land after repression, κ_H is the cost of losing human capital during repression, θ^i is a share income of individual i ; $i \in r, m, p$, β is an elasticity of substitution between skilled and unskilled labor, σ an elasticity of substitution between capital and land.

An indirect utility of the rich if they choose democracy is:

$$V^r(D) = \frac{1}{\delta^r} [\theta^r + \tau^D(\delta^r - \theta^r) - \delta^r C(\tau^D)] (K + \sigma L)^{\theta^r} ((1 - \beta)H)^{\theta^m} (\beta N)^{\theta^p} \quad (6.3)$$

where θ^i is a share income of an individual i ; $i \in r, m, p$, δ^r is the size of the rich, K is capital, L is land, H is human capital, N is unskilled labor, $C(\tau^D)$ is the cost of collecting tax, β is an elasticity of substitution between skilled and unskilled labor, σ an elasticity of substitution between capital and land, θ^i is a share income of individual i ; $i \in r, m, p$.

The elites choose not to repress when : $V^r(D) \geq V^r(R)$

$$\left[1 + \frac{\tau^D}{\theta^r}(\delta^r - \theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D)\right] (K + \sigma L)^{\theta^r} (H + \beta N)^{\theta^m + \theta^p}$$

\geq

$$((1 - \kappa_K)K + \sigma(1 - \kappa_L)L)^{\theta^r} ((1 - \kappa_H)H + \beta N)^{\theta^m + \theta^p}$$

Let $k^* = K/L$ is a critical point that makes the elites are indifferent between repression and transition to democracy. An equal indirect utility if the rich under repression and democracy can be written as:

$$V^r(D) = V^r(R)$$

$$[1 + \frac{\tau^D}{\theta^r}(\delta^r - \theta^r) - \frac{\delta^r}{\theta^r}C(\tau^D)]^{\frac{1}{\theta^r}}(k^* + \sigma)(H + \beta N)^{\frac{\theta^m + \theta^p}{\theta^r}} = ((1 - \kappa_K)k^* + \sigma(1 - \kappa_L))((1 - \kappa_H)H + \beta N)^{\frac{\theta^m + \theta^p}{\theta^r}}$$

Next, rearranging an equation to find the critical of the rich (k^*). At $V^r(D) = V^r(O | \kappa)$ gives $k^* = K/L$

$$k^* = \frac{\sigma[(1 - \kappa_L)((1 - \kappa_H)H + \beta N)^{\frac{\theta^m + \theta^p}{\theta^r}} - [1 + \frac{\tau^D}{\theta^r}(\delta^r - \theta^r) - \frac{\delta^r}{\theta^r}C(\tau^D)]^{\frac{1}{\theta^r}}(H + \beta N)^{\frac{\theta^m + \theta^p}{\theta^r}}]}{[[1 + \frac{\tau^D}{\theta^r}(\delta^r - \theta^r) - \frac{\delta^r}{\theta^r}C(\tau^D)]^{\frac{1}{\theta^r}}(H + \beta N)^{\frac{\theta^m + \theta^p}{\theta^r}} - (1 - \kappa_K)((1 - \kappa_H)H + \beta N)^{\frac{\theta^m + \theta^p}{\theta^r}}]} \quad (6.4)$$

Using the first derivative of the critical point (k^*) with respect to an impact of middle class's income (θ^m).

$$\frac{\partial k^*}{\partial \theta^m} = \frac{\sigma[1 + \frac{\tau^D}{\theta^r}(\delta^r - \theta^r) - \frac{\delta^r}{\theta^r}C(\tau^D)]^{\frac{1}{\theta^r}}(H + \beta N)^{\frac{\theta^m + \theta^p}{\theta^r}}((1 - \kappa_H)H + \beta N)^{\frac{\theta^m + \theta^p}{\theta^r}}[(1 - \kappa_L) - (1 - \kappa_K)]}{\theta^r [[1 + \frac{\tau^D}{\theta^r}(\delta^r - \theta^r) - \frac{\delta^r}{\theta^r}C(\tau^D)]^{\frac{1}{\theta^r}}(H + \beta N)^{\frac{\theta^m + \theta^p}{\theta^r}} - (1 - \kappa_K)((1 - \kappa_H)H + \beta N)^{\frac{\theta^m + \theta^p}{\theta^r}}]^2}$$

Since $\ln((1 - \kappa_H)H + \beta N) - \ln(H + \beta N)$ is positive, and after repression the remaining of land is greater than capital $(1 - \kappa_L) - (1 - \kappa_K) > 0$. Hence, $\frac{\partial k^*}{\partial \theta^m} > 0$.

Intuitively, The richer middle class ($\theta^m \uparrow$) demands lower tax rate ($\tau^m \downarrow$). Lower tax on income make investors capital investment more attractive ($K \uparrow$) which people prefer more democratic as a guarantee that their properties truly belong to them. In other words, the cost of capital under repression is relatively higher ($\kappa_K \uparrow$) that makes an indirect utility of the rich decreases ($V^r(R) \downarrow$). At critical point the rich are indifferent between repression and democracy ($V^r(R) \downarrow = V^r(D)$), so k^* increases at a decline in the utilities of the rich. Also, $k^* = K/L$ at the critical point. An increase in k^* mean this society is relatively greater in capital abundant. Because of higher cost of capital under repression and lower redistributive rate in partial

democracy , repression is less attractive which increases the chance of partial democratization (P(PD)↑, P(R)↓) .

Then, using the first derivative of the critical point (k^*) with respect to the size of middle class (δ^m). Note that human capital is H which equal to δ^m .

$$\frac{\partial k^*}{\partial \delta^m} = \frac{\sigma \frac{(\theta^m + \theta^p)}{\theta^r} (1 - \kappa_L) [1 + \frac{\tau^D}{\theta^r} (\delta^r - \theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D)]^{\frac{1}{\theta^r}} [1 - (1 - \kappa_K)] \beta N [(1 - \kappa_H) - 1]}{(H + \beta N) ((1 - \kappa_H) H + \beta N) [1 + \frac{\tau^D}{\theta^r} (\delta^r - \theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D)]^{\frac{1}{\theta^r}} (H + \beta N) \frac{\theta^m + \theta^p}{\theta^r}}$$

$$\frac{(H + \beta N) \frac{\theta^m + \theta^p}{\theta^r} ((1 - \kappa_H) H + \beta N) \frac{\theta^m + \theta^p}{\theta^r}}{-(1 - \kappa_K) ((1 - \kappa_H) H + \beta N) \frac{\theta^m + \theta^p}{\theta^r}]^2}$$

Since $(1 - \kappa_H) - 1 < 0$, the size of middle class and an indifferent point of the elites have negative impact ($\frac{\partial k^*}{\partial \delta^m} < 0$).

Since $(1 - \kappa_H) - 1 < 0$, the size of middle class and an indifferent point of the elites have negative impact ($\frac{\partial k^*}{\partial \delta^m} < 0$). As the size of middle class increase ($\delta^m \uparrow$), human capital becomes important to an economy which means the cost of human capital in repression is relatively higher ($\kappa_H \uparrow$). It is because skilled labor might be killed or get injured under political violent situation. Eventually, this makes an indirect utility of the rich under repression decreases ($V^r(R) \downarrow$), so the critical point declines ($k^* \downarrow$) at a decrease of the rich's utilities. At the critical point where ($V^r(R) = V^r(D)$) and $k^* = K/L$, a decrease in k^* means capital intensive ratio is relatively lower ,in other words ; human capital intensive is relatively greater. If middle class is a median voter ,then full democracy is controlled by the interest of middle class (τ^m) that make the rich are indifferent between partial and full democracy ($\tau^F D = \tau^P D = \tau^m$). Hence, this political system is more likely to be full democracy when human capital become more important to an economy (P(FD)↑, P(R)↓).

Proposition Case 1: assume that only the elites own capital ($K_r > 0, K_m = 0$) and land ($L_r > 0, L_m = L_p = 0$), and at the critical point $V^r(D) = V^r(R)$ and $k^* = K/L$ hold .

- If an income of the middle class increases ($\theta^m \uparrow$) then they want to lower income redistribution ($\tau^m \downarrow$) which make capital investment is more attractive ($K \uparrow$). As the society become more capital intensive, the cost of losing capital under repression is higher (κ_H). The rich prefer partial democracy to repression.

- if $\delta^m \uparrow$ and $\delta^p < 1/2$, the middle class is a median voter. Because human capital is relatively greater, the cost of skilled labor would get killed or die during repression increases ($\kappa_H \uparrow$). Then, the rich are indifferent between full and partial democracy when the middle class is a median voter ($\tau^{FD} = \tau^{PD} = \tau^m$). Thus, the rich prefer full democracy to repression.

6.1.2 An effect of capital inequality on democratization

To understand the role of middle class on democratization under capital inequality conditions, in this section the model assuming that every social class has the rights to own an equal amount of land ($L_r = L_m = L_p$). There are four inputs of the production function. The elites earn income from holding capital and land. The middle class as human capital and land owner receive returns to skills and land. Finally, the poor earn wages and return to land. Hence, the second aggregate production function can be written as:

$$Y = (K + \sigma L)^{\theta^r} (E(1 - \beta)H + \sigma L)^{\theta^m} (\beta N + L)^{\theta^p} = \bar{y} \quad (6.5)$$

where θ^i is a share income of an individual i ; $i \in r, m, p$, δ^r is the size of the rich, K is capital, L is land, H is human capital, N is unskilled labor, $C(\tau^D)$ is the cost of collecting tax, β is an elasticity of substitution between skilled and unskilled labor, σ an elasticity of substitution between capital and land, θ^i is a share income of individual i ; $i \in r, m, p$, \bar{y} an average national income.

In this case, an indirect utility of the elites if they choose democracy can be written as:

$$V^r(D) = [1 + \frac{\tau^D}{\theta^r}(\delta^r - \theta^r) - \frac{\delta^r}{\theta^r}C(\tau^D)](K + \sigma L)^{\theta^r} (E(1 - \beta)H + \sigma L)^{\theta^m} (\beta N + L)^{\theta^p}$$

Note that the redistributive rate under democracy is $\tau^D \in (\tau^m, \tau^p)$. If the middle class is a median voter ($\delta^p < 1/2$), then democratic redistributive rate is set by the middle class ($\tau^D = \tau^m$). But, If the poor are majority people ($\delta^p \geq 1/2$) then an income redistributive rate is set by the poor which is ($\tau^D = \tau^p$). It is because the middle class is richer than the poor, so the redistributive rate of the middle class is lower than the poor as $\tau^m < \tau^p$. Therefore, $V^r(D, \tau^m) > V^r(D, \tau^p)$.

If the rich choose repression then their indirect utility is:

$$V^r(R) = ((1 - \kappa_k)K + \sigma(1 - \kappa_L)L)^{\theta^r} ((1 - \beta)(1 - \kappa_H)EH + (1 - \kappa_L)L)^{\theta^m} (\beta N + (1 - \kappa_L)L)^{\theta^p}$$

Here, κ denotes the cost of repression such as the cost of losing capital (κ_K), the cost of destroyed land (κ_L), κ_H is the cost of damaged human capital, σ an elasticity of substitution between capital and land, θ^i is a share income of individual i ; $i \in r, m, p$, E is an elasticity of substitution between skilled and unskilled labor.

The rich prefer democracy to repression when:

$$V^r(D) \geq V^r(R)$$

$$\left[1 + \frac{\tau^D}{\theta^r}(\delta^r - \theta^r) - \frac{\delta^r}{\theta^r}C(\tau^D)\right] \geq \left[\frac{((1 - \kappa_k)K + \sigma(1 - \kappa_L)L)}{(K + \sigma L)}\right]^{\theta^r} \left[\frac{((1 - \beta)(1 - \kappa_H)EH + (1 - \kappa_L)L)}{(1 - \beta)EH + L}\right]^{\theta^m} \left[\frac{(\beta N + (1 - \kappa_L)L)}{\beta N + L}\right]^{\theta^p}$$

Let $k = K/L$ represent capital to land ratio, $h = H/L$ is human capital to land ratio and $n = N/L$ is unskilled labor to land ratio. Then, the rich are indifferent between repression and democracy at the critical points.

$$V^r(D) = V^r(R)$$

$$\left[1 + \frac{\tau^D}{\theta^r}(\delta^r - \theta^r) - \frac{\delta^r}{\theta^r}C(\tau^D)\right] = \left[\frac{((1 - \kappa_k)k^* + \sigma(1 - \kappa_L))}{(k^* + \sigma)}\right]^{\theta^r} \left[\frac{((1 - \beta)(1 - \kappa_H)Eh^* + (1 - \kappa_L))}{(1 - \beta)Eh^* + 1}\right]^{\theta^m} \left[\frac{(\beta n^* + (1 - \kappa_L))}{\beta n^* + 1}\right]^{\theta^p}$$

Next, rearranging an equation above to find the critical points of the rich k^* , h^* , n^* .

$$k^* = \frac{\sigma[(1 - \beta)(1 - \kappa_H)Eh^* + (1 - \kappa_L)]^{\frac{\theta^m}{\theta^r}} [\beta n^* + (1 - \kappa_L)]^{\frac{\theta^p}{\theta^r}} (1 - \kappa_L)}{\left[1 + \frac{\tau^D}{\theta^r}(\delta^r - \theta^r) - \frac{\delta^r}{\theta^r}C(\tau^D)\right]^{\frac{1}{\theta^r}} [(1 - \beta)Eh^* + 1]^{\frac{\theta^m}{\theta^r}} [\beta n^* + 1]^{\frac{\theta^p}{\theta^r}} - [(1 - \beta)(1 - \kappa_H)Eh^* + (1 - \kappa_L)]^{\frac{\theta^m}{\theta^r}}}$$

$$\frac{-\left[1 + \frac{\tau^D}{\theta^r}(\delta^r - \theta^r) - \frac{\delta^r}{\theta^r}C(\tau^D)\right]^{\frac{1}{\theta^r}} [(1 - \beta)Eh^* + 1]^{\frac{\theta^m}{\theta^r}} [\beta n^* + 1]^{\frac{\theta^p}{\theta^r}}}{[\beta n^* + (1 - \kappa_L)]^{\frac{\theta^p}{\theta^r}} (1 - \kappa_K)} \quad (6.6)$$

$$h^* = \frac{\left[\frac{((1-\kappa_k)k^* + \sigma(1-\kappa_L))}{k^* + \sigma} \right]^{\theta^r} \left[\frac{\beta n^* + (1-\kappa_L)}{\beta n^*} \right]^{\theta^p} (1-\kappa_L)}{(1-\beta)E \left[1 + \frac{\tau^D}{\theta^r} (\delta^r - \theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D) \right]^{\frac{1}{\theta^m}}} \frac{- \left[1 + \frac{\tau^D}{\theta^r} (\delta^r - \theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D) \right]^{\frac{1}{\theta^m}}}{-(1-\kappa_H) \left[\frac{((1-\kappa_k)k^* + \sigma(1-\kappa_L))}{k^* + \sigma} \right]^{\theta^r} \left[\frac{\beta n^* + (1-\kappa_L)}{\beta n^*} \right]^{\theta^p} \left[\frac{1}{\theta^m} \right]} \quad (6.7)$$

$$n^* = \frac{(1-\kappa_L) \left[\frac{((1-\kappa_k)k^* + \sigma(1-\kappa_L))}{k^* + \sigma} \right]^{\frac{\theta^r}{\theta^p}} \left[\frac{(1-\beta)(1-\kappa_H)Eh^* + (1-\kappa_L)}{(1-\beta)Eh^* + 1} \right]^{\frac{\theta^m}{\theta^p}}}{\beta^2 \left[1 + \frac{\tau^D}{\theta^r} (\delta^r - \theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D) \right]^{\frac{1}{\theta^p}} - \left[\frac{((1-\kappa_k)k^* + \sigma(1-\kappa_L))}{k^* + \sigma} \right]^{\frac{\theta^r}{\theta^p}}} \frac{- \left[1 + \frac{\tau^D}{\theta^r} (\delta^r - \theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D) \right]^{\frac{1}{\theta^p}}}{\left[\frac{(1-\beta)(1-\kappa_H)Eh^* + (1-\kappa_L)}{(1-\beta)Eh^* + 1} \right]^{\frac{\theta^m}{\theta^p}}} \quad (6.8)$$

Using the first derivative to test the relationship between an income of the middle class (θ^m) and the critical points (k^* , h^* , n^*) that make the elites are indifferent between repression and transition to democracy.

$$\frac{\partial k^*}{\partial \theta^m} = \frac{\sigma \left[1 + \frac{\tau^D}{\theta^r} (\delta^r - \theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D) \right]^{\frac{1}{\theta^r}} \left[(1-\beta)Eh^* + 1 \right]^{\frac{\theta^m}{\theta^r}} \left[\beta n^* + 1 \right]^{\frac{\theta^p}{\theta^r}} \left[(1-\beta)(1-\kappa_H)Eh^* + (1-\kappa_L) \right]^{\frac{\theta^m}{\theta^r}}}{\theta^r \left[1 + \frac{\tau^D}{\theta^r} (\delta^r - \theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D) \right]^{\frac{1}{\theta^r}} \left[(1-\beta)Eh^* + 1 \right]^{\frac{\theta^m}{\theta^r}} \left[\beta n^* + 1 \right]^{\frac{\theta^p}{\theta^r}}}$$

$$\frac{In(\beta n^* + (1-\kappa_L)) [In((1-\beta)(1-\kappa_H)Eh^* + (1-\kappa_L)) - In((1-\beta)Eh^* + 1)] [(1-\kappa_L) - (1-\kappa_K)]}{-(1-\kappa_K) [(1-\beta)(1-\kappa_H)Eh^* + (1-\kappa_L)]^{\frac{\theta^m}{\theta^r}} [\beta n^* + (1-\kappa_L)]^{\frac{\theta^p}{\theta^r}}]^2}$$

Because $In((1-\beta)(1-\kappa_H)Eh^* + (1-\kappa_L)) - In((1-\beta)Eh^* + 1) < 0$ and after repression the remaining of land is greater than capital $(1-\kappa_L) - (1-\kappa_K) > 0$. Hence, the relationship between an income of the middle class and an indifferent point between repression and democratization of the elites is positive. $\frac{\partial k^*}{\partial \theta^m} > 0$.

$$\frac{\partial h^*}{\partial \theta^m} = \frac{(1-\beta) \left((1-\kappa_L) - (1-\kappa_H) \right) \left(1/\theta^m \left[\frac{((1-\kappa_k)k^* + \sigma(1-\kappa_L))}{k^* + \sigma} \right]^{\theta^r} \left[\frac{\beta n^* + (1-\kappa_L)}{\beta n^*} \right]^{\theta^p} \right)^{\frac{1-\theta^m}{\theta^m}}}{\left[(1-\beta)E \left[1 + \frac{\tau^D}{\theta^r} (\delta^r - \theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D) \right]^{\frac{1}{\theta^m}} - (1-\kappa_H) \right]} \frac{\left[1 + \frac{\tau^D}{\theta^r} (\delta^r - \theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D) \right]^{\frac{1}{\theta^m}} - \left[1 + \frac{\tau^D}{\theta^r} (\delta^r - \theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D) \right]^{\frac{1}{\theta^m}} In \left[1 + \frac{\tau^D}{\theta^r} (\delta^r - \theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D) \right]^{\frac{-1}{(\theta^m)^2}}}{\left[\frac{((1-\kappa_k)k^* + \sigma(1-\kappa_L))}{k^* + \sigma} \right]^{\theta^r} \left[\frac{\beta n^* + (1-\kappa_L)}{\beta n^*} \right]^{\theta^p} \left[\frac{1}{\theta^m} \right]^2}$$

It is because the cost of land under repression is greater than human capital $(1 - \kappa_L) - (1 - \kappa_H) > 0$. Therefore, $\frac{\partial h^*}{\partial \theta^m} < 0$.

$$\frac{\partial n^*}{\partial \theta^m} = \frac{\beta \left((1 - \kappa_L) - 1 \right) \left(\left[1 + \frac{\tau^D}{\theta^r} (\delta^r - \theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D) \right] \frac{1}{\theta^p} \left[\frac{((1 - \kappa_k)k^* + \sigma(1 - \kappa_L))}{k^* + \sigma} \right] \right)^{\frac{\theta^r}{\theta^p}} \left[\frac{(1 - \beta)(1 - \kappa_H)Eh^* + (1 - \kappa_L)}{(1 - \beta)Eh^* + 1} \right]}{\beta \left[\left[1 + \frac{\tau^D}{\theta^r} (\delta^r - \theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D) \right] \frac{1}{\theta^p} - \left[\frac{((1 - \kappa_k)k^* + \sigma(1 - \kappa_L))}{k^* + \sigma} \right] \right)^{\frac{\theta^r}{\theta^p}}}$$

$$\frac{1/\theta^p \ln \left(\frac{(1 - \beta)(1 - \kappa_H)Eh^* + (1 - \kappa_L)}{(1 - \beta)Eh^* + 1} \right)}{\left[\frac{(1 - \beta)(1 - \kappa_H)Eh^* + (1 - \kappa_L)}{(1 - \beta)Eh^* + 1} \right]^{\frac{\theta^m}{\theta^p}} \right]^2}$$

Because $(1 - \kappa_L) - 1 < 0$ and $\ln \left(\frac{(1 - \beta)(1 - \kappa_H)Eh^* + (1 - \kappa_L)}{(1 - \beta)Eh^* + 1} \right) < 0$. So, $\frac{\partial n^*}{\partial \theta^m} > 0$.

The critical points of the rich include k^* , h^* , n^* which give $\frac{\partial k^*}{\partial \theta^m} > 0$, $\frac{\partial h^*}{\partial \theta^m} < 0$, $\frac{\partial n^*}{\partial \theta^m} > 0$. The positive sign is dominant, so $\frac{\partial k^*}{\partial \theta^m} > 0$. As a result, if the middle class is relatively richer ($\theta^m \uparrow$), they want lower transfer from the rich ($\tau^m \downarrow$) which mean tax on the rich's income decrease. With lower tax rate, capital investment is more attractive to the rich ($K \uparrow$). Because democracy guarantee that the property belong to the investors, doing repression in capital intensive society is costly to the rich ($\kappa_K \uparrow$). This higher cost of repression makes an indirect utility of the rich if they choose repression declines ($V^r(R) \downarrow$), the critical point increase at a decline indirect utility of the rich. At the indifferent point of the rich when k^* increases, capital to land ratio also increases. In words, capital becomes more important than land in an economic structure, the rich prefer democracy to repression. The rich have to choose either partial or full democracy. In full democracy, political power belongs to the poor as majority voter which mean the rich have to pay redistributive rate at τ^p whereas in partial democracy the middle class is a median voter to set their most preferred tax rate at τ^m . Because the middle class is relatively richer than the poor, $\tau^m < \tau^p$, partial democracy is more attractive to the rich ($V^r(PD) > V^r(FD)$).

To examine the relationship between the size of middle class (δ^m) and democratization, using the first derivative for each critical point (k^* , n^*) respect to s size of middle class (δ^m). Note that the middle class is human capital H, so H is the size of middle class which can be written as δ^m .

$$\frac{\partial k^*}{\partial \delta^m} = \frac{\sigma \theta^m (1 - \beta) \left[1 + \frac{\tau^D}{\theta^r} (\delta^r - \theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D) \right] \frac{1}{\theta^p} [\beta n^* + 1] \frac{\theta^p}{\theta^r} [\beta n^* + (1 - \kappa_L)] \frac{\theta^p}{\theta^r} \left[\frac{(1 - \beta)Eh^* + 1}{\theta^r} \right]^{\frac{\theta^m}{\theta^r}}}{\theta^r K \left[\left[1 + \frac{\tau^D}{\theta^r} (\delta^r - \theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D) \right] \frac{1}{\theta^p} - \left[\frac{((1 - \kappa_k)k^* + \sigma(1 - \kappa_L))}{k^* + \sigma} \right] \right)^{\frac{\theta^r}{\theta^p}} \left[\frac{(1 - \beta)Eh^* + 1}{\theta^r} \right]^{\frac{\theta^m}{\theta^r}} [\beta n^* + 1] \frac{\theta^p}{\theta^r}}$$

$$\frac{\left(\frac{(1 - \beta)(1 - \kappa_H)Eh^* + (1 - \kappa_L)}{\theta^r} \right)^{\frac{\theta^m - \theta^r}{\theta^r}} (1 - \kappa_H) - \left(\frac{(1 - \beta)(1 - \kappa_H)Eh^* + (1 - \kappa_L)}{\theta^r} \right)^{\frac{\theta^m}{\theta^r}} \left[\frac{(1 - \beta)Eh^* + 1}{\theta^r} \right]^{\frac{\theta^m - \theta^r}{\theta^r}}}{- \left[\frac{(1 - \beta)(1 - \kappa_H)Eh^* + (1 - \kappa_L)}{\theta^r} \right]^{\frac{\theta^m}{\theta^r}}}$$

$$\frac{[(1-\kappa_L)-(1-\kappa_K)]}{[\beta n^*+(1-\kappa_L)]^{\frac{\theta^p}{\theta^r}}(1-\kappa_K)^2}$$

Because $[(1-\beta)Eh^*+1]^{\frac{\theta^m}{\theta^r}}((1-\beta)(1-\kappa_H)Eh^*+(1-\kappa_L))^{\frac{\theta^m-\theta^r}{\theta^r}}(1-\kappa_H)-((1-\beta)(1-\kappa_H)Eh^*+(1-\kappa_L))^{\frac{\theta^m}{\theta^r}}[(1-\beta)Eh^*+1]^{\frac{\theta^m-\theta^r}{\theta^r}} < 0$ and $[(1-\kappa_L)-(1-\kappa_K)] > 0$. Therefore, $\frac{\partial k^*}{\partial \delta^m} < 0$.

$$\begin{aligned} \frac{\partial n^*}{\partial \delta^m} &= \frac{\beta((1-\kappa_L)-1)^{\frac{\theta^m}{\theta^p}} \left(\frac{(1-\beta)(1-\kappa_H)\delta^m+(1-\kappa_L)L}{E(1-\beta)\delta^m+L} \right)^{\frac{\theta^m-\theta^p}{\theta^p}} \left(\frac{E(1-\beta)\delta^m+L}{E(1-\beta)\delta^m+L} \right)^{\frac{\theta^m-\theta^p}{\theta^p}}}{\beta^2 \left[1 + \frac{\tau^D}{\theta^r}(\delta^r-\theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D) \right]^{\frac{1}{\theta^p}}} \\ &\quad - \frac{\left(\frac{E(1-\beta)(1-\kappa_H)\delta^m+(1-\kappa_L)L}{E(1-\beta)\delta^m+L} \right) E(1-\beta)}{\left(\frac{E(1-\beta)\delta^m+L}{E(1-\beta)\delta^m+L} \right)^2} \left[\frac{((1-\kappa_K)k^*+\sigma(1-\kappa_L))}{k^*+\sigma} \right]^{\frac{\theta^r}{\theta^p}} \\ &\quad \frac{\left[1 + \frac{\tau^D}{\theta^r}(\delta^r-\theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D) \right]^{\frac{1}{\theta^p}} \left[\frac{((1-\kappa_K)k^*+\sigma(1-\kappa_L))}{k^*+\sigma} \right]^{\frac{\theta^r}{\theta^p}}}{\left[\frac{E(1-\beta)(1-\kappa_H)\delta^m+(1-\kappa_L)L}{E(1-\beta)\delta^m+L} \right]^{\frac{\theta^m}{\theta^p}} \left[\frac{((1-\kappa_K)k^*+\sigma(1-\kappa_L))}{k^*+\sigma} \right]^2} \end{aligned}$$

It is because the remaining of land after repression minus one is negative sign as $(1-\kappa_L)-1 < 0$. Therefore, $\frac{\partial n^*}{\partial \delta^m} < 0$.

Overall, as the size of middle class increases ($\delta^m \uparrow$), the middle class becomes a median voter in the political system ($\delta^p < 1/2$). This economic structure is relatively greater in human capital mean the cost of skilled labor under repression increases (κ_H). Because human capital is easily to get killed under repression, an indirect utility of the rich decreases in relatively greater human capital intensive ($V^r(R) \downarrow$). The critical points decrease ($k^* \downarrow, n^* \downarrow$) at lower indirect utility of the rich. In words, in human capital intensive society, the middle class is a median voter. In full democracy, median voters have political power to set their most preferred policy rate ($\tau^F D = \tau^m$). As the rich are indifferent between full and partial democracy when the middle class is a median voter ($\tau^F D = \tau^m = \tau^P D$), full democracy is more attractive to the rich than using repression.

Proposition Case 2: assume that only the elites own capital where $K_r > 0, K_m = 0$ and $L_r = L_m = L_p$.

- If the poor are majority people ($\delta^p \geq 1/2$) and the middle class becomes relatively richer ($\theta^m \uparrow$), The richer middle class demand lower transfer ($\tau^m \downarrow$). The future tax rate on income in this society declines. As capital investment is more attractive to investors ($K \uparrow$), an economic structure become more capital intensive. Therefore, partial democracy is more attractive than using repression to the rich.
- If the middle class is a median voter ($\delta^p < 1/2$) and the number of human capital increases ($\delta^m \uparrow$), then $\tau^{PD} = \tau^D$ and $V^r(D) = V^r(PD)$ hold. The elites are indifferent between partial and full democracy. When skilled labor become the most import input to an economy, this human capital society is more likely to be full democracy ($\tau^P D = \tau^F D = \tau^m$).

6.1.3 An effect of land inequality on democratization (redistribute capital equally)

In this section, to test an impact of land inequality on democratization. This case the models expand the rights to own capital to the middle class. The elites are the owner of capital and land. The middle class are skilled labor and the owner of capital. The poor are unskilled labor and own the smallest fraction of land.

The aggregate production function under land inequality can be written as:

$$Y = (K + \sigma L)^{\theta^r} (K + E(1 - \beta)H)^{\theta^m} (\beta N)^{\theta^p} = \bar{y} \quad (6.9)$$

Where Y is output, σ is the elasticity of substitution between capital and land, H is human capital, N is unskilled labor, \bar{y} is an average national income, δ^i is the size of group i ($\sum \delta^i = 1$), θ^i is a share income of individual i ($\sum \theta^i = 1$); $i \in r, m, p$, \bar{y} is an average national income. If the rich democracy, their indirect utilities can be written as:

$$V^r(D) = [1 + \frac{\tau^D}{\theta^r}(\delta^r - \theta^r) - \frac{\delta^r}{\theta^r}C(\tau^D)](K + \sigma L)^{\theta^r} (K + E(1 - \beta)H)^{\theta^m} (\beta N)^{\theta^p}$$

where θ^i is a share income of an individual i ; $i \in r, m, p$, δ^r is the size of the rich, K is capital, L is land, H is human capital, N is unskilled labor, $C(\tau^D)$ is the cost of collecting tax, β is an elasticity of substitution between skilled and unskilled labor, σ an elasticity of substitution between capital and land, θ^i is a share income of individual i; $i \in r, m, p$.

However, if the elites choose to make repression then they face the cost of making repression. Let κ represents the cost of repression. The cost of destroyed capital is κ_K , the cost of

damaged land is κ_L and the cost of human capital is κ_H . An indirect utility of the rich under repression is:

$$V^r(R) = ((1 - \kappa_K)K + \sigma(1 - \kappa_L)L)^{\theta^r} ((1 - \kappa_K)K + E(1 - \beta)(1 - \kappa_H)H)^{\theta^m} (\beta N)^{\theta^p}$$

Then, $(1 - \kappa_K)$, $(1 - \kappa_L)$, $(1 - \kappa_H)$ is the remaining of capital, land and human capital after repression

The rich choose democracy when:

$$\begin{aligned}
 & V^r(D) \geq V^r(R) : \\
 & (K + \sigma L)^{\theta^r} (K + E(1 - \beta)H)^{\theta^m} (\beta N)^{\theta^p} \\
 & \geq \\
 & ((1 - \kappa_K)K + \sigma(1 - \kappa_L)L)^{\theta^r} ((1 - \kappa_K)K + E(1 - \beta)(1 - \kappa_H)H)^{\theta^m} (\beta N)^{\theta^p}
 \end{aligned}$$

At the critical point, an indirect utility of the rich under democracy and repression are equal, so the rich can choose either democracy or repression at this point. Let $k^* = K/L$ is capital to land ratio, $h^* = H/K$ is human capital to capital ratio. k^* , h^* are the critical points that make the elites are indifferent between repression and transition to democracy which can be written as:

$$\begin{aligned}
 & V^r(D) = V^r(R) : \\
 & [1 + \frac{\tau^D}{\theta^r}(\delta^r - \theta^r) - \frac{\delta^r}{\theta^r}C(\tau^D)](k^* + \sigma)(1 + E(1 - \beta)h^*)^{\theta^m} (\beta N)^{\theta^p} \\
 & = \\
 & ((1 - \kappa_K)k^* + \sigma(1 - \kappa_L))^{\theta^r} ((1 - \kappa_K) + E(1 - \beta)(1 - \kappa_H)h^*)^{\theta^m} (\beta N)^{\theta^p}
 \end{aligned}$$

Next, rearranging an equation to find the critical points of the rich (k^* , h^*).

$$k^* = \frac{\sigma \left[(1-\kappa_L)((1-\kappa_K)+E(1-\beta)(1-\kappa_H)h^*)^{\frac{\theta^m}{\theta^r}} (\beta N)^{\frac{\theta^p}{\theta^r}} - (1-\tau^D)^{\frac{1}{\theta^r}} (1+E(1-\beta)h^*)^{\frac{\theta^m}{\theta^r}} (\beta N)^{\frac{\theta^p}{\theta^r}} \right]}{\left[(1-\tau^D)^{\frac{1}{\theta^r}} (1+E(1-\beta)h^*)^{\frac{\theta^m}{\theta^r}} (\beta N)^{\frac{\theta^p}{\theta^r}} - (1-\kappa_K)((1-\kappa_K)+E(1-\beta)(1-\kappa_H)h^*)^{\frac{\theta^m}{\theta^r}} (\beta N)^{\frac{\theta^p}{\theta^r}} \right]} \frac{- (1-\tau^D)^{\frac{1}{\theta^r}} (1+E(1-\beta)h^*)^{\frac{\theta^m}{\theta^r}} (\beta N)^{\frac{\theta^p}{\theta^r}}}{+E(1-\beta)(1-\kappa_H)h^*)^{\frac{\theta^m}{\theta^r}} (\beta N)^{\frac{\theta^p}{\theta^r}}} \quad (6.10)$$

$$h^* = \frac{(1-\kappa_K) \left(\left(\frac{(1-\kappa_K)k^* + \sigma(1-\kappa_L)}{k^* + \sigma} \right)^{\theta^r} (\beta N)^{\theta^p} \right)^{\frac{1}{\theta^m}} - \left[1 + \frac{\tau^D}{\theta^r} (\delta^r - \theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D) \right]^{\frac{1}{\theta^m}}}{\left[1 + \frac{\tau^D}{\theta^r} (\delta^r - \theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D) \right]^{\frac{1}{\theta^m}} - E(1-\beta)(1-\kappa_H) \left(\left(\frac{(1-\kappa_K)k^* + \sigma(1-\kappa_L)}{k^* + \sigma} \right)^{\theta^r} (\beta N)^{\theta^p} \right)^{\frac{1}{\theta^m}}} \quad (6.11)$$

Then, using the first derivative of each critical point (k^* , h^*) with respect to an income of the middle class (θ^m) to test an impact of an income of middle class on democratization ($\frac{\partial k^*}{\partial \theta^m}$ and $\frac{\partial h^*}{\partial \theta^m}$):

$$\frac{\partial k^*}{\partial \theta^m} = \frac{\sigma \left[(1+E(1-\beta)h^*)^{\frac{\theta^m}{\theta^r}} (\beta N)^{\frac{\theta^p}{\theta^r}} ((1-\kappa_K)+E(1-\beta)(1-\kappa_H)h^*)^{\frac{\theta^m}{\theta^r}} \frac{(1-\tau^D)^{\frac{1}{\theta^r}}}{\theta^r} \right]}{\left[(1-\tau^D)^{\frac{1}{\theta^r}} (1+E(1-\beta)h^*)^{\frac{\theta^m}{\theta^r}} \right]} \frac{[In((1-\kappa_K)+E(1-\beta)(1-\kappa_H)h^*) + In(1+E(1-\beta)h^*)][(1-\kappa_L)-(1-\kappa_K)]}{\left[(\beta N)^{\frac{\theta^p}{\theta^r}} - (1-\kappa_K)((1-\kappa_K)+E(1-\beta)(1-\kappa_H)h^*)^{\frac{\theta^m}{\theta^r}} (\beta N)^{\frac{\theta^p}{\theta^r}} \right]^2}$$

Since the cost of destroyed capital is higher than land $(1-\kappa_L) - (1-\kappa_K) > 0$ and $(1+E(1-\beta)h^* + \sigma) - ((1-\kappa_K) + E(1-\beta)(1-\kappa_H)h^*) > 0$. Therefore, $\frac{\partial k^*}{\partial \theta^m} > 0$.

$$\begin{aligned}
\frac{\partial h^*}{\partial \theta^m} &= \frac{\left(\left(\frac{(1-\kappa_K)k^* + \sigma(1-\kappa_L)}{k^* + \sigma} \right)^{\frac{\theta^r}{\theta^m}} (\beta N)^{\frac{\theta^p}{\theta^m}} \right) \left(\frac{-1}{\theta^m} \ln \left(\left(\frac{(1-\kappa_K)k^* + \sigma(1-\kappa_L)}{k^* + \sigma} \right)^{\theta^r} (\beta N)^{\theta^p} \right) - 1 \right)}{\left[1 + \frac{\tau^D}{\theta^r} (\delta^r - \theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D) \right]^{\frac{1}{\theta^m}}} \\
&= \frac{(1-\kappa_K) \left[1 + \frac{\tau^D}{\theta^r} (\delta^r - \theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D) \right]^{\frac{1}{\theta^m}} + E(1-\beta)(1-\kappa_H) \left[1 + \frac{\tau^D}{\theta^r} (\delta^r - \theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D) \right]^{\frac{1}{\theta^m}}}{-E(1-\beta)(1-\kappa_H) \left(\left(\frac{(1-\kappa_K)k^* + \sigma(1-\kappa_L)}{k^* + \sigma} \right)^{\theta^r} (\beta N)^{\theta^p} \right)^{\frac{1}{\theta^m}} } \\
&= \frac{In \left(1 + \frac{\tau^D}{\theta^r} (\delta^r - \theta^r) - \frac{\delta^r}{\theta^r} C(\tau^D) \right) \left(\frac{-1}{\theta^m} \right)}{2}
\end{aligned}$$

It is because $In \left(\left(\frac{(1-\kappa_K)k^* + \sigma(1-\kappa_L)}{k^* + \sigma} \right)^{\theta^r} (\beta N)^{\theta^p} \right) - 1 < 0$ and the remaining of capital is greater than human capital $(1 - \kappa_K) - (1 - \kappa_H) > 0$. Hence, $\frac{\partial h^*}{\partial \theta^m} < 0$.

A positive effect of $\frac{\partial k^*}{\partial \theta^m}$ is greater than negative $\frac{\partial h^*}{\partial \theta^m}$ because the cost of capital is lower than the cost of human capital ($\kappa_K < \kappa_H$). There is a positive relationship between the critical point and an income of the middle class. When the middle class is relatively poorer ($\theta^m \downarrow$), they require higher transfer from the government ($\tau^m \uparrow$). Because the government have a balance budget, they have to increase tax on the rich in order to redistribute to the middle class and the poor. When tax on income is greater, investors move their capital to lower tax countries ($K \downarrow$). Then, the cost of capital under repression decrease which makes an indirect utility of the rich increase ($V^r(R) \uparrow$). A decrease in an indirect utility of the rich decreases the critical point k^* . Note that at the turning point $k^* = k/L$, lower k^* means this society becomes more relatively land intensive. This situation makes the cost of democracy (paying tax) is relatively higher than choosing repression. As a result, the elites prefer repression under land intensity.

Next, testing an impact of the size of middle class on transition to democracy by using the first derivative of each critical point (k^*) with respect to the size of middle class (δ^m).

$$\begin{aligned}
\frac{\partial k^*}{\partial \delta^m} &= \frac{\sigma \left[(1-\tau^D)^{\frac{1}{\theta^r}} (\beta N)^{\frac{\theta^p}{\theta^r}} (\beta N)^{\frac{\theta^p}{\theta^r}} \left((1+E(1-\beta)h^*)^{\frac{\theta^m}{\theta^r}} \frac{\theta^m}{\theta^r} ((1-\kappa_K)+E(1-\beta)(1-\kappa_H)h^*)^{\frac{\theta^m-\theta^r}{\theta^r}} \right) \right]}{\left[(1-\tau^D)^{\frac{1}{\theta^r}} (1+E(1-\beta)h^*)^{\frac{\theta^m}{\theta^r}} (\beta N)^{\frac{\theta^p}{\theta^r}} \right]} \\
&\quad \frac{E(1-\beta)(1-\kappa_H) - \frac{\theta^m}{\theta^r} E(1-\beta) \left((1+E(1-\beta)h^*)^{\frac{\theta^m-\theta^r}{\theta^r}} \right) \left((1-\kappa_L) - (1-\kappa_K) \right)}{- (1-\kappa_K) \left((1-\kappa_K) + E(1-\beta)(1-\kappa_H)h^* \right)^{\frac{\theta^m}{\theta^r}} (\beta N)^{\frac{\theta^p}{\theta^r}} }
\end{aligned}$$

Since $(1 - \kappa_L) - 1 - \kappa_K > 0$ and $(1 + E(1 - \beta)h^* + \frac{\sigma}{k_m^*})^{\frac{\theta^m}{\theta^r}} - ((1 - \kappa_K) + E(1 - \beta)(1 - \kappa_H)h^* + \sigma(1 - \kappa_L))^{\frac{\theta^m}{\theta^r}} > 0$. Therefore, $\frac{\partial k^*}{\partial \delta^m} < 0$.

If the number of the middle class increases until they are median voter ($\delta^m \uparrow$), then an economic structure become more human capital intensive. There is higher cost of human capital under repression because they are easily to get injured ($\kappa_H \uparrow$), so the rich prefer less repression ($V^r(R) \downarrow$). The result $\frac{\partial k^*}{\partial \delta^m} < 0$ implies that the critical point of the rich is lower at a decrease of an indirect utility of the rich if they choose repression. Then, when the rich choose democracy, they have two options which are full democracy and partial democracy. In full democracy, policy rate is set by the middle class as a median voter ($\tau^F D = \tau^m$). Also, in partial democracy the middle class is a median voter who has political power to set their most preferred tax rate ($\tau^P D = \tau^m$). As the rich are indifferent between partial and full democracy ($\tau^F D = \tau^P D = \tau^m$), the probability of full democratization increases.

Proposition Case 3: Assume that the elites and middle class own capital where $K_r = K_m$, but only the elites have the rights to own land ($L_r > 0, L_m = L_p = 0$).

- If the poor are majority people ($\delta^p \geq 1/2$) and the middle class is relatively poorer ($\theta^m \downarrow$), the middle class require a higher income redistribution ($\tau^m \uparrow$). Capital flow out from high tax to low tax countries, then this society becomes more land intensive ($K/L \downarrow$). The cost of repression is relatively lower ($\kappa_K \downarrow$). Therefore, repression is more attractive to the rich.
- If the middle class is a median voter ($\delta^p < 1/2$) and the number of middle class is greater ($\delta^m \uparrow$), then the elites are indifferent between partial and full democracy ($\tau^P D = \tau^D$ and $V^r(D) = V^r(PD)$). Thus, human capital intensive societies tend to be more democratic than land intensity.

CHAPTER VII

CONCLUSION

Finally, this paper divides into three sections including (1) overall results, (2) results table and (3) suggestion policies for the government.

7.1 Summary

To conclude, this study aim to represent the role of the middle class on democratization under capital and land inequality by using theoretical methods based on Acemoglu and Robinson models. The extended models show that the middle class has both positive and negative impact on democratization. It is because the level of democracy depends on an income redistributive rate. The greater redistributive rate leads to lower opportunity of transition to democracy. On one hand, under capital inequality condition the middle class as capital owners becomes relatively richer after trading. In this case, the richer middle class and the rich have similar tax preferences that they both want to pay lower redistributive rate. However, in full democracy the poor as majority group of people can vote for a greater income redistribution which make the richer middle class and the rich have more fear of democratic income redistribution. Because in capital intensive society the middle class and the rich as capital owner concern about trade relationship and they try to avoid political violent situations, partial democracy is more attractive than choosing repression. On the other hand, land intensive society tends to be less democratic when an income of the middle class decreases. The poorer middle class prefer greater redistributive rate from the rich. Under land inequality, when land is the main resource of an economy, the cost of democracy is relatively higher than making repression. It is because in full democracy majority people can vote for land redistribution or an increase in tax on land which make the rich prefer nondemocracy to democracy. In this case the poorer middle class does not have power to drive democracy. However, if the size of middle class is sufficiently large then this type of an economy depends most on human capital productions. The middle class as skilled labor makes the cost of choosing repression is relatively greater than democracy. Moreover, when the middle class is dominant the poor, the redistributive rate in full and partial democracy is set by the most preferred rate of the middle class. This makes the rich are indifferent between full and partial democracy. Therefore, human capital intensive society is more likely to be democratic.

7.2 Results table

Case studies	An impact of middle class's income	An income redistribution	Types of an economic structure	An indirect utility of the rich	Political systems
1. Capital and land inequality	Increase $\theta^m \uparrow$	Decrease $\tau^m \downarrow$	Capital intensive	$V^r(PD, \tau^m) > V^r(D, \tau^p)$	Partial democracy
2. Capital inequality	Increase $\theta^m \uparrow$	Decrease $\tau^m \downarrow$	Capital intensive	$V^r(PD, \tau^m) > V^r(D, \tau^p)$	Partial democracy
3. Land inequality	Decrease $\theta^m \downarrow$	Increase $\tau^m \uparrow$	Land intensive	$V^r(ND, \tau^r) > V^r(D, \tau^p)$	Non democracy

Figure 7.1: An impact of middle class's income on democracy

Case studies	An effect of the size of middle class	An income redistribution	Types of an economic structure	An indirect utility of the rich	Political systems
1. Capital and land inequality	Increase $\delta^m \uparrow$	The middle class as a median voter set redistributive rate, τ^m	Human capital intensive	$V^r(D, \tau^m) = V^r(PD, \tau^m)$	Full democracy
2. Capital inequality	Increase $\delta^m \uparrow$	The middle class as a median voter set redistributive rate, τ^m	Human capital intensive	$V^r(D, \tau^m) = V^r(PD, \tau^m)$	Full democracy
3. Land inequality	Increase $\delta^m \uparrow$	The middle class as a median voter set redistributive rate, τ^m	Human capital intensive	$V^r(D, \tau^m) = V^r(PD, \tau^m)$	Full democracy

Figure 7.2: An effect of the number of middle class on democracy

7.3 Suggestion policies for the government

Overall, the results from the extended mathematical model suggest that to create full democratization the government should focus on expanding the size of middle class such as supporting education policy. It is because human capital is more efficient than unskilled labor and return to skilled is greater than wages. The larger number of skilled labor create higher productivities, an increase in income distribution and better standard of living. As most people depend less on public services, the government spending decreases. With lower cost of public services,

the government can choose to cut redistributive rate. As the cost of democracy decrease, the elites have less fear of the future income redistribution. Therefore, an increase in the size of middle class lead to higher probability of democratization . Moreover, a decrease in land and capital inequality does help to increase probability of transition to democracy. The government should create land reform policy and not too low not too high tax on capital to reduce an inequality. After land redistribution, the middle class and the poor earn higher income from return to land. This land reform creates an increase in income distribution in an economy which help to cut tax burden of the elites (Islam, 2017). When wealth inequality decrease, the cost of fighting agains democracy becomes relatively greater as a result democracy is more attractive.



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