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The Prospect of Factor Market Reforms in China and its Impact on the World Economy

James Xiaohe Zhang*

This paper examines the impact of reforms in China's rural land and labour markets on the aggregate economic welfare in both China and the rest of the world. The hypothesis is that a clearer specification of China's rural land ownership and free mobility of rural labour force across different sectors will have a significant impact on production, employment and international trade patterns in the rest of the world, particularly in agricultural and capital intensive industries and regions. This will result in a large-scale restructuring of the world economy in line with regional specialisation and comparative advantage. Specifically, the natural resource based and capital intensive industries benefit and labour intensive industries suffer from China's labour market liberalisation, but these impacts will be offset somewhat by the land market reforms. The hypothesis is tested by simulations on an applied general equilibrium model (the GTAP Model). Policy implications are generated based on the simulation results.

Field of Research: Aspects of the China Economy and Business; International Economics, Trade and Political Relations

1. Introduction

Before 1949, virtually all the farmlands in China were privately owned. The land was almost evenly distributed after the Communists came to power but was recaptured in the form of collectivization in 1956 when 1.5 billion *mu* of private land (100 million hectare) was taken away from their lawful owners. No compensation was ever paid for an inch of the collectivized land until 1961 in the form of 'family plots' which produced yield level 10 times larger than their communist counterparts (Deng, 2011, p.128 and p.136).[1] After that, for more than 20 years, there was virtually no progress in labour productivity (Deng, 2011, p.135). Although later under Deng Xiaoping's reform in the 1980s 100% of all the farmers quitted collective farming, the collective ownership of agricultural remained.

Another important productive factor, rural labour, was also tightly under the government control until the late 1980s. The labour market in China has been seriously distorted since the late 1950s when the restriction on rural-urban migration was implemented. China is one of the few countries in the world that uses a household registration (*hukou*) regime to prohibit migration not only from rural to urban areas, but also from one province to another. Starting in 1955, the *hukou* regime virtually prohibited inter-sector migration (Cheng and Selden, 1994). The

*Newcastle School of Business, Faculty of Business and Law, University of Newcastle, University Drive, Callaghan, NSW, 2308, Australia
Telephone: 612-49215034, Fax: 612-49216919
Email: James.Zhang@newcastle.edu.au

Chinese citizens were thus broadly divided into two groups: rural residents and urban residents. Since the *hukou* regime differentiated not only rural and urban residents, but also urban residents in different provincial administrative units, the mobility among different provincial units was also prohibited. The *hukou* regime, in conjunction with an elabourate rationing mechanism that restricted food and housing supply to urban dwellers, froze and formalized each individual's job position and eliminated possibilities of changes in residential status. A hierarchic economic structure was thereafter created in China with big cities at the apex, provincial and smaller cities in the middle, and the poorest rural areas at the base.

The restrictions on commercialisation of land and free mobility of labour place the two important productive factors in a special way. As some commentators have acknowledged, in China, it is not the people owns the land, but the land owns the people (Selden, 1993). Acknowledging the heavy loss in efficiency and detrimental impact on income distribution, the ambiguous specification of the rural land ownership and constraints on labour mobility have been widely criticized and reforms aiming at partially privatising the rural land ownership and abolishing the constrains on rural to urban migration have been initiated since the late 1990s (Vendryes, 2010, Mullan, Grosjean and Knotoleon 2011).

So far the labour market reform has been quite successful. In the early 1980s, the government began to encourage farmers to leave agricultural production. A major policy reform took place in 1988, when the control over labour flows was officially relaxed. Farmers were allowed to move into cities if they could provide their own staples and were financially capable of running a business. On the supply side, the adoption of the household responsibility system gave rural households a freedom of allocating productive resources, including labour. On the demand side, the development of rural township and village enterprises and urban private and informal sectors increased the demand for rural labour.

Although the *hukou* is still effective in the major capital cities at the provincial levels, the restrictions on rural to urban migration have been relaxed in most of the smaller and middle-sized cities. This may indicate that the labour market segmentation between the rural and urban sectors has started to end. Even in the large cities, rural migrants now are able to stay as long as they can finance their own living expenses. At the same time, the lifetime employment which has been maintained for the privileged urban workers in the state-owned enterprises for more than 40 years has been replaced by some temporary, casual and fixed-term working contracts. In same provincial cities in the south, the residential status plays no role in worker's recruitment, compensation and promotion prospects. In addition, a special phenomenon known as *rural industrialisation*, which is partially created by the segmentation of the rural and urban labour market in the early period, continues to develop. These rural enterprises as a whole have overtaken the state-owned enterprises to become the largest employer of non-farming workers since 1996 (Zhang, 1999, 2000).

After the deregulation on rural–urban migration in the late 1980s, the size of rural migrants in cities increased rapidly. Rozelle, *et al* (2009) estimated that 154 million rural individuals worked off-farm in 1995, including 54 million long-term migrants. Migration has become the most prevalent form of labour supply to off-farm activities since the late 1990s. Although the exact numbers vary, between 170 million and 200

million members of the rural labour force found a job off the farm ranging from 35 to 40 percentage points of the total rural labour force (Wang *et al.* 2011, p.573). Rural to urban migration has exploded in recent years. Sheng (2008) estimates that the number of migrants reached more than 120 million in 2005. Golley and Meng (2010) also project that under alternative institutional settings, the migrant stock could easily be doubled from the current 150 million to 300 million by increasing either the average length of migrant stay, or the migrant inflow, or both.

The rural land reform has also become a scheme of further economic reforms in the Chinese economy, especially when the export-oriented pattern of economic growth seems running out of its fuel so a new engine for further economic growth has to be sought and initiated. As compared with the reforms in labour market, the reform in rural land ownership is sluggish. While still under an ambiguous title of 'collective' ownership, the land using right for the rural farmers was extended to 30 years in 1993 which was reaffirmed by two laws in 1998 and 2002 (Vendryes, 2010, p.90). Although the 2002 Law on Land Contract gives land transfer rights to peasants, commercial transactions of land between different individuals, particularly for the land use from agricultural to non-agricultural, is still prohibited.

In short, the reforms in both the labour and land markets place China somewhere in between a centrally planned economic regime and a free market economy. This means huge potentials and welfare gains exist not only for China itself, but also for the rest of the world. Since these changes occurred gradually and sometimes quietly, to the best of my knowledge, there have not been sufficient studies undertaking in reference to a comprehensive assessment on the simultaneously implementation of reforms in both the labour and the land markets. This paper attempts to fill the gap.

The objective of this paper is to assess the possible impact of reforms in both the household registration (*hukou*) system and the rural land ownership on the world economy. The task is carried out by running simulations on a well known CGE model, the GTAP model.

This rest of the paper is organized as follows: the next section provides a simple theoretical framework for analysing the issue and reviews some empirical studies in the literature. This is followed by a simple specification of three scenarios for the prospect of further reforms in these markets in Section 3. The results of some primary simulations for these policy scenarios are reported and discussed in Section 4. The final section concludes.

2. Literature Review

As one of the most populous developing countries, China is still a labour abundant economy. According to Lewis (1954), Ranis and Fei, (1961) and Sen (1984), this means that surplus labour exists so that a withdrawal of a substantial percentage of workers from the labour force in the rural sector would have no or little effect on the productivity of the existing labourers. In such an economy, factor rewards will not equal either their marginal productivity or their opportunity cost, and factor price differential exists for the same factors used in different sectors. [2]

According to this theory, the dualism between a capital intensive industrial sector and labour surplus agricultural sector implies a misallocation of resources since more could have been produced through additional investment in agriculture and the use of less capital intensive industrial technologies in the industrial sector. However, if labour were mobile, the urban sector would absorb surplus labour from the rural sector until the marginal products were equalized in the two sectors. The dualism would have ended and the entire economy would allocate labour and other resources in such a way that their respective marginal products were equalised across sectors. This would lead industrialization and the corresponding urbanization, a key stage of development in all less developed countries (Bhattacharya, 1993, p.243).

The economic impact of the dualistic development in the Chinese labour market can be described by a simple two-sector model. We assume that a standard dual economy produces two goods and allocates its labour between the two sectors. Manufactures are produced in the urban sector using labour and capital (but not land), while food is produced in the rural sector using land and labour (but not capital). Labour is therefore the only mobile factor and the other two factors (land and capital) are assumed to be specific. If there were no restrictions to labour mobility, labour would move between sectors until the value of the marginal product of labour in each sector was equal to the wage rate.

The theoretical welfare gain from removing any distortions in labour and land market is well acknowledged (see Zhang 1992, Hertel and Fan, 2006, Whalley and Zhang, 2007, among others). If the rural land reform occurs concurrently with a free labour mobility, one would expect that when the rural wage increases, the rental income falls so there is a redistribution effect between the rural migrants and farmers remaining in the farmland, provided the migrants have to give up their land ownership as a prerequisite for permanent migration. While the migrants gain a wage increase, the urban dwellers may also gain from their investment in capital and housing.

With the help of computable general equilibrium (CGE) models, all these gains and losses can be quantitatively assessed. For instance, using a household-disaggregated national CGE model, Hertel and Fan (2006) find that a combination of WTO accession and factor market reforms significantly improves both efficiency and equality in China. In their model, the labour market liberalization is a relaxation of the *hukou* system in such a way that the ad valorem tax equivalent of the indirect transaction costs are reduced from 81% to 34%—at current levels of migration. This is the portion of the observed differential in wages that has been directly attributed to possession of a *hukou*. Hertel and Fan (2006)'s simulation results show that the labour and land market reforms add about 1.4% and 0.6 to China's GDP respectively, and a reduction of urban-rural income ratio by 0.169 and 0.150 respectively, and a reduction of the Gini ratio by -0.014 and -0.011, respectively. They also show that both factor market reforms serve to increase migration from the relatively low productive agricultural sector, to the higher productive non-agricultural sectors and from the rural to the urban economies. In the case of land reform, 10.7 million additional workers leave agriculture when they are permitted to rent their land out, as opposed to simply leaving it behind.

From their results, it is clear that such reforms could be potentially quite significant. Overall GDP is 2.1% higher and aggregate welfare, measured by the summation of household Equivalent Variations (EV) is 1.8% greater in 2007. Most striking is the impact on relative rural and urban incomes. In 2007, the ratio of urban to rural incomes drops from 2.59 in the baseline to 2.27 in the labour market reform scenario.

By using a similar approach, Whalley and Zhang (2007) discover that when the migration restrictions are removed, all wage and most income inequality disappears. The impacts of *hukou* elimination imply that the per capita income differential falls from 2:1 to 7:10 between the urban and rural sectors, and approximately 48% of the work force and 45% of the population move from rural to urban areas after *hukou* removal. Only around 17% of the population remains in rural areas. They become richer because their average income (GDP per capita) being 1.42 times higher than that in urban areas. Total output increase by about 13%, GDP per capita and income per worker both increase.

Using a similar methodology but switching the focus from domestic income distribution issues in the Chinese economy to its worldwide impact on production and international trade, this paper incorporates both the labour and land reforms in China into the model. Given the fact that China is already the second largest economy, and the largest exporter in the world, any significant change in its domestic economy will affect the rest of the world. Since the real world situation is more complex than any theoretical model can predict, the net impact of the Chinese factor market liberalisations on the world economy cannot be identified without a quantitative assessment underpinned by a multi-national and multi-sector general equilibrium framework. To carry out such an analysis, a well-known computable general equilibrium model, the Global Trade Analysis Project (GTAP) model, is used in this study.

3. Methodology

The GTAP is a global general equilibrium project based in Purdue University in the USA. Version 6 of the GTAP dataset which is based on 2001 data of the world economy is used for the simulations. This data set is chosen because it is the base year when most of the dramatic changes in China's labour market occurred and also the law on land transfer right was passed for the first time.[3] The world economy is disaggregated into ten regions and ten sectors to capture the regional and sectoral impact of the change. The method of the disaggregation is detailed in the Appendix.

Three policy scenarios are simulated. The first scenario assumes that there is a net increase of 10% in unskilled labour endowment in five of the ten sectors in China, as a result of removing the *hukou* system and a consequential increase in labour intensity in these industries. These five sectors, namely textiles and clothing, machinery, construction, services and other light manufactures, are considered conventionally as labour intensive (Leamer, 1984, Zhang,1994, Song, 1996). A 10% increase in labour force in these industries is assumed to be the rural surplus labour that had migrated into the urban areas.[4]

The second scenario assumes that there is an increase in the natural endowment of rural land in the food sector, also by 10%, as a result of fully commercialisation of the rural agricultural land ownership. This specification is based China's past

experience that when the collective production brigades were dismissed, factor productivities increased dramatically (Deng, 2011, p.147).[5] As a result, the output of agricultural production in the rural sector is expected to increase. In the GTAP model, it is treated as 'primary factor augmenting change'.

To capture the combined policy impact of reforms in both the labour and the land markets in China, the third scenarios simply combine the first and second scenarios together.

4. The Results

The simulation results concerning the key economic variables for the three scenarios are summarized in the following tables and the details of the changes at sector levels for each region are available upon request.

4.1 Changes in Regional GDP

The changes in GDP in the ten regions are given in Table 1. It is clearly shown in the table that when GDP increases significantly in China, it declines in almost all the other regions, with the only exception of Australia and New Zealand (ANZ) for the first scenario of perfect labour mobility and with the exceptions of Japan, ASEAN & NICs in Asia for the second scenario of land reform. In the third scenario, when China becomes the only beneficiary, the GDP for all other nine regions is reduced at the range of 0.01% and 0.12%.

Among the three scenarios, the combination of land and labour reform scenario generates the largest GDP gain for China, and this is followed by the labour mobility scenario and land reform scenario. This seems to indicate that while the economic gains from land reform are modest, the gains from labour mobility are dominant. These results are consistent with the findings of Hertel and Fan (2006) and Whalley and Zhang (2007).

4.2 Changes in International Trade

The international trade effects in the 10 regions for the three scenarios are shown in Table 2. The result is consistent with the changes in GDP. While China and the Australasian countries gain an increase in exports in the labour mobility scenario, the exports in all other regions increase in the land reform scenario, although the effect is quite modest. When the two scenarios are combined, labour mobility effect dominates the change so there is no increase in export in all regions except for China and Japan where both exports and imports are increased.

Table 1: Changes in Value of Regional GDP (%)

Region	Scenario 1 (Free Labour Mobility)	Scenario 2 (Land Reform)	Scenario 3 (Land & Labour Reform)
ANZ	0.02	-0.02	-0.01
China	1.92	0.05	1.97
Japan	-0.05	0.01	-0.04
USA	-0.05	0.00	-0.06
EU15	-0.05	0.00	-0.05
ASEAN & NICs	-0.04	0.01	-0.03
Rest of America	-0.05	-0.01	-0.12
Rest of Asia	-0.11	-0.01	-0.06
Rest of Europe	-0.04	0.00	-0.04
Rest of world	-0.01	0.00	-0.01

4.3 Changes in Output in the Industry Level

To further explore the effect of factor market reforms, changes in production in different industries and in different regions are examined. The results are reported in Table 3 for China and in Table 4 for Australia and New Zealand (ANZ), respectively. The regional economy is divided into ten sectors, in addition to a capital good sector.

The results shown in Table 3 reveal a significant increase in output in all industries for the free labour mobility scenario and the combined scenario in China, but metals and machinery industries fall slightly for the land reform scenario. This appears to indicate again when the labour market reform definitely generates production gains, the land reform would have some offset income distribution effect. Specifically, all other industries gain at the expense of metals and machinery industries.

Table 2: Changes in Regional Exports and Imports (%)

Region	Scenario 1 (Free Labour Mobility)	Scenario 2 (Land Reform)	Scenario 3 (Scenario 1 + Scenario 2)
Exports			
ANZ	0.00	0.00	-0.01
China	2.20	0.14	2.06
Japan	-0.03	0.05	0.02
USA	-0.04	0.02	-0.03
EU15	-0.08	0.01	-0.06
ASEAN & NICs	-0.04	0.03	-0.01
Rest of America	-0.11	0.01	-0.10
Rest of Asia	-0.07	0.01	-0.06
Rest of Europe	-0.06	0.02	-0.05
Rest of world	-0.05	0.02	-0.03
Imports			
ANZ	0.05	-0.03	0.02
China	1.71	0.34	2.05
Japan	0.04	0.02	0.06
USA	-0.01	-0.01	-0.02
EU15	-0.06	0.00	-0.06
ASEAN & NICs	-0.03	0.03	-0.01
Rest of America	-0.12	-0.01	-0.13
Rest of Asia	-0.05	-0.01	-0.06
Rest of Europe	-0.04	0.00	-0.03
Rest of world	0.01	0.00	0.01

Table 3: Changes in Production in China (%)

	Scenario 1 (Free Labour Mobility)	Scenario 2 (Land Reform)	Scenario 3 (Scenario 1 + Scenario 2)
Output			
Food	0.94	1.74	2.68
Other Primary Goods	1.67	0.13	1.80
Textiles	4.50	0.07	4.57
Petroleum & Coal	1.85	0.31	2.16
Metals	2.20	-0.19	2.00
Machinery	3.86	-0.29	3.56
Utilities	2.28	0.36	2.64
Construction	2.02	0.34	2.36
Other Manufactures	2.99	0.10	3.09
Service	2.93	0.25	3.18
Capital Goods	1.89	0.32	2.20

As compared with the tremendous economic gains in China, the overall impact on the ANZ economy is slightly pessimistic, though the losses are not evenly distributed across different industries. With food, construction and capital goods sectors gain from the free labour mobility scenario, all these three sectors suffer from the land reform scenario. When the two reform schemes are combined, textiles, machinery and other light manufacturing industries are added into the list of the losing industries in ANZ. The industries gaining in the combined reform scenario include other primary, petroleum and coal, metals, utility construction and capital good sectors. This result is interesting because it reveals a complementary effect created by the labour market reforms and a substitution effect created by the land reforms between China and ANZ. Specifically, when labour market reform benefits agricultural and capital intensive industries in ANZ, land reform hurts these industries. For the labour intensive industries, what one can see from the table is just the opposite.

The overall impact of the two factor market reforms is consistent with what the theoretical model has predicted. While the labour mobility reform generates tremendous economic gains, the land reform has some income redistribution effects in China. Specifically, when the labour intensive manufacturing industries in China benefit the most as a result of removing the labour mobility restrictions, the relatively more capital intensive metals and machinery industries are more likely to suffer from the land reform. This is approximate to a trade liberalisation reform which usually results in an expansion of the industries where the country's comparative advantage is located.

Table 4: Changes in Production in ANZ (%)

	Scenario 1 (Free labour Migration)	Scenario 2 (Land Reform)	Scenario 3 (Scenario 1 + Scenario 2)
Output			
Food	0.11	-0.17	-0.07
Other Primary Goods	0.10	0.07	0.17
Textiles	-0.76	0.10	-0.66
Petroleum & Coal	-0.01	0.01	0.00
Metals	-0.02	0.10	0.08
Machinery	-0.20	0.07	-0.12
Utilities	0.00	0.01	0.01
Construction	0.04	-0.02	0.02
Other Manufactures	-0.09	0.02	-0.07
Service	0.00	0.00	0.00
Capital Goods	0.06	-0.03	0.03

5. Conclusion

Based on a brief review of the distortions and reforms in Chinese labour and land markets, this paper attempts to examine the economic impact of free mobility of the rural labour and a reform in its rural land ownership on the production and trade pattern not only in China but also in the rest of the world. By simulating three general equilibrium experiments based on different assumptions of the Chinese factor market reforms, the theoretical projection of gains in economic welfare and impact of redistribution of national income are conditionally accepted. Specifically, it reveals that while the labour market liberalisation generates unambiguous gains, the land reform may have some impact on income distribution. As a result, when the labour intensive industries gain in China, the capital intensive metals and machinery industries suffer from these reforms.

The international impact to the rest of the world is slightly pessimistic. While modest gains in production and trade are found in Australia and New Zealand, and to a less extent in Japan, all other regions lose slightly in their GDP, as a result of the factor market reforms. While the labour market reform and land reform usually have opposite impact on the economies of the rest of the world, it is the natural resource intensive and capital intensive sectors that may benefit the most from China's factor market liberalisations. This seems to suggest that these reforms in factor market would have a similar impact approximating to a free trade agreement, because the comparative advantage of the regions are better exploited as a result.

Although still very tentative, the findings of this paper have some important policy implications for both China and the rest of the world. Firstly, since the net impact of economic reforms in the Chinese factor market is positive for China, the reforms

should be continued, broadened and deepened. Secondly, the governments in the rest of the world may need to pay a special attention to the factor market reforms in China because these reforms will impact their regions in a way that is approximate to those of free trade deals during the process of globalisation. While labour intensive industries could suffer slightly, the capital intensive sectors are more likely to gain from these changes. Some corresponding policies may be therefore necessary to be placed well before these effects come to realise in a foreseeable future.

Endnotes

[1] From the hateful experience of China's rural land collectivization, Deng (2011:136) concludes that 'People's Communes performed worse than rural co-operatives; . . . co-operatives performed worse than mutual aid groups; and mutual aid groups performed worse than private farmers'. In short, collective farming was a total failure.

[2] What makes China distinctive from the standard Lewis model is that the dual nature of the labour market is not only a consequence of its relatively labour abundance, but also the result of a policy used to isolate the urban labour force from competition and to accumulate capital for its heavy industry oriented industrialization in the pre-reform era.

[3] Based on this dataset, this paper actually conducts a counter-factual approach to show that if the reforms were fully implemented, what would have had happened to the Chinese economy as well as in the rest of the world. This also shows a prospect for some future changes if more complete reforms are adapted, say, an full abortion of the *hukou* system and a genuine privatization of the rural land ownership.

[4] Bhattacharyya and Parker (1999) estimated that in 1995, between 35 and 40% of the agricultural labour force was redundant in China. Cook (1999) also found that the marginal productivity of farm labour is very low in China. Although there are some debates on the diminishing rural surplus labour in China (see Fleisher Fearn and Ye 2011 for details) , Golley and Meng (2011) argue that China still has abundant under-employed workers with very low income in the rural sector. Under alternative institutional settings, the migrant stock could easily be doubled from the current 150 million to 300 million by increasing either the average length of migrant stay, or the migrant inflow, or both.

[5] Deng (2011, p.147) shows that labour productivity increased 50% and land yield increased 200–300% after the old institutional arrangement of the collective people commune was replaced by the lease-holding contracts. Other researchers (e.g., Lin 1992) also indicated that lease-holding of land contributed 87% to the revitalising of China's agricultural productivity; and the ending of the scissors pricing, about 20%.

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Appendix : The Aggregation of Regions

Table A1: The aggregation of the ten regions

No.	Region code	Comprising economies	Description
1	ANZ	Australia, New Zealand	Australia, New Zealand
2	China	China	China
3	Japan	Japan	Japan
4	USA	USA	USA
5	EU15	Austria, Belgium, Netherlands, Luxembourg France, Italy, Germany, UK, Ireland, Denmark, Greece, Spain, Portugal, Sweden, Finland	The 15 member countries of European Union in 1997
6	ASEAN & NICs	Singapore, Malaysia, Indonesia, Philippines, Thailand, Vietnam, Korea, Hong Kong, Taiwan	ASEAN members in 1997 plus Korea, Hong Kong, Taiwan
7	Rest of Asia	India, Pakistan, Bangladesh	India, Pakistan, Bangladesh
8	Rest of America	Canada plus South America	Canada plus South America
9	Rest of Europe	Hungry, Poland, the rest of Central European Association, former Soviet Union, Turkey	Non EU member countries in Europe
10	ROW	Rest of the World	All other countries that are not included in the other 9 groups

Table A2: The aggregation of the ten sectors

No.	Sector Code	Comprising industries	Description
1	Food	Paddy rice, wheat, cereal grain, vegetable, fruits, nuts, oil seed, sugar cane, sugar, beet, crops, cattle, sheep, goat, horses, animal product, raw milk, fishing, meat, dairy product, beverage and tobacco,	Primary production, land and resource intensive goods
2	Other Primary goods	plant-based fibbers, wool, silk-worm cocoons, forestry, coal, oil, gas, minerals	Primary production, land and resource intensive goods
3	Textiles	Textiles, apparel, leather	Labour intensive goods
4	Petroleum and Coal	Petroleum and Coal, chemical, rubber, minerals	Resource based and capital intensive goods
5	Metals	Ferrous metals, metal products	Resource based and capital intensive goods
6	Machinery	Motor vehicles and parts, transportation equipment, electronic equipment, machinery equipment,	Capital or labour intensive goods
7	Utility	Electricity, gas distribution, water,	Capital intensive
8	Construction	Construction, dwelling	Labour intensive
9	Other manufactures	Shoes polish, and other manufactures	Labour intensive
10	Service	Trade, transport (sea, air, road), communication, financial service, insurance, recreation, public administration, education	Labour intensive