ISSN 2187-5677

The Northeast Asian Economic Review

Vol. 2 No. 2 October 2014

Contents

ERINA
Economic Research Institute for Northeast Asia

The Northeast Asian Economic Review

The Northeast Asian Economic Review is an ERINA English-language academic journal to be published twice annually, and we will accept a wide-range of contributions.
While it includes studies on all aspects of economy and society in Northeast Asia, research in areas related to ERINA's research activities is particularly welcome.

Economic Research Institute for Northeast Asia (ERINA)
13th Floor, Bandaijima Building, Bandaijima 5-1, Chuo-ku, Niigata City,
950-0078, Japan

Tel: +81-25-290-5545
Fax: +81-25-249-7550
E-mail: economic-review@erina.or.jp

The Northeast Asian Economic Review

Vol. 2 **October 2014** **Number 2**

Contents

The Special Edition on the Russian Economy

The Special Edition on the Russian Economy

Tomoyoshi Nakajima

This issue is a special edition on the Russian economy. It contains four papers on the theme of the Russian economy.

The paper by Nina Ershova carries out analysis of Japanese direct investment into Russia with a comparison of the Russian Far East and the remaining regions.

The paper by Eiko Tomiyama deals with the competitive strategies of major foreign automobile manufacturers in the Russian market.

The papers by Mayu Michigami and by Elena Shadrina deal with Russian housing conditions and with Sino–Russian energy issues, respectively.

It is hoped that the publishing of such a variety of research outcomes in this issue will deepen understanding of the Russian economy.

Japanese Investment in Russia: Far Eastern and Western Russian Regions Compared

Nina Ershova*

Abstract

Starting from Sakhalin projects and following the production facilities establishment by Japanese companies in manufacturing industries in Russia investment relations between the two countries started expanding rapidly during the recent couple of decades. Today investment cooperation has reached a new development stage, which reveals not only quantitative, but also qualitative changes in the pattern of FDI flows, especially in terms of structure and technological level.

The paper addresses the aspect of regional differences in the approach of Japanese investors toward projects in Russia. The comparison of the major macro-regions that attract Japanese investment (Far-Eastern and Western regions, including Central and North-Western Federal Districts) allows to reveal the critical differences in the industrial distribution that reflect specifics of economic development and investment climate of these territories. However, the Western and Eastern parts of Russia complement each other in terms of investment attraction and contribute to the development of multifaceted and diversified framework for investment cooperation between Russia and Japan.

Keywords: Russia-Japan investment relations, investment projects, regions, Russian Far East

1. The background of investment cooperation

From the historical perspective Japanese-Russian investment relations have passed several stages of development characterized by different organizational forms and level of intensity, but mostly the same field of cooperation (natural resource development) and predominantly in Far Eastern regions of Russia. The periodization of the investment relations development suggested below reflects the emergence of new cooperation areas and forms. These stages can be shortly described in the following way:

1) Collaboration on the basis of natural resources concessions (1920-1940s) under the Soviet-Japanese Basic Convention signed in 1925 may be considered a "start point" of the inflow of Japanese capital into the Soviet economy (Dijkov 1991). The convention aimed at setting bilateral diplomatic and consular relations between two countries as well as postwar stabilization in the Far East region. It granted Japanese companies a right to engage in concession projects in coal-mining industry and in oil extraction.

2) The peculiarities of the participation of Japan and Russia in the system of international economic relations have led to the investment collaboration in the sphere of natural resource development in Siberia and Far East on the basis of compensation agreements (1960-1980s). Such projects concentrated in forestry and fuel industry (coal mining). According to the terms and conditions of compensation agreements the Japanese side provided equipment under favorable credit terms for the joint enterprise, while the Soviet side took an obligation to supply to Japan a particular volume of the enterprise output. Therefore, Japanese manufacturing industry reached an extensive market for the equipment and a stable source of raw materials and semi-

finished products, while the Soviet side gained access to additional productive capacities and long-term loans as well as high-quality goods for internal market and export.

3) Joint ventures creation and cooperation within Special Economic Zones in the Far East (late 1980-1990s). The issue of decree on joint ventures in the Soviet Union in 1987 became the first step to the creation of regular legal framework for foreign investment. Foreign companies got an opportunity to engage in a wider range of spheres and diversify investment flows. By 1991 49 joint Japan-Soviet enterprises operated in USSR, they represented less than 2% of all joint ventures with foreign capital. Japan took 11th place by the number of joint ventures in Soviet Union among developed capitalist countries in 1991. A half of joint enterprises operated in timber or fishing industry (from 1987 till 1991 17 joint ventures in fishery have been founded in USSR). The aggregate volume of investment equaled to 50 mln. Rubles and the share of Japanese companies in the enterprise equity capital accounted to about 30% (Dijkov 1991), the rest of ventures were in services.

4) Sakhalin projects, which are carried out on the basis of international cooperation with participation of Japanese companies under Production Sharing Agreements, can be regarded as a new stage of investment cooperation development. 30% of Sakhalin 1 project belongs to Japanese SODECO consortium (Sakhalin Oil & Gas Development Co. Ltd) and 22.5% of Sakhalin 2 – to Mitsui Sakhalin Holdings B.V. (subsidiary of Mitsui) and Diamond Gas Sakhalin (subsidiary of Mitsubishi) (12.5 and 10% respectively). Although Sakhalin projects represent the largest share of Japanese-Russian investment cooperation (in the structure of total investment stock by Japanese companies they account to about 86% of about 10 bln USD total invested by December 2013)[1], from statistical point of view they are regarded as "other" type of investment, i.e. they are not included in FDI for the reasons of finance mechanisms that imply funding via operator's special accounts.

Thus, most of investment projects specialized in resources development (especially timber and fuel). Due to geographical location and compliance with the investment aims the attention of Japanese investors was focused on the Far East of Russia, therefore, this region has always been playing an extremely important role in the development of economic relations between two countries.

Recent decade has seen several new trends in the development of Japanese-Russian investment relations. First of all they included fast and continuous growth of direct investment inflow volume: 31-fold increase of stock from 2004 to 2012; diversification of industrial structure: increase of FDI in manufacturing; diversification of Japanese direct investment regional distribution. However, despite all qualitative changes in Japanese direct investment trends, they still represent quite a modest share of total Japanese investment in Russia – only about 10% (in 2012)[2]. The major volume of Japanese investment in Russian economy is represented by indirect investment into the extracting sector of the Far Eastern region of Russia. The prevalence of indirect investment causes huge difference in the regional and sectorial structure of total and direct investment flow from Japan to Russia and makes it impossible to analyze Japan-Russia investment relations without referring to the investment type.

2. Regional and structural trends Japanese investment

2.1. Total investment of Japanese companies

Keeping this in mind let's address first to the overall trends of investment activities of Japanese companies in Russia in recent years. The Japanese investment stock in Russia almost approached 10.8 bln USD in 2012[3], with the share of Far Eastern Federal District (FEFD) accounting for 87% of that volume. Central Federal District (CFD) that attracts more than a half of total inward investment in Russia accounted for only 10% of Japanese investment stock (Table 1). North-Western Federal District (NWFD) ranked third with less than 2%. Other districts didn't reach a 1% share, therefore it would be reasonable to consider these 3 districts for further analysis.

Table 1 : Japanese Investment Stock Distribution by Federal Districts, 2012

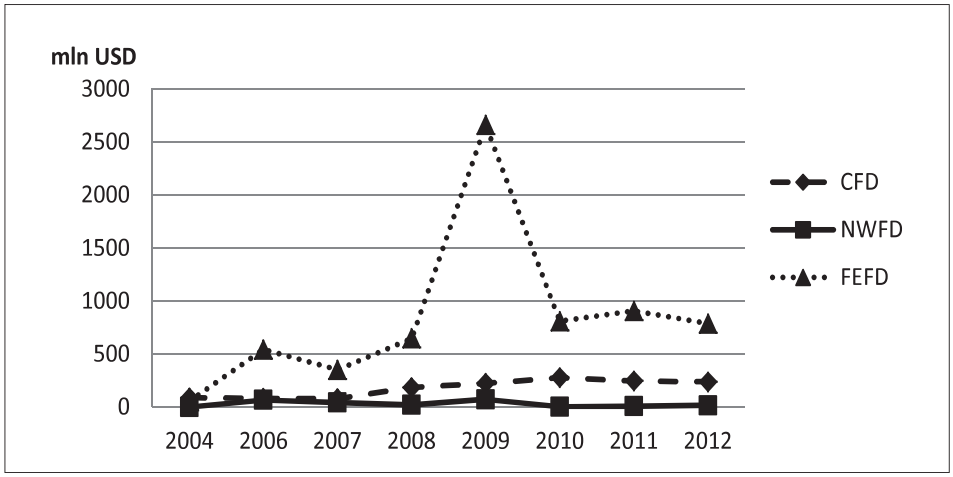
	Japan		All countries		
	Investment stock (2012, mln USD)	Share of Federal Districts in total volume (2012, %)	Investment stock (2012, bln USD)	Share of Federal Districts in total volume (2012, %)	Share of Japanese investment stock in total by regions (2012, %)
Russian Federation	10,778.90	100	362.366	100	2.98
Central Federal District	1,097.30	10.18	200.538	55.34	0.55
Moscow*	681.8	*62,13**	149.7247	*74,66**	0.46
North-Western Federal District	181.5	1.68	38.5717	10.64	0.47
Saint-Petersburg*	181.5	*100,00**	20.9136	*54,22**	0.87
Southern Federal District	5.8	0.05	15.1071	4.17	0.04
North-Caucasian Federal District	0	0	1.5047	0.42	0
Volga Federal District	30.2	0.28	15.8006	4.36	0.19
Ural Federal District	0.5	0	26.1243	7.21	0
Siberian Federal District	47.8	0.44	11.9888	3.31	0.4
Far Eastern Federal District	9,415.90	87.35	53	14.55	17.86

*Moscow - percentage of CFD volume, St.Petersburg - from NWFD volume
Source: Unified Interdepartmental Statistical Information System, Federal State Statistic Service

It is also worth noting that Japan accounts for about 3% of the total foreign investment stock in Russia while in FEFD its share increases to almost 18% (Table 1). Underlying this trend are multiple Japanese investment projects and trade developed in the region during decades, neighboring location and the abundance of resources that attract investors.

In 2010-2012 the annual inflow of Japanese capital to the regions of FEFD equaled to 700-800 mln USD following a peak of 2.7 bln USD in 2009, while the central regions of Russia received 3-times less (200-250 mln USD) annually (Figure 1).

Figure 1 : Japanese investment inflow to Russia for CFD, NWFD and FEFD, 2012



Source: Unified Interdepartmental Statistical Information System, Federal State Statistic Service

The sectorial structure analysis of inward Japanese investment in 3 Federal districts reveals significant difference in the approach of Japanese investors towards regions and reflects the specific features of economic activities prevalent and typical for these territories. Almost all (98%) investment in FEFD is stocked in extraction and mining industries, forestry and agriculture are also worth mentioning with 1.11% and only 0.5% goes to manufacturing in the Far Eastern regions (Table 2). The structure of Japanese investment in the Central Federal District is completely different: manufacturing and wholesale and retail trade represent about 84% of total volume. Investment in real estate and lease and Finance follow with 6.4 and 4% respectively. In North-Western Federal district Japanese capital is highly concentrated in manufacturing (99.7%), the rest is invested to wholesale and retail trade sector.

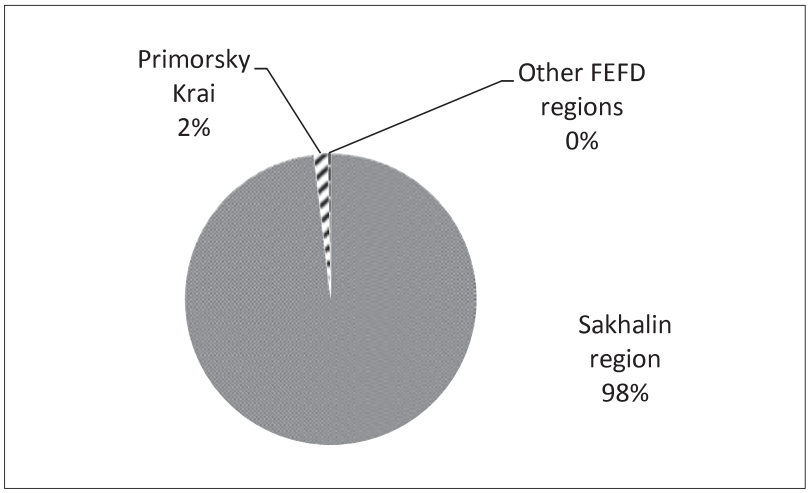
Table 2: Japan stock investment structure for RF, FEFD, CFD, NWFD (2012, %)

	Russian Federation	FEFD	CFD	NWFD
Total	100	100	100	100
Manufacturing	6.09	0.47	36.25	99.71
Construction	0.032	0	0.29	0
Wholesale and retail trade	5.38	0.09	47.52	0.27
Transportation and communication	0.15	0.11	0.5	0
Finance	0.41	0	4.04	0
Real estate and lease	0.81	0.17	6.4	0
Forestry and agriculture	1.48	1.11	5	0
Fishery	0.03	0.04	0	0
Extraction and mining	85.62	98	0	0

Source: Unified Interdepartmental Statistical Information System, Federal State Statistic Service

Within Far Eastern Federal District the distribution pattern of Japanese investment looked the following way: Sakhalin region with its shelf gas and oil extraction projects and gas liquefaction facilities where Japanese companies are largely engaged, accounts for about 98% of total investment stock volume or 9.24 bln USD (Figure 2).

Figure 2: Regional distribution of Japanese investment stock in FEFD, 2012



Source: Unified Interdepartmental Statistical Information System, Federal State Statistic Service

Primorsky Krai with 2% (145 mln USD) is ranked second, although actually it is the FEFD region with the widest range of sectors represented in investment relations with Japan: almost equal share of total (8-6%) is distributed between timber processing, transportation and communication and wholesale and retail trade (Table 3). Investment in agricultural sector accounts for the biggest share – 72%, also chemical production and real estate operations attract a noticeable volume – 3.5 and 3.2% respectively.

Table 3: The structure of Japanese investment stock in some regions of FEFD, 2012, %

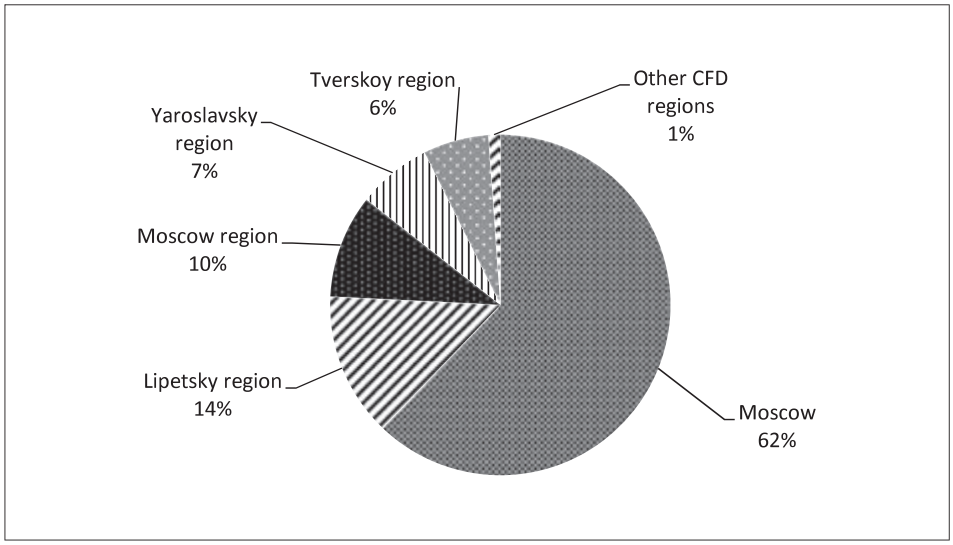
	Primorsky Krai	Sakhalin region
Forestry and timber processing	7.84	
Chemical production	3.21	
Wholesale and retail trade	5.83	
Transportation and communication	7.09	
Real estate and lease	3.54	0.12
Agriculture	72	
Extraction and mining		99.86
Other industries	0.52	0.02

Source: Unified Interdepartmental Statistical Information System, Federal State Statistic Service

Within FEFD Republic of Sakha (Yakutia) is also worth mentioning: although its share doesn't exceed 0.3%, the whole investment volume (27.6 mln USD) is accumulated in diamond extraction and geological exploration and engineering.

The investments of Japan in CFD are mainly directed to Moscow (62%, 681 mln USD), where they distribute mostly between such sectors as wholesale and retail trade (73%), real estate and lease (10.3%), agricultural (mainly food) production (8%) and finance (6.4%) (Figure 3).

Figure 3: Regional distribution of Japanese investment stock in CFD, 2012



Source: Unified Interdepartmental Statistical Information System, Federal State Statistic Service

Actually the CFD investment inward stock from Japan is the most diversified in terms of regional distribution: except from Moscow there are 4 more big recipient region such as Lipetsky region (14 %, 150 mln USD), Moscow region (10%, 108 mln USD), Yaroslavsky (7%, 77 mln USD) and Tverskoy regions (6%, 68 mln USD) (Table 4). However the sectorial structure within the 3 of them is not diversified at all as the Japanese investments are engaged only in particular projects for each region: rubber production on Yokohama plant in Lipetsky region, Hitachi Kenki excavators and large construction vehicles production in Tverskoy region, Komatsu (excavators and other construction vehicles) and Mitsui (equipment for oil-processing plants) in Yaroslavsky region.

Table 4: The structure of Japanese investment stock in some regions of CFD, 2012, %

	Moscow	Lipetsky region	Moscow region	Tverskoy region	Yaroslavsky region
Rubber production		99.99			
Non-metal mineral production			36.63		
Other manufacturing			41.5	100	100
Wholesale and retail trade	73.02		21.03		
Finance	6.37		0.84		
Real estate and lease	10.3				
Agriculture	8.06				
Other industries	1.93	0.01	0.01		

Source: Unified Interdepartmental Statistical Information System, Federal State Statistic Service

Other regions of CFD are not represented with large volumes.

In NWFD almost all Japanese capital is concentrated in Saint-Petersburg, therefore the sectorial distribution pattern is the same as for the whole federal district.

To sum it up, the investment activity of Japanese companies is concentrated in 2 macro

regions of Russia – the Far East (FEFD), and the Western regions (namely CFD and NWFD). These territories account for about 99% of Japanese investment stock in Russia (including direct, portfolio and other (the prevalent) types of investment). Japanese investment effectively specialize in particular industries depending on the investment environment and production potential of Russian regions. The resources availability, infrastructural development, market conditions and requirements play a critical role in formation of the final pattern of capital distribution between regions and industries. In FEFD the investment project are carried out in extraction and mining sector, forestry and timber, some manufacturing. Quite different pattern is shown by CFD: investment is concentrated in wholesale and retail trade, manufacturing, real estate and finance sectors, while NWFD is dealing almost with manufacturing projects only.

2.2. Direct investment of Japanese companies

The most large-scale investment projects involving Japanese capital are the Sakhalin shelf oil and gas extraction projects and Sakhalin LNG plant. They account for more than 85% of all inward investment stock. However, almost all investment in Sakhalin projects is indirect capital of "other" type from statistical viewpoint. It is administered through loans and via project operating company's special accounts. If we take a look at the trends in direct investment from Japan that exclude Sakhalin projects, the picture is absolutely different.

As far as the current Japanese FDI inflow to Russia is concerned, there are 2 major tendencies to be pointed out: significant growth of FDI volume in the recent years and important changes in its sectorial distribution structure.

During the period of 2008-2012 the volumes of FDI by Japanese companies into Russian economy showed a record high: for instance, the flow of Japanese investments in 2012 exceeded the stock accumulated-by 2008 (Table 5). According to JETRO data the FDI stock experienced more than 31-fold growth during the past 8 years starting from 2004.

Table 5: Japanese FDI flow and stock in Russia 2004-2010 (mln USD)

	2004	2005	2006	2007	2008	2009	2010	2011	2012
FDI inflow	49	95	160	99	306	391	350	339	757
FDI stock	87	157	258	373	668	954	1220	1725	2734

Source: Japan External Trade Organization (JETRO) – Japanese Trade and Investment Statistics – FDI Flow and FDI Stock (based on Balance of Payments, net)

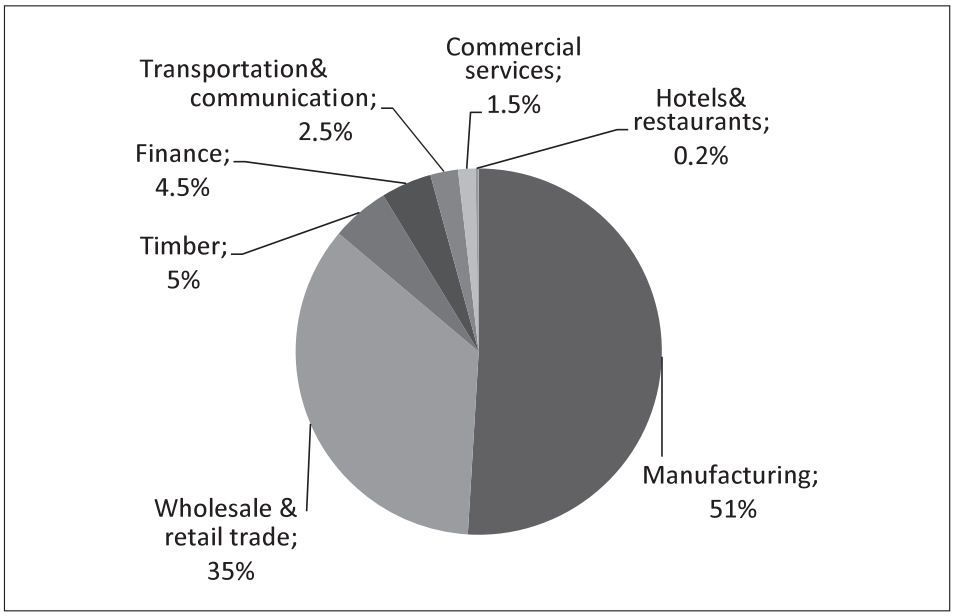
Such an upturn is to a certain extent a result of low initial level of Japanese FDI in Russian economy. This fact becomes obvious from the position of Japan as a foreign investor in Russia in comparison to other countries. Despite the high growth rates, Japanese investment account for quite a small proportion of FDI in Russia. For instance, in 2012 Japan was the 10th country in terms of direct investment in equity capital accounting for 2.05% of total[4]. However, the indicator of share in total is strongly affected by the fact that the top investors in equity capital are mainly represented by offshore territories (Bahama, Bermuda and Virgin Islands, Netherlands etc.).

Despite the relatively stable and dynamic growth of Japanese company's presence in Russia it is still obvious that even now the scale of real activities is still much below the potential of investment relations between two countries.[5] While the share of Japanese companies in cumulative FDI in Russia is less than 1%, Russia accounts for about 0.22% of total investment

in the regional distribution of Japanese companies' direct equity capital investment structure.[6] On the other hand, as in case of Sakhalin projects, official statistics do not always reflect the real situation. The errors often occur due to the complexity of funding schemes and statistical methodology weakness that do not allow registering FDI as direct type of investment in some cases. For instance, in case of Japan Tobacco International the financing is carried out through European branches. As a result statistically these investments are not regarded as Japanese FDI. And this case is far from being unique. According to the Ministry of Economic Development of Russia estimations the volume of Japanese FDI in fact accounts to about 5 bln USD.[7] But even in this case the improvement of investment indices for both countries would be insignificant.

A major shift in investment pattern concerns industrial distribution structure. The direct capital is mostly concentrated in two sectors – manufacturing and trade (retail and wholesale) – 51 and 35% respectively (Figure 4). Given the dynamic growth of capital inflow into manufacturing sector (on average about 2-fold inflow volume increase annually for the past 5 years) we can conclude that the technological level of Japanese FDI inflow in Russian economy is gradually rising. For instance, in 2013 manufacturing accounted for more than 60% of the whole Japanese FDI inflow into Russian economy.[8]

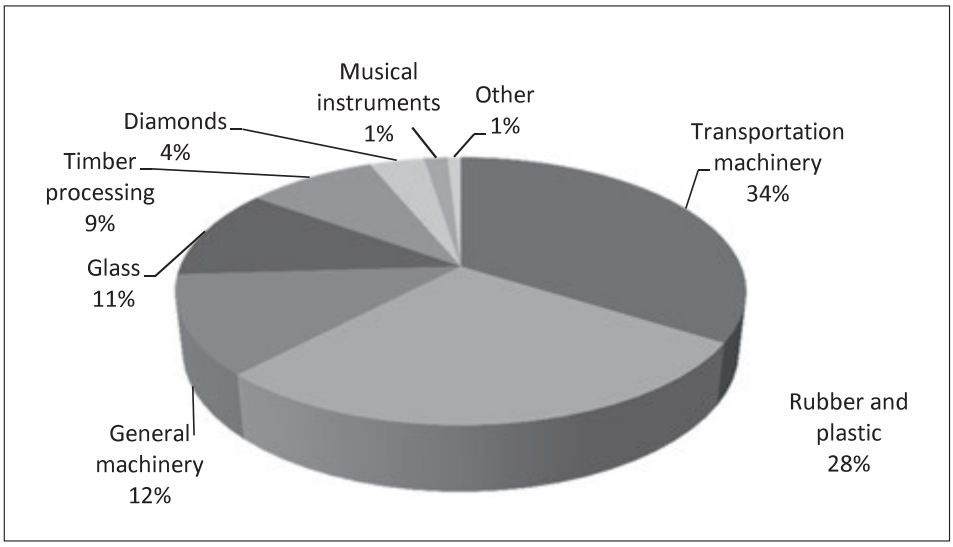
Figure 4: Japanese FDI stock structure by industry, 2012



Source: Unified Interdepartmental Statistical Information System, Federal State Statistic Service

As far as the distribution within the manufacturing sector is concerned in 2012 about 1/3 of FDI stock was concentrated in transportation equipment production, 28% - in rubber and plastic products manufacturing, 12% in general machinery and 11% in glass production (Figure 5). Also timber processing, diamonds cutting and musical instruments production spheres are quite representative in terms of Japanese direct investment stock.

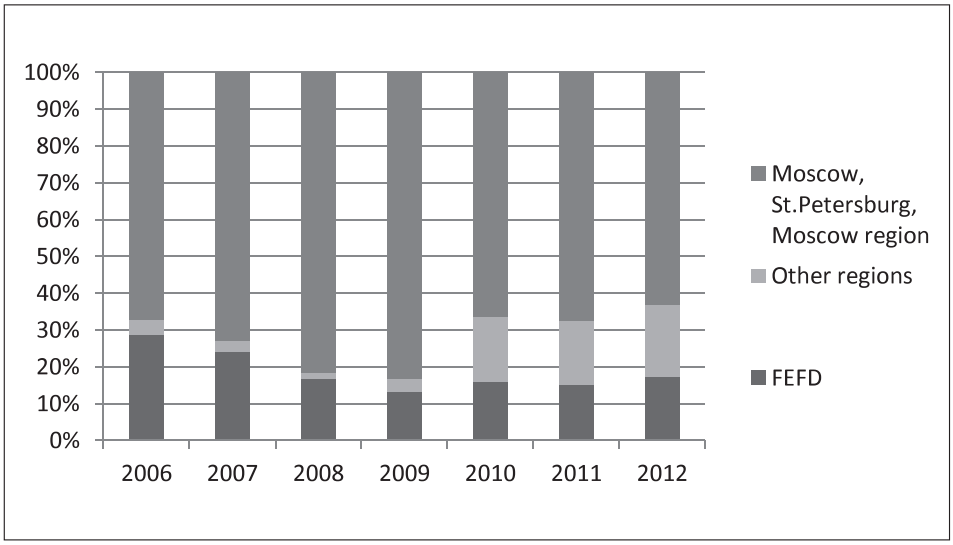
Figure 5: Japanese manufacturing FDI stock structure by industry, 2012



Source: Unified Interdepartmental Statistical Information System, Federal State Statistic Service

In terms of regional distribution of Japanese direct investment to Russia a trend of investment directions diversification becomes obvious starting from 2010. While in 2006 the share of FEFD and 3 regions of CFD, namely Moscow, Saint Petersburg and Moscow region accounted for 96% of total, by 2012 the share of other regions increase to almost 20% (Figure 6). The share of the Far Eastern Federal District regions reduced from 29 to 17% regardless of 70% growth of investment stock on average within the period mentioned. The main recipients were Primorsky and Khabarovsky Krai as well as the Republic of Sakha (Yakutia).

Figure 6: Japanese FDI stock regional distribution trend (FDI stock share of particular regions, %)



Source: Unified Interdepartmental Statistical Information System, Federal State Statistic Service

The leading regions attracting Japanese FDI in 2012 included Moscow and St. Petersburg (47 and 17% respectively), but Lipetsky region replaced Moscow region as №3 top recipient (11.3 vs. 10.1%). Together with Tverskoy, Nizhegorodsky and Yaroslavsky regions this region contributed to the distribution diversification greatly due to the dramatic FDI inflow increase. The share of manufacturing investment in Moscow region reaches 98% while in Moscow 86% of total Japanese direct capital is stocked in the wholesale trade.

Almost each of the leading regions attract Japanese FDI to a narrow range of (or even single) particular industries which reflects the region's specialization and market conditions. For example, St. Petersburg attracts 93% of total Japanese investment stock in transportation equipment production in Russia, Primorsky Krai and Khabarovsky Krai attract 90% of FDI in wood processing and 80% of investment in transportation and communication.

Following are some examples of investment projects underlying the figures of statistics for the two macro-regions.

3. Japanese investment projects in Russia

3.1. Projects in the Western part of Russia

Following the "pioneers" Toyota and Nissan who decided to set up production plants near St. Petersburg other Japanese automobile producer such as Isuzu (light tracks), Mitsubishi Motors (in cooperation with Peugeot-Citroen), Mitsubishi Fuso (tracks) and Komatsu (road-construction equipment and machines) have opened their plants in Russia too. It caused intensive inflow of investment into related industries. For instance, "Asahi Glass" started its second sheet glass production plant in Nizhniy Novgorod (the first one operates in Klin), "Yokohama Rubber" is producing automobile tires in Lipetsky region from 2011. Automobile industry is pulling together a set of related production companies that are focused on supplying details and components to the assembly plants. Among these companies can be mentioned the following: "Toyota Boshoku" (car seats), "Ishikawajima-Harima Heavy Industries" (details of passenger and truck body), "Daido Metal" (bearings), "Sakura Kogyou" (details of breaking and fuel systems) and others. In 2014 Hitachi Kenki started the production of excavators in Tver'. Therefore automobile production becomes a core industry for Japanese direct capital: it implies increase of FDI inflow in related industries (cluster development), growth of technological level of investment thus contributing to the development of balanced industrial structure of Russian economy.

Not only automobile, but also chemical industry attracts Japanese investors (Sojitz and Mitsubishi have plants processing ammonia and methanol in Tatarstan, Marubeni invests in chemical plants modernization projects in Tatarstan, Novosibirskiy region and Krasnodarsky Krai). Panasonic and Sony run assembly plants in Kaliningradsky region, Ajinomoto is engaged in foods production and Fujikura – in fiber-optic materials production in Moscow. And the list is far from over.

In trade sector FDI are mostly concentrated in retail and wholesale trade in machinery, equipment (55%) and automobile parts (34%). The FDI distribution pattern in trade is largely connected to the structure of import and reflects the development of sales network, after-sale services, technical support chains. It is especially common for producers of household and office equipment, as well as construction and special equipment.

In the sphere of finance and banking the largest Japanese banks such as Tokyo-Mitsubishi

UFJ, Mitsui Sumitomo, Mizuho Corporate Bank as well as Toyota Bank opened representative offices in Russia mainly in order to support local activities of Japanese companies. Obviously, banking attracts Japanese investment in the Far Eastern regions too.

3.2. Projects in the Far Eastern region

Except Sakhalin projects and LNG plant that were mentioned already there are several large extraction projects carried out in the FEFD or Siberian Federal District (SFD) with Japanese capital participation: for example, gold field in Chukotsky region explored by Mitsubishi, uranium field in Yakutia with Mitsui Bussan participation.

Two plants jointly established by Sumitomo and Terneiles in Primorsky Krai can be mentioned among the latest timber processing investment projects in the Far East region and the largest ventures in communication are the projects by KDDI-Rostelecom (fiber-optic communication line between Nakhodka and Joetsu) and NTTCom-Transtelecom (fiber-optic cable between Nevelsk and Ishikari).

Recently Japanese automobile producers started exploring not only the Western part of the country, but also the Far East: in 2012 Mazda has opened a joint plant with Sollers in Vladivostok, while Toyota started assembly of LandCruiser Prado on the line of Sollers-Mitsui&Co joint production platform in 2013. An interesting fact worth mentioning concerning the types of automobiles produced in the Western and Eastern parts of Russia: as the markets of these two macro regions actually are logistically separated from each other and differ, the producers have to develop individual market strategies for those. So the market of the Far East region demands crossovers to cope with different road types and severe conditions. At the same time in the Western regions the preferences are more differentiated: so called “family” type cars are almost as popular as crossovers or even more. On the other hand regions with high income (Moscow, St Petersburg and some Southern regions of Russian Caucasus) create demand for cars of luxury category. Therefore Japanese producers adapt their local production facilities to be in line with the market trends.

4. Investment cooperation prospects

Current trends of Japanese-Russian investment relations development and mutual interests of both countries makes it logical to assume that energy sector is going to continue being the priority cooperation sphere. There are plans for another gas liquefaction plant to be built in Vladivostok, development of cooperation in potential hydrocarbon deposits in East Siberia and in the Far East region. Actually energy is an area of high interest for both countries: Japan is seeking for stable resource supplies and energy balance optimization, while Russia is interested in developing energy cooperation in the Asian direction. Cooperation project will thus be stimulated and pushed by mutual interest.

The localization of existing production and new facilities construction will ensure high level of investment inflow in mid- and high-tech manufacturing industries such as oil and gas, chemistry (gas- and petrochemical industry), machinery, primarily automobile and details and components production. For example, Toshiba is planning to start automobile electric transformers production in Saint Petersburg in 2014. Another interesting project is a car utilizing plant by Toyota to be built in Moscow region[9]. This project is both timely and relevant

considering the size of outdated car fleet in Russia and it opens a new and very promising sphere of cooperation for the two countries.

The cooperation in high-tech innovation sectors may include medicine and pharmacy industry. For example in 2007 Kanazawa Medical University in cooperation with Yaroslavskaya Medical Academy founded Russian endoscopic training center, that allows to train doctors who conduct the latest endoscopic surgery. In 2014 Takeda-Nycomed has finished the construction of a plant that started pharmacy production for oncological and nephrological treatment.[10]

Finally, one of the most promising spheres of cooperation between Russia and Japan is power efficiency technologies application, especially on production premises. "If we take an energy unit used to produce 1 conventional GDP unit in Japan for 1, the same indicator would be 16.8 for Russia, while in China it equals 8.3, in the US – 2.1 EU – 1.8" (Ide 2012). That's why application of Japanese energy efficiency boosting technologies and experience seems extremely promising. Renewable power, combined energy generation technologies and intellectual power networks is another example of cooperation development sphere.

Conclusions

The scale of investment cooperation between Russia and Japan is reaching a new stage nowadays both in terms of qualitative and quantitative aspects. Japanese business in Russia is living an unprecedented growth period and the recent decade without exaggeration may be referred to as a new historical stage in Russia-Japanese investment cooperation. During the previous 10 years Japan moved from third to the first ten of investors in terms of capital stock in Russia.

The driving factors for Japanese companies for foreign market penetration and overseas investment increase are quite numerous and diversified. They include resource access, market access, trade barriers and yen appreciation effect avoidance, use of relatively cheap local resources to explore the local market or increase sales and even to export to third countries or re-export. The Russian direction provides opportunities to address almost all possible investment stimulating factors that differ depending on the recipient region or industry.

Historically investment cooperation of Japanese companies with Russia was almost limited to resource exploration projects, however, current stage of relations development shows a shift from the one-way perception of investment opportunities. The changes of market potential and trends contribute to the structural shifts in Russia-Japan investment cooperation: particularly to the increase of the investment technological level and the creation of basis for production clusters development primarily in automotive industry.

The strategies and motivation factors for Japanese investors largely depend on opportunities underlying it. Russian market can be divided into two large parts without clear borders, but showing discrepant trends: Western (European) part and Far Eastern and Siberian part. The former attracts investors with its capacious promising market, fast economic growth, opportunities for cluster production development. The Far Eastern and Siberian regions are extremely important for investment cooperation: they are promising for resource development projects and have a huge logistic advantage of its close location to Japan. Therefore the strategies both for production and market exploration should be adapted to local and regional conditions.

It is quite difficult to determine which region is more important for investment cooperation because the structure of relations differs dramatically. Actually the Western and Eastern parts

of Russia complement each other in terms of investment attraction, therefore, they contribute to the development of multifaceted and diversified framework for investment cooperation between Russia and Japan.

* PhD, Junior Researcher, Institute for Industrial and Market Studies and Senior Lecturer, World Economy Department, National Research University – Higher School of Economics

[1] Unified Interdepartmental Statistical Information System, Federal State Statistic Service http://www.fedstat.ru/indicators/start.do

[2] Ibid.

[3] Unfortunately due to the gaps in the Federal State Statistic Service database for foreign investment in 2013 in most cases we have to refer to 2012 data.

[4] Bank of Russia, Statistics, Macroeconomic statistics, External sector statistics, Direct investment in Russian Federation http://www.cbr.ru/Eng/statistics/?PrtId=macro_itm (Extracted in Russian http://www.cbr.ru/statistics/?Prtid=svs&ch=PAR_30241#CheckedItem)

[5] According to Motoyuki Oka, the chairman of Japan-Russia economic cooperation committee, in the near future Japanese investment in Russia even could possibly reach 30 bln. doll. – Rosbalt Business *Rossija teryaet 9/10 japonskih investitsij [Russia loses 9/10 of Japanese investment]* 08.09.2008 14:18 http://www.rosbalt.ru/business/2008/09/08/521404.html [In Russian]

[6] Bank of Japan, Statistics, Balance of payments https://www.boj.or.jp/en/statistics/br/bop_06/index.htm/

[7] Doklad Ministerstva ekonomicheskogo razvitiya Rossijskoj Federatsii "Rossijsko-Japonskoe vzaimodejstvie v investitsionnoj sfere" [Ministry of Economic Development Report "Russia-Japan cooperation in the investment sphere"] 12.10.2009 [In Russian] http://www.economy.gov.ru/wps/wcm/connect/4c74b78040cc80a5b5fdfdfbe92eee1a/rus_jap_inter_12_10_09.doc?MOD=AJPERES&CACHEID=4c74b78040cc80a5b5fdfdfbe92eee1a

[8] Unified Interdepartmental Statistical Information System, Federal State Statistic Service http://www.fedstat.ru/indicators/start.do

[9] Autonews.ru News portal Toyota planiruet postroit' v Podmoskov'e utilizatsionnyj zavod [Toyota is planning to build a utilization plant in the Moscow region] 19.10.2012 [In Russian] http://www.autonews.ru/automarket_news/index.shtml?2012/10/19/1742290

[10] Rossijskoe agentstvo medico-social'noj informatsii. Regiony. Pravitel'stvo Yaroslavskoj oblasti priglashaet japonskie farmkompanii k sotrudnichestvu [Russian agency for medico-social information. Regions. The Yaroslavsky region government invites Japanese pharmaceutical companies for cooperation] 21.11.2012. [In Russian] http://ria-ami.ru/news/62189

References

Autonews.ru (2012): News portal "Toyota planiruet postroit' v Podmoskov'e utilizatsionnyj zavod [Toyota is planning to build a utilization plant in the Moscow region]" October 19, 2012 [In Russian] http://www.autonews.ru/automarket_news/index.shtml?2012/10/19/1742290

Bank of Russia: Statistics, Macroeconomic statistics, External sector statistics, Direct investment in Russian Federation http://www.cbr.ru/Eng/statistics/?PrtId=macro_itm (Extracted in Russian http://www.cbr.ru/statistics/?Prtid=svs&ch=PAR_30241#CheckedItem)

Bank of Japan: Statistics, Balance of payments https://www.boj.or.jp/en/statistics/br/bop_06/index.htm/

Dijkov, Sergey (1991): "Nashi delovye partnery: Japonija [Our business partners: Japan]". Moscow: *International relations*. [in Russian]

Ide, Keiji (2012): Pryamye inostrannye investicii Japonii I economicheskoe razvitie Rossii [Foreign direct investment of Japan and economic development in Russia] *Rossiya v ATR* [Russia in the Pacific Rim] No.3 (24), [In Russian]

Japan Association for Trade with Russian and NIS (ROTOBO) (2011): *Yurashia Sangyo Toshi Buridji Masutapuran [Special Report: Master Plan on Industrial investment in Eurasia]*. Tokyo [in Japanese]

Japan External Trade Organization (JETRO), International Economic Research Division (2001): *Current and Future Prospects of Foreign Direct Investment by Japanese Companies in the 21st Century.* p.32

Japan External Trade Organization (JETRO): – Japanese Trade and Investment Statistics – FDI Flow and FDI Stock 2004-2011 (based on Balance of Payments, net) http://www.jetro.go.jp/en/reports/statistics/

Japan Overseas Enterprise Association (2011): *Roshia Bijinesu Risku Handobukku [Russia Business Risk*

Handbook]. Tokyo, 2011, [in Japanese]
Ministry of Economic Development of the RF (2009): "*Rossijsko-Japonskoe vzaimodejstvie v investitsionnoj sfere*" [Ministry of Economic Development Report "Russia-Japan cooperation in the investment sphere"] October 12, 2009. http://www.economy.gov.ru/wps/wcm/connect/4c74b78040cc80a5b5fdfdfbe92eee1a/rus_jap_inter_12_10_09.doc?MOD=AJPERES&CACHEID=4c74b78040cc80a5b5fdfdfbe92eee1a [In Russian]
Rosbalt Business (2008): *Rossija teryaet 9/10 japonskih investitsij [Russia loses 9/10 of Japanese investment]* September 8, 2008 14:18 http://www.rosbalt.ru/business/2008/09/08/521404.html [In Russian]
Russian agency for medico-social information (2012): "*Pravitel'stvo Yaroslavskoj oblasti priglashaet japonskie farmkompanii k sotrudnichestvu* [The Yaroslavsky region government invites Japanese pharmaceutical companies for cooperation]", November 21, 2012. http://ria-ami.ru/news/62189 [In Russian]
Unified Interdepartmental Statistical Information System: Federal State Statistic Service http://www.fedstat.ru/indicators/start.do [Extracted in Russian]

Intergenerational Differences in Russian Housing Conditions in the 2000s: Based on the *RLMS* (2008)*

Mayu Michigami †

Abstract

That Russia's real estate market, beginning with housing, has been developed along with Russia's market-oriented economic reforms is a truth that needs no mention. This study considers the development of Russia's urban housing market as observed from several measures by narrowing the focus to the measure of differences in household spending on housing. As a first research step, this paper uses the 2008 data from the Russia Longitudinal Monitoring Survey (RLMS) for the purpose of clarifying the actual status of housing differences in Russia in the 2000s.

With the development of the urban housing market and flow of workers into cities as the result of market-oriented economic reforms, inter-generational differences arose and the purchase of residential housing by young households in particular has become difficult. Interest rates on mortgage loans in Russia are still high, and for low income young families, loans are out of reach. Based on these circumstances, the government implemented policies to provide mortgage loan assistance to young families and promote housing purchases by young households. This paper approaches the effects exerted by such housing policies on residential housing purchases and home improvements by young households, the main purpose of which was increasing the volume of housing loans and housing construction, and attempts to look specifically at the housing problems directly confronting each generation, through clarification of the housing reality by generation based on the RLMS.

As a result, it was understood based on several measures that housing differences between generations arose and that, depending on those differences, the housing problems faced by each generation varied. This difference in problems was caused by effects that resulted from the fact the timing of residential housing purchases was segmentalized as the result of a systemic transformation. The difference in particular between the generation that was able to remain in and privatize its housing from the Soviet era, and the generation that had to purchase homes through Russia's market economy, is substantial. In terms of its real estate industry, housing construction industry, housing remodeling industry, construction materials industry and rental housing circulation, the development of Russia's unique residential real estate market has occurred in response to the problems confronting each generation.

On the other hand, this means the government must devise various housing policies to respond not only to development of the market but also to address each of the housing problems that differ between generations. That is, the government must shift away from a housing policy that emphasized only the promotion of housing purchases and housing construction, and move in the direction of (1) improving circulation of the existing housing stock and promoting systematic expansion of the rental housing market, (2) nurturing housing-related industries that will contribute to the quality aspect of the housing environment and formulating policies to assist this sector, and (3) implementing diverse policy support for not only young households but for each generation. This paper draws this conclusion from the housing demand bracket problem, based on an analysis of the RLMS.

Keywords: Intergenerational difference, housing in Russia, young household, housing policy

1. Market-oriented reform of Russia's housing market and family domicile circumstances

At one time, during the Soviet era, housing was a good allocated from the government or firms; rents and public utility charges set at low levels, and it's said there was never a housing shortage condition. In truth, however, because of the housing shortage, the number of years spent

waiting for an allocation was long, and residents were not always pleased with housing quality. The Soviet government was unable to flexibly allocate housing that corresponded to changes in people's family structures. It also proved incapable of allocating housing quality, typically judged in terms of living space or indoor facilities, in a way that left people sufficiently satisfied. Because housing allocation was deficient, residents not only lived together with their parents, in urban areas so-called *kommunalka* – blocks of flats where people lived in households shared with others – were created, which generated further resident discontent. Therefore, of the various indicators concerning present-day housing in Russia, as a mirror showing what kind of change the market economy has wrought on housing life in Russia, and how people's living environment was changed by market forces, the question of how much such dissatisfaction over people's housing was eliminated by Russia's market-oriented economic reforms can be called a critical social indicator. This paper discusses this question by focusing on Russia's primarily urban housing market and the sale and rental of apartments (in Russian, *kvartira*), which are the main housing stock circulating in that market.

The period when Russia's housing market circulation was invigorated and housing prices in major cities spiked rapidly was between 2000 and 2008, the years before the global financial crisis. While a brief downward trend was seen in the aftermath of the crisis until 2009, when prices plummeted and housing construction decreased, since 2010 a modest rise in housing prices has continued up to the present. Such a move in the level of housing prices overlapped with the flow of Russia's macroeconomic growth during the 2000s, when Russia was able to achieve a high growth rate based on a trade surplus supported by resource exports[1].

On the other hand, today the following issues have arisen concerning the living environment of Russia's urban housing. The steep increase in housing prices and difficulty of obtaining housing because of the steep price increase, delays in the renewal of the housing stock and reform of housing public services, the reform of public utilities charges and the impact on residents' lives caused by higher public utility charges, the instability of newly-built housing quality, growing traffic congestion in city centers, and problems resulting from such issues, including the jump in used housing prices. These issues are confronting Russia's people as part of the market-oriented economic reform of the housing sector that was newly formed atop the legacy of housing stock carried over from the Soviet era. These issues are problems that are similar to the housing problems that occurred during the development process in other countries including Japan, yet simultaneously also reflect special circumstances created by the systemic transformation from the Soviet Union to today's Russia. One additional characteristic of Russia's current housing market is the conflict in the housing sector between the remnants of the Soviet Union's legacy, and changes that seek to adapt that legacy to the market economy while carrying it forward.

As a first approximation, this paper illuminates the special nature of the housing market in Russia during the 2000s when the market moved so greatly in this way, and the housing realities in Russia during the 2000s, based on the 2008 data from the *Russia Longitudinal Monitoring Survey* (*RLMS*-HSE, abbreviated below as *RLMS*).

1.1. Characteristics of Russian family housing: Greater differences in housing between generations than between incomes

Table 1 and Table 2 (Michigami and Kumo (2011)) show the results of measuring whether

the income differences caused by the market-oriented economic reforms have produced any differences in the living environment, based on the *RLMS*. When the correlation coefficient of income and living space is taken, the result is 0.058 when all households are viewed (significant at the 1% level, significance probability 0.000, N=5314), 0.038 for two-or-more-person households (significant at the 5% level, significance probability 0.018, N=4233), and 0.065 for one-person households (significant at the 5% level, significance probability 0.036, N=1081), which confirmed that as household income increases, living space becomes slightly larger. If compared over three points in time, living space has expanded slightly. When we calculate the coefficient of variation for living space and living space per person for each year, this expands during the interval 1998 to 2004 (Table 2). This increase in the coefficient of variation indicates the living space differential has expanded. This result can be said to show that privatization of housing, market-oriented economic reforms and rising incomes are beginning to contribute to living environment enhancement in terms of people's living space. During the ten years from 1998 to 2008, housing construction expanded, mortgage loans began to spread and housing prices also began to rise. The rise in incomes over the same period can be evaluated to have brought a certain amount of improvement to the housing environment as seen in the *RLMS* household spending on living space.

On the other hand, the interpretation that the relationship between income and living space remains weak at this point in time also can be taken. It would be difficult to say the improvement in living space that occurred was as remarkable as the change in the macro economy overall. With rapid economic growth similar to the 2000s difficult to project under present conditions, we probably cannot expect the correlation between income and living space to strengthen notably, and the difference in living space based on income to expand rapidly, in the future. Expressed in a way that conforms more closely to the realities accompanying Russia's systemic transformation, there is a possibility the change in housing conditions will expand the existence of differences based on generation, not differences based on income, in the future.

Living space is one indicator that shows living environment quality, and in the present Russian Federation government's housing policy as well living space per person is an important indicator raised as a numerical target[2]. When we try to read the change from the Soviet era from this indicator, what is perceived to be the driving factor is not change but the legacy aspects from having succeeded to the Soviet Union's housing stock. Despite the fact living space in Russia is expanding, the pace has been slow, and many people are managing their housing life in cramped residential units thrown up during the Soviet period.

With the progress of market-oriented economic reforms, new high-rise apartments and condominiums are being constructed in cities, and sites with aging multi-family apartment buildings that will be demolished can often be observed. It is difficult to demonstrate from the macro statistical data, however, the changes that market-oriented economic reform has brought to the living environment. The living environment is not merely floor area, and the percentage of installed housing and public infrastructure facilities such as interior finish, electricity, gas, central water supply and sewerage, and hot water supply and heating, as well as their upgrade, serve as important indicators. These indicators too, however, are macro data, and even today take a form in which the regional disparities seen in the Soviet era, between cities and rural villages and the Moscow metropolitan area and other regions, have continued unchanged. The characteristic change in the housing sector evident in today's Russia is new changes that were not part of the Soviet period and, simultaneously, the presence of the legacy continued from the Soviet Union.

Table 1 : Five income quintiles and average living space (m^2): *RLMS* 1998, 2004, 2008

Income bracket	All households			Households with a family structure of two-or-more persons			One-person households		
	Total			Total			Total		
	1998	2004	2008	1998	2004	2008	1998	2004	2008
I	27.18	28.23	29.04	31.06	31.93	32.75	24.34	25.64	25.28
II	29.24	30.91	32.27	31.41	33.15	34.25	25.91	25.24	27.26
III	31.12	32.84	33.70	32.60	33.95	34.53	23.72	27.84	28.92
IV	34.80	36.30	35.79	35.64	37.33	36.91	27.89	27.49	28.04
V	38.69	37.30	39.98	39.66	38.08	40.77	29.39	25.22	28.55
	Urban zones			Urban zones			Urban zones		
I	26.53	26.36	27.38	29.95	30.62	31.22	24.32	24.34	23.13
II	28.55	29.47	30.47	30.85	31.74	32.73	24.99	24.03	25.55
III	30.43	31.45	32.02	32.06	32.72	32.55	22.76	26.54	27.77
IV	33.50	34.09	33.68	34.39	35.09	34.63	23.91	25.71	26.06
V	35.45	35.77	37.75	36.60	36.40	38.71	21.96	24.53	27.09
	Rural zones			Rural zones			Rural zones		
I	29.50	31.49	33.24	34.94	33.85	35.97	24.41	27.41	30.48
II	31.74	34.64	37.56	33.51	37.01	38.66	28.67	29.22	33.64
III	34.00	37.82	38.93	34.66	38.79	40.92	27.71	33.88	32.86
IV	40.91	44.94	44.32	41.64	45.36	45.60	34.65	35.43	36.49
V	42.92	44.07	49.03	43.42	45.58	49.93	33.11	30.50	36.98

Source: Michigami and Kumo (2011), p.36

Table 2 : Coefficient of variation of living space

1998 RLMS Total mean				
	Mean	Standard deviation	Variance	Coefficient of variation
Living space (m^2)	32.2095	13.9578	194.8203	0.4333
Living space per person (m^2)	14.2238	8.6356	74.5739	0.6071
2004 RLMS Total mean				
	Mean	Standard deviation	Variance	Coefficient of variation
Living space (m^2)	33.1429	15.80779	249.886	0.477
Living space per person (m^2)	14.9345	9.51778	90.588	0.6373
2008 RLMS Total mean				
	Mean	Standard deviation	Variance	Coefficient of variation
Living spac (m^2)	34.183	16.1965	262.327	0.4738
Living space per person (m^2)	15.4057	9.83849	96.796	0.6386

Source: Michigami and Kumo (2011), p.37

What the market-oriented economic reforms continue to produce are a change in the living environment based on the income differential and differences among regions, and a change in the way in which young households that must find housing through a residential real estate market that did not exist during the Soviet era. Stated in a way that conforms more closely to reality, the

change in Russia's living environment during the 2000s is a qualitative change in the differences in housing between generations.

Table 3 : Housing conditions in Soviet cities in 1991

Age	Percent living in a separate apartment (%)	Percent with private room (%)	Living space per capita (median value) (m^2)
Total 1,583	56	67	10
Age 21-30	29	55	9
Age 31-40	62	61	9
Age 41-50	68	69	10
Age 51 and older	66	79	13

Source: Reproduced from *General Social Survey of the European USSR* in Zavisca (2012) p. 38, Table 1.1

*Halftone portions in Tables 3 and 4 indicate comparable numerical values.

Table 4 : Housing conditions according to *RLMS* 2008 data

(%)	Separate apartment	Part of an apartment	Separate house	Part of a house	Living space per capita (median value) (m^2)
Total 5,314	60.0	5.0	18.0	6.3	12.8
Age 21-30	51.6	2.8	8.5	4.3	9.3
Age 31-40	57.5	4.8	16.1	6.7	9.8
Age 41-50	61.0	3.3	18.5	6.5	11.3
Age 51 and older	67.0	3.6	20.1	6.3	15.9

Source: Author's calculation based on *RLMS* 2008

Table 3 shows, by age bracket in cities at the end of the Soviet period, the percentage living in a separate apartment, percentage living in a private room per generation and per capita living space. These figures were compiled for all age groups, for families with children only. To provide figures that are as comparable as possible with the numerical values for the Soviet era in Table 3, similar numerical values calculated for living conditions and per capita floor space based on the *RLMS* for 2008 are shown in Table 4. While Table 3 and Table 4 cannot be simply compared because the living conditions by age bracket shown in Table 4 include families without children, by looking at the change from the Soviet period we can take a general view of whether it is possible to live in a "separate apartment" per comparable family, and how the size of the living space per person changed. We can see that although the percentage of households in the age 21-30 bracket that was living in a separate apartment was only 29% in 1991, this had increased to 51.6% by 2008. The fact the number of age 30 and under households living in a separate apartment increased substantially means that for young households, which had no choice but to wait for a government housing allocation and be content with two generations sharing accommodations during the Soviet era, it had become possible to acquire independent housing through the residential real estate market. In this sense, circulation in Russia's housing market has expanded and the benefits of that expansion have fallen to young households.

On the other hand, the benefits from market reforms of the housing sector have led to new housing acquisition tribulations for young households. From a comparison of Table 3 and Table 4 it is evident that living space per capita has not increased significantly since the Soviet

era. Although a slight expansion in living space per capita is seen for the age 41 and older generations, for age 40 or younger households, only a faint expansion in living space since the Soviet period can be found by 2008, when market-oriented economic reform had already progressed.

In sharp contrast to their parents' generation, which obtained housing in the Soviet era as a good assigned by the government or their company and was able to succeed to and continue living in that housing under the market economy, young households age 30 and younger will become the first post-Soviet Union generation that has obtained its housing through the private sector housing market. In a market where housing prices in Russia's cities have soared, young households' housing acquisition is confronted with housing acquisition difficulties in a sense that is different from their parents' households[3].

A unique characteristic in Russia produced by the systemic transformation, whereby households of all ages have not simultaneously begun to acquire their first home under the private sector housing market, is that the continued use of Soviet housing stock among young households is hindering the expansion of living space. This phenomenon becomes clear when the statistical data, the author's interview surveys and the early survey results are synthesized. Therefore in the following chapter, the household spending data from the *RLMS* for 2008 are used to perform a t test to clarify the living environment for young households during Russia's ten-year period of high economic growth from 1999. The test results, which look at whether there are differences in the living environment depending on the generation that provides for most household necessities, are presented and the meaning of the results discussed.

2. Russian household spending on living environment by generation

This paper takes data that show the living environment in Soviet urban areas in 1991 as its research starting point, and apart from the age classifications in Table 3, the ages of heads of families (primary income provider) studied by the *RLMS* (2008) are classified into four groups for ages 21-35, ages 36-45, ages 46-55 and ages 56 and older and the differences in average housing conditions in each head of family age bracket are clarified by a t test. Close attention is given in particular to the living environment of age 35 and younger households that were the first to secure housing in Russia's housing market in the 2000s, with heads of families who are ages 21-35 defined as young households. This is based on the fact 35 and younger is the age standard for the housing subsidies Russia's current government provides to young households[4]. The total number of households in the *RLMS* (2008) is 5,314 families; the distribution of households based on the four age classifications is shown in Table 5.

Table 6 looks at the individuals who own the dwelling in which they reside. The table shows the mean residency rate for households by age that reside in (1) housing owned by the individual in question or family such as parents, (2) housing owned by a relative other than family, (3) housing owned by another individual or, finally, (4) housing that has still not been privatized in the form of either (1), (2) or (3) (public housing owned by a municipal authority, housing owned by a firm, etc.), respectively.

The breakdown of housing by form of ownership for all 5,314 families shows 75.6% of households reside in family-owned housing, 3.9% in housing owned by a relative, 0.5% in housing owned by another person and 9.2% in non-privately owned housing; the remaining 10.8% were households that did not respond. For households where the head of family is age

Table 5 : *RLMS* (2008) household distribution by age

Age - head of family	N	(%)
Total number of households	5314	100.0
Age 21-35	526	9.9
Age 36-45	687	12.9
Age 46-55	962	18.1
Age 56 and older	1739	32.7
Number of valid responses	3967	74.7

(Note) Of the total number of households (number of households that responded), the number of households that provided the primary income provider's birth year was 3,967 (74.7%); the number of households for which the primary income provider's birth year was unclear was 1,347 (25.3%)
Source: Calculated by the author based on the *RLMS* (2008)

Table 6 : Who owns the dwelling where they reside?

Owner		Mean value		Owner		Mean value	
Owned by household member (%)	All households	75.56		Owned by another individual (%)	All households	0.53	
	Age 21-35	62.55	***		Age 21-35	0.19	
	Age 36-45	73.51	**		Age 36-45	0.58	
	Age 46-55	76.61			Age 46-55	0.42	
	Age 56 and older	85.45	***		Age 56 and older	0.58	
Owned by relative (%)	All households	3.88		Not privately owned (%)	All households	9.16	
	Age 21-35	5.70	**		Age 21-35	5.32	***
	Age 36-45	2.47			Age 36-45	10.92	
	Age 46-55	1.66	***		Age 46-55	14.14	***
	Age 56 and older	3.28			Age 56 and older	7.82	***

Note: Significant at the ***1%, **5%, *10% level
Source: Calculated by the author based on the *RLMS* (2008)

35 and younger, statistically significant values were shown for all housing conditions by form of ownership, except for housing owned by another individual. Among young households age 35 and younger, 62.6% reside in housing owned by their family, 5.7% in housing owned by a relative and 5.3% in housing that has not been privatized, while those living in housing owned by someone else was only 0.2%; the remaining 26.2% did not reply. While this result obviously reflects the fact students who have not yet begun working are included in young households, households living in family-owned housing are the overwhelmingly majority. For every generation, the mean value of the occupancy rate is highest for family-owned housing, and as the age bracket of the head of family increases, the percentage of households living in family-owned housing also increases. Compared with the averages for households of other ages and for all households, the percentage of households living in family-owned housing is lowest for age 35 and younger households, and is below the mean. The difference with households age 56 and older, which have the highest percentage of households living in family-owned housing (85.5%), is 1.4 times. For housing not owned privately as well, young households show the lowest residency rate (5.3%), a difference of 2.7 times compared with age 46-55 households, which has the highest residency rate in that category (14.1%). The residency rate for households living in housing owned by a relative, on the other hand, is highest for young households and exceeds the

mean, and the difference with age 46-55 households, which have the lowest rate in this category (1.7%), is 3.4 times.

Another statistically significant result is the percentage of age 46-55 households living in housing owned by a relative, which at 1.7% is notably lower than that for other age generations and the mean for all households, while the percentage of this generation living in housing that is not privately owned is 14.1%, the overwhelmingly highest rate. Moreover, among age 56 and older households, the percentage living in housing not privately owned is the second lowest after young households.

The following characteristics of the living environment of young households become evident when we turn our attention to the difference between generations based on the test results. First, compared with other age households, the percentage of young households living in family-owned, other-owned or non-privatized housing such as public housing or company-owned housing is surprisingly low, and the percentage of young households residing in housing owned by relatives is remarkably high. This can be said to highlight how, among housing other than family-owned housing, renting a room in a place owned by a relative has become the means to provide housing for young households that have moved to the cities to study or find employment. On the other hand, compared with other generations, the percentage of age 56 and older households living in family-owned housing is overwhelmingly high. This could be said to be the result of pursuing the procedures to privatize the housing units allocated to this generation during the Soviet years. On the other hand, the fact the percentage of age 46-55 households living in housing that has not been privatized is greater than for the other generations might mean units such as public housing and company housing provide housing of last resort for part of this generation's housing. Or it could be they perhaps didn't convert their units to private ownership because they plan to purchase a new dwelling in the near future, or that they are on the border line of the generation that is waiting to succeed to the housing of their parents' generation. If speaking in comparison with age 56 and older households, this can be interpreted to mean that, unlike those of the age 56 and older generation who were able to benefit most from the no-cost (free) privatization of Soviet period housing, the age 55 and younger generations have not only benefited from privatization but also have begun to face difficulties in acquiring a home in the residential real estate market, and that the greatest burden has been tilted toward young households.

Table 7 : Housing status: Home ownership, rental or dormitory

Occupancy		Mean value		Occupancy		Mean value	
Own residence (%)	All households	89.44		Rented residence (%)	All households	6.49	
	Age 21-35	74.52	***		Age 21-35	16.73	***
	Age 36-45	87.92	**		Age 36-45	6.70	
	Age 46-55	92.93	***		Age 46-55	4.16	**
	Age 56 and older	97.35	***		Age 56 and older	1.61	***
Dormitory (%)	All households	3.56					
	Age 21-35	8.37	***				
	Age 36-45	5.09	**				
	Age 46-55	2.60	*				
	Age 56 and older	0.63	***				

Note: Significant at the ***1%, **5%, *10% level
Source: Calculated by the author based on the *RLMS* (2008)

Next, Table 7 summarizes the test result concerning whether each household owns or rents its housing. Among young households age 35 and younger, 74.5% own their home, 16.7% are living in rented residences and 8.4% are living in dormitories. Compared with other age households as well, young households have statistically significant characteristics in each housing status, exhibiting the lowest percentage of home ownership and highest use of rented residences. Among age 36-45 households, 87.9% own their housing and 6.7% live in rented residences, while households living in dormitories account for 5.1%. From age 46-55 households up through households of the most elderly, the percentage of housing ownership is above 90%, while the percentage of households having a rented residence is notably lower than that of other generations. For age 56 and older households, 97.4% own their housing, a figure notable for being nearly all households of that age bracket, while 1.6% live in a rented residence and households living in dormitories did not account for even 1%. While the percentage of households that own housing is high for every age bracket, beginning from the age 46 and older households, as age rises the housing ownership percentage becomes higher and exceeds the mean for all households. Based on this characteristic and an interpretation of Table 6, from the perspective of housing acquisition by means other than succeeding to one's parents' home, the generations that were able to enjoy the benefits of no-cost privatization are thought to range mainly senior citizens to families in age 46-55 households, while the age 45 and younger generations are thought to form the core of the bracket that purchases housing in the residential housing market[5].

On the other hand, for age 36-45 households the ratio of households living in rented residences is near the mean for all households, while households younger than this have the highest percentage of households in rented residences. It is believed these two generations, which face the difficulty of obtaining housing through the market, are compensating for this with rented residences. This is interpreted to mean the demand bracket in the rental housing market is centered on young households age 45 and younger, and especially age 35 and under.

Further clarified by this test is the marked difference in housing ownership between the age 35 and younger generation and age 56 and older generation; this difference expressed as a ratio is 1.3 times, while for the use of rented residences, the difference climbs to 10.4 times. The existence of this difference in housing acquisition between the age 35 and younger households, which have the most difficulty acquiring housing as a result of market-oriented economic reforms, and age 56 and older households, which not only have a higher probability of acquiring housing because of their income level but also because they were able to privatize their Soviet era housing for free, must be regarded as grounded in the realities of Russia's rental housing market. In Table 7, the percentage of all households using rented residences is merely 6.5%, and even when combined with the figure for dormitories is only 10%. Compared with a rental housing share in Japan of about 40%[6] the percentage of households occupying rental housing is extremely low, and can be said to be in an undeveloped state. In Russia, rental housing has not been developed sufficiently to ease the difficulty that young households face in obtaining housing. When this fact is considered, the existence of this difference in housing acquisition between generations suggests the problems age 35 and younger households face in housing acquisition are serious.

While the question of why rental housing in Russia is less developed than in Japan will be touched on in the following chapter, one topic we do want to address here is that this situation is related to the strength of the Russian people's desire to own their own home, which has also

been pointed out from this author's original interview survey and previous research[7]. During the soaring housing market period in the 2000s, not only housing prices but rents in urban areas as well similarly rose. The fact the percentage of all households owning their home increased to 89.4%, even as housing acquisition and rental continued to be difficult not just for young households, while the ownership rate for the age 36-45 generation as well reached 88%, can be called a result that, in addition to the possibility of privatizing one's home, confirms the strength of the desire among Russians to own their own home.

Table 8 : Living space and housing market value

		Mean value				Mean value	
Living space per person (m^2)	All households	15.41		Living space (m^2)	All households	34.18	
	Age 21-35	10.89	***		Age 21-35	30.55	***
	Age 36-45	11.67	***		Age 36-45	35.45	
	Age 46-55	14.33	***		Age 46-55	36.78	***
	Age 56 and older	19.46	***		Age 56 and older	34.76	
Housing market prices (rubles)	All households	11253357.47					
	Age 21-35	9351023.52					
	Age 36-45	10446980.93					
	Age 46-55	11999454.20					
	Age 56 and older	12452457.03					

Notes: The living space per person in Table 4 are median values, whereas all of the figures in this table are mean values.
Significant at the ***1%, **5%, *10% level
Source: Calculated by the author based on the *RLMS* (2008)

Table 8 is the average floor space and average housing price (nominal) of the housing units lived in by the households of each age bracket. The housing market values are not only the prices at which households purchased their housing but also include responses based on analogy from market prices in nearby housing markets. While no statistically significant difference in the mean value for any age bracket was shown in the responses concerning housing market value, it was clear the market value was highest for age 56 and older households, many of which privatized their home free of charge, and in 2008, the year of the survey, the value reached 12,452,457 rubles (about 423,836 dollars (end of 2008, Central Bank of Russia rate; US1.00 dollar = 29.3804 rubles and 100 yen = 32.5779 rubles). Housing prices climbed rapidly in Russia during the 2000s[8].

For the age 35 and younger generation, the mean values for both the average living space per person and average living space per housing unit fall substantially below the mean value, and at $10.9m^2$ and $30.6m^2$, respectively, are the smallest for any age bracket. For living space per housing unit in particular, the age 35 and younger generation is the only one to fall below the mean value for all households. While also including households residing in facilities such as university dormitories, the living environments of young households tend to be cramped. The difference in living space per person is 1.8 times for age 56 and older households, which enjoy the largest area, while the difference in living space per housing unit is 1.2 times for age 46-55 households, which average $36.8m^2$.

Age 46-55 households, which have the maximum living space per housing unit, form the core of the generations that also include children who have grown into adults about to become independent and require the most living space. Because of the increased number of family

members under one roof, the living space per person is below the mean for all households as well. Once they join the age 56 and older generation, however, living space per person exceeds the mean value for all households and becomes the largest among all age brackets, reflecting the fact their children have become independent and the number of family members has declined.

The minimum necessary living space the Russian government has set for its people is $33m^2$ for a single-person household, $42m^2$ for a two-member family and $18m^2$ per person for families with three or more individuals; that is, $54m^2$ or more. No generation other than age 56 and older households has reached the government standard for living space per person, and the younger the generation, the greater the level of divergence from the government standard becomes. This living area standard has been carried forward from the Soviet period. Although the average level of housing prices soared as a result of Russia's market-oriented economic reforms, from the standpoint of living space these reforms have not yet stimulated any notable improvement in average area. Market reform of the housing sector led to major changes in housing purchases and sales by creating differences in housing acquisition between generations and a large run-up in housing prices, but what change has reform produced from the aspect of quality of living environment? The following section zeroes in on the realities of each age household's living environment from the aspect of living environment quality, as seen based on the *RLMS*.

2.1. Living environment quality: Living environment as viewed based on status of housing utilities installed

Any index showing the living environment requires an evaluation based on various indicators besides living space. This section looks at the installation status in Russia of indoor lifeline facilities referred to as government housing authority services and housing utilities – that is, heating, central water supply and sewerage, hot water supply, electric stoves (kitchens), metered gas and telephones[9]. The percentages of households of each generation where housing utilities have been installed are summarized in Table 9.

The installation rates for all households were 72% for heating, 85% for water supply, 65% for hot water supply, 67% for gas, 20% for electric stoves, 72% for sewerage lines and 63% for telephones. Heating is provided by central heating, while hot water is supplied from a centralized hot water supply system and delivered through pipes from an entire building to each unit. Both gas and electric stoves refer to kitchen cooking stoves; these two being nearly interchangeable. Either a gas or electric cooking stove has been installed in each home. For electric stoves, an old Soviet era cooking stove that uses either gas or electric burners will have been installed. Electric stoves include units ranging from old-fashioned models from the Soviet period that warm food with electrical coils to electromagnetic cookers like the latest IH cooking range. In the *RLMS*, gas and electricity means a metered unit, and both indicate facilities that bill charges used to each home corresponding to the amount. Telephone means a landline phone.

The status of housing utilities installed in the homes of age 35 and younger households - heating 79%, service water 88%, hot water supply 73%, gas 62%, electric stove 23%, sewerage line 78% and telephone 48% - showed statistically significant characteristics compared with all other generations. The reason the percentage of young households with a landline installed is low is believed to be their alternative use of mobile phones. The installation percentages at young households for heating, service water, sewerage lines, hot water supply and electric stoves exceed the mean values for all households and the installation rates are the highest compared with other

Table 9 : Percentage of homes with housing utilities installed

Installed utility		Mean value		Installed utility		Mean value	
Heating (%)	All households	71.85		Electric stove (%)	All households	19.78	
	Age 21-35	78.52	***		Age 21-35	23.38	**
	Age 36-45	72.05			Age 36-45	18.92	
	Age 46-55	69.96	**		Age 46-55	22.14	**
	Age 56 and older	71.48			Age 56 and older	16.79	***
Service water (%)	All households	85.42		Sewerage line (%)	All households	72.00	
	Age 21-35	88.40	**		Age 21-35	78.14	**
	Age 36-45	86.32			Age 36-45	72.49	
	Age 46-55	85.86			Age 46-55	70.06	**
	Age 56 and older	83.84	***		Age 56 and older	72.05	
Hot water supply (%)	All households	64.79		Telephone (%)	All households	62.50	
	Age 21-35	72.81	***		Age 21-35	48.48	***
	Age 36-45	65.94			Age 36-45	65.07	
	Age 46-55	62.58	**		Age 46-55	67.15	*
	Age 56 and older	63.54	**		Age 56 and older	69.06	***
Gas (%)	All households	66.82					
	Age 21-35	61.79	**				
	Age 36-45	69.14					
	Age 46-55	63.51	***				
	Age 56 and older	71.13	***				

Note: Significant at the ***1%, **5%, *10% level
Source: Calculated by the author based on the *RLMS* (2008)

age households as well; the installation rate for gas, which is substitutive with electric stoves, is the lowest. The test results newly clarified that the housing of young households that acquired their dwellings during the market-oriented economic reforms is better equipped with lifeline facilities than the housing of other generations, which suggests such households are concentrated in urban housing where the shift to all-electric homes is advanced. This indicates that, viewed from the standpoint of the housing utilities installation rate, the living environment of young households, which are thought to have low incomes, is not necessarily inferior to that of other generations.

While this must be considered by discounting for the fact a high percentage of such households live with their families or in dormitories and rented residences, these can be considered to be cases of young households that were able to acquire or rent a newly built home or a resale property that was built comparatively recently and are residing in housing units furnished with new facilities such as electric stoves. In other words, the living environment problems of young households can be said to be chiefly a problem of housing acquisition, and provided they are able to surmount this acquisition problem, they are the generation that can move into housing units that boast a high percentage of new facilities installed.

From this we can also reason by analogy that age 56 and older households will have the highest percentage with gas facilities installed and lowest percentage furnished with electric stoves. We can further surmise the percentage of landlines installed will be highest for age 56 and older households, while conversely the installation percentages for service water and

hot water supply will be low. From the standpoint of housing acquisition, age 56 and older households were able to easily obtain housing as a result of no-cost privatization, but in terms of the facilities installed in the homes they acquired, the age of the amenities and low installation rates are remarkable compared with other generations. The disadvantages from a housing quality perspective that resulted from old dwellings being converted to private ownership are thought to be biased toward age 56 and older households. We can construe this to mean the housing environment problem for the age 56 and older generation is mainly not housing acquisition, but the problem of improving their living environment quality in terms of housing utilities.

On the other hand, 70% of the housing of age 46-55 households is furnished with heating, 63% with hot water supply and 70% with a sewerage line; compared with other age generations these are the lowest rates, while the percentage of homes supplied with gas is the second lowest after young households, and oppositely the percentage with an electric stove installed is the highest next to young households. Housing of the age 46-55 generation is thought to counterbalance that of households that succeeded to the old housing facilities from the Soviet era and the households residing in new dwellings through the residential real estate market. That is, viewed from the status of housing utilities, this generation is located at the boundary between the housing of the former Soviet Union and housing in the new Russia, and housing equipment modernization is surmised that be advancing more quickly among the generations that are younger than this generation.

Table 10 shows the results of analyzing the relationship between household spending (income and expenditures) and utility payments by generation. There is a striking difference between age 35 and younger households and age 56 and older households. Compared with other generations, elderly households age 56 and older receive the highest average public utility charges subsidy amount (monthly), yet the amounts for public utility charges expenditures and unpaid public utility charges also are low, and therefore the percentage of households that fail to pay public utility charges is lowest as well. Because this generation has the lowest income, however, the burden for public utility charges as a percentage of household spending has risen to 14%, the highest when compared with other generations. This generation's housing is old, which will mean a further increase in the burden when tempered for the cost of housing repairs as discussed in the following section.

On the other hand, age 35 and younger households have twice the income and expenditures of age 56 and older elderly households, and their household spending burden rate for public utility charges is a low 1.5 times but the amount of their expenditures for public utility charges and unpaid public utility charges are conversely about 1.5 times as high. The percentage of households with unpaid public utility charges is the second highest after age 36-45 households, and three times more than that of 56-year-old or more elderly households. The high percentage of young households with unpaid public utility charges means the public utilities charges burden is heavy, especially for young households with low-income wage earners. The amount of public utility charges subsidies to mitigate the burden is smaller than that of seniors, the difference being as much as 4.6 times. Although opposition to the government's hikes in public utility charges has emerged mainly among the senior citizen bracket, these test results suggest that attention and allowances must be given to low-wage earners in young households who are ineligible for subsidies and struggling.

The share of household spending of young households accounted for by utility payments must be noted carefully because of the complexly interwoven following factors. Policies to

Table 10 : Household spending and public utility charges (monthly amount)

		Mean value				Mean value	
Percentage of households having unpaid public utility charges (%)	All households	9.62		Rent and public utility charges household expenditures burden rate (%)	All households	11.24	
	Age 21-35	13.50	***		Age 21-35	9.26	***
	Age 36-45	13.54	***		Age 36-45	9.19	***
	Age 46-55	10.60	**		Age 46-55	10.40	***
	Age 56 and older	4.49	***		Age 56 and older	13.88	***
Rent and public utilities expenditures (real, rubles)	All households	1003.46		Public utility charges subsidy (real, rubles)	All households	102.21	
	Age 21-35	1219.61	***		Age 21-35	40.33	***
	Age 36-45	1187.44	***		Age 36-45	65.75	***
	Age 46-55	1125.95	***		Age 46-55	66.56	***
	Age 56 and older	830.55	***		Age 56 and older	186.96	***
Total household expenditures (real, rubles)	All households	15301.44		Total household income (real, rubles)	All households	14591.62	
	Age 21-35	20202.09	**		Age 21-35	20234.51	*
	Age 36-45	22018.64	**		Age 36-45	21913.14	**
	Age 46-55	18157.01	**		Age 46-55	15953.29	
	Age 56 and older	10136.36	***		Age 56 and older	11136.86	***
Unpaid amount of public utility charges (monthly average, rubles)	All households	1864.52					
	Age 21-35	2278.71	***				
	Age 36-45	2168.31	***				
	Age 46-55	2057.47	***				
	Age 56 and older	1513.19	***				

Note: Significant at the ***1%, **5%, *10% level
Source: Calculated by the author based on the *RLMS* (2008)

select young households assumed to need assistance and provide appropriate subsidies might be required. First, because households living together with their parents' generation are included in the figures, there is the possibility the percentage of young households with unpaid public utility charges is higher than that of other generations because of cases where the parents, rather than the young household, are paying the charges. Second, the fact the amount for rent and utility payments is higher than that of other generations is thought to reflect the many cases where rent payments are also included in utility payments, because more households living in rented residences are included than is the case for other age brackets. The third factor is related to the introduction of meters at public housing facilities included in housing and also coincides with the high level of housing utilities installed in young household housing shown in Table 9. Newly built or used housing that was constructed in the 2000s is also included among part of the housing units that are included in young households. For Soviet era housing units, as a rule public utility charges for each unit were a uniform fee per family regardless of the amount consumed, based on a metering system for an entire building. Consequently, for elderly households that continue to live in housing from the Soviet period that they received as their own residence, the utility payment burden did not rise to the extent that public utility charges were raised. Since the 2000s, however, the installation of single household electricity, water service and gas metering facilities continues to spread with Russia's newly built housing. Because the volume of public utilities used by households living in housing where new facilities and meter were installed is linked directly with household spending for every age bracket, the burden for public utility charges as a share of household expenditures has grown heavier. For comparatively low income young

households for whom living with parents is not an option, the burden for public utility charges rooted in this new system is believed to have grown heavier.

2.2. Living environment quality: Housing repairs and second homes (Dacha)

The frequent need to repair and mend housing that arises from the low quality and age of housing units constructed during the Soviet years is invariably mentioned as part of the conversation whenever discussing enhancement of Russia's living environment. The housing reform industry, which contracts work such as plumbing repairs and redecorating, and the retail industry for repair and remodeling materials, are developing rapidly in urban areas as a reflection of such demand. Consequently, in this chapter we measure the amount households spend on housing repairs and the burden rate as a means to gauge actual living environment quality.

Back in the Soviet era, when even waiting in line for repair services was enough to make the population weep and housing life was not working out as planned, the dacha – the second home with attached kitchen garden that is so unique to the Soviet Union – was the only housing where people could freely design, build and improve their residential space. From the *RLMS*, let's try to analyze whether it is possible even now to eliminate the dissatisfaction concerning improvements to people's main homes by having a cottage or second home. Furthermore, efforts to earn rental income by turning second houses received through succession into rental properties, or to take advantage of the quickly rising market and earn money by renting second houses purchased with borrowed funds as asset management, or by reselling them, also can be seen. We also will use the *RLMS* as an indicator showing the living environment to clarify the rate of ownership of cottages and second houses that people possess for various reasons. The results from having tested for each age group whether people have purchased building materials or construction materials for repairs and the amounts of such purchases, the cottage and second house ownership rates and the cost to purchase such properties, are summarized in Table 11.

Because the family income and expenditure survey questions from the *RLMS* ask about purchases of building materials and land for dachas during the most recent past three months and ask about purchases of repair materials during the past 30 days, the answers are varied and include an extremely low number of responses. For those questions with the small number of responses, no statistically significant differences could be recognized.

Table 12 summarizes the percentages of household expenditures accounted for by the cost of construction materials for repairs and the cost of building materials. Because these materials costs are thought to include not only monthly spending amounts but also instances of amounts spent from savings and by credit cards, further analysis using more detailed funding source information is necessary. Although no statistically significant differences were found, the data are provided as a reference for understanding the summary of the housing expense burden including public utility charges as a share of household spending.

From the results in Table 11, we can see there are many purchases of building materials used for dachas or other housing as well as purchases of construction materials for repairs by age 46-55 households (15.3%, 6.2%) and age 56 and older households (10.3%, 4.4%). When tempered by the fact these two generations have a high dacha ownership rate, we can see efforts are being made by the middle ages and older generations to improve the living environment of their second homes through dachas. Although the actual amounts expended are not always substantial, this speaks to the fact that creativity is being exercised in forms corresponding to

Table 11 : Housing repair costs and ownership rates for housing other than a principal home

(Past three months)		N	Mean value		(Past 30 days)		N	Mean value	
Purchase of building materials (%)	All households	5314	12.34		Purchase of construction materials for repairs (%)	All households	5314	4.20	
	Age 21-35	526	11.22			Age 21-35	526	2.28	***
	Age 36-45	687	14.41	*		Age 36-45	687	4.22	
	Age 46-55	962	15.28	***		Age 46-55	962	6.24	***
	Age 56 and older	1739	10.29	***		Age 56 and older	1739	4.37	
Cost of building materials (rubles)	All households	633	19176.13		Cost of construction materials for repairs (rubles)	All households	211	16329.76	
	Age 21-35	58	21882.28			Age 21-35	11	23472.73	
	Age 36-45	93	25526.19			Age 36-45	27	14666.67	
	Age 46-55	142	20912.04			Age 46-55	55	16662.00	
	Age 56 and older	174	15523.37	**		Age 56 and older	74	18342.91	
Purchase of land for dacha or apartment (%)	All households	5314	0.64		Dacha ownership rate (%)	All households	5314	19.87	
	Age 21-35	526	1.33			Age 21-35	526	13.69	***
	Age 36-45	687	1.02			Age 36-45	687	19.94	*
	Age 46-55	962	0.83			Age 46-55	962	24.95	**
	Age 56 and older	1739	0.35	**		Age 56 and older	1739	24.67	***
Cost of purchase of land for dacha or apartment (rubles)	All households	33	948642.42		Other apartment ownership rate (%)	All households	5314	6.51	
	Age 21-35	6	766666.67			Age 21-35	526	10.08	***
	Age 36-45	7	1152314.29			Age 36-45	687	8.73	**
	Age 46-55	8	1118125.00			Age 46-55	962	7.59	
	Age 56 and older	6	858166.67			Age 56 and older	1739	4.31	***

Note: Significant at the ***1%,**5%,*10% level; responses concerning whether respondent has purchased building materials and the cost of such purchases, or purchased land and the cost of such purchases, during the most recent past three months before the survey date. Dacha and other apartment ownership rates means the ownership rates based on responses at the time of the survey.

Source: Calculated by the author based on the *RLMS* (2008)

Table : 12 Percentage of household expenditures accounted for by cost of materials for repairs and cost of building materials

		N	Mean value	
Burden ratio for cost of construction materials for repairs (%)	All households	167	42.80	
	Age 21-35	11	44.48	
	Age 36-45	27	33.32	*
	Age 46-55	55	44.49	
	Age 56 and older	74	48.91	
Burden ratio for cost of building materials (%)	All households	633	11.61	
	Age 21-35	58	9.75	
	Age 36-45	93	10.40	
	Age 46-55	142	11.88	
	Age 56 and older	174	13.39	

Note: Significant at the ***1%, **5% and *10% level. Burden ratio for cost of construction materials for repairs is the percent share of household expenditures for one month; burden ratio for cost of building materials is the percent share of household expenditures (nominal) converted to three-month figure.

Source: Calculated by the author based on the *RLMS* (2008)

each generation's ability to pay.

The dacha ownership rate among age 21-35 young households and age 36-45 households, on the other hand, is remarkably low. Conversely, the ownership rate of other apartments has climbed above that of other generations. Purchases of building materials and construction materials for repairs also are low. This reflects the likelihood that age 45 and younger generations are coping with the costs to improve their living environment by owning second apartments instead of dachas, and owning new apartments as asset management vehicles, rather than by owning dachas or repairing existing housing. This result can also be thought to suggest that along with the diversification of leisure and growing popularity of overseas travel, the dacha tradition is disappearing from the lifestyle of young households.

The presence of a certain kind of boundary with the age 46-55 generation can be sensed here as well. The tradition of a dacha that eases the frustrations with one's existing housing remains one of the age 46-55 and older generations. Even the small percentage of land purchases for dachas by age 56 and older households shows this generation values highly the dachas they were able to receive during the Soviet era, and so invests in building materials. It is also evident from the results in Table 11 and Table 12 that the burden for construction materials for repairs sits heavily on elderly households that have succeeded to comparatively old housing.

From a living environment quality aspect, constraints on the money needed for maintenance and improvement of the existing housing stock largely affect the elderly. Young households, on the other hand, are seeking living environment quality aspect improvements in the form of new housing stock purchases and rentals, and face limits on their funds for that purpose. What was obvious was that while every generation faces cash constraints, the nature of such constraints varies.

3. Special circumstances in Russia's housing market: Information from the survey of actual conditions and prior research

The preceding chapters clarified each generation's housing conditions based on the *RLMS*. This chapter uses knowledge from the author's past interview surveys and field investigation, together with previous research, to supplement the results of the analysis based on the data[10].

3.1. Peculiarities of Russia's rental housing market

Russia's rental housing market is characterized by the fact property in the form of condominiums built and rented by real estate companies in Japan as rental housing are almost unknown in Russia. Add to this the conversion of newly built housing to rentals, which was spurred as a means of lessening the repayment burden without relinquishing one's home when the mortgage loan repayment burden becomes heavy, plus entry from dwellings purchased for speculative purposes, and the supply of rental housing by individuals in Russia's rental housing market is brisk. This author interviewed real estate agencies in various regions throughout Russia, but heard almost no talk of construction of condominiums specifically for use as rental housing. Therefore, given talk as well that about 10% of rental housing is formally registered as a rental housing business, an accurate measurement of the number of rental housing contracts and their classification is difficult. The fact is, when real estate agencies are not used there are many informal, so to speak, rental agreements where owners are personally managing a rental business

as a side job. And it is not only empty rooms and vacant houses that are used in this way; there also are cases of newly built housing being purchased and not used as homes but turned into rentals as one means of investment management. From the rent and management of newly-built properties to the rent of used rooms while sharing quarters with others, the range of housing used as rental properties in Russia is broad.

While the use of real estate agents has recently become the principal means for arranging transactions in Russia's rental housing market, there also are cases where individuals arrange rentals through channels such as newspaper classified columns and the Internet. Home-made flyers with someone's telephone number announcing a "Room to Let" that have been hung on street corner utility poles and pasted on subway car walls can also be seen frequently in various parts of Russia. We can construe this way of renting a dwelling by such exchange of information between individuals as a practice carried over to the present from the Soviet era. During the Soviet years, it was difficult for local governments or the companies where people worked to allocate housing in response to changes in family structure, and a mismatch between allocated housing and the living area that people wanted arose from that difficulty. The reason is that eliminating the housing allocation mismatch by means of rentals between individuals, such as households with surplus rooms renting out those rooms, has been used frequently since the Soviet period by households that find it difficult to obtain permission to move from rural to urban areas. The practices from that period can be said to be hampering the reorganization of Russia's rental housing market even now when new means such as the Internet and real estate agent services have come into use.

3.2. Asset awareness regarding housing: The emphasis on home ownership and low use of mortgage loans

Despite the fairly widespread use of mortgage loans in Russia, the total volume of such loans still remains less than 3% of Russia's GDP. The causes behind this low reliance on loans can be said to be not simply the fact loans have high interest rates and are difficult to obtain but the Russian people's wariness towards mortgage loans, including the administration of collateral. According to a sociological study conducted independently in Kaluga Oblast (province) by Zavisca (2012), the percentage of the population with a sense of values that believes the government should ensure housing is high even among the younger generation that grew up since Russia's free market economic reforms. People of the young generation with such a sense of values consequently harbor a deep-rooted distrust and fear that if they use a mortgage loan to purchase a home and fall behind in their loan payments during the loan term, the home they have purchased and are living in will be seized by the bank as collateral. In the case of unsecured consumer loans, automobiles or televisions aren't seized by banks if consumers have trouble making their payments. Housing is different, however. A pattern of unsettled ownership in which the bank might seize a home as collateral lingers. This familiarity people have with collateral is still limited.

Furthermore, if a bank has confiscated a home as collateral, the borrower's descendant will immediately lose their housing too and become homeless if the bank resells the seized property to someone else. Analyses that assume it is this fear that keeps Russians from using mortgage loans have been published.

This individual awareness of wanting to not sell a dwelling but retain it as a rental is

also transparently evident in the fact the main activity in Russia's rental housing market is not the construction of housing for rental use but the supply of rentals by individuals. Another characteristic of Russia's housing market prices is higher selling prices for used properties than for newly-built housing, which involves the same factors. Used properties equipped with high quality amenities are more popular than newly-built properties. Although the details are available in Michigami (2013a) and omitted here, the Russian people always prefer to purchase, even if it is a used property, rather than rent. This acknowledges that for Russians, the asset that is their home is an indispensable good for fundamental human life, and illustrates the extremely strong preference to own property as one's own home. This is proven as well by the strength of households' intent to own a home that we saw in the preceding chapter and the low rental housing occupancy rate.

This asset awareness appears not only among residents but also in the housing laws and housing policies Russia's government enacts. In Russia, both the administration and residents have a strong awareness of housing as something the government should ensure, and the carryover of this awareness from the Soviet period was clarified by Shinoda (Shinoda (2011a, b) et. al) through research on Russia's housing laws. Individuals with weak access to housing who are specified by the present Russian government's housing policy program "Federal Target Program 'Housing' for 2011-2015" are mainly victims (injured) of war, nuclear accident victims (injured), veterans, multi-child families, low-income wage earners, returnees from forced relocation and young households (age 35 and younger married couples) who are registered as household categories to receive government assistance. This category is unchanged from the Soviet period[11]. Furthermore, housing subsidies for young researchers and teachers, and assistance and subsidies for housing acquisition as a measure to address the declining birthrate, have been added as well, so that in addition to the categories of subsidized households eligible for assistance that existed in the Soviet period, the government has added six more categories, and continues to increase them even after the market oriented reforms. This is interpreted to mean the government intends to boost the economy through expansion of housing construction and development of the construction industry, by increasing the number of households covered by its housing policy. All of these are focused on funding support for housing purchases and housing allocations. In reality, nothing is being done at present to promote rental housing construction.

4. Conclusions

This paper has clarified housing conditions and the differences in such condition for four age generations, based on data from the *RLMS* (2008). Age 35 and younger households have to be content with housing where the living space is more cramped than that of other generations, but which has a high percentage of utilities installed. The housing-related problem of young households was shown by the analysis in this paper to specifically be the limit on funding for housing purchases through the residential real estate market. From this result, the housing purchase funding assistance for young households under the current government's housing policy can be evaluated to be a sound policy. On the other hand, the possibility that the current government's reform of public utility charges and the housing public services program will lead to a heavier utility payment burden for the low-income bracket of age 45 and younger households including age 36-45 households was suggested by the results of the analysis. A public utility charges allowance must be provided to low-income young households.

On the other hand the core of the rental housing demand bracket is concentrated in young households, and based on the *RLMS*, their use of rental housing is low. This is thought to be related to the strength of people's intention to own their own home as well. If the strong sense of resistance to mortgage loans among young households is also taken into consideration, limits on the future development of any housing policy that depends solely on easing funding constraints through housing fund assistance and public utility charges subsidies can be expected from a fiscal burden standpoint as well. A policy to promote the development of private sector rental housing that does not rely on housing ownership alone, similar to the development of the organized rental housing-only business in Japan, for example, probably will be needed in the future. It will be necessary to formalize guarantees of the quality, for not only new construction of affordably priced private sector rental housing but for the stock of existing housing for resale, and systematic rental management logistics.

It was clear the problems affecting the living environment of age 46-55 households and age 56 and older households, on the other hand, was not constraints on funds for housing purchases but improvement of the quality of privatized housing units and constraints on funds for repairs and remodeling costs. In this sense, it became obvious that policies to assist home purchases and policies to promote the popularization of mortgage loans cannot be said to always produce results that will improve the living environment of such middle-aged and elderly households. This is where segmentation of housing acquisition among generations resulting from the systemic transformation can be found. This segmentation is producing compartmentalization of housing demand in the residential real estate market. The housing reform and repair materials industry in Russia in recent years is thought to have developed around these generations as the main buyer brackets. Compartmentalization of housing policy as well is probably similarly needed.

By not merely expecting a response based on a change in asset awareness or development of the market as a result of future generational changes, and by the government also formulating various housing policies to address each generation's different housing problems, it will be feasible to promote development of the residential housing market and related industries in Russia. That is, the government must shift away from a housing policy that emphasizes only the promotion of housing purchases and housing construction, and move in the direction of (1) improving circulation of the existing housing stock and promoting systematic expansion of the rental housing market, (2) nurturing housing-related industries that will contribute to the quality aspect of the housing environment and formulating policies to assist this sector, and (3) implementing diverse policy support for not only young households but for each generation.

* This work was supported by JSPS KAKENHI Grant Number 26504005, 26245034 and 2014 Joint Usage and Research Center, Institute of Economic Research, Hitotsubashi University Grant Number IERPK1403. We thank the *Russia Longitudinal Monitoring Survey*, RLMS-HSE, conducted by the National Research University Higher School of Economics and ZAO "Demoscope" together with Carolina Population Center, University of North Carolina at Chapel Hill and the Institute of Sociology RAS, for making these data available.

† Associate Professor, Faculty of Economics, Niigata University

[1] See Michigami (2010), (2011), and (2013 a, b) etc. for details.

[2] Expanding living space from the federal average of 22.4m^2 per person in 2009 to 24.4m^2 per person in 2015 has been set out as a numerical target. Postanovlenie Pravitel'stva Rossiiskoi Federatsii ot 17 dekabrya 2010 g. N 1050.

[3] For the relationships between the housing market, mortgage loan system and the young generation's housing acquisition see Michigami (2013 a,b)and Zavisca (2012).

[4] In this paper, households where the head of family is age 56 or older are classified as elderly households, because the age when individuals in Russia can begin receiving a pension is 55 for women and 60 for men. Furthermore, although the test results for the living environment in the RLMS (2008) using the age classification in Table 3 are omitted from this text because of space constraints, the test results based on the age classification in this manuscript, as well as comparable results for interpretation, are shown. The intertemporal change for each generation based on the RLMS data from the viewpoint of comparison with 1991 will be analyzed in a separate paper.

[5] While unfortunately the questionnaire items in the RLMS (2008) did not include a question item on whether households purchased a home during the past three months, even if such a question had been asked the number of responses would be very small and few and a statistically significant analysis would not always be possible. Which generation is the purchaser bracket can therefore only be conjectured by analogy from the ownership patterns in this data or other such information.

[6] Michigami (2011), p. 50 and Jutaku Keizai Data Shu (2012)

[7] See Michigami (2013 a) and Zavisca (2012)

[8] See Russian Federal State Statistical Service

[9] Electricity was excluded from the question items in the RLMS (2008) concerning installed housing utilities because electricity service is widespread. Questions concerning electricity cost and quantity of electricity used were asked, however, as part of the questions concerning amounts paid for public utilities.

[10] See Attwood (2010), Brumfield and Ruble (1993), Prevost and Dushkina (1999), Zavisca(2012), Kulakova (2006), Svyatlovskii(2012), and Michigami (2013a) etc.

[11] Shinoda (2011a, b) points out that even in this category it is limited to low-income earners, but the category remains unchanged.

References

Attwood, Lynne (2010): *Gender and Housing in Soviet Russia: Private Life in a Public Space,* Manchester University Press

Brumfield, William Craft, and Blair A. Ruble (ed). (1993), *Russian Housing in the Modern Age: Design and Social History,* Washington, D.C., Woodrow Wilson Center Press and Cambridge, New York, Cambridge University Press

Hirayama, Yosuke (2009): *Jutakuseisaku no dokoga mondaika* [Where are the problems in the housing policy?]. Tokyo, Kobunshashinsho. [in Japanese]

JETRO (2010): *Russia Kyokutochiikiniokeru Juutakukenzaishijouno Chousa* [The market research of Housing building materials in Russian Far-East]. Tokyo, JETRO. [in Japanese]

Jutaku Fudosan Zeisei Kenkyukai (2008): *Korekarano jutakushutokushienzeiseino arikata wo kangaeru* [Thinking of Tax system for Housing Acquisition Assistance]. Tokyo, Fudosan kyoukai [The Real Estate Companies Association of Japan]. Available at (http://www.fdk.or.jp/f_suggestion/pdf/cyukan-t2.pdf) Accessed on 19. September 2013. [in Japanese]

Komorida, Akio (ed.) (2001): *Shijou Keizaika no Houshakaigaku* [Socio-Legal Study of Marketization]. Tokyo, Yushindo. [in Japanese]

Kulakova, Irina (2006): *Istoriya Moskovskogo Zhil'ya.* [*The Housing History in Moscow*]. Moscow, O.G.I. [in Russian]

Michigami, Mayu (2008): "Roshia Enkaichihou Vladivostok no Jutaku Shijou" ["Housing market in Primorsky krai and Vladivostok city of Russia"], *Russian Eurasian Economy,* No.910, pp.18-33. [in Japanese]

Michigami, Mayu, Riichi Tabata and Katsuyuki Nakamura (2010): "Russia Jutaku Shijouno Hatten Katei to Juutakuseisaku no Kouka no Kenkyu" ["The Developmental Process of the Housing Market and the Effect of Housing Policy in Russia"]. *Jutaku Sogou Kenkyu Zaidan Kenkyu Ronbunshu*, No.36, 2009 pp.259-268. [in Japanese].

Michigami, Mayu (2011): "Comparison of Affordability of Russian and Japanese Housing Markets", *Far Eastern Studies,* Center for Far Eastern Studies, University of Toyama, Vol.10, pp.25-57

Michigami, Mayu, and Kazuhiro Kumo (2011): "Russia Kakei Chousa Data (RLMS) karamita Kyojuu Kankyo to Juutaku Seisaku no Mondai". ["The Russia's Problems of Residential Environment and Housing Policy based on RLMS (Russia Longitudinal Monitoring Survey) "]. *Russian Eurasian Economy & Society,* No.952, pp.2-22. [in Japanese]

Michigami, Mayu (2013 a): *Jutaku Binbo Toshi Moscow.* [*Housing Poverty City - Moscow*]. Tokyo, Toyoshoten. [in Japanese]

Michigami, Mayu (2013 b): "Russia Kyokutochiikiniokeru Juutakukakaku Douko". ["Housing Price Trends in the Russian Far East"]. *ERINA REPORT*, No.114, 2013, November, pp.16-29. [in Japanese].

Ministry of regional development in Russian Federation (http://www.minregion.ru/) [in Russian]
MLIT and Juutaku Sangyou Shinbunsha (2012): *Juutaku Keizai Data Shu (2012)*. [*Housing Economic Data (2012)*] Tokyo, Juutaku Sangyou Shinbunsha. [in Japanese].
Nakamura, Ryohei, and Takatoshi Tabuchi (1996): *Toshi to Chiiki no Keizaigaku,* [*The Economics of Cities and Regions*], Tokyo, Uhikaku. [in Japanese].
NHK (1986): *Mouhitotsuno Soviet Mosukuwa Danchizoku wo otte* [*Another Soviet, In the chase of Moscow Housing Development*].Tokyo, Japan Broadcasting Corporation Press. [in Japanese]
Postanovlenie Pravitel'stva Rossiiskoi Federatsii ot 17 dekabrya 2010 g. N 1050: *O Federal'noi Tselevoi Programme –Zhilische na 2011-2015 godyi-*.[*About Federal Program –Housing in 2011-2015-*][in Russian]
Prevost, Dyranda, and Natalia Dushkina (1999): *Living Places in Russia,* Australia, Images Publishing
Russian Federal State Statistical Service (http:/www.gks.ru/) [in Russian]
Shinoda, Yu (2011a,b): "Taiseitenkan to Juutakuhousei- Russia 2004nen Juutaku Houten no mae to ato (sono1), (sono2)", ["System Transformation and Housing Law- Housing Law in Russia before and after 2004 (I), (II)"]. *Russian Eurasian Economy & Society,* No.945, pp.2-15 and No.946, pp.2-15. [in Japanese]
Shiozaki, Yoshimitsu (ed.) (2006): *Jutaku Seisaku no Saisei* [*The Renewal of Housing Policy*]. Tokyo, Nihon Keizai Hyouronsha. [in Japanese]
Svyatlovskii, V. V. (2012): *Zhilischnyi i kvartirnyi vopros v Rossii*. [*Housing and apartment problem in Russia*], Moscow, ROSSPEN.[in Russian]
Zavisca, Jane R.(2012): *Housing the New Russia*, New York, Cornell University Press

A Study of Semi Knock Down (SKD) Production and Sales and Marketing Strategy in the Russian Far East*

Eiko Tomiyama †

Abstract

The objective of this study is to reconsider strategies for entering markets in emerging nations by analyzing entry into emerging nations based on Semi Knock Down (SKD) production and the approach adopted toward local sales and marketing. Using case studies of SKD production in Vladivostok, Russia undertaken by the automobile manufacturers SsangYong of the ROK and Toyota and Mazda of Japan, this study analyzed and examined each company's mode of entry and sales and marketing strategy.

It ascertained that while SsangYong entrusts the whole of its SKD production to the local contractor, Mazda and Toyota of Japan have training staff leaders stationed there permanently to ensure thorough quality control; in addition, whereas SsangYong entrusts all of its sales and marketing to the local contractor, Mazda and Toyota have established wholly-owned subsidiaries to carry out local sales and marketing, demonstrating the importance that these companies attach to such activities.

Keywords: SKD production, CKD production, outsourced production, sales and marketing, value chain

Introduction

In February 2013, Toyota Motor Corporation (Toyota) began Semi Knock Down (SKD) production in Vladivostok in Russia's Far East, at Sollers-Bussan, a joint venture between local automobile manufacturer Sollers and Mitsui & Co., Ltd. SsangYong Motor Company (SsangYong) and Mazda Motor Corporation (Mazda) have also been conducting SKD production at Sollers in Vladivostok since 2009 and 2012, respectively. In SKD production, the parts are first partly assembled into units and components in the home country, before being exported as a kit and assembled into the finished product locally. The kits can be assembled locally using bolts, nuts, and simple welding machinery. The countries to which these kits are exported are those where the automotive industry is at a relatively low stage of development. The other form of knock down (KD) production is Completely Knock Down (CKD) production. In CKD production, the parts are exported as they are, without first being assembled into units, and are then fully assembled into the finished product locally. Local facilities include press plants, welding plants, painting plants, and assembly plants. The countries to which these kits are exported are those where the automotive industry is at a relatively high stage of development (Tomiyama & Shioji 2010).

The governments of emerging nations have a tendency to adopt protective policies to promote the modernization of domestic automotive industry, including raising import duties and imposing domestic content requirements. The Russian government is no exception, adopting policies such as Resolution of the Government of the Russian Federation No.166, to make foreign automobile manufacturers shift from SKD to CKD production in order to modernize Russia's own automotive industry.[1]

Previous studies in the fields of international management and international marketing have pointed out that entry into overseas markets is an important part of international business activity.

However, most of these studies focus on investigating the mechanism used for selecting the mode of entry from among direct investment, export, joint ventures, and technology licensing, examining the factors that make companies choose a mode of entry and the outcomes arising from this (Hill, Hwang & Kim (1990); Kim & Hwang (1992); Anderson & Gatignon (1986); Oishi ed. (2009); Academy of Multinational Enterprises (2012); Cavusgil et al. (2002); Kotabe & Helsen (2007)). There has been little research focused on SKD.

Securing a competitive advantage in the markets of emerging nations will be a major challenge for Japan's automotive industry in the future. When producing vehicles for Russia and other emerging nations where demand is growing, Toyota prioritizes quality and has spent money on building its own plants. On the other hand, Hyundai and other automobile manufacturers from the ROK have mostly used licensing and outsourced KD production in their global expansion strategy, allowing them to use the resources of local companies to enter markets quickly (Tomiyama & Shioji 2012). Mazda has begun SKD production as a joint venture with a local company. SKD production in Vladivostok and the sales and marketing strategies subsequently employed provide a new perspective on conventional studies of modes of entry into global markets. Accordingly, this study seeks to analyze and categorize the SKD production and sales and marketing strategies of these three companies in Vladivostok. In addition, it makes deductions concerning strategies for entering markets in emerging nations.

1. Research Method

The research for this study was conducted not only via quantitative analysis, but also by gathering data from literature and conducting interview-based surveys. Field surveys were conducted in Japan, the ROK, and Russia in 2011 and 2012. Interviews were conducted at the SsangYong head office in the ROK and at Toyota's head office, as well as in Vladivostok at Mazda Sollers, Sollers-Bussan, the SsangYong and Mazda SKD plants, and the Sollers PR department.[2]

2. The Russian Government's Policy Pivot to the Russian Far East and Sollers

2.1 The Russian Government's Policy Pivot to the Russian Far East

In March 2013, positioning the development of Russia's Far East as a key national strategy, the Putin administration approved a federal budget worth approximately 11 trillion yen in total over the period to 2025. A succession of plans for the long-term development of the Far East have been formulated since Gorbachev was in power, but most have ended up as wishful thinking. Russia previously exported the majority of its oil, gas, and other energy resources to Europe, which is its biggest trading partner, and its economic relations with the countries of Europe were strengthening. However, the European economy floundered and there ceased to be any prospect of major growth from exports to European countries alone. Accordingly, Russia has been compelled to review its energy export strategy and adopt a more diverse trade and commercial structure that was less reliant on energy resources; as such, it is rebalancing its focus toward the Asia-Pacific region. In addition, the APEC Summit was held in Vladivostok in 2012, so infrastructure development progressed. The Russian government aims to stem population decline in the Far Eastern region by promoting economic development there[3]. In line with

this policy, Sollers has expanded its production activities in Vladivostok. Sollers CEO Vadim Shvetsov has political influence, being the son-in-law of former Trade and Industry Minister Viktor Khristenko. SKD assembly of SsangYong cars began at the Sollers Far Eastern plant in Vladivostok in 2009, followed by Mazda in 2012 and Toyota in February 2013. Sollers wishes to increase production in this region to around 180,000 vehicles annually, in due course.[4]

2.2 Sollers

Under its former name of SeverstalAvto, Sollers was established in 2002 as a holding company owning a number of automobile plants. In 2004, it acquired UAZ,[5] which produces SUVs and commercial vehicles based on military vehicles. In 2005, it acquired the ZMA[6] Naberezhnye Chelny plant, which formerly produced the Lada Oka subcompact car, from KAMAZ[7] and began producing Fiat cars there in 2006. In 2007, it established a joint venture with Isuzu and Sojitz to produce and sell Isuzu trucks, and in 2008 the name of the company was changed to Sollers. It established a new plant in Elabuga, where it began producing Fiat, Isuzu, and SsangYong vehicles. In December 2009, Sollers established the wholly-owned Far Eastern assembly plant in Vladivostok, where it began assembling SUVs including the SsangYong Actyon (compact SUV) in 2010. Assembly of SsangYong SUVs was transferred to Vladivostok from the Elabuga plant. The number of SsangYong vehicles produced in Vladivostok is growing steadily, increasing from 140,000 vehicles in 2010 to 33,000 in 2012.[8]

2.3 Incentive to Use Rail Transport

The Sollers Far Eastern plant benefits from an incentive under which rail charges (fees for using railway infrastructure) are waived when using rail transport to ship vehicles to areas outside the Far Eastern region. The government used to provide Russian Railways with a subsidy equivalent to the fee waived. Following Russia's accession to the WTO, the government provided Sollers with a subsidy equivalent to the fee waived, which Sollers then paid to Russian Railways as the rail freight fee. In 2013, it was initially envisaged that the subsidy would be 3 billion rubles, but this was raised to 4.9 billion rubles due to an increase in the number of vehicles produced at the Far Eastern plant. The government has committed to providing a subsidy of 6.5 billion rubles in 2014-2015. According to the State Program for Industrial Development and Improving Industrial Competitiveness by 2020, the government will provide the Sollers Far Eastern plant with subsidies totaling a further 20.1 billion rubles between 2016 and 2020.[9]

While this incentive for rail transport is being offered by the Russian government as part of its Far Eastern industrial development policy, price competitiveness can be maintained even when assembling vehicles in the Far East and shipping the completed vehicles to European Russia.

3. SKD Production by SsangYong

SsangYong was established in the ROK in 1954 as the Ha Dong-hwan Motor Workshop. In 1963, it was reorganized to form the Ha Dong-hwan Motor Company. In 1979, it began production at the Pyeongtaek plant in the ROK's Gyeonggi Province, but managerial control over its passenger car department was transferred to the Daewoo Group in 1997, due to financial

troubles. The company was acquired in 2004 by SAIC Motor of China, and the Indian automobile manufacturer Mahindra & Mahindra subsequently acquired a 70% stake in March 2011.[10]

The Sollers Far Eastern plant has a dedicated berth used by ships from the ROK carrying parts for use in SKD production of SsangYong vehicles. It is only 20m from the plant to the wharf, and only 7m from the plant to a siding that leads onto the Trans-Siberian Railway, giving the site a competitive advantage in terms of both transport costs and distance. Parts are shipped from Japan, as well as the ROK. Accordingly, inland areas are at a disadvantage in projects that have a low local procurement rate. This is because transport efficiency deteriorates if plants are sited in inland areas. Due in part to this fact, Sollers is shifting its SKD assembly plant from its inland Elabuga plant to its Vladivostok plant. Container ships enter the berth directly in front of the plant and the unloaded containers are placed temporarily in a bonded warehouse. Customs clearance then takes place as required. After customs clearance, the parts are supplied to the assembly lines and the assembled vehicles are stored in the yard until they are loaded onto the Trans-Siberian Railway for shipment.[11]

Russia is SsangYong's biggest market after the ROK. Production of SsangYong vehicles at the Sollers Far Eastern plant is expanding by the year, growing from 14,000 vehicles in 2010 to 25,000 in 2011 and 33,000 in 2012. In 2012, the plant began producing the new Actyon (compact SUV) and the Actyon Sports Pickup. All of the SsangYong vehicles assembled by Sollers are made-to-order when an order is placed by the sales company owned by Sollers. Every aspect of the assembly of SsangYong cars is entrusted to Sollers.

The sale of SsangYong cars in Russia is handled by DC SsangYong, a wholly-owned subsidiary of Sollers. Within Russia, Moscow is the top area in terms of the number of SsangYong vehicles sold, followed by Saint Petersburg in second place and the Far Eastern Federal District in third. There are 104 SsangYong dealerships in 74 cities nationwide (2012). The price of a SsangYong vehicle is set 30,000 rubles higher in Moscow than it is in Vladivostok in the Far Eastern Federal District. This is because the Sollers plant is located in Vladivostok and the company has a policy of setting a cheaper selling price in areas where its plants are located. Sollers uses a videoconferencing link between the plant and SsangYong's head office in the ROK to hold quality meetings, allowing them to work together to resolve any problems that arise. The machinery and equipment now at the Sollers Far Eastern plant were formerly installed at its Naberezhnye Chelny plant. At that time, Korean staff were stationed there for quality control purposes. Sollers subsequently decided to start up a plant in the Far East, so it transported the body-on-frame SUV line from Naberezhnye Chelny to the Vladivostok plant. There are no Korean staff stationed at the Vladivostok plant. The average age of assembly line workers at the Sollers plant in Vladivostok is 27. According to Sollers, when it started assembly at the Vladivostok plant, the assembly process took time, so the plant operated on a three-shift basis, working throughout the night as well. The takt time (time required for a single process) was more than 20 minutes. The pace has increased and the plant has been able to switch to just two shifts. Assembly line workers alternate between day and night shifts on a weekly basis. The first run rate is around 95%, with 154 vehicles assembled each day, 1-2 of which have problems.[12] If there is a scratch on the body due to a storm, for example, the damaged area is repainted. Each month, the plant assembles the orders received by the 20th, allowing 3 months' leeway.[13]

Sales and marketing are also handled by Sollers's wholly-owned subsidiary DC SsangYong, with all aspects of sales and marketing entrusted to Sollers by SsangYong. This is not ideal as a marketing policy, because sales volumes and prices are determined according to orders received

from the Sollers subsidiary, resulting in unstable turnover for SsangYong. Furthermore, the company is unable to build up know-how and experience of marketing techniques and sales channels in Russia, as well as being unable to engage in more proactive sales promotion and improve its after-sales service itself. Ssangyong is unable to sell directly to dealers, so it cannot ascertain the problems faced by customers or obtain new information. This hinders marketing innovation. Moreover, it is hard for the company to adapt to its customers and obtain new information from them that would lead to product innovation or improvements to part of the product. Furthermore, it allows the counterpart – which might in future become a rival – to study the company's marketing capabilities.

4. SKD Production by Mazda

The following provides an overview of the history of Mazda's Russian business operations.

Mazda established a local representative office in December 2004, followed by the wholly-owned sales subsidiary Mazda Motors Russia in Moscow in December 2005. This company is an importer-distributor. In Russia, Mazda's cars are popular for their sporty design. They appeal to Russians in their 30s who like sporty, stylish cars, and both the Mazda 3 (C-segment[14]) and the Mazda 6 (D-segment) experienced sharp rises sales volumes before the Lehman Crisis in 2009.[15] In October 2008, the company began shipping its cars to European Russia via the Trans-Siberian Railway, to reduce transport time. On this route, the completed vehicles are shipped by sea from Mazda's plants in Hiroshima and Hofu to Zarubino on the outskirts of Vladivostok, and then on a dedicated 30-car train to Moscow via the Trans-Siberian Railway. It takes around 11 days to cover the 9,300km or so to Moscow, compared to up to 30 days under the previous system, which involved shipping the vehicles by sea via Western Europe and then taking them overland to Moscow. In September 2012, Mazda established a joint venture to which it and Sollers both contributed a 50% investment (total investment 10 billion rubles (25 billion yen)), Mazda Sollers Manufacturing Rus, which began assembly production of the CX-5 (compact SUV) in October that year. An existing Sollers plant was used for this. Between October and December 2012, it produced 3,108 vehicles. It currently employs around 1,000 staff, but intends to expand this to 3,000 once it transitions to CKD production in future. This was the first Japanese manufacturer to begin assembly production of passenger cars in the Russian Far East. Mazda Chairman Takashi Yamanouchi believes that the Russian market is "growing into one of Mazda's top markets worldwide, with sales reaching almost 3 million vehicles, and we have particularly high hopes for development in Vladivostok, as an access point into the economies of East Asia, so we wish to contribute to its growth as a new hub for the Russian automotive industry,"[16] and Mazda is currently making careful preparations for switching from SKD to CKD production.

Mazda began production of the Mazda 6 (D-segment) in April 2013. The annual production capacity is 50,000 vehicles, but new body and painting plants are due to be built in the future, with a view to increasing annual production to around 100,000 via CKD production. Germany was formerly Mazda's biggest market in Europe, but it was overtaken by Russia in 2012. Mazda embarked on a production joint venture because it recognized that although there are elements of instability in Russia, including economic risk, the Russian market is growing steadily. Mazda's SKD assembly line is located in the same building where SsangYong's vehicles are assembled.

Mazda's wholly-owned subsidiary Mazda Motor Rus functions as an importer-distributor, conducting import and wholesale sales and marketing targeted at dealers throughout Russia.

Mazda's CX-5 won the 2012 Japan Car of the Year Award; its competitors in the compact SUV category include the Toyota RAV4 and the VW Tiguan. Russia's roads are poor, so sales of SUVs are growing; accordingly, Mazda began with SKD production of the CX-5 SUV. The plant also has a test track. Its production capacity was 35,000 vehicles in 2012, rising to 50,000-60,000 vehicles in 2013. New body and painting plants are to be built in the future, with a view to increasing annual production to around 100,000, based on CKD production.[17] Assembly workers are hired as new graduates and undergo a month of training (three weeks off-line, followed by a week on-line).

Vehicles are shipped from Hiroshima to the port in Pohang, ROK, where the parts to be used for Mazda assembly are transferred onto a ship along with parts for SsangYong vehicles before being shipped to the Vladivostok plant. The Russian government ceased applying the old system of import duties on parts at the end of 2011, but it granted a special exception for the application of the old system in the Far East, as a region where it is seeking to boost economic development, so Mazda makes use of this system in its business venture. Mazda has four Japanese staff on loan to the joint venture: one vice-president, two engineers (one in charge of quality and the other in charge of production technology), and one financial affairs coordinator. In terms of the division of labor within the joint venture, Mazda handles production, quality, and production readiness, while Sollers deals with personnel, general administration, and liaison with the government; important matters concerning the company are decided via consultation between the executives on loan from the two partners in the joint venture. Apart from those destined for the Far East, all completed vehicles are shipped via the Trans-Siberian Railway. Use of the Trans-Siberian Railway poses no major problems in terms of quality or time. Trivial problems such as vandalism in transit sometimes arise, but any damage is repaired by the Mazda distributor/dealer once the vehicle arrives at its destination. Mazda plans to switch from simple SKD assembly to integrated production – including bodywork, painting, and assembly – within the next few years. As a result, it will employ more than double the number of engineers and plant workers that it has at present. It is currently preparing the construction plans, work plans, employment plans, and organizational systems required for this and has already begun to implement some of these. It intends to begin training at its plants in Japan and/or ASEAN countries within 2014. A condition of the tax incentive for parts is that the company must reduce the quantity of imported parts subject to the incentive by 30% within 4-5 years of commencing integrated production. In order to satisfy this condition, Mazda is apparently considering either procuring parts locally in collaboration with Sollers or using its production bases in China or ASEAN countries to reduce the cost of parts.[18]

5. SKD Production by Toyota

5.1 Toyota's Entry Process

Toyota first entered the Russian market during the Soviet era, indirectly exporting its vehicles via a trading company. It subsequently established a representative office in 1998. In 2001, it established Toyota Motor Russia (TMR) in Moscow as an importer-distributor, and TMR began operating in 2002. In April 2005, it concluded MOUs with the Russian Ministry of Economic Development and Trade and the city of Saint Petersburg. In May 2005, it established a production plant, Toyota Motor Manufacturing Russia (TMMR), in Saint Petersburg and began

local production of the Toyota Camry (E-segment) in December 2007. In August 2010, Mitsui & Co., Ltd. established Sollers-Bussan, a joint production venture with Sollers, in which each company holds a 50% stake. In March 2011, Sollers-Bussan concluded a basic agreement with Toyota to begin assembly of the Land Cruiser Prado at the Far Eastern plant in Vladivostok, and SKD production began in February 2013.

Sollers-Bussan proposed models for SKD production and Toyota made the final decision, choosing the Land Cruiser Prado. One of the factors in its decision was the popularity of SUVs and other large luxury cars in Russia. After assembly, the finished cars are all purchased by TMR in Moscow. The business units involved are Mitsui & Co., Ltd. and Sollers, and the Russian government applies the old import duty incentive to the parts imported. Toyota supplies the parts and provides support in the areas of production, technical guidance, and quality control.

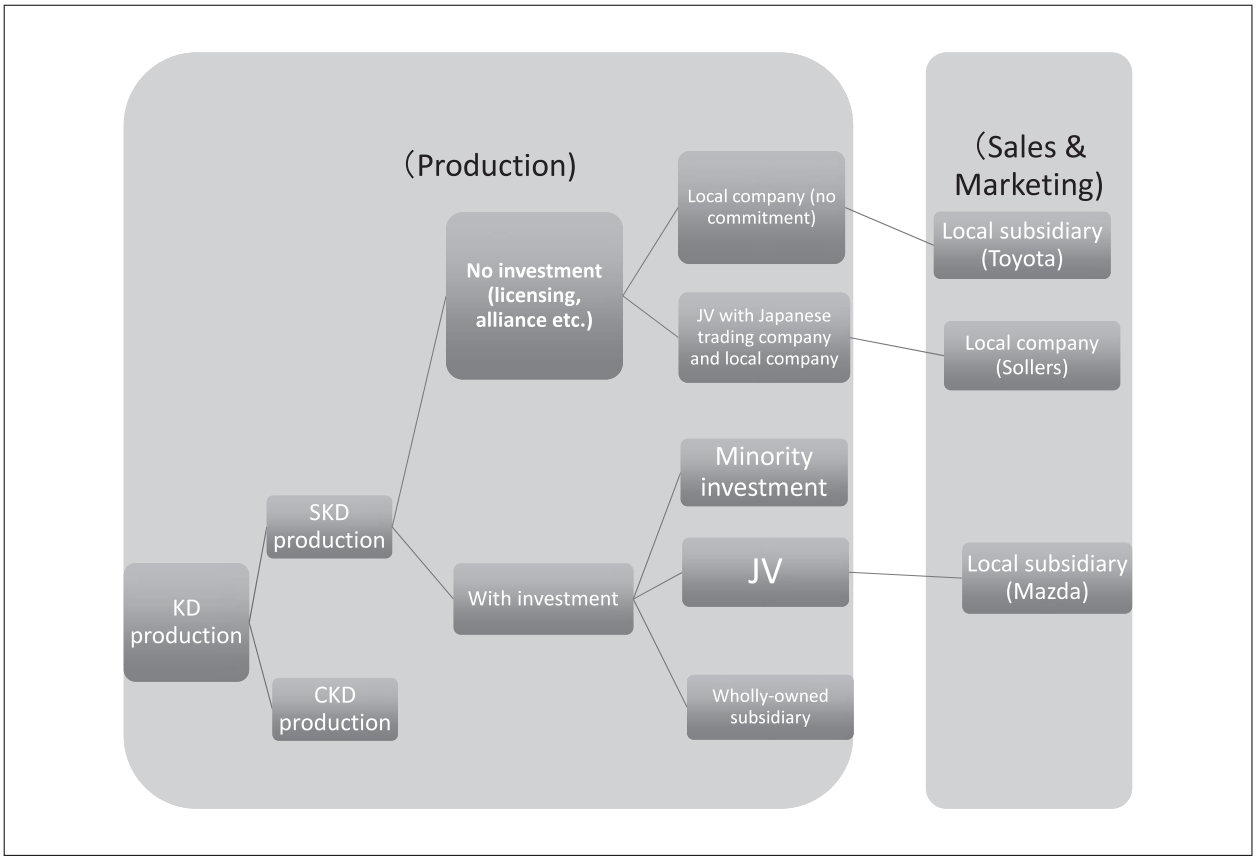
In terms of the assembly process, Toyota first packages up the parts at its Tahara plant and Mitsui & Co., Ltd. arranges shipment from the Tahara plant to the Port of Toyohashi. Sollers-Bussan takes responsibility for marine container transport, reassembly, and transport of the finished vehicles, loading them onto railway freight trucks for shipment. The Toyota vehicles are assembled in a different building from the plant in which SsangYong and Mazda vehicles are assembled. Like both of those other brands, the form of production used for Toyota vehicles at the Vladivostok plant is SKD involving assembly only, with no welding or painting. It takes just under a day from the vehicle entering the assembly line until it comes off the line. Toyota's profits depend on sales of parts and sales of finished vehicles by TMR. The Tahara plant is the designated support plant for this project and has been providing support since before SKD production in Vladivostok started. Before the Vladivostok line started up, a dozen or so staff from Tahara spent six months there helping to set it up. Since the line started up, a staff member from the quality control department and a staff member from the assembly department at the Tahara plant have been stationed there permanently. Their job title is Executive Coordinator.[19] Sollers carries out human resource development. Novices and inexperienced workers receive four weeks of basic training. Sollers has an educational program that it cultivated through its experience with Korean cars, into which it has incorporated the strengths of both Sollers and Toyota, based on advice provided by Toyota. With 2 shifts per day, the plant produces around 1,000 vehicles a month. It plans to produce 13,000-14,000 vehicles per year. In terms of cubic volume, its marine transport is equivalent to about one ship every ten days. As it is not possible to fill an entire Trans-Siberian Railway block train[20] using Toyota cargo alone, the cars with Toyota vehicles are joined up to freight cars in transit that are carrying other cargo. The lead time is around 20 days. Apart from some materials, all parts are supplied from Japan. Sollers-Bussan employs a total of 280 staff there, including shop floor staff and management (as of July 4, 2013). Sollers itself has a total of 1,100 staff in Vladivostok. In Moscow, Toyota charges the same selling price for Land Cruiser Prado imported as completely built up vehicles (CBU) as it does for those produced by Sollers-Bussan under SKD production in Vladivostok. Dealers in the Far East (Vladivostok, Khabarovsk, Nakhodka) pick the vehicles up from Vladivostok, but for other areas, the vehicles are shipped to Moscow on the Trans-Siberian Railway and are then taken to the relevant cities from there. Toyota itself is aware that this is inefficient in logistical terms. Upon arrival, TMR carries out a pre-handover quality inspection. The Trans-Siberian Railway does not use containers; instead, eight vehicles are loaded onto each dedicated freight car.[21]

6. Analysis and Examination

SsangYong, Mazda, and Toyota all use a local company in Russia and export semifinished goods to be assembled locally using the SKD method. In the case of SsangYong, the local assembly and sales company Sollers covered the cost of investment, while for Mazda, costs were split equally between Sollers and Mazda, and for Toyota, the costs were borne by Mitsui & Co., Ltd. and Sollers. What all three automobile manufacturers have in common is that they provided the production technology. The cost of parts is minimized via intensive production. Import duty on finished vehicles is high, so they are exported as semifinished goods, on which duty is low, and assembled locally. This enables the finished vehicles to be assembled cheaply, thereby bolstering their price competitiveness. SKD production also has a substantial advantage in terms of the fact that it allows the investment risks involved in overseas expansion to be reduced.

Some SKD involves investment, some does not, and some involves only a little. SKD involving investment includes cases in which a joint venture is formed with a local company, cases in which the company establishes a wholly-owned subsidiary, and cases in which the company obtains a minority stake in a company (Figure 1). In Mazda's case, it established a 50/50 joint venture with the local company Sollers to carry out assembly locally. Sales and marketing is carried out by its wholly-owned local subsidiary. This is the Mazda case in Figure 1.

Figure 1: Local Assembly Based on SKD Production and Local Sales and Marketing



Source: Compiled by the author.

Joint ventures entail a certain amount of risk compared with outsourced production. This is because joint ventures require the overseas relocation of more production elements and management resources than outsourced production. However, there is no guarantee that the overseas transfer of these will be successful or without problems. Consequently, investment is required in order to control local operations. The joint venture approach is often used when entering a large market, such as Russia, or a potentially large market. Mazda adopted the joint venture approach because it was seeking not only control of local operations, but also a partner with specialist knowledge of the Russian market (knowledge about the local market and laws), as well as experience and personnel.

Toyota and SsangYong outsource assembly to the local company without any investment. Approaches such as licensing and outsourced production do not involve investment. Even if some investment is involved, it is minimal. The quantity of resources invested is small, minimizing costs. This enables a company to enter a market quickly, with few political or economic risks, and little damage to management resources. On the other hand, there is a risk that the company could be nurturing a future rival. There are, of course, teething troubles. That is why companies thoroughly inspect the quality and production level, and station their own staff at the plant to provide guidance. However, SsangYong does not have any staff stationed at the plant. There is also a risk of leakage, with the potential for the company's intellectual property to be transferred to rival products or appropriated by the contract manufacturer. Accordingly, it is necessary to choose as a contract manufacturer a reasonable, trustworthy partner that will not leak the company's secrets (Arruñada and Vázquez 2006). Sollers-Bussan is a joint venture between a Japanese trading company and a local company, so in that sense as well, Toyota can regard it as a more trustworthy partner. It is also easier to communicate and there is little in the way of payment risk.[22]

As with Mazda, Toyota's sales and marketing and after-sales service are carried out by its own wholly-owned local subsidiary. This is the Toyota case in Figure 1. On the other hand, a local company does this for SsangYong. This is the SsangYong case in Figure 1. The company handling sales and marketing for SsangYong vehicles is part of the Sollers organization and everything is entrusted to that counterpart. This saves on distribution expenses arising from sales, enabling SsangYong to reduce costs, but the counterpart (Sollers) even determines the selling price and there is a tendency to adopt a product-out approach, focusing on how to sell at a cheap price the product that has been produced. After-sales service is also entrusted to the counterpart. Entrusting matters to the counterpart prevents the company accumulating know-how and experience of marketing techniques and sales channels. It is a sales-oriented strategy that focuses on earning profits by increasing the number of vehicles sold.

Mazda's marketing and after-sales service are handled by its wholly-owned sales subsidiary, and Toyota's wholly-owned sales subsidiary performs the same role for Toyota. These companies' sales subsidiaries have good control over distribution channels and are better positioned to consider the views of customers, so it is easier for these companies to adopt the market-in approach, identifying local needs and considering how to make a product that will sell. Both companies' strategies are based on the market-in approach of earning profits via customer satisfaction, including service. SKD production enables a company to reduce manufacturing costs and devote its energies to high-added-value sales and marketing and after-sales service. Considered from a long-term perspective, the marketing policies of Mazda and Toyota are more likely to increase the number of their devotees in Russia.

Conclusion

This paper has analyzed examples of SKD production in Vladivostok by SsangYong of the ROK and Toyota and Mazda of Japan, examining their strategies for entering Russia's emerging market from the perspective of KD production and sales and marketing. The following can be deduced from this study.

First, Japanese manufacturers such as Mazda and Toyota dispatch production technicians to the local plant to provide thorough staff training and technical assistance, enabling the plant to produce high-quality products. Thus, KD production – involving the supply of parts to a local company to assemble – is one strategy that companies can adopt in order to provide a finely-tuned response to areas of small demand when expanding into emerging nations. This not only enables the company to identify and respond to small areas of need locally, but also makes effective use of local resources, while allowing it to minimize its investment. Export and KD production is a form of overseas expansion offering a good level of control. Emerging markets such as Russia are particularly prone to political and economic risks. In such markets, there is a particular need to consider a means of entry that makes effective use of the local partner's management resources. Companies must be flexible in adopting such competitive strategies in their emerging market strategies.

Second, Toyota and Mazda both established sales subsidiaries before commencing local assembly. Through this approach, they are enhancing their models after establishing their competitiveness in terms of customer care via their sales networks. In their distribution channel strategies, both companies started by providing meticulous service. Reducing costs via SKD production and devoting energies to high-added-value sales and marketing and after-sales service are part of their initiatives focused on increasing customer value, which is total value in the value chain.

* This paper is a revised version of Tomiyama (2014b). In writing this paper, the author received considerable support and assistance from Professor Hiromi Shioji of the Graduate School of Economics, Kyoto University, as well as from various staff members at the head office of Toyota Motor Corporation, Mazda Sollers, Sollers-Bussan, the Sollers Far East plant, and the head office of SsangYong Motor Company. We would like to take this opportunity to record our thanks to them. In addition, the author received support for research expenditure under the Ministry of Education, Culture, Sports, Science and Technology KAKENHI Grant-in-Aid for Scientific Research (Scientific Research C Topic No. 25380581 and No. 25380550) and also an encouragement grant from the Graduate Institute for Entrepreneurial Studies

† Regional & International Vice President and Professor, Graduate Institute for Entrepreneurial Studies

[1] For details, see Sakaguchi & Tomiyama (2012), pp. 22-32.

[2] According to surveys conducted at Sollers PR department in Vladivostok (September 19, 2012), SsangYong head office in the ROK (August 16, 2012), Sollers-Bussan in Vladivostok (July 4, 2012), Mazda Sollers in Vladivostok (December 25, 2012), and Toyota head office (September 7, 2011 and May 27, 2013).

[3] Handouts and discussion at the panel discussion "Energy to Connect Northeast Asia: Energy Transportation Infrastructure and Security" (held on Monday, December 16, 2013 at Toki Messe, Niigata City) co-hosted by the Economic Research Institute for Northeast Asia (ERINA) and the Institute of Eurasian Studies (speakers: Motohiro Ikeda "Russia's Natural Gas Resources and Japan-Russia Cooperation"; Shinji Hyodo "Russia's Arctic Policy"; Kazuaki Hiraishi "Northeast Asia's Natural Gas Transportation Infrastructure"; Masumi Motomura "Russia's Pipeline

[4] Interview with Sollers PR department (September 19, 2012, in Russian).

[5] UAZ is an abbreviation that stands for Ulyanovsky Avtomobilny Zavod (Ulyanovsk Automobile Plant) in Russian. Founded in 1941, it began by producing military vehicles during World War II. In Ulyanovsk, it produces SUVs, trucks, and buses based on military vehicles (http://www.uaz.ru/company).

[6] ZMA is an abbreviation that stands for Zavod Malolitrazhnykh Avtomobiley (Subcompact Car Plant) in Russian.
[7] KAMAZ is an abbreviation that stands for Kamskiy Avtomobilny Zavod (Kama Automobile Plant) in Russian. It was founded in 1969 and reorganized into a joint-stock corporation in 1990. It is a truck manufacturer. The head office is located in Naberezhnye Chelny, in the Republic of Tatarstan (http://kamaz.net/ru/).
[8] Details regarding Sollers are from FOURIN (2013b).
[9] Interview with Sollers PR department (September 19, 2012, in Russian); see also Sakaguchi (2013) p. 13.
[10] Information concerning SsangYong is according to a survey at SsangYong head office (op. cit.) and Mizuno (1997).
[11] According to a field survey at the Sollers Vladivostok plant (September 19, 2012).
[12] The figure of 154 vehicles per day was achieved when the plant was only carrying out SKD production for SsangYong, before it began SKD production for Mazda and Sollers-Bussan.
[13] According to a field survey at the Sollers Vladivostok plant (September 19, 2012).
[14] Segments are a concept used to classify passenger cars. Some classification systems simply use body length as the criterion, while others take multiple factors into account, including body length, price, image, and equipment. The criteria differ depending on the country and company carrying out the classification. For example, the leading European research company Global Insight classifies Segment A as small cars, Segment B as super compacts, Segment C as lower medium, Segment D as upper medium, and Segment E as executive. This paper uses FOURIN's classification.
[15] The number of Mazda 3s sold surged from 28,547 in 2007 to 39,144 in 2008, but subsequently fell to 13,006 in 2009, following the Lehman Crisis. Similarly, Mazda 6 sales rose from 15,298 vehicles in 2007 to 17,569 in 2008, but then fell to 8,583 in 2009 (FOURIN (2013a) p. 149). In Russia, Mazda's cars are mainly bought by people in their 30s, while in Germany they are mainly bought by people in their 50s and in Japan mainly by people in their 40s. Mazda uses the same specs for its vehicles worldwide, but the age bracket of its main customers differs from country to country. The regulations differ in each country, so tuning for the Russian market is carried out at the head office in Japan. In the case of the CX-5, which is assembled in Vladivostok, the structure is the same, but the tuning is different (according to a survey at Mazda Sollers (December 25, 2012)).
[16] Extract from a speech by Takashi Yamanouchi on September 6, 2012 in Vladivostok, Primorsky Krai, Far Eastern Federal District, Russia, at the ceremony to commemorate the establishment of Mazda Sollers Manufacturing Rus as a joint venture by Mazda Motor Corporation (Chairman: Takashi Yamanouchi) and Sollers OJSC (CEO: Vadim Shvetsov) (press release by Mazda on September 6, 2012).
[17] 13,063 CX-5s were sold in 2012 (FOURIN (2013a) p. 149).
[18] Information concerning Mazda's business in Russia is according to a survey at Mazda Sollers (op. cit.).
[19] They have responsibility for technology, but do not go onto the assembly line.
[20] A block train is a dedicated cargo express train that uses the Trans-Siberian Railway. It is a train that travels non-stop to its destination in a single configuration, consisting of between 31 and 37 cars designed to carry 80-foot (24-meter) containers (equivalent to a capacity of 62-74 40-foot (12-meter) containers). The route is determined in advance, which eliminates the need to reconfigure the train en route, thereby reducing delivery times and ensuring a more punctual service. Block trains do not stop at any stations along the way, which not only reduces the risk of cargo loss, but also ensures minimal damage to cargo, because it is not subject to the jolting that arises when other freight cars are attached to the train. It takes 11-12 days for the trains to travel from the Port of Vladivostok to Moscow. The biggest advantage is the reduction in lead times resulting from the reduction in shipment time and more punctual transit https://www.mitsui.com/jp/ja/business/challenge/1190506_1589.html (accessed January 8, 2014), http://www.mitsui-tsr.com/index5.html (accessed January 8, 2014).
[21] Details of Toyota's business in Russia are based on a survey at Toyota's head office (Toyota head office (September 7, 2011 and May 27, 2013)).
[22] See Kotabe & Helsen 2007.

References

Academy of Multinational Enterprises (2012): *Takokuseki kigyō to shinkōkoku shijō [Multinational Enterprises and Markets in Emerging Nations]*. Tokyo: Bunshindo. [in Japanese]

Anderson, Erin, and Hubert Gatignon (1986): "Modes of Foreign Entry: A Transaction Cost Analysis and Propositions" in *Journal of International Business Studies*, 17 (Fall), pp. 1-26. Academy of International

Business.
Arruñada, Benito, and Xosé Vázquez (2006): "When Your Contract Manufacturer Becomes Your Competitor", in *Harvard Business Review*, September 2006, Vol. 84, Issue 9, pp. 135-144. Harvard Business Publishing.
Cavusgil, S. Tamer, Pervez N. Ghauri, and Ayse A. Akcal (2002): *Doing Business in Emerging Markets*. London: SAGE Publications.
FOURIN (2013a): *Roshia toruko chūtō-ō jidōsha buhin sangyō [The Automotive Components Industry in Russia, Turkey, and Central and Eastern Europe]*. FOURIN. [in Japanese]
FOURIN (2013b): *Sekai jidōsha chōsa geppō [Global Automotive Monthly Report]*, No. 334, June 2013. FOURIN [in Japanese]
Hill, Charles W.L., Peter Hwang, and W. Chan Kim (1990): "An Eclectic Theory of the Choice of International Entry Mode" in *Strategic Management Journal*, 11(2), pp. 117-128. Strategic Management Society.
Hubbard, Nancy (2013): *Conquering Global Markets: Secrets from the World's Most Successful Multinationals*. Basingstoke: Palgrave Macmillan. (in the Japanese translation: KPMGFAS (translation supervisor), Yukiko TAKAHASHI (translator): Tokyo: Toyo Keizai.)
Kim, W. Chan, and Peter Hwang (1992): "Global Strategy and Multinationals' Entry Mode Choice" in *Journal of International Business Studies,* 23(1), pp. 29-53. Academy of International Business.
Kotabe, Masaaki, and Kristiaan Helsen (2007): *Global Marketing Management* (Fourth Edition). New York: Wiley.
Mizuno, Junko (1997): *Kankoku no jidōsha sangyō [The South Korean Automotive Industry]*. Tokyo: Institute of Developing Economies, Japan External Trade Organization. [in Japanese]
Oishi, Yoshihiro ed. (2009): *Nihon kigyō no gurōbaru māketeingu [Global Marketing of Japanese Companies]*. Tokyo: Hakuto Shobo. [in Japanese]
Sakaguchi, Izumi (2013): "Roshia de gaishi mēkā ga chokumen suru genchōka no nanmon" ["The Knotty Problem of Increasing Localization Faced by Foreign Manufacturers in Russia"] in *Roshia NIS chōsa geppō [Russia & NIS Business Monthly]*, December 2013, pp. 1-16. Japan Association for Trade with Russia & NIS. [in Japanese]
Sakaguchi, Izumi, and Eiko Tomiyama(2012): *Roshia no jidōsha shijō [Russia's Automotive Industry]*. Tokyo: Toyo Shoten. [in Japanese]
Tomiyama, Eiko (2004): *Roshia shijō sannyū senryaku [Russian Market Entry Strategies]*. Kyoto: Minerva Shobo. [in Japanese]
Tomiyama, Eiko, and Hiromi Shioji (2010): "Gendai jidōsha no gurōbaru tenkai ni okeru roshia shijō sannyū no tokuchō – raisenshingu kara kogaisha KD seisan he –" ["Characteristics of Hyundai Motor Company's Entry into the Russian Market in its Global Expansion: From Licensing to Subsidiaries and KD Production"] in *Roshia yūrashia keizai [Russian-Eurasian Economy]*, No. 940, pp. 10-26. Institute of Eurasian Studies. [in Japanese]
Tomiyama, Eiko (2014a): "Jidōsha mēkā no shinkōkoku roshia he no sannyū senryaku – sanyon jidōsha, matsuda, toyota jidōsha no urajiosutoku de no seminokkudaun (SKD) seisan ni yoru sannyū wo koto to shite –" ["The Entry Strategies of Automobile Manufacturers into the Emerging Nation of Russia: Focus on Entry by SsangYong Motor Company, Mazda, and Toyota Motor Corporation via Semi Knock Down (SKD) Production in Vladivostok"] in *ERINA Report* No. 116, March 2014. Economic Research Institute for Northeast Asia. [in Japanese]
Tomiyama, Eiko (2014b): "Shinkōkoku ni okeru jidōsha mēkā no seminokkudaun (SKD) seisan to hanbai māketeingu senryaku – urajiosutoku ni okeryu sanyon jidōsha, matsuda, toyota jidōsha no jirei kenkyū –" ["Semi Knock Down (SKD) Production and Sales and Marketing Strategy by Automobile Manufacturers in Emerging Nations: A Case Study of SsangYong Motor Company, Mazda, and Toyota Motor Corporation in Vladivostok"] in *Jigyō sōzō daigakuin daigaku kiyō [Journal of Graduate Institute for Entrepreneurial Studies]*, Vol. 5, No. 1, pp. 1-18, April 2014. Graduate Institute for Entrepreneurial Studies. [in Japanese]
Yoshida, Nobuyoshi (2003): "Kyūseichō wo tsudzukeru smōru kā shijō - nihon kigyō no sentaku to senryaku" ["Ongoing Rapid Growth in the Small Car Market: The Options and Strategies of Japanese Companies"] in *JAMAGAZINE*, March 2003. Japan Automobile Manufacturers Association. [in Japanese] http://www.jama.or.jp/lib/jamagazine/200303/03.html (accessed on January 8, 2014).

Russia's Dilemmas about China's Gas Market

Elena Shadrina*

Abstract

Russia has abundant gas resources located in direct proximity to China and is able to satisfy a significant share of gas demand of the world's second largest economy. For long, Russia's attempts to enter China's rapidly growing gas market were to no avail. Despite the eventual conclusion of a long-negotiated Sino-Russian gas contract in May 2014, some uncertainties about Russia-China gas cooperation persist. The article addresses the Chinese gas market principal trends, examines Russia's current position as China's supplier and scrutinises Russia's China-bound gas export potential. The article explores whether Russia's interest to further expand in China's gas market can materialise and how Russia needs to act in order to attain this goal.

Keywords: China, Russia, natural gas, Power of Siberia gas pipeline

Introduction

The Ukrainian crisis of 2013-2014 revealed the risks of Russia's overdependence on European energy demand, making clear that export diversification should be Russia's rational choice allowing it to alleviate its vulnerability vis-à-vis European markets. Under the new circumstances of the sanctions initiated by the USA and the EU and supported by Japan and some other countries, Russia turned more orientated towards China, and in May 2014 signed what was dubbed a historic gas deal.[1] While the scope of Russo-Chinese gas cooperation is not limited to this large-scale contract and while it is still too early to assess the impact of this newly-struck agreement, it seems worthwhile to examine the overall potential for the bilateral gas cooperation.

China's gas market is exceptionally attractive to any gas exporter. In 2012, it was the fastest growing gas market, accounting alone for 40 per cent of additional gas consumption among non-OECD countries. While in 2013 China's GDP grew by 7.7 per cent (in the preceding three decades it averaged 9.8 per cent), the country's gas consumption increased by 13 per cent. A result of the rather modest expansion in domestic gas output (of less than 9 per cent), China's gas imports rose by 25 per cent in 2012 (Du 2014). By 2035, China's natural gas production is predicted to grow by 232 per cent, while its demand is expected to rise by 322 per cent. Hence, China's gas imports will continue to increase causing import dependency to exceed 40 per cent by 2035 (BP 2014) from 31.6 per cent in 2013. Over the next few years China is expected to surpass the world's third largest gas user, Iran (IEA 2013) and by 2025 to overtake Russia as the world's second largest gas consumer (BP 2014). Until 2018, China's gas demand is projected to grow by 12 per cent annually and the country will absorb one-third of new LNG supplies worldwide (IEA 2013).

The imperative factors driving China's gas consumption are: rising energy use associated with economic growth, continuing urbanisation and industrialisation (Wang and Lin 2014), recovery of China's relatively energy-intensive exports from the 2008 crisis (Li et al. 2014), increasing role of gas in China's energy mix as a part of the government's pollution mitigating policies, etc. Overall, China's energy mix is dominated by coal (some 68 per cent), but the role

of natural gas is increasing. It is projected to rise from the current 5.9 per cent (Du 2014) to 10 per cent by 2020 (IEA) and 12 per cent by 2030 (CNPC). Certainly, as China's economic growth decelerates and industrialisation, electrification and motorisation continue at a more moderate pace, China's gas demand growth rates will also be lower (BP 2013, 2014). Even so, owing to its present large scale and significant potential for further growth, China's gas market will remain one of the most attractive.

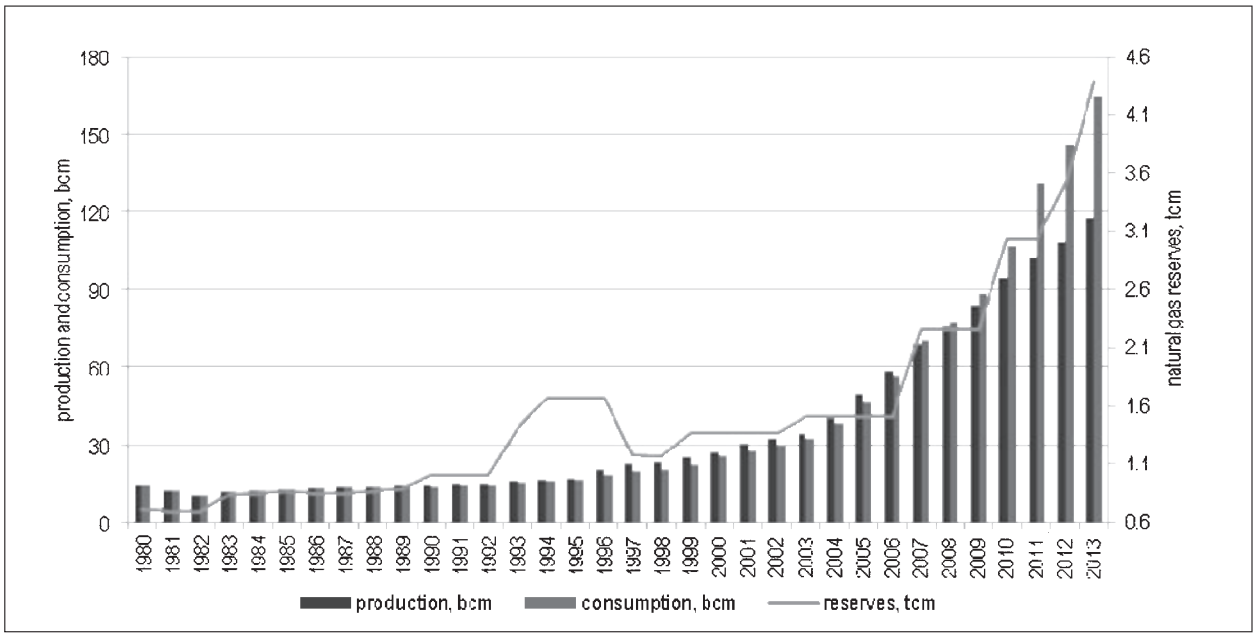
The article discusses the possibility for Russia to increase gas exports to China. The study analyses the trends in China's gas market, characterises the country's current gas supply-demand balance and its import needs. It discusses Russia's current role in the Chinese gas market and overviews Russia's China-oriented projects. While evaluating Russia's opportunities to expand into the Chinese gas market, the article gauges the match between the timing and volume of gas flows as required in China and planned by Russia. The concluding section proposes policy implications related to Russia's gas policy vis-à-vis China.

1. China's Gas Supply – Demand Balance

1.1. Reserves

Since the 1978 Reform and the Opening-Up, five major national oil and gas resource assessments have been implemented (Wang et al. 2013). China's natural gas reserves have been increasing[2] due to the advancement of innovations in geological theory and progress in exploration technology, but data on conventional gas reserves vary widely. While China's domestic assessments agree that the country's recoverable gas resources range from 7 tcm to 10 tcm (Wang et al. 2013: 691-93), the external agencies, such as BP (2013), estimate China's proved gas reserves at 3.1 tcm and EIA (2014) refers to 4.4 tcm (Figure 1). The discrepancy in reserves classifications and terminology is one of the reasons for data inconsistency.

Figure 1: China's Natural Gas Reserves, Production and Consumption, 1980-2013



Source: composed by author.

Gas resources are unevenly distributed across China. The main deposits are located in the western and central regions, whereas consumption concentrates in the eastern coastal areas. Three major basins - Ordos, Tarim and Sichuan - contain more than half of China's total proved reserves (Higashi 2009: 7). In the Ordos basin (11 tcm), the flagship field is Sulige 6 with 1.69 tcm reserves. In the Sichuan basin, Longgang (700-750 bcm) and Puguang (412 bcm) are the biggest fields. The recent discovery of the Yuanba field adds reserves of 160 bcm. The largest deposits in the Tarim basin are Kela 2 (284 bcm), Dina 2 (175 bcm) and Dabei 3 (150 bcm). Besides, China possesses the world's largest technically recoverable shale gas resources of 32.7 bcm[3], most of which are concentrated in Sichuan and Tarim (Golden Rules 2012: 115), but also in Jianghan, Junggar, Songliao, Subei and Yangtze Platform (Map 1).[4]

Map 1: Major Unconventional Natural Gas Resources in China

Source: Chrisman 2014

1.2. Production

China's domestic gas production has been increasing from 94.4 bcm in 2010 to 102.8 bcm in 2011, 108 bcm in 2012, and 117.6 bcm in 2013. However, the production growth rates (12 per cent, about 9.6 and 9 per cent respectively) were significantly lower than the growth in demand. The increase in domestic production is imperative to national gas policy.

China's primary sources of conventional supply are in Sichuan Province (Puguang in the Sichuan basin produced 10 bcm in 2012), the Xinjiang and Qinghai Provinces in the Northwest

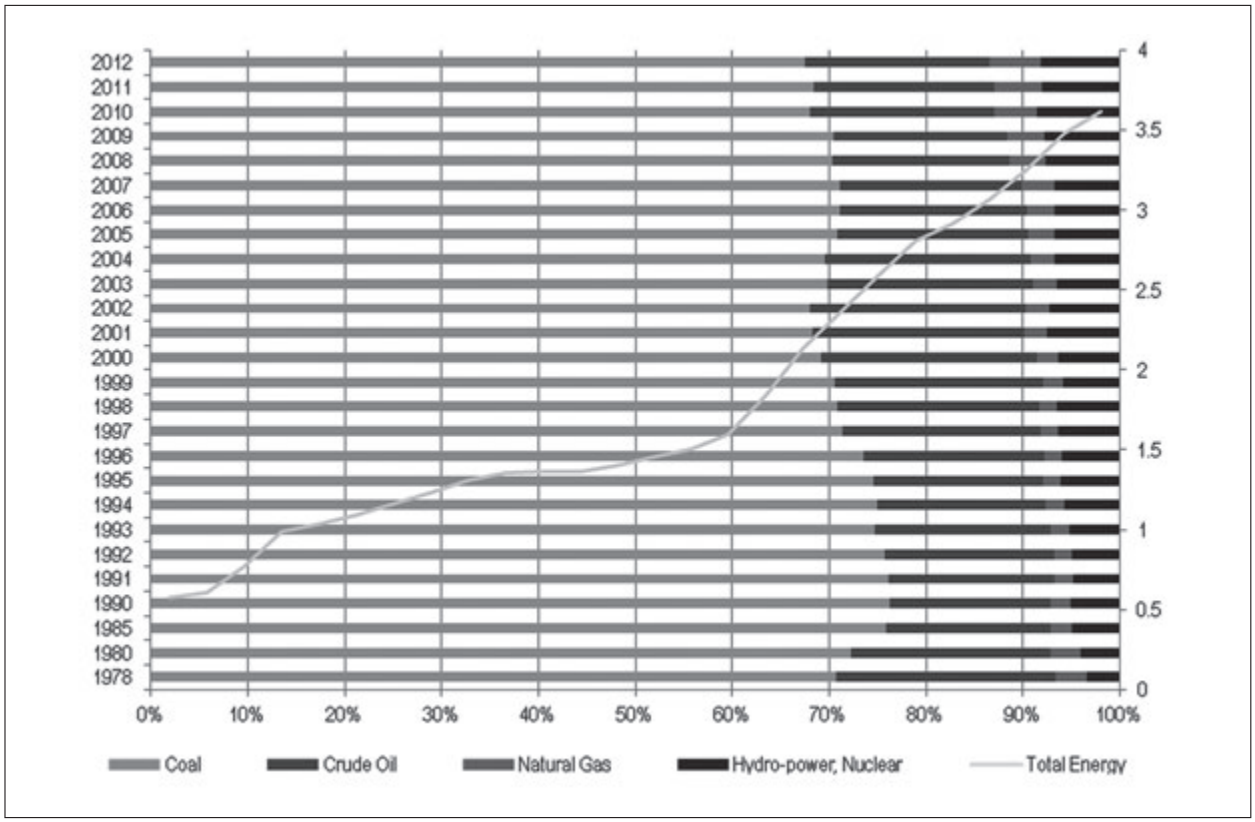
(Tarim basin produced 19.3 bcm in 2012), Junggar and Qaidam basins and Shanxi Province in the North (the Changqing field in Ordos basin produced nearly 30 bcm in 2012). There are also offshore gas producing fields in the Bohai basin and the Panyu complex of the Pearl River Mouth Basin (the South China Sea). By 2015, China plans to increase conventional gas production to 138.5 bcm. Of this, Sichuan Basin is projected to produce 41 bcm, Ordos – 39 bcm, Tarim – 32 bcm and South China Sea – 20 bcm[5]. The development of unconventional sources of gas is emphasised as a realistic way to reduce China's increasing import dependency. In 2013, China's shale gas production was 0.2 bcm (up from just 0.05 bcm in 2012),[6] while coal-bed methane (CBM) totalled to 3 bcm. China's targets for CBM production are 16 bcm (30 bcm) by 2015[7] and 50 bcm by 2020; for coal-to-gas (CTG) or synthetic natural gas (SNG) - 15-18 bcm by 2015 and 80 bcm by 2017; and for shale gas - 6.5 bcm by 2015[8] and 100 bcm by 2020. Based on China's 12th FYP, the total output from unconventional sources would add over 40 bcm by 2015 and 190-230 bcm by 2020. The recent estimates by the IEA and EIA on China's unconventional gas production are more cautious. For instance, the IEA projects China's tight gas, shale gas and CBM production at 17.2 bcm in 2015. Wood Mackenzie estimates China's 2020 shale gas output at some 11 bcm.[9] The overall assessments of the achievability of China's goals for unconventional production are predominantly sceptical (Hu and Xu 2013, Kushkina and Chow 2013, Rattanavich et al. 2013, etc.). There is certain reason to assess the Chinese government's projections for unconventional gas production as overambitious. While in China's 11th FYP (2007-2011) the 2010 target for CBM production was 8 bcm, actual output was less than 4 bcm.

Complex geological structure (faulting, high tectonic stress, etc.), location in seismically active areas, primitive drilling technologies, high production costs, etc. have been frequently cited as factors impeding the rapid commercialisation of China's shale gas. However, the more Chinese companies report on their progress,[10] the faster the earlier pessimistic assessments are being revised.[11] Platts estimates China's 2030 unconventional gas production at some 150 bcm and total domestic output at around 300 bcm.[12] Assessing two scenarios (high and low unconventional gas production), the IEA 2012 projects China's 2020 gas production at 246 bcm and 139 bcm, and the 2035 two scenario assessments are 473 bcm and 194 bcm respectively.

1.3. Demand

For about a decade China's gas consumption has been growing at a two-digit rate. In 2010, China consumed 106.7 bcm, demonstrating a 20.6 per cent y-o-y. In 2011, gas consumption increased by 22.7 per cent to 130.1 bcm. Further growth of 11.4 per cent to 146.6 bcm and almost 15 per cent or 167.7 bcm was recorded in 2012 and 2013 respectively. China remains a coal-dominated economy (Figure 2), although the role of natural gas is increasing rapidly. In 2013 share of natural gas in the primary energy mix was almost 6 per cent, while the 12th FYP target is 8.3 per cent by 2015.

Figure 2: China's Total Consumption Energy and its Composition

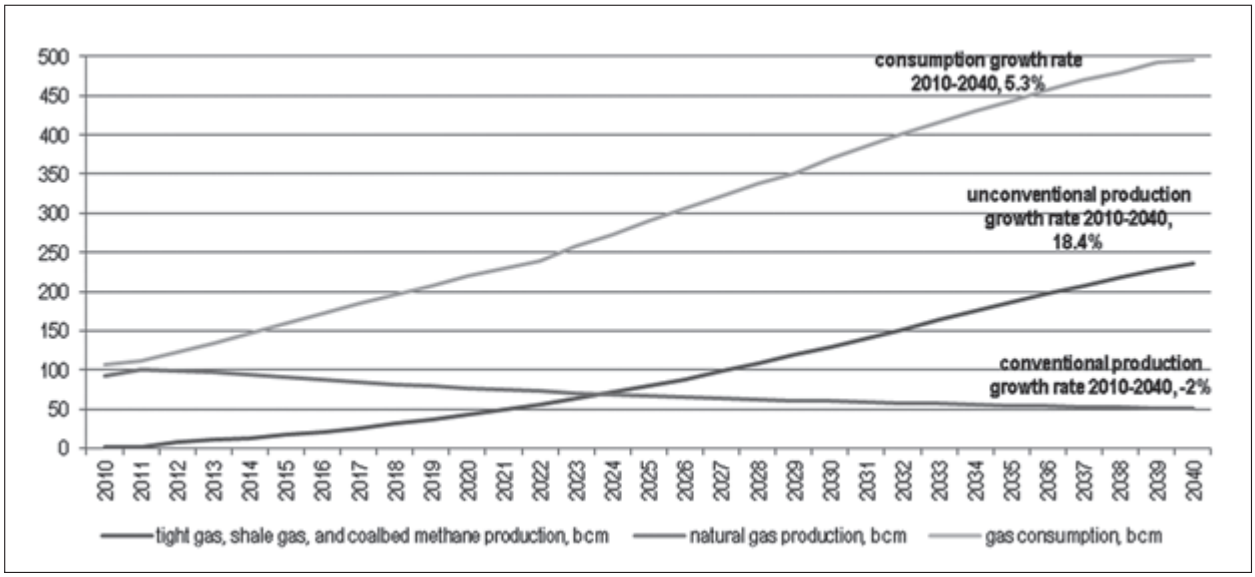


Source: composed by author based on data <http://www.stats.gov.cn/tjsj/ndsj/2012/html/G0702e.htm>

There is significant difference between the international agencies' estimates and those by the Chinese government regarding China's future natural gas demand. The Chinese experts (Lin 2012: 227, Paik et al. 2012: 3, Wang et al. 2013: 695) tend to agree that by 2030 China will consume no less than 400 bcm. While the IEA envisages China's 2015 gas demand at 159 bcm, the Chinese NDRC assesses it at 230 bcm. Estimates by the Chinese government may be more accurate, as, for instance, in 2010 the IEA predicted China's 2012 gas consumption at 123.1 bcm, while the actual 2012 demand reached 146.6 bcm. The IEA (2011) forecasts China's 2030 demand at 535 bcm and 2035 demand at 634 bcm. CNPC assesses China's 2030 gas demand based on three scenarios as 400, 500 and 550 bcm, showing that China's gas demand includes many uncertainties and is sensitive to many factors. One of the key parameters defining China's gas demand is economic growth, which has become weaker (about 7.5 per cent a year). Even so, China's continuous economic development translates into continuous growth in energy demand. Also, the Chinese government aims at a new quality of economic growth for which the decreasing carbon and energy intensity become important policy denominators. The Chinese government environmental targets[13] confirm that the deteriorating environmental situation is one of the most significant factors defining China's energy policy. Natural gas will replace the diminishing share of coal in the country's energy mix, thereby playing an increasingly important role.

In either scenario, high or low domestic unconventional gas production, China's supply-demand imbalance is widening (Figure 3).

Figure 3: IEA 2012 Forecast on China's Demand and Production, 2010-2040

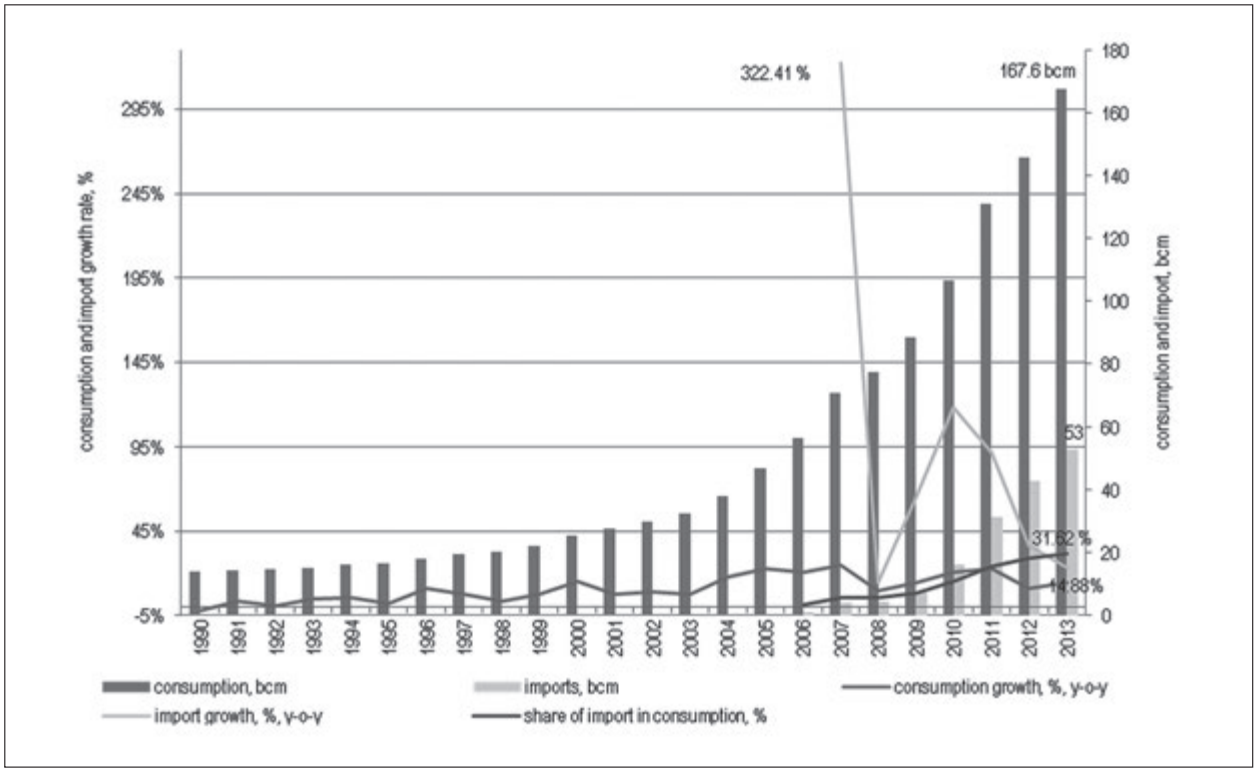


Source: composed by author based on data from<http://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm?tid=3&pid=26&aid=1>

1.4. Imports

In 2007 China became a net importer of natural gas and in 2013 China's gas import dependency ratio exceeded 30 per cent (Figure 4).

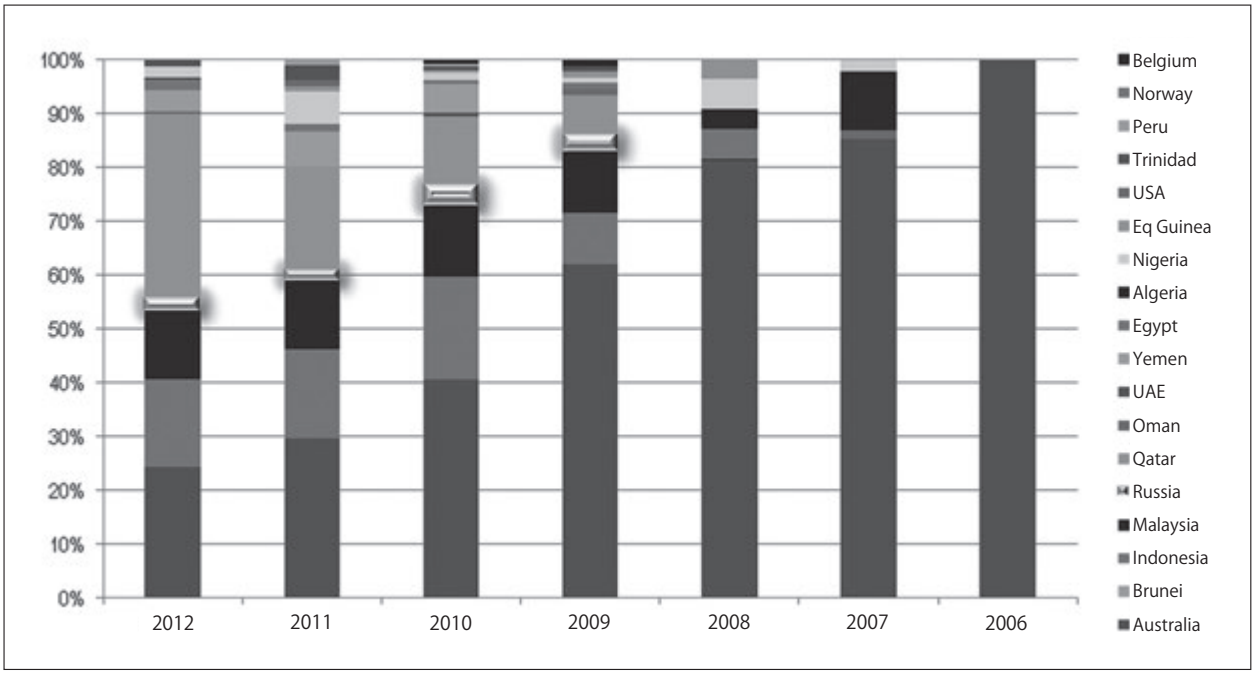
Figure 4: China's Natural Gas Consumption and Import, 1990-2013



Source: composed by author.

As China's dependency on imported gas is projected to rise further, diversification of LNG and pipeline gas imports is crucial to ensure the country's energy security. China's first LNG terminal - Guangdong - opened in 2006. Since then, China's LNG imports have grown rapidly, making the country the world's third largest importer in 2012. China imported 20.26 bcm in 2012 (21.9 per cent up from 2011) and 25 bcm in 2013 (23.4 per cent increase against 2012). LNG imports accounted for over 47 per cent of China's total gas imports in 2013. Qatar, Australia, Indonesia and Malaysia are China's major LNG suppliers (Figure 5). LNG imports will continue to rise, keeping pace with the expansion of capacity of LNG receiving terminals. CNOOC, Sinopec Group and CNPC are actively involved in new construction projects.[14]

Figure 5: Composition of China's LNG Import by Origin, %, 2006-2012



Source: composed by author.

Since 2009, the Central Asian countries have become China's main pipeline gas suppliers (Table 1). In 2012, Turkmenistan was the origin of nearly 50 per cent of China's total gas imports. In 2013, Myanmar commenced gas exports to China via the newly completed pipeline.

Table 1: China's Actual (and Agreed) Import of Pipeline Gas

Source country	2012 Imports (announced capacity/ agreed extension), bcm/ y	Developments
Turkmenistan	21.3 (40 → 65 → 90)*	2006 agreements; 2007 construction of Central Asia – China Gas Pipeline (CACGP) started; 2009 inauguration
Uzbekistan	0.2 (10 → 25)	2007 agreements; 2007 construction of CACGP started; 2009 inauguration
Kazakhstan	(5 → 10)	2003 agreements; 2007 construction of CACGP started; 2009 inauguration; 2010 new branch line from Western Kazakhstan agreed
Myanmar	→ 12	2004; 2009 construction started; July 2013 completion

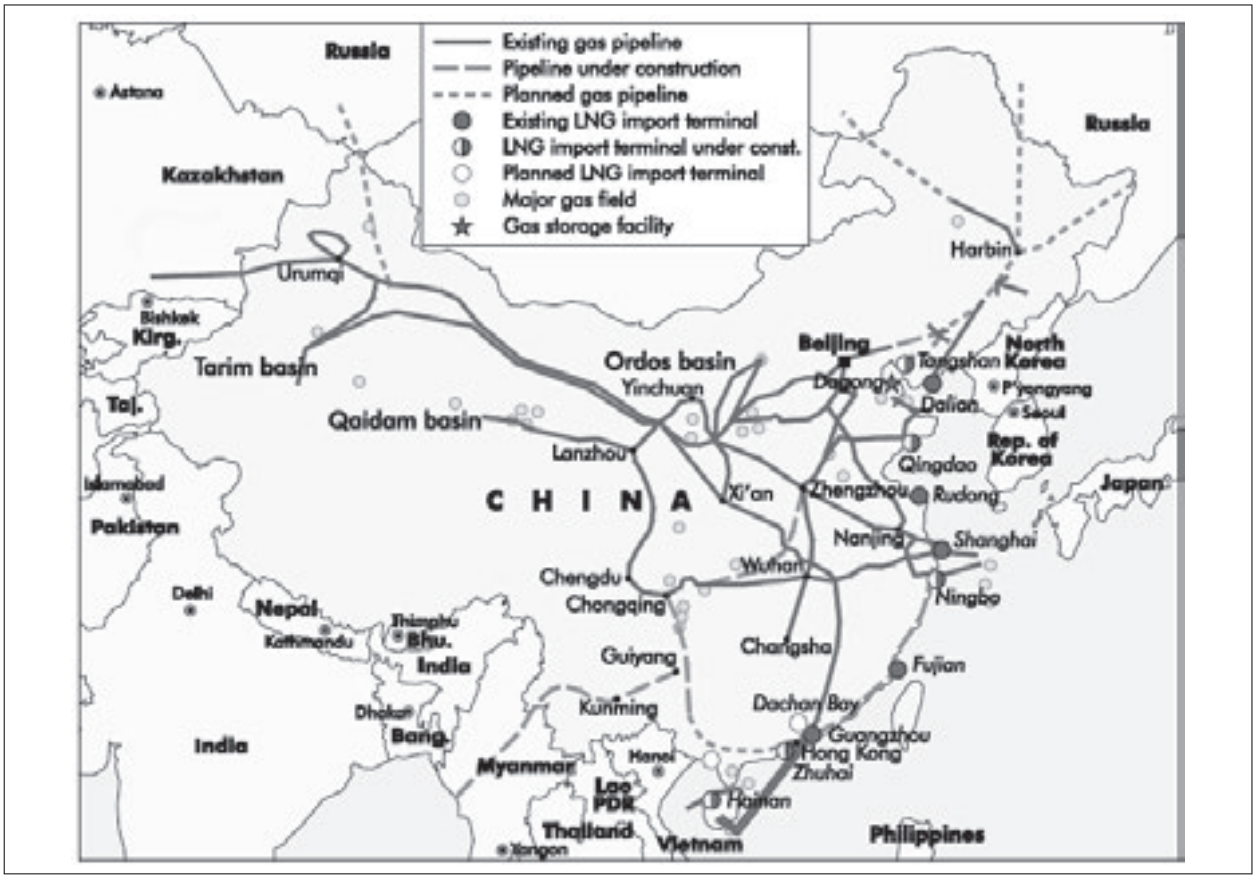
Source: composed by author.
Note: * shows export volumes after the agreed extensions actualised.

1.5. Infrastructure

Gas infrastructure development is an important aspect for China's domestic production and imports (Map 2). China has been gradually progressing with pipeline and LNG terminal construction. The recently completed gas pipelines include West-East II, the Sichuan-East China gas pipeline, the Shibuya Cullinan double pipeline, the Jiangdu-Rudong pipeline, the Shaanxi-Beijing gas pipeline III and the China-Myanmar oil and gas pipeline (domestic section). The 12th FYP envisages the construction of the Central Asia natural gas pipeline (Phase 2) and the West-East Gas Transmission Lines 3 and 4. By 2015, about 44,000 km of new pipelines will be added, bringing the total gas pipelines network to about 100,000 km.

China's re-gasification facilities include ten currently operational terminals with five more under construction. This will bring total re-gasification capacity from about 35 Mt/y as of 2013 to 52.6 Mt/y by 2016. Some five additional terminals are in the planning and feasibility study stage. By 2020, China will have some 120 Mt/y re-gasification capacity.[15] Currently approximately one third of re-gasification facilities are located in China's north and east. This share would expand by nearly 50 per cent by 2020.[16]

Map 2: Natural Gas Infrastructure in China



Source: Gas Pricing and Regulation 2012: 16.

2. China's Strategic Goals in Gas Policy

The key elements of China's gas policy include: expansion of natural gas reserves; accelerated domestic production from conventional and unconventional sources; construction of new gas storage facilities (to bring their total capacity to 30 bcm by 2020); accelerated construction of LNG terminals and construction of interregional gas pipelines.[17] The Chinese gas sector is undergoing significant transformation. Addressing two shifts in China's gas policy appears to be especially relevant to the purposes of this study.

Concerned about how to alleviate the environmental damage to which the continuing prevalence of coal in the country's energy mix contributes enormously, the Chinese government advocates a larger role for natural gas, a cleanest fossil energy source. As China's dependence on imported supplies rapidly increases, keeping it under control is at the forefront of the government's policy agenda. Seeking effective means to decrease China's reliance on external gas sources, the government targets the *development of reserves and expansion of indigenous gas production.* Progressing with domestic *gas market reforms* is indispensable for optimising China`s energy mix, as well as for balancing the volumes of domestically produced and imported energy resources. A closer examination of the developments on these two policy dimensions - indigenous gas production and pricing reform – aims to contribute to a better understanding of the trends determining China's demand for imported gas.

2.1. Indigenous Gas Production

China currently produces insignificant quantities of shale gas. The 2020 target is set at 60 – 100 bcm shale gas, but many estimates agree on a smaller output of under 20 bcm[18] as being more realistic (Wu 2012). Numerous geological issues make shale gas production difficult in China. That is to say, China's shale deposits are deeper, less thick, have lower porosity, lower pressure, lower gas content and contain more clay component, etc. (Kushkina and Chow 2013). For these reasons, the productivity of the wells is low. Consequently, the Chinese companies incur substantial production costs, which are higher than the average in the USA. Indeed, the costs in (China's) Sichuan are estimated at $6.6-12/ MBtu and in Tarim at even 30-80 per cent larger (Kushkina and Chow 2013) than some $3-4/ MBtu in the USA. Challenges include scarcity of water resources, underdeveloped pipeline infrastructure among others (Rattanavich et al. 2013).

Other perspectives on the sluggish development of unconventional resources include China's institutional hurdles and lack of adequate domestic technology. PetroChina, Sinopec (China Petroleum & Chemical Corp.), Shaanxi Yanchang Petroleum and CNOOC and also Henan and Zhonglian are the companies operating respectively in the shale and CBM sectors. While these state-owned companies (SOC) are reluctant to engage in innovation- and investment-intensive unconventional business, small- and mid-sized companies have no access to the sector. Producing gas is only one part of the process, transporting it may prove problematic because PetroChina controls over 80 per cent of China's pipeline infrastructure. China's interest in obtaining innovations, technologies and expertise for unconventional gas production to a degree facilitated access to domestic shale gas projects for foreign companies (Chevron, Royal Dutch Shell Plc., Total SA, ExxonMobil, etc.). To gain expertise (as well as to secure some additional gas imports), Chinese companies are actively investing in overseas unconventional gas projects (Chen 2013).

Additionally, the development of shale gas demands significant investments, and this is another challenge for China. To produce 5 bcm, China needs to develop 1,300 wells, each of which costs 80 to 100 million yuan ($13 to 16 mn), which requires 130 billion yuan ($21 bn) in upfront investment.[19] The regulated gas prices and the overall weak government incentives have often been cited as factors discouraging investment in shale gas. To boost unconventional gas production the central government has introduced a subsidy of 0.4 yuan/m^3 [20] ($1.7/MBtu) for shale gas producers for the period 2012-2015 and proposed an increase in subsidies for CBM from 0.2 yuan/m^3 ($0.8/MBtu) to 0.6 yuan/$m^3$ ($2.5/MBtu). In addition to the central government subsidies, CBM producers also receive 0.1 yuan/m^3 ($0.4/MBtu) from the local government. This scheme may be extended to shale gas producers. Another policy shift supporting domestic gas production is gas price reform, which was initially piloted in Guangdong and Guangxi from 2011, and is currently being expanded to other provinces. By 2015, the Chinese government plans to establish 19 key exploration and production zones in 13 provinces and regions including Sichuan, Chongqing, Guizhou, Hunan, Hubei, Yunnan, Anhui, Jingxi, Shaanxi, Liaoning and Xinjiang. The government started implementing a special fiscal regime for the domestic gas industry and introduced new pricing to encourage domestic gas production.

2.2. Gas Pricing Reform

The price for the residential sector is traditionally lower than for the industrial and commercial sectors (Wang and Ling 2014); the prices of all sectors are subsidised, although to different extents. Historically, China's National Development and Reform Commission (NDRC) has made few adjustments to China's natural gas prices. Significant problems with gas pricing in China include the prevalence of a supply-driven approach and a lack of market mechanisms, such as disregard of cost differences to different types of consumers or during peak and peak-off periods, volume-based rather than heat value-based pricing and domestic price insensitivity to price fluctuations in the international markets, etc. (Kushkina and Chow 2013).

Traditionally China has followed a cost-plus approach to gas price regulation. The NDRC regulated ex-plant (by field basis) and transportation fee rates and set profit margins. Thus the prices varied depending on the price of the field and distance of transportation. In 2010, the NDRC raised the onshore wellhead gas prices by 25 per cent, and some Chinese cities raised end-user prices in the industrial and power sectors. Yet, the prices for producers were set at the relatively low level of 0.7-1.4 yuan/m^3 ($3-6/MBtu). At the same time, the government did not regulate LNG prices, and as they were increasing,[21] China's LNG importers have been experiencing significant losses.[22]

In order to bolster investment in the gas sector, create more transparency in the pricing system and responsiveness to market fluctuations, and to make domestic natural gas competitive with other fuels and imported gas, the NDRC initiated the Pilot Program – a pricing experiment in China's two southern provinces of Guangdong and Guangxi in December 2011. Pipeline gas in these provinces was priced under a net-back mechanism. The city-gate price was calculated on the basis of a 15 per cent discount on the average price of liquefied petroleum gas (LPG, 40 per cent weighting) and fuel oil (60 per cent weighting) with calorific differences accounted for. The net-back calculation with Shanghai[23] prices of fuel oil and LPG as the benchmarks and transportation costs were used for these two provinces. In July 2012, China opened its first natural gas spot trading market at the Shanghai Petroleum Exchange as part of its course towards

gas price liberalization.[24] In July 2013, the NDRC expanded the Pilot Program to the rest of the country and made an average upward price adjustment of 15 per cent for all consumers apart from the residential sector. Under this new program, the NDRC sets the province-specific city-gate prices (for domestic onshore and imported pipeline gas), while prices for shale gas, CBM, SNG, offshore domestic natural gas and LNG are negotiated between producer and wholesale buyer. The price reform applies to incremental natural gas demand beyond the 2012 levels. The incremental demand was approximately 9 per cent of total gas demand in 2013. The full-scale application of the new pricing scheme[25] will be in place by the end of 2015. In 2014, the NDRC announced the introduction of a multi-tier pricing mechanism for the residential sector before the end of 2015.[26] The latter signifies a more fine-tuned approach to pricing, whereby price differs depending on the volume of consumption.

The important implications of the described policy measures are such that, owing to the incentives for unconventional gas production and progression of market-based pricing, China is likely to increase domestic gas output and optimise consumption. In turn, the combined outcome of these shifts will determine China's future import needs.

3. Russia - China Gas Cooperation

In recent years, Russia-China economic relations have been especially intense. Bilateral trade reached $88 bn in 2012,[27] making China Russia's largest single trading partner. The Russian – Chinese cooperation is being promoted through various levers, including the 2011 agreement allowing for bilateral transactions to be conducted in renminbi or roubles, thereby removing the need for either convertible currency.[28] The bilateral trade is expected to expand to $100 bn by 2015 and reach $200 bn by 2020.[29] The official reciprocal investments total $12 bn, with the Russian energy sector being one of the most attractive areas for Chinese capital. In 2013, for instance, PetroChina (a branch of the CNPC) announced its intention to invest $10 bn in Rosneft and Gazprom-operated gas fields in Eastern Siberia and the Far East (ESFE).[30]

Overall, the hydrocarbon-rich countries of Central Asia and Russia are well positioned to be China's energy suppliers. During the summit of the Shanghai Cooperation Organization (SCO) in June 2012, the then President Hu Jintao emphasised that China and Russia should focus on promoting cooperation on upstream and downstream energy projects.[31] The Chinese government, as Zhang Guobao, an advisor to China's National Energy Administration (NEA), articulated, sees Russia (along with Central Asia) as best suited to meet China's long-term energy demand.[32] On his first after the inauguration state visit to Russia in March 2013, the Chinese President Xi Jinping assigned top priority to joint exploitation of oil and gas resources.[33]

3.1. Russia's Achievements and Potential

Russia is the world's largest producer of conventional gas, producing 653 bcm in 2012 and 668 bcm in 2013 (a 2.7 per cent decrease and a 2.3 per cent increase respectively). Conducting only a small volume of LNG and no pipeline gas exports so far, Russia is favourably located to become China's significant supplier.

Russia started LNG exports to China after its first (and so far only) LNG plant in Sakhalin came online in 2009, but Russia remains a minor supplier to China (Table 2). Notwithstanding all the impressive growth of China's LNG imports, the country is not among Russia's principal

LNG buyers. The reason is that Sakhalin LNG is supplied under long-term contracts, the largest holders of which are Japanese and Korean companies. Objectively, Russia has no readily available LNG for other customers.

Table 2: Russia – China LNG Trade, 2009-2012

	2009	2010	2011	2012
Russia's LNG exports to China, bcm/y	0.25	0.51	0.33	0.53
Russia's share in China's LNG imports, %	3.23	3.98	2.04	2.62
China's share in Russia's LNG exports, %	3.78	3.81	2.29	3.54
China's LNG imports growth rate, %, y-o-y	72.07	67.54	29.84	21.90

Source: based on BP data.

Although in 2013 Gazprom disclosed that it could not confirm its earlier estimated as proved gas reserves of 25 tcm in ESFE, the company insisted that proved reserves of 10 tcm would suffice to satisfy the demands of China, South Korea and Japan. Poor exploration (only 6 -7 per cent of the ESFE territory was covered by geological exploration) remains a serious problem. In the period 2013-2016 Gazprom plans to spend RUB 40 bn ($1.2bn) annually on geological exploration in the ESFE.[34] Amidst the Ukrainian crisis, which escalated tensions between Russia and the European countries, the Russian government prioritises the course toward Asia and is enhancing the implementation of the Eastern Gas Programme (EGP). In these new circumstances, the tasks for the ESFE advanced development formulated by the Russian government and actively pursued in recent years (Shadrina 2014b) are to be accorded high significance. Thus it is appropriate to expect an unprecedented development of the ESFE economy and its mineral resource sector, in particular.

Russia has a number of projects developed with a view to China being either the principal beneficiary (pipeline projects) or the one importer among others (Table 3).

Table 3: Russia's Asia-oriented Gas Projects

Commissioning	Project	Characteristics	Capacity, Mt/ bcm
2005	Sakhalin I	RN 20%; ExxonMobil 30%, Sodeco 30%, ONGC 20%; long-term sales contracts btwn Rosneft & Marubeni and Rosneft & SODECO* gas - 485 bcm	gas pumped back; (possible gas swap with GP)
2009	Sakhalin II	Gazprom Sakhalin Holdings B.V. 50%+1; Shell Sakhalin Holdings B. V. (Royal Dutch Shell plc.) 27.5% - 1; Mitsui Sakhalin Holdings B.V. (Mitsui & Co. Ltd.) 12.5%; Diamond Gas Sakhalin B.V. (Mitsubishi Co.) 10%	
2009	LNG plant in Prigorodnoe	Sakhalin Energy	10.8/ 14.6
	Sakhalin III	Gazprom, for Sakhalin-Khabarovsk-Vladivostok (SKV**) pipeline: Kirinsky, Ayashsky and Vostochno-Odoptinsky fields; deposits: Kirinskoe – gas 162.5 bcm; condensate 19.1 Mt; Yuzhno-Kirinskoe – gas 636.6 bcm; condensate 97.3 Mt; Mynginskoe – gas 19.8 bcm; condensate 2.5 Mt	(possible oil swap with RN)
	Sakhalin III	RN 74.9%; Sinopec 25.1%, Veninsky field: gas 578 bcm; oil & condensate 88 Mt	
2019 (2021, 2025)***	LNG plant in Vladivostok, plant at Perevoznaya Bay, Lomonosov Peninsula	Gazprom & Japan Far East Gas Co. (consortium of Itochu Corp., Japan Petroleum Exploration Co. (JAPEX) and Marubeni Corp.)	5 (10.3-15)/ 6.9 (14.2-20.7)
2017	Yamal LNG	Novatek 60% & Total 20% & Sinopec 20%; Yuzchno-Tambeiskoye: gas 0.9 tcm; condensate 31 Mt; Gydan deposits (LNG contracts: 3Mt/y, 15 yrs to CNPC, 2.5Mt/y, 20 yrs to Gas Natural Fenosa/ Spain. 4Mt/y to Total)	16.5/ 22.7
2018 (2025, 2030)	LNG plant at the Iljinsky Port, Sakhalin	Sakhalin III, plant construction Rosneft & ExxonMobil & General Electric; Resources of Sakhalin I (RN 20%; ExxonMobil 30%, Sodeco 30%, ONGC 20%) and Sakhalin III (RN 74.9%; Sinopec 25.1%)	5 (15)/ 6.9 (20.7)
2018	Sakhalin II LNG plant 3rd train	Gazprom	5/ 6.9
2018-2020 (2030***)	Eastern Route (Power of Siberia, Sila Sibiri)	resources of Eastern Siberia, Irkutskaya oblast (Kovyktinskoe) and Yakutiya (Chayandinskoe) with the Far East (Khabarovsk -Vladivostok); resources of Sakhalin III (Kirinsky, Vostochno-Odoptinsky and Ayashsky blocks), possibly Sakhalin I through SKV; Yuzhno-Kirinskoe - from 2019; peak - 11.4 bn cm/y by 2023-24; Kovyktinskoe – from 2021: gas 1.9 tn cm, helium 3 tn cm, gas condensate 77 mn t; gas extraction – 30-35 bn cm/y; Chayandinskoe field – start 2019: 1.2 tn cm, oil and gas condensate 79.1 mt; gas extraction – 25 bn cm/y Power of Siberia: 3,177 km (3,968, if Kovyktinskoe gas field is linked); $40 b ($80-90b) (Kovykta, later stage)-Chayanda-Lensk-Aldan-Olyokminsk-Neryungri-Skovorodino-Belogorsk-Blagovezchensk(→ China)-Birobidjan-Khabarovsk-Dal'nerechensk(→ China)-Vladivostok-(→ Korea, etc.)	27.5 (44.2)/ 38 (61) 50 years
2030	Western Route (Altai gas pipeline****)	resources of Western Siberia (main field Yurubcheno-Tokhomskoe, fields in Nadym Pur Taz region); Yurubcheno-Tokhomskoe – gas reserves 709 bcm; 2,622 km: deposits in Yamal Nenets and Khanty Mansiisk Autonomous District, Tomsk and Novosibirsk Region, Altai Krai – Republic of Altai – Xinjiang region, Western China – West-East gas pipeline (Novosibirsk-Barnaul-Biisk-Gorno-Altaiisk --- China)	21.7/ 30 30 years

Source: composed by author.
Notes:
* Sakhalin Oil and Gas Development Co. – a consortium established in 1974, unites JAPEX, JOGMEC, Itochu Corp. and Marubeni Corp.
** Sakhalin-Khabarovsk-Vladivostok gas pipeline is a domestic project, but it is an important part of export infrastructure;
*** (year) shows the beginning of the next stage, i.e. Vladivostok LNG plant's second and third trains, respectively;
**** Order # 1416.

The list of projects is impressive; some, like the Power of Siberia, are so large that international cooperation will be the only realistic way to secure the necessary financial, technological, innovation and other aspects required for their development. The Sakhalin I and Sakhalin II, operated under a production sharing agreement (PSA) scheme, can be regarded as successful experiences of cooperation between the Russian and international companies.

Russia's gas supply potentially available for China is considerable (Table 4). While only a rather small volume of new LNG supplies is contracted to China, Russia's ambitions to expand gas exports to China reside in the pipeline sector.

Table 4: Russia's Actual and Projected Gas Exports to China, bcm/y

Projects	2012	2017	By 2020	By 2030
Sakhalin II LNG plant	0.53	0.5	0.5	0.5
Yamal LNG		4.14	4.14	4.14
Vladivostok LNG			6.9 – "X"	14.2 – "X"/ 20.7 – "X"
Sakhalin II LNG plant, 3rd train			6.9 – "X"	6.9 – "X"
RN LNG plant in Sakhalin			(6.9, all contracted to Japan)	13.8 – "X"
Power of Siberia pipeline			38	61
Altai pipeline				30
Total	0.5	4.5	42.5 + (13.8 – 3 "X")	95.5 + (35 – 3 "X")/ 95.5 + (41 – 3 "X")

Source: composed by author based on various sources.
Note: "X" – a dummy, denotes unknown/ undecided quantities of Russia's gas supply beyond China.

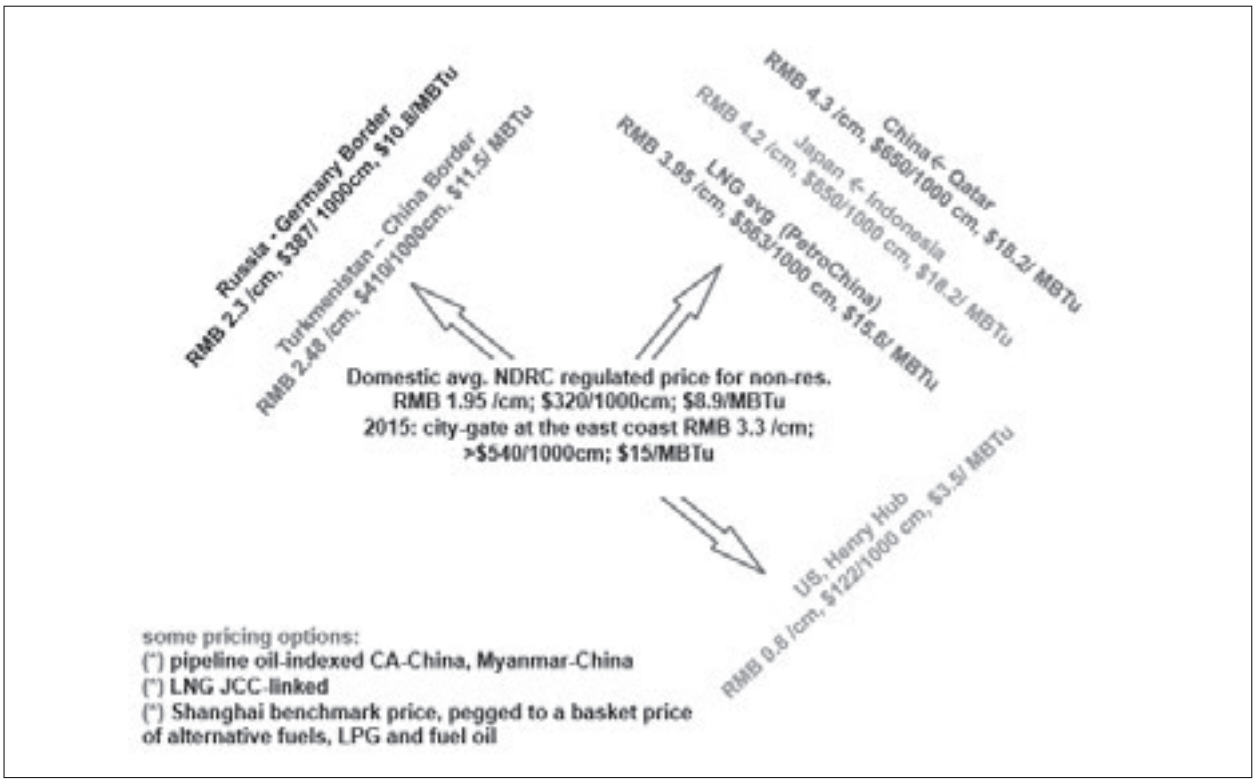
All Russia's LNG projects have been lacking dynamism for their inception, with Gazprom's monopoly being one of the principal hurdles. In December 2013, the Russian government undertook a step crucial for LNG export development.[35] After the government liberalised LNG exports, the positions of two other companies besides Gazprom – namely Rosneft and Novatek – were consolidated by allowing them to begin supplying gas to the Chinese market.[36] The decision to liberalise LNG exports was intended to transform into intensified competition between Gazprom and other gas producers from the area, bringing ambitious business strategies for gas export[37] into the realm of practical implementation. The government expects to see various forms of cooperation among the national gas companies, such as gas swaps, joint projects, etc. The Russian regulators consider the latter a plausible way to improve the economics of gas projects. In practice, there has been only cautious speculation about such partnerships. In particular, Gazprom and Rosneft are hinting at a possible gas-for-oil swap[38] with regard to Yuzhno-Kirinskoe oil from Gazprom`s Sakhalin-3 and Rosneft`s gas from Sakhalin-1. This is seen as rational, but, owing to the existing competition for the new gas deals, difficult to implement undertaking. Such schemes, nevertheless, could optimise Russia's portfolio of gas export projects and significantly improve the price competitiveness of Russia`s gas (Henderson and Stern 2014). Although the pipeline segment was not affected by the December 2013 liberalisation, the expectations are high that Russia's pipeline sector will soon see similar reforms.

3.2. Russia's Obstacles and Opportunities in the Chinese Market

For over a decade, Gazprom and CNPC (Russia's and China's SOCs respectively) have

been attempting to build their gas partnership. They eventually managed to eliminate the major differences with regard to prices and pricing (Figure 6) and concluded a gas agreement in May 2014.

Figure 6: Price and Pricing:
LNG vs. Pipeline Dilemma in Europe-Asia-North America Triangle



Source: developed by author.

One of the early documents signed by Gazprom and CNPC - the Agreement on Strategic Cooperation – was concluded in October 2004 (the idea of cooperation itself dates as far back as the 1990s). In March 2006, CNPC and Gazprom signed a memorandum of understanding (MoU) for pipeline gas deliveries of 60-80 bcm /y. At the time, the negotiations stalled over setting the price and determining the supply route. While Russia favoured the Western Route (not least because some gas deposits and infrastructure have already been developed there), China preferred the Eastern Route (partly because it already secured gas deliveries to its western regions through the Central Asian pipeline, but also because it did not want Russia turn into a swing supplier capable of switching gas deliveries between China and Europe depending on a particular market's attractiveness). In October 2009 Gazprom and CNPC announced the Framework Agreement on General Terms on gas supply of 68 bcm. In September 2010 Gazprom and CNPC succeeded in elaborating their intentions and signed an agreement on Extended General Terms. In 2013 the hopes of overcoming the Russia - China impasse over the terms of gas supply were particularly high. Nonetheless, despite the MoU on the Eastern Route of gas pipeline (the Power of Siberia) with an annual capacity of 38 bcm (with a possible extension to 61 bcm /y) for 30 years was concluded in March 2013, and even some of the works towards the implementation of the project have been started in the ESFE (Order 1416), the grand project

was not finalised. Signed in September 2013 by Gazprom and CNPC, the General Terms of Gas Supply[39] demonstrated that the two failed again to agree on price, although China reportedly agreed to abandon its claim for the pipeline gas price to be linked to the US Henry Hub natural gas spot price.[40] At earlier stages of negotiations, China adamantly insisted that any price above $250/1000m^3$ would not be acceptable, as it would make the Chinese manufacturing sector uncompetitive. Meanwhile, the available data suggest that China has not been enjoying any outstandingly attractive prices from other gas suppliers. At the end of 2011, the Turkmen pipeline gas at the Chinese border cost $9.1/MBtu ($334/1000m^3$), the Turkmen gas delivered to Shanghai cost $13.3/MBtu ($488/1000m^3$)[41] (Pirani 2012) and the Qatari LNG delivered to Shanghai cost $18.2/MBtu ($655/1000m^3$) (Kushkina and Chow 2013). In 2012, the average price of imported LNG was $10.8/MBtu ($388/1000m^3$) and imported pipeline gas $10.4/MBtu ($375/1000m^3$) (Lin 2013). In April 2014, China's LNG spot contracts, according to Argus, reached a level of $17.5/ MBtu (over $600/1000m^3$).

Gazprom's approach to the negotiations was initially such that China was to pay a price close to what the European consumers pay under long-term contracts. The average price of Gazprom`s gas at the German border was $402/ 1000m^3$ ($11.5/MBtu) in 2012 and $387 ($10.8/ MBtu) in 2013. Gazprom proposed using an oil-linked benchmark – the Japanese Crude Cocktail (Japan Customs-cleared Crude, JCC) in price formula. The JCC is notorious for instilling the Asian premium effect into the Asian gas markets and sending LNG prices in the region to the world's highest levels. In February 2014, for instance, the LNG price in Asia reached $20/ MBtu ($720/1000m^3$). Certainly, using the JCC for new gas deliveries has never appeared appealing to China.

Eventually, Gazprom and CNPC settled their differences on pricing and price and signed the gas deal during the Russian President's official visit to China in May 2014. While the agreed price was said to be a "commercial secret" and remained unrevealed, Russian e-media reported extensively that the price of the deal was within a range of $380-395/1000m^3$ and pegged to a basket price of diesel, fuel oil and Brent in Singapore. If so, the deal seems to be fair to both sides, not to mention that in a new political and economic environment informed by Russia's position vis-à-vis Ukraine, securing a gas project with China becomes almost a vital undertaking for Russia.

Recently, Russia's opportunities for expanded gas exports to Asia have been estimated as rather bleak against the backdrop of North American shale gas success. A closer look at costs and prices, however, suggests that Russia's gas is competitive price-wise. More precisely, a number of US-based LNG projects coming online in 2016-2025 would produce some 75 Mt/ y (103.5 bcm/y) of exports with Henry Hub prices hovering between $5-6/MBtu by 2020 and up to $7/MBtu by 2025. However, other costs associated with exports, such as liquefaction and re-gasification, and especially transportation, would increase the price of North American LNG to no less than $11/MBtu when delivered to Europe and around $16/MBtu for Asia. According to some estimates, a floor price of $12/MBtu could be a benchmark for LNG delivered to Asia, which is equivalent to the range of $80-90/b JCC-based crude oil indexation.[42] Objectively, Asian importers have no grounds to anticipate inexpensive North American LNG for their markets even if oil prices fall, because the latter would arrest investment in unconventional gas production, thereby suspending the new supplies. The hub pricing will certainly play a role in new LNG contracts for Asia, but conventional oil indexation will also remain in use. The main intrigue surrounding LNG pricing is about new supplies from Australia, Canada, East Africa, but

also Russia, which currently accounts for some 4 per cent in the world's LNG market, but aims to expand its share to 10 per cent in 2020 and 15 per cent by 2025.

The sluggish development of Russia – China gas cooperation has often been explained by China's lack of interest in bringing imported gas to its north-eastern regions. However, it becomes palpable that Russian supplies match the growing gas demand in China's rapidly developing north-eastern provinces (Map 3).

Map 3: The Power of Siberia Gas Pipeline

Source: http://www.gazprom.com/f/posts/74/805991/2013-12-18-map-sila-sib-en.jpg

Juxtaposing the data on China's projected demand and supply and its contracted imports with Russia's export project capacity and its contracted exports (Tables 3 and 4), makes it possible to generate a set of approximate estimates of Russia's potential to expand gas export to China (Table 5).

Table 5: Russia's Opportunities for Gas Export Expansion to China

Year	China's Projected Import, bcm	China's Contracted Import, bcm	(2-3), Discrepancy, bcm	Russia's Projected Export, bcm	Russia's Contracted Export / incl. to China, bcm	(5-6), Discrepancy, bcm	(4-7), Discrepancy, bcm
1	2	3	4	5	6	7	8
2015	60-80	-	-	-	-	-	-
2020	150 -200, incl. 100 LNG	130, incl. 70 LNG	"-" 40 PL "-" 30 LNG	~ 80, incl. LNG ~ 40	38 + 26 LNG/ 38 + 4 LNG	0 "+" 14 LNG	"0" PL "+" 20 LNG
2030	250-300, incl. 150 LNG	230, incl. 130 LNG	"-" 40 PL "-" 20 LNG	~ 160, incl. LNG ~ 70	91 + 40 bcm/ 91 + 4 bcm LNG	0 "+" 30 LNG	"-" 50 PG "-" 10 LNG

Source: developed by author based on data from IEA 2011, 2012, 2013; EIA 2014; Wu 2012; Hu and Xu 2013; Wang et al. 2013; etc.

The principal conclusions which can be drawn from the Table are: 1) Russia has no chance to enter the Chinese gas market by 2015 because it has no viable supplies to offer; 2) Russia's pipeline supplies projected by 2020 seem to be needed in China (and therefore the Table contain "zero" discrepancy), but Russia can additionally pursue a larger volume of LNG exports to the Chinese market. The very rough estimates show that some extra 20 bcm may find its demand in China. Here it is important to note that by 2030 Russia's potential share in LNG supplies to the Chinese market is likely to shrink (the discrepancy between China's uncontracted imports and Russia's uncontracted exports is negative). Russia needs to expedite bringing its LNG projects online. Because a large share of LNG in Asia is traditionally supplied under long-term contracts, by delaying on making any concrete offers of significant volumes (through the acceleration of the 2nd and 3rd trains of the RN Sakhalin and Vladivostok projects) Russia may lose a niche in China's LNG segment (negative assessment for 2030 in column "8" for LNG); 3) the significant increase in Russia's pipeline gas export projected by 2030 appears not to be matched by China's forecast for pipeline imports. This may suggest that Russia cannot retain its hopes once abandoned, but re-emerging in August 2013 (Order #1416), for the Altai gas pipeline project to materialise, at least not before 2030.

Conclusions and Policy Recommendations

China's gas market is evolving on various dimensions: the demand is growing apace with continuing economic and structural transformations, domestic production is increasing, not least owing to rather revolutionary shifts involving offshore and unconventional technologies, the domestic gas market reforms are unfolding, and so on. These simultaneous shifts contribute to uncertainty about China's future domestic reserves, production and consumption. China's gas import is predicted to continue to grow rapidly, but the available numerical assessments by China's policy-making agencies and domestic experts and also those by international organisations and professionals outside China vary greatly and often contradict each other. Thus it is important to apply the existing assessments with caution.

As environmental stewardship becomes an indispensable component of sustainable economic growth strategy, it increasingly defines China's gas policies. In particular, growing air pollution forces the Chinese government to introduce stricter targets for a wider application of environment friendly energy sources. Gradual liberalisation of China's domestic gas market is a novel denominator affecting the future of China's gas.

Given the scale and the dynamism of the Chinese gas market, Russia's current role here is insignificant. This is a consequence of Russia's protracted excessive reliance on the European gas markets and its short-sightedness in ignoring Asia's plentiful opportunities.

New China-oriented gas projects can reinforce Russia's export potential, which is especially important given the EU's course in reducing Russia's deliveries. Geographically, Russia is favourably located to become China's gas supplier. There are prerequisites for Russia to expand its LNG supplies and commence pipeline gas exports to China. While both scenarios are viable, the volume of Russia's exports depends largely on China's success in increasing domestic production of unconventional gas and competition from other regional and non-regional producers of LNG and pipeline gas suppliers. As discussed, Russia's positions in price competition are strong in both the LNG and pipeline segments. To succeed, Russia most importantly needs to focus on the timing of new deliveries.

Interestingly, Russia's LNG supplies are not limited by the capacities of its east-located projects. Navigation through the Northeast Passage in the Arctic Sea is an additional factor favouring Russia's LNG exports to China. Even if the price of Russian LNG shipped through this lane is comparable to that of Russia's competitors, it still appears to be attractive to China due to a shorter shipping time. In the pipeline sector, Russian supplies are intended for China's north-eastern territories, which is important as these latecomers gradually start catching up with China's more developed coastal provinces.

Overall, Russia has opportunities to expand its gas exports to China. However, for this to materialise Russia needs to analyse its experience of gas relationship with China and formulate a long-term policy vis-à-vis China. The eventual conclusion of the 30-year 38 bcm /y gas deal proved that bilateral gas cooperation is indeed viable under mutually fair terms and satisfactory conditions. One of the areas where China's expectations were so far not matched by Russia's attitude was the option for the Chinese companies to participate in the gas value chain and have gas equity in the Russian projects (something that China commonly practises in Central Asia and elsewhere).

Russia needs the Asian gas markets and among these, Russia especially needs China, not only to sell additional gas volumes, thereby offsetting the negative impact occasioned by the spread of anti-Russian sentiment among the traditional European consumers of Russian gas, but also for China's substantial financial potential. Russian energy (in particular, oil) companies have been tapping into this source and plan to do so again while developing the large-scale gas pipeline project in the ESFE. Also, cooperation with China is increasingly attractive to Russia because the former shows certain progress in the challenging technology- and innovation-intensive energy sectors and quickly turns into a partner from closer cooperation with whom Russia stands to benefit. The latter is particularly important in light of the sanctions imposed on Russia by the USA, the EU, Japan and others. On the whole, China is a valuable partner for Russia due to its unique ability to fulfil simultaneously three important roles: as a buyer-consumer, as a banker-lender and as a partner-innovator.

* Associate Professor, Graduate School of Governance Studies, Meiji University

[1] Russia and China seal historic $400bn gas deal. *The RT,* 21 May 2014. http://rt.com/business/160068-china-russia-gas-deal/ (retrieved 21 May 2014)

[2] "Proven oil, gas reserves increase steadily in China". *The People Daily*, 28 February 2014. http://english.peopledaily.com.cn/98649/8550592.html (retrieved 5 March 2014)

[3] *EIA/ARI world shale gas and shale oil resource assessment, 2013*. Advanced Resources International, Inc. June 2013. http://www.adv-res.com/pdf/A_EIA_ARI_2013%20World%20Shale%20Gas%20and%20Shale%20Oil%20Resource%20Assessment.pdf (retrieved 6 August 2013)

[4] Of these, the closest to the route of proposed by Russia the Power of Siberia gas pipeline (and therefore potentially competing with Russian supplies) is Songliao; Ordos, which is relatively close to Beijing, can, to a degree, also be regarded as competing supplying area.

[5] *The 12th Five-Year Plan for National Economic and Social Development of the People's Republic of China for 2011-2015* (English language version) http://www.cbichina.org.cn/cbichina/upload/fckeditor/Full%20Translation%20of%20the%2012th%20Five-Year%20Plan.pdf (retrieved 23 August 2013); *The Development Plan for Shale Gas (2011-2015)*, NDRC and the National Energy Administration. 2012; *The Natural Gas Development Plan during the 12th Five-Year Plan Period,* NDRC. October 2012

[6] China's 2013 shale gas output rises to 200 million cubic meters. *Bloomberg News,* 8 January 2014. http://www.bloomberg.com/news/2014-01-08/china-s-2013-shale-gas-output-rises-to-200-million-cubic-meters.html (retrieved 4 March 2014).

[7] *The 12th Five-Year Plan for National Economic and Social Development of the People's Republic of China for 2011-2015* op.cit

[8] Retrieved from The Second State Council Meeting on Implementation of China's 12th FYP on Energy Development. January 1, 2013 http://www.gov.cn/zwgk/2013-01/23/content_2318554.htm (retrieved 4 August 2013)
[9] Ma, W. 2014. Sinopec says shale-gas output ahead of schedule. *The Wall Street Journal.* 24 March. http://online.wsj.com/news/articles/SB10001424052702303949704579458900508770462?mg=reno64-wsj&url=http%3A%2F%2Fonline.wsj.com%2Farticle%2FSB10001424052702303949704579458900508770462.html (retrieved 26 March 2014)
[10] Sinopec aims to produce 1.8 bcm of shale gas in 2014 from Fuling field. http://www.naturalgasasia.com/sinopec-aims-to-produce-1.8-bcm-of-shale-gas-in-2014-from-fuling-field-12095 (retrieved 26 March 2014)
[11] Global Data, 1 April 2014. http://energy.globaldata.com/media-center/press-releases/oil-and-gas/china-on-track-to-meet-its-2015-shale-gas-production-goal-but-2020-target-and-industry-reform-remain-challenging-says-globaldata-analyst (retrieved 4 April 2014)
[12] China could double oil, gas production by 2030 to 700 mil mtoe. http://www.platts.com/latest-news/oil/singapore/china-could-double-oil-gas-production-by-2030-27807594 (retrieved 26 March 2014)
[13] *Reuters*. 12 September 2013. http://www.reuters.com/article/2013/09/12/china-coal-pollution-idUSL3N0H80HB20130912 (retrieved 17 September 2013)
[14] China approves first floating terminal for LNG imports. *Reuters.* 14 August 2013. http://www.reuters.com/article/2013/08/14/china-cnooc-lng-idUSL4N0GF24C20130814 (retrieved 7 September 2013)
[15] Estimated based on EIA 2014 data on China's LNG terminals operating and planned.
[16] Author's estimates based on EIA 2014. The location is emphasised to point at Russia's opportunities for new LNG exports.
[17] *The Natural Gas Development Plan during the 12th Five-Year Plan Period,* NDRC. October 2012;
[18] "Why China will miss its shale gas production targets". *Bloomberg News.* 20 February 20 2013. http://business.financialpost.com/2013/02/20/why-china-will-miss-its-shale-gas-production-targets/?__lsa=c6a5-afb3
[19] Jun, Pu and Huang Kaiqian (2013): "China's lofty goals for shale gas development just pipe dreams, experts say". *Caixin Online.* 26 August. http://english.caixin.com/2013-08-26/100574015.html (retrieved 2 March 2014)
[20] About 7.5 per cent of the 2.28 yuan/m^3 price that Beijing residents pay for gas, while 1.5 yuan (24 US cents)/m^3 subsidy is said to be necessary in order to spur shale gas investment.
[21] From the average price for the early concluded long-term contracts with Australia and Indonesia for the deliveries to commence in 2006 and 2009 at $3.2/MBtu and $4/MBtu, respectively, to $18.2/MBtu for Qatari gas delivered to Shanghai in 2011 (Kushkina and Chow 2013: 3).
[22] As the practice continues, PetroChina alone reported a $6.5 b loss in 2013.
[23] Where a hub of future unified gas transportation system is planned.
[24] China. U.S. Energy Information Administration. http://www.eia.gov/countries/cab.cfm?fips=CH (retrieved 11 March 2014)
[25] Price depends on the volume of consumption, 3 tiers are arranged so that smaller consumption will be charged at lower price.
[26] With subsidies, China's household natural gas price averages about 2.5 yuan ($0.41)/ m^3, while the industrial natural gas price averages about 3.5 yuan ($0.57)/ m^3, as of 2014. http://english.cntv.cn/20140321/103190.shtml (retrieved 26 March 2014)
[27] China–Russia trade up 11% to $88 bln in 2012, *RIA Novosti,* 10 January 10 2013. http://en.rian.ru/business/20130110/178687770.html (retrieved 3 February 2013)
[28] China and Russia signed new bilateral local currency settlement agreement, The People's Bank of China, 23 June 23 2011. http://www.pbc.gov.cn/publish/english/955/2011/20110630151646500985220/20110630151646500985220_.html (retrieved 13 September 2013)
[29] Jiao, Wu and Xiaokun Li (2013): "China, Russia a step closer on gas supply". *China Daily*. 6 September. http://www.chinadaily.com.cn/business/2013-09/06/content_16948450.htm (retrieved 23 September 2013)
[30] Chernichkin, Konstantin (2013): "PetroChina considering $10 billion Russian gas investment". *Reuters*, 10 September. <http://rt.com/business/china-russia-gas-investment-647/ (retrieved 3 December 2013)
[31] "China and Russia sign 11 agreements, emphasizing joint energy development", *Beijing News*, 6 June 2012. http://money.163.com/12/0606/02/839IJKU800253B0H_all.html (retrieved 4 August 2013)
[32] Hoong, Ng Weng (2013): "China: Significant energy challenges ahead". http://www.energyglobal.com/news/special-reports/articles/The_oil_and_gas_pipeline_and_energy_challenges_in_China.aspx (retrieved 5 September 2013)
[33] Herszenhorn, David and Chris Buckley (2013): "China's leader argues for cooperation with Russia". *The New York Times*, 23 March 2013. http://www.nytimes.com/2013/03/24/world/europe/chinas-leader-argues-

for-cooperation-with-russia.html (retrieved 17 September 2013)

[34] Topalov, Alexey (2013): "Gazprom "sduvaet" Sibirj [Gazprom "downsizes" Siberia]". *GazetaRu*, 4 April. http://www.gazeta.ru/business/2013/04/04/5243689.shtml (retrieved 5 April 2014)

[35] As of now, only four companies Rosneft, Novatek, SOCs Zarubezhneft and Gazprom have met government-set criteria and are eligible for LNG exports. According to the law, only those companies which have more than 50 per cent of state ownership and secured their plans for LNG plants' construction before January 1, 2013 will be granted such rights. The liberalisation can be called partial not only because of a very limited number of eligible exporters, but also because the government set up a coordination mechanism (to prevent competition among Russian LNG exporters in external markets), which requires exporters to submit their export plans to the Ministry of Energy. The newly endorsed law on LNG export liberalisation requires the amendments to Article 3 of the Federal Law "On Gas Export" and Articles 13 and 24 of the Federal Law "On the Principles of State Regulation of Foreign Trade."

[36] Shiryaevskaya, Anna, Jake Rudnitsky, and Stephen Bierman (2013): "Russia hastens China energy pivot with oil, LNG supply deals", *Bloomberg*, 21 June. http://www.bloomberg.com/news/2013-06-21/russia-hastens-china-energy-pivot-with-crude-lng-supply-deals.htm (retrieved 25 June 2013)

[37] Rosneft made such a claim targeting to become Russia`s largest oil and gas company in the Asian markets.

[38] Serov,Mikhail, Elena Khodyakova and Galina Starinskaya (2014): Gazprom i Rosneft' obsujdayut obmen resursami na Sakhaline [Gazprom and Rosneft discuss resource swap for Sakhalin] *Vedomosti*. 3 March. http://www.vedomosti.ru/companies/news/23476061/rodstvennyj-obmen (retrieved 8 March 2014)

[39] *Reuters*, 5 September 2013. http://www.reuters.com/article/2013/09/05/us-gazprom-cnpc-export-idUSBRE9840TH20130905 (retrieved 9 October 2013)

[40] Data available from http://www.eia.gov/dnav/ng/hist/rngwhhdm.htm

[41] In the end of 2011, Shanghai city gate price of domestically produced gas was $9.8/MBtu ($360/ 1000m^3).

[42] Caruzo, Guy (2014): The US LNG export and policy. Seminar at JOGMEC. 17 February. http://oilgas-info.jogmec.go.jp/report_pdf.pl?pdf=1402_JOGMEC_seminar02_caruso%2epdf&id=5174 (retrieved 13 March 2014)

References

Advanced Resources International, Inc. (2013): *EIA/ARI world shale gas and shale oil resource assessment*, http://www.adv-res.com/pdf/A_EIA_ARI_2013%20World%20Shale%20Gas%20and%20Shale%20Oil%20Resource%20Assessment.pdf (retrieved 6 August 2013)

Agreement between the Russian Federation's Central Bank and the People's Bank of China on Interbank Cross-Border Trade Payments and Settlements, 2007.

BP Statistical Review of World Energy (2013): BP. London. 2013.

BP Energy Outlook 2035 (2014): January 14. Available from: <http://www.bp.com/content/dam/bp/pdf/Energy-economics/Energy-Outlook/Energy_Outlook_2035_booklet.pdf> (retrieved 2 February 2014)

Chen, Yi (2013): "Development strategies of the Chinese natural gas market". *Clingendael International Energy Programme.* July. Available from: < http://www.clingendaelenergy.com/inc/upload/files/Ciep_Paper_2013-07.pdf> (retrieved 6 August 2013)

China Natural Gas Map Project. http://www.chinagasmap.com/theprojects/projectoverview.htm (3 August 2013)

Chrisman, Kate Rosow (2014): "Shale gas blooms in China? Not so fast." *Breaking Energy*. April 9. http://breakingenergy.com/2014/04/09/shale-gas-blooms-in-china-not-so-fast/ (retrieved 9 April 2014)

The Development Plan for Shale Gas (2011-2015), NDRC and the National Energy Administration. 2012

Du, Juan (2014): "Gas imports to rise by 19 %". *China Daily Asia*. January 16. http://www.chinadailyasia.com/business/2014-01/16/content_15112682.html (retrieved 7 March 2014)

EGP 2007 – "The Program of Creation of Unified System of Gas Production, Transportation and Supplies in East Siberia and the Far East with Possibility of Exporting Gas to China and other Asia-Pacific Countries". The Ministry of Energy of the Russian Federation Order No. 340. 3 September 2007. Available from: <http://bestpravo.ru/rossijskoje/rx-normy/r9n.htm>

EIA 2014 – *U.S. Energy Information Administration. China*. 2014.

EIA historical data and projections through 2040 retrieved from http://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm?tid=3&pid=26&aid=1

Energy Efficiency and Development of Energy, State Program of the Russian Federation, Ministry of Energy, adopted by the Government of the Russian Federation Order 03.03.2013 No. 512-p. Subprogram 4 "Development of Gas Industry".

Evers, Marco (2013): Northeast passage: Russia moves to boost the Arctic shipping. Spiegel Online

International, September 22. http://www.spiegel.de/international/world/russia-moves-to-promote-northeast-passage-through-arctic-ocean-a-917824.html (retrieved 25 September 2013)

Gas Pricing and Regulation, 2012 – *Gas pricing and regulation. China's challenges and IEA experience.* OECD/ IEA. http://www.iea.org/publications/freepublications/publication/ChinaGasReport_Final_WEB.pdf (retrieved 7 July 2013)

Gazprom's press conference 2013 - Presentation "Gazprom" in Russia's East: Market entry to Asia Pacific. Moscow, June 13. http://www.gazprom.com/press/conference/2013/asia-pacific/ (retrieved 3 February 2014)

Golden Age 2011 – *Golden age: Are we entering a golden age of gas*. World Energy Outlook Special Report, IEA.

Golden Rules 2012 - *Golden Rules for a Golden Age of Gas.* World Energy Outlook Special Report on Unconventional Gas. IEA.

GreenTech 2013 - *The China GreenTech report 2013.* China at a crossroads, 2013. China GreenTech Initiative. http://284582c4ec799f36cf68-3958fb6e2144223e03d1fa1c325551a2.r86.cf1.rackcdn.com/The%20China%20Greentech%20Report%202013%20(English%20version).pdf (retrieved 30 January 2014).

Henderson, James, and Jonathan Stern (2014): "The potential impact on Asian gas markets of Russia's Eastern Gas Strategy". The Oxford Institute for Energy Studies. February.

Higashi, Nobuyuki (2009): "Natural gas in China. Market evolution and strategy". IEA Working Paper Series. IEA/OECD, June. http://www.iea.org/publications/freepublications/publication/nat_gas_china.pdf (retrieved 3 August 2013)

Hu, Desheng, and Shengqing Xu (2013): "Opportunity, challenges and policy choices for China on the development of shale gas". *Energy Policy,* 60: pp.21-26.

IEA 2013 – World Energy Outlook 2013 <http://www.worldenergyoutlook.org/publications/weo-2013/> (retrieved 1 April 2014)

Kate, Warner ten, Laszlo Varro, and Anne-Sophie Corbeau (2013): *Developing a natural gas trading hub in Asia. Obstacles and opportunities*. IEA. http://www.iea.org/media/freepublications/AsianGasHub_WEB.pdf (retrieved 3 February 2014)

Kezik, Irina (2013): Minprirody raskrylo zapasy nefti i gaza Rossii [Ministry of Nature disclosed Russia's oil and gas reserves]. Kommersant, July 15. http://www.vedomosti.ru/companies/news/14167541/minprirody-pereschitaet-zapasy (retrieved 3 February 2014) [in Russian]

Korzhubaev, Alexey (2011): Perspektivy Razvitiya Neftegazovogo Kompleksa Vostochnoi Sibiri i Daljnego Vostoka [Oil and gas development in Eastern Siberia and Far East]. *Region: Ekonomika i Sotsiologiya,* 2: pp.193-210. [in Russian]

Korzhubaev, Alexey, and Oleg Zalevskiy (2010): Problemy i perspektivy eksporta nefti i gaza iz Rossii v Kitai [Export of Russian oil and gas to China: Problems and possibilities]. *Sovremennye Issledovaniya Sotsialjnykh Problem*, No. 4.1 (04). pp.438-445.

Kushkina, Ksenia, and Edward, Chow (2013): "*Golden Age" of gas in China. Is there still a window of opportunity for more gas exports to China?* Yegor Gaidar Fellowship Program in Economics. USRF. IREX.

Li, Fangyi, Zhouying Song and Weidong Liu (2014): China's energy consumption under the global economic crisis: Decomposition and sectoral analysis. *Energy Policy*: 64: pp.193-202.

Li, Zhidong (2013): "Natural gas use policy trends in China". IEEJ: May.

Lin, Boqiang and Ting Wang (2012): "Forecasting Natural Gas Supply in China: Production Peak and Import Trends", *Energy Policy* 49: pp.225-233.

Ling, Song Yen (2013): "China Gas Prices: Deregulating the Market", Insight. October. http://www.platts.com/IM.Platts.Content%5Caboutplatts%5Cmediacenter%5Cpdf%5Cinsight-oct13-chinalng.pdf (retrieved 10 March 2014)

Medium-Term Gas Market Report. Market Trends and Projections to 2018. IEA. 21 June 2013.

National Bureau of Statistics of China, Statistical Yearbook 2012. http://www.stats.gov.cn/tjsj/ndsj/2012/html/G0702e.htm (retrieved 3 August 2013)

The Natural Gas Development Plan during the 12th Five-Year Plan Period, NDRC. October 2012

Nikitin, Boris, Anatoly Dzyublo, Anna Storojeva and Konstantin Khalimov (20130: Shelf Sakhalina. Resursnaya baza i perspektivy osvoeniya gazokondensatnyh mestorozhdenii Kirinskogo Bloka [Resources and development of gas condensate Kirinksky field]. *Neftegaz.Ru*. No. 6, pp. 12-16. [in Russian]

Notice 2012 - *The Notice on Issuing the Subsidy Policies of Exploring and Utilizing Shale Gas.* The Ministry of Finance and the National Energy Administration, 2012.

"Oil and gas regulation in China", *Practical Law*. http://uk.practicallaw.com/3-525-3038 (retrieved 13 March 2014)

Oil and gas security. Emergency Response of IEA Countries. People's Republic of China. IEA. 2012.
Order # 1416 - Schema territorialjnogo planirovaniya Rossiiskoi Federatsii v oblasti federaljnogo transporta (v chasti truboprovodnogo transporta) [Russian Government Order on The Roadmap of Territorial Planning in the Russian Federation in the Area of Federal Transport (in the Part of Pipeline Transport)] The Russian Government Order #1416-p, 13 August 2013. [in Russian]
Program of Cooperation between the Regions of the Far East and Eastern Siberia and the Northeast of the People's Republic of China in 2009-2018. 23 September 2009.
Rattanavich, Raj, Stephen Thompson and Ming Cai (2013) *Unconventional gas and LNG: the ying and yang of Chinese natural gas planning*. Poten & Partners Pty Ltd.
Rosow, Kate (2014): Going big at home and abroad: China's nuclear ambitions. *Breaking Energy*. http://breakingenergy.com/2014/03/11/going-big-at-home-and-abroad-chinas-nuclear-ambitions/?utm_source=Breaking+Energy&utm_campaign=a49f4faeeb-RSS_EMAIL_CAMPAIGN&utm_medium=email&utm_term=0_f852427a4b-a49f4faeeb-407963981 (retrieved 11 March 2014)
Shadrina, Elena (2010): Russia's foreign energy policy: Paradigm shifts within the geographical context of Europe, Central Eurasia and Northeast Asia. Oslo: Norwegian Institute for Defence Studies. *IFS Insights*. http://www. ifspublications.com/pdf_downloads/Shadrina_nov_2010.pdf (retrieved 10 January 2014)
Shadrina, Elena (2013): "State capitalism and Russia's energy policy in Northeast Asia". *Near East University Journal of Social Sciences*, 6 (2), pp.65-123.
Shadrina, Elena (2014): "Russia's hydrocarbons for Northeast Asia: Dynamics and dilemmas". *Journal of Governance Studies*. 10, pp.139 -178.
Shadrina, Elena, and Michael Bradshaw (2013): "Russia's energy governance transitions and implications for enhanced cooperation with China, Japan, and South Korea". *Post Soviet Affairs*. 29 (6), 461–469
The Second State Council meeting on implementation of China's 12th FYP on energy development. 1 January 2013. http://www.gov.cn/zwgk/2013-01/23/content_2318554.htm (retrieved 6 July 2013)
The 12th Five-Year Plan for National Economic and Social Development of the People's Republic of China for 2011-2015 (English language version) http://www.cbichina.org.cn/cbichina/upload/fckeditor/Full%20Translation%20of%20the%2012th%20Five-Year%20Plan.pdf (retrieved 23 August 2013)
Vygon, Grigory, and Maria, Belova (2013): Razvitie mirovogo rynka SPG: Vyzovy i vozmozhnosti Rossii [World's LNG market: Russia's opportunities and challenges]. Energeticheskii Tsentr Moskovskoi Shkoly Upravleniya Skolkovo. May. p. 53. [in Russian]
Wang, Jianliang, Lianyong Feng, Lin Zhao and Simon Snowden (2013): "China's natural gas: Resources, production and its impacts". *Energy Policy* 55: pp.690-698.
Wang, Ting, and Boqiang, Lin (2014): "China's natural gas consumption and subsidies – From a sector perspective". *Energy Policy* 65 (2014) pp.541-551.
Wood Mackinzie (2012): "China: Shale gas will not satisfy demand, requiring coal-to-gas and additional imports by 2030". Press Release. 6 June 2012. http://www.woodmacresearch.com/cgi-bin/wmprod/portal/corp/corpPressDetail.jsp?oid=10598941 (retrieved 6 August 2013)
Wu, Kang (2012): *Energy economy in China: Policy imperative, market dynamics, and regional developments.* World Scientific.
Yamaguchi, Kaoru, and Keii Cho (2003): "*Natural gas in Chin*"*a*. Institute of Energy Economics, Japan (IEEJ). August. http://eneken.ieej.or.jp/en/data/pdf/221.pdf (retrieved 16 August 2013)
Yujno-Kirinskoe GKM stalo konkurentom Shtokmana [Yuzhno-Kirinskoe field rivals Shtokman]. *Neftegaz.Ru*. No. 6, 2013. p.8 [in Russian]
Zhou, Nan, David Fridley, Michael McNeil, Nina Zheng, Jing Ke and Mark Levine (2011): *China's energy and carbon emissions outlook to 2050*. China Energy Group. Energy Analysis Department. Environmental Energy Technologies Division. Ernest Orlando Lawrence Berkeley National Laboratory. April.

An Analysis of South Korea's Industries Exporting to Japan*

Joong-Ho Kook †

Abstract

South Korea has chronically recorded huge trade deficit with Japan. The excessively skewed trade towards a particular country can make bilateral trade undesirable and lead to inefficiencies because economic activity options of the country that is deeply dependent on another country are limited so much. This paper analyzes South Korea's industries exporting to Japan, reviewing bilateral trade relations between the two countries. The four categories can be obtained in Korea's industries exporting to Japan based on the classification of HS (Harmonized System): vigorous industries, stable industries, unstable industries, and declining industries. The development of the industries such as electrical machinery and equipment, and their parts etc. is recommended for Korea to reduce the trade gaps at the viewpoint that the industries can have strong potentials in Japanese market.

Keywords: trade imbalance, industry classification, Japan, South Korea

1. Introduction

Though South Korea's outward-oriented trade tendency has been more vigorous compared to the Japanese one, in particular, after the financial crisis in late 1997, its trade deficits with Japan have ever increased. What is the reason? What is the problem of persistent trade deficits between the two countries? How can South Korea adjust trade imbalances? Those questions are main motivation of the paper.

Chou and Shih (1991) analyze the economic impacts of the trade flows between Japan and four Asian economies (or Hong Kong, Korea, Singapore, and Taiwan), and point out their chronic trade deficit with Japan during 1970s and 1980s due to the export-oriented industrialization depending on imports from Japan. Rajan (1996) reveals that Singapore's trade with Japan has become more intensive over the period 1976-1992. Furthermore, Simandjuntak (1991) asserts that many Asian economies have benefitted from the economic growth of Japan through trade of merchandise and services etc. We focus the analysis of South Korea's industries exporting to Japan reviewing bilateral trade relations between the two countries.

With regard to policy goals, Research Department of BOK(2009) emphasizes the elimination of South Korea's import-induced industrial structure and appropriate medium-to-long term measures rather than focusing on short-term outcomes to reduce its trade deficit with Japan. According to the research, some measures that are important for improvement over the medium to long term are strengthening of technology development such as core (source) technology, development of leading enterprises through an increase in size, and development of human resources, etc. Though the research states that there should be active efforts to increase exports to Japan, it does not discuss what kinds of industries have comparative advantage in Japanese market.

Yoon and Ahn (2008) suggest that South Korea should promote a stable increase in exports through improving the quality of commodities and transforming Korean economy into an energy-saving industrial structure. KOTRA (2010) takes some examples of vigorous industries in the market of Japan. After discussing some of the special characteristics of the Japanese

market, KOTRA (2010) introduces the success stories of several selected companies such as a plastics manufacturer, and a company which produces charging systems for electric vehicles, etc. Recently, Oh, et al. (2011) carries out the interview-based research which introduces actual examples of successes and failures in entering the Japanese market. KOTRA (2010) and Oh, et al. (2011), however, just report some characteristics of South Korea's exporting industries to Japan. We analytically try to provide some characteristics of South Korea's exporting industries to Japan, based on three concrete indices of: the average growth rate, the variability and the share of each industry out of Korea's total exports to Japan.

The fact that South Korea is more dependent on the imports from Japan than on the exports to Japan implies that South Korea's trade deficit with Japan is quite large. In other words, the fact that Japanese exports to South Korea is far greater than its imports from South Korea means that Japan's trade surplus with South Korea reaches huge amounts. Kim (2009) points out Korea's persistent bilateral trade deficit with Japan based on the empirical analysis[1]; he argues that the economic growth accompanying technological advances and import substitution of the core parts in major export products of Korea would reduce persistent trade deficits against Japan.

Concerning the bilateral trade between Japan and South Korea, Mizuno (2010) describes the properties of the trade deficit with Japan referring to the import-induced problem of the industrial structure of South Korea. Mizuno (2010) claims that it cannot be resolved if the Korea's government and companies do not make an effort over the long term because the problem of Korea's trade deficit with Japan is structural. Pan (2009) deals with the problem of trade deficits between China and South Korea. According to Pan (2009), though globalization since the early 1990s has had a positive impact on trade relations between China and Korea, China's increasing trade deficits with Korea has become an urgent problem to be solved. As a same token, Korea's higher dependence on imports from Japan than exports to Japan, thereby causing the huge size of the trade deficit to happen.

This paper differs from the existing studies that focus on macroeconomic viewpoints of trade such as Pan (2009), Kim (2009), and Rajan (1996), among others. The calculations based on three indices of the growth rate, the variability, and the share of each industry out of South Korea's exports to Japan are utilized to show their characteristics. We also discuss some measures for trade balances between Japan and South Korea to reduce South Korea's trade deficit with Japan. If the country whose trade is excessively skewed towards a particular region or country has not a strong political and military power like USA, a long-term huge trade deficit can make bilateral trade ineffective. It is because the long-term huge trade deficit can constrain production and consumption options. In other words, when a country has a chronic heavy dependence on another region or country, its economic activity options can be limited.

In the side of bilateral trade between Japan and South Korea, South Korea's 'star' industries (or products) with high growth rate as well as high market share did not appear in Japanese market. We propose to some measures to expand South Korea's exports to Japan, which may lead to a reduction in their trade imbalances. Regarding how to raise the status of exports to Japan, South Korea is recommended to boost the exports through the development of industries such as electrical machinery and equipment, and their parts etc. Those industries may have strong potentials for exports to Japan.

At Section 2 we investigate bilateral trade relations between Japan and South Korea giving the imports/exports data of the two countries. Section 3 discusses a methodology to evaluate South Korea's industries exporting to Japan. Section 4 presents the classification results of those

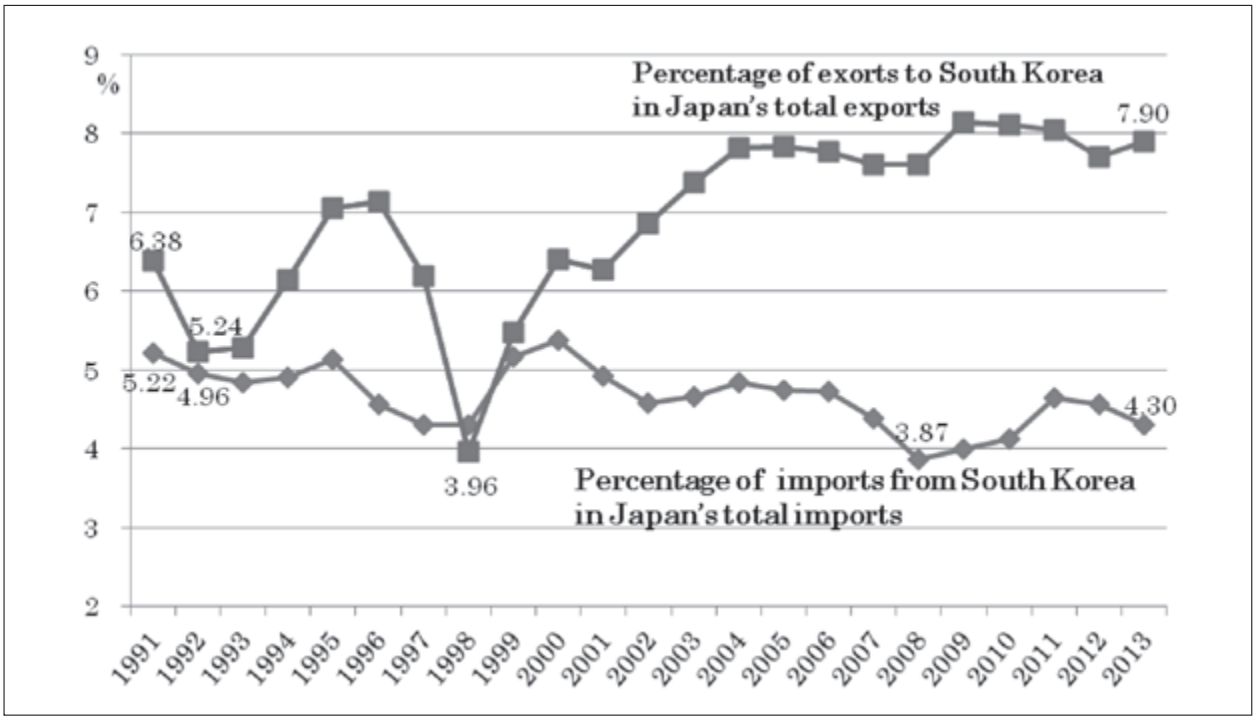
industries on the basis of the methodology of Section 3. Section 5 recommends South Korea's some potential industries for expanding exports to Japan based on the analysis of Section 4. Final Section 6 is concluding remarks.

2. Trade features between Japan and South Korea

2.1. Japan's trade dependence on South Korea

What will become of Japan's trade dependence on South Korea? We utilize some indicators related to the imports of Japan from South Korea: the trend of percentage of its imports from South Korea among Japan's total imports (=[Japan's imports from South Korea / total imports in Japan]) and the trend of percentage of its exports to South Korea among Japan's total exports (=[Japan's exports to South Korea / total exports in Japan]). Figure 1 shows the trend of Japan's exports to South Korea and its import from South Korea with the values of percentage among total exports and imports, respectively, from 1991 up to 2013.

Figure 1 Japan's exports to South Korea and its imports from South Korea



Source: Ministry of Finance in Japan. (2014). Trade Statistics of Japan [online; citied May 2014.] Available from http://www.customs.go.jp/toukei/sankou/howto/krei.htm.

Figure 1 compares Japanese exports to South Korea as a percentage of its total exports (=[Japan's exports to South Korea / total exports in Japan]) with Japanese imports from South Korea as a percentage of its total imports (=[Japan's imports from South Korea / total imports in Japan]). As shown at Figure 1, the former has been greater than the latter for the whole period in question, with the exception of the year 1998 when South Korea got the bailouts from the International Monetary Fund as of financial crisis. In 1992, while the percentage of Japanese imports from South Korea is 4.96%, the percentage of exports to South Korea is 5.24%, so

that percentage of imports from South Korea is just 0.28 percentage points lower than the percentage of exports to South Korea. Percentage gap between Japan's exports to South Korea and its imports from South Korea has recently been widened. In 2013, for instance, while the percentage of Japan's exports to South Korea is 7.90%, the proportion of imports from South Korea is 4.30%, so that the percentage of exports to South Korea comes to 3.60 percentage points higher than the percentage of imports from South Korea. These results illustrate that Japanese dependence on imports from South Korea has not changed much, while its dependence on exports to South Korea has been on the rise.

As we see in the next subsection, Japan's trade dependence on South Korea is greatly different from South Korea's trade dependence on Japan. As we described above, the percentage of imports form South Korea in Japan's total imports has not changed much, while there has been a lot increase in Japan's dependence on exports to South Korea recently. In the case of South Korea' dependence on trade with Japan (see Figure 2), however, the percentage of South Korea's imports from Japan and its exports to Japan has been gradually reduced, still remaining huge trade deficits to South Korea.

The Japanese imports from South Korea as a percentage of total Japanese imports was 4.96% in 1992 and 4.30% in 2013, showing little change (or a slight downward change) after the burst of bubble economy in early 1990s. In contrast, since early 1990s the Japan's exports to South Korea as a percentage of Japan's total exports has increased 2.66 percentage points to 7.90% in 2013 from 5.24% in 1992, meaning that Japan's dependency on exports to South Korea has increased so much.

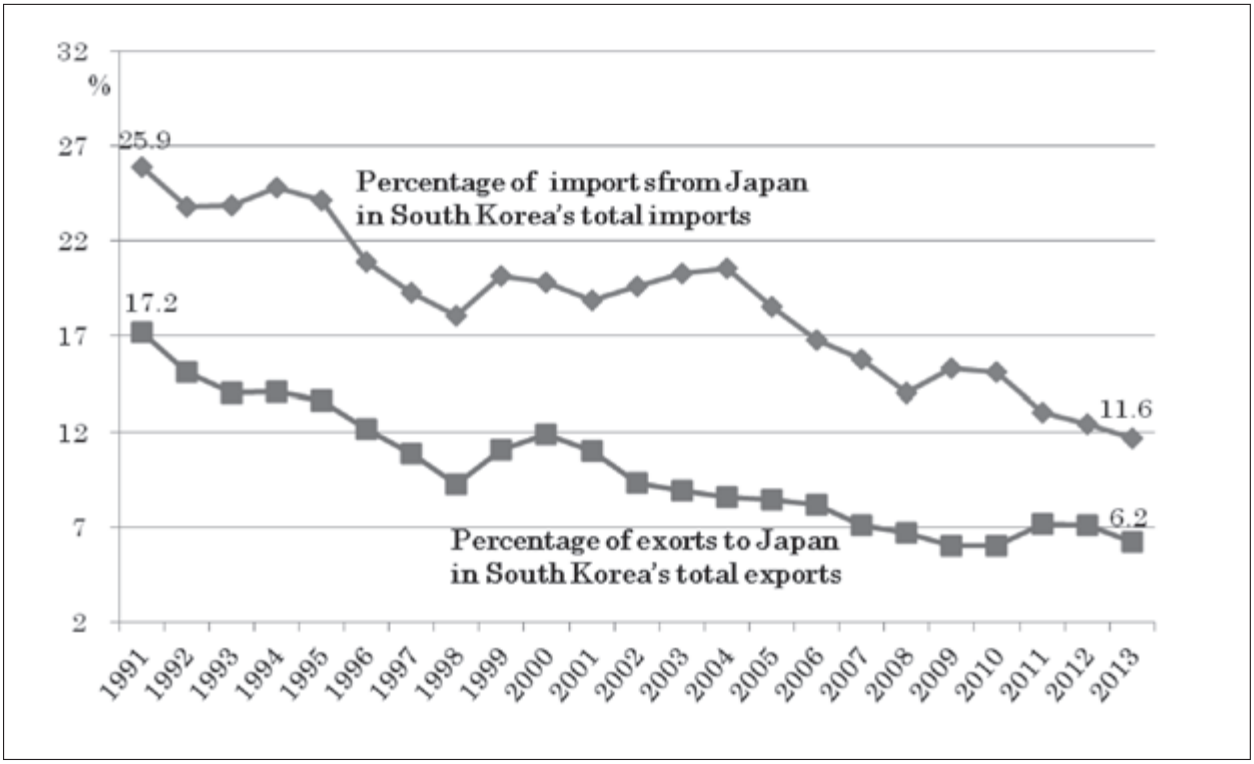
2.2. South Korea's trade balance and its dependence on Japan

South Korea heavily depends on Japan in the trade, especially in the imports from Japan. The features of bilateral trade reliance between Japan and South Korea each other have gradually changed over the last 20 years. Figure 2 draws both the imports of South Korea from Japan and the exports of South Korea to Japan as a percentage of each total amount for the period from 1991 to 2013.

We can find out two main features in South Korea's trade with Japan: (a) the proportion of imports from Japan as a percentage of total Korean imports is larger than that of exports to Japan as a percentage of total Korean exports, which means that South Korea's dependence on imports from Japan is a lot greater than its exports to Japan; and (b) its dependence on Japan has been gradually reduced in both exports and imports.

Firstly, let us compare the imports of South Korea from Japan as a percentage of its total imports (= [South Korea's imports from Japan / total imports in South Korea]) with the exports of South Korea to Japan as a percentage of its total exports (= [South Korea's exports to Japan /total exports in South Korea]). During the whole of the period of over last two decades, the former exceeds the latter. As shown in Figure 2, in 1991, the percentage of South Korea's imports from Japan is 25.9%, while the percentage of its exports to Japan is 17.2%, showing that the degree of dependence on the imports from Japan is 8.7 percentage points higher than the degree of dependence on the exports to Japan. In 2013, South Korea's dependence on imports from Japan is 11.6%, and the percentage of exports to Japan is 6.2%, meaning that there is also a 5.4 percentage point difference. Dependence on imports from Japan being higher than the dependence on exports to Japan is caused by the industrial structure of South Korea that heavily

Figure 2: South Korea's exports to Japan and its imports from Japan



Source: KITA (Korea International Trade Association). (2014) Trade statistics of Korea. KITA, Seoul [online; citied May 2014.] Available from http://stat.kita.net/

depends on Japan. As pointed out by Kim and Noh (2008) as well as Yoon and Ahn(2008), a characteristic of Korean trade is the expansion of finished products exporting them to the world market through the importation of materials and parts from Japan.

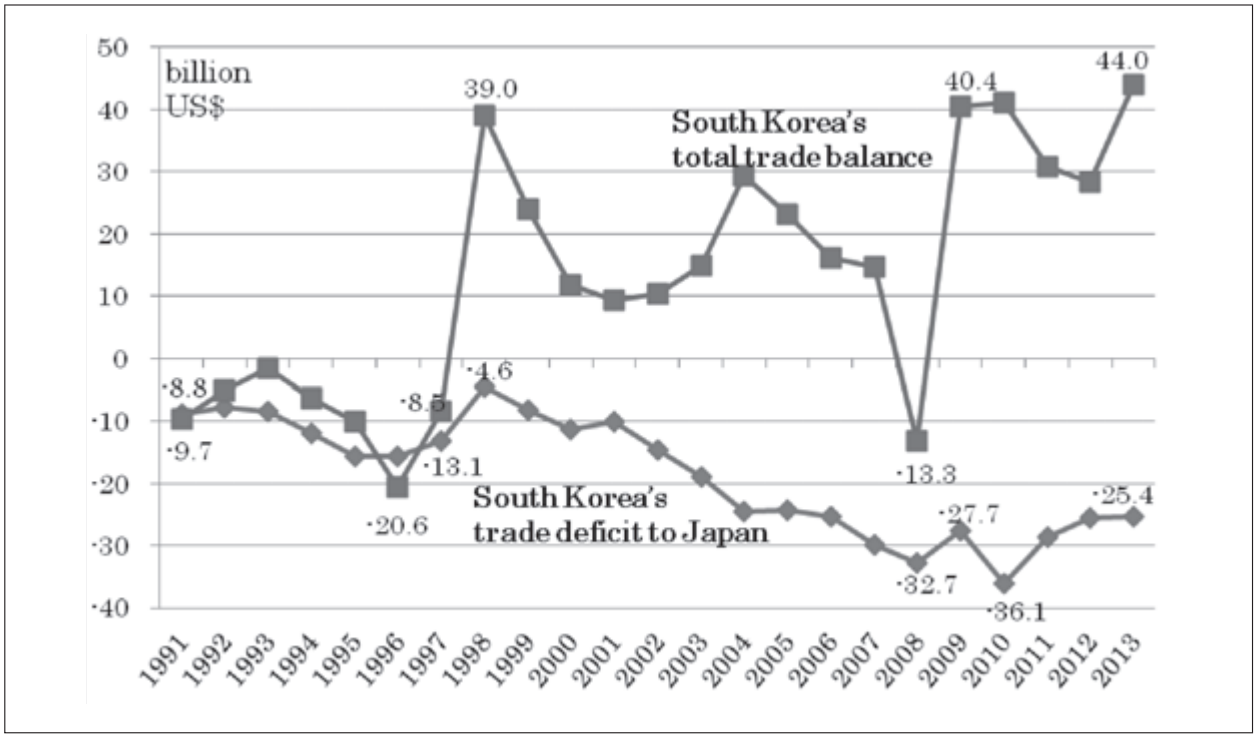
Next, after the bubble burst in Japan in early 1990s South Korea's dependence on trade with Japan has been reduced for both imports and exports. Figure 2 signifies that the place of Japan as a trading partner of South Korea has gradually dropped. The imports from Japan as a percentage of total imports of South Korea gradually declined 14.3 percentage points from 25.9% in 1991 to 11.6 % in 2013. In the same period the exports to Japan as a percentage of total exports of South Korea also went down 11.0 percentage points from 17.2% in 1991 to 6.2% in 2013. These features show that South Korea's dependence on trade with Japan has lowered so much. Figure 2 confirms that both the ratios of South Korea's imports from Japan and those of its exports to Japan have gradually decreased. In other words, for South Korea's trade, trade volumes with other nations other than Japan have become relatively larger.

2.3 South Korea's trade balance and trade deficit wiht Japan

Let us discuss South Korea's total trade balance and trade deficit with Japan after 1991 in some more detail. South Korean government changed its trade policy into export-oriented policy after the financial crisis in late 1997. According to the trade statistics of the Korea International Trade Association, or KITA, South Korea's trade deficit amounted to US$20.6 billion in 1996. To our surprise, South Korea accomplished trade surplus at US$39.0 billion in 1998. South Korea's trade deficit with Japan, however, increased after the financial crisis in 1997 because the import

from Japan has played an important role to raise the export to the other countries. South Korea's import-dependent exports to Japan can be a direct cause of the trade deficit with Japan. Kim and Noh (2008) demonstrate this on the basis of the high correlation between South Korean exports and the trade deficit with Japan. Figure 3 shows South Korea's total trade balance and its trade deficit with Japan from 1991 until 2013.

Figure 3 South Korea's total trade balance and trade deficit with Japan



Source: KITA (Korea International Trade Association). (2014) Trade statistics of Korea. KITA, Seoul [online; citied May 2014.] Available from http://stat.kita.net/

We pointed out that the ratio of South Korea's trade (i.e., export and import) with Japan relative to its total exports and imports has fallen, which means that Japan's importance in South Korea as its trading partner has declined. As depicted in Figure 3, South Korea's trade balance drastically changed. Korea has achieved huge amounts of trade surplus after the economic crisis in 1997 except the year 2008 influenced by financial crisis originated from USA. For instance, South Korea's trade surplus accounts for US$440 billion in 2013. South Korea's trade deficit with Japan, however, increased 2.9-fold, from US$8.8 billion in 1991 to US$25.4 billion in 2013. As a result, South Korean government has required Japan to reduce the deficit. Concerning the bilateral trade of the two countries, Mizuno (2010) refers to a structural problem that should be resolved over the long term based on the concerted efforts by South Korean companies. Yoon and Ahn (2008) also discuss the issue related to the trade deficit between Japan and South Korea from an industrial structure perspective.

South Korea's effective method to reduce the trade deficit with Japan is to increase its exports to Japan, which is the theme of next sections. South Korea has few exporting industries with high growth rate and large market share. We will investigate various types of South Korean industries exporting to Japan at Section 4 by utilizing a method based on the indicators of market

share, growth rate, and degree of stability of the industries exporting to Japan.

3. Methodology and classification

We calculate three indices to evaluate of South Korea's industries exporting to Japan: the growth rate and the variability (or stability) of each industry and the percentage share of each industry out of Korea's total exports to Japan. With respect to the indices of growth rate and variability, we have to devise those indices in an appropriate manner. Kook (2001), Gentry and Ladd (1994), and White (1983) estimate a following simple equation for utilizing indicators of growth rate and stability to evaluate tax system.[2] We apply their methods to access South Korea's industries exporting to Japan.

$$\log T_i = a + bt_i + e_i \qquad (1)$$

In equation (1), T_i is the export value of each industry i to Japan, t_i is the target period for the last two decades, 1991 to 2010, e_i is an error term, and a, b are parameters. When we estimate the equation (1), the parameter b represents the average growth rate of each exporting industry, because by differentiating equation (1) with respect to t_i, we can obtain the result that $b=(dT_i/T_i)/dt_i$. The coefficient of t_i, or b, multiplied by 100 becomes the percentage growth rate of industry i exporting to Japan. Rajan (1996) also makes use of similar indicator to estimate Singapore's trade intensity with respect to Japan and the United States.

While the growth rate of industry i measures how much it grows in average during a given period, the index of variability indicates a degree of variation in exports of the industry i. We can make use of the adjusted R^2 in the estimation of the equation (1) as an indicator of the variability of industry i. Since an adjusted R^2 denotes the fitness of the regression line, the higher the value of R^2 gets, the greater the stability is or the lower the variability is. We can apply a method of the estimation of equation (1) to the calculation of the values of growth rate and variability over around the last 20 years, and the share of each industry out of Korea's total exports to Japan in 2010[3].

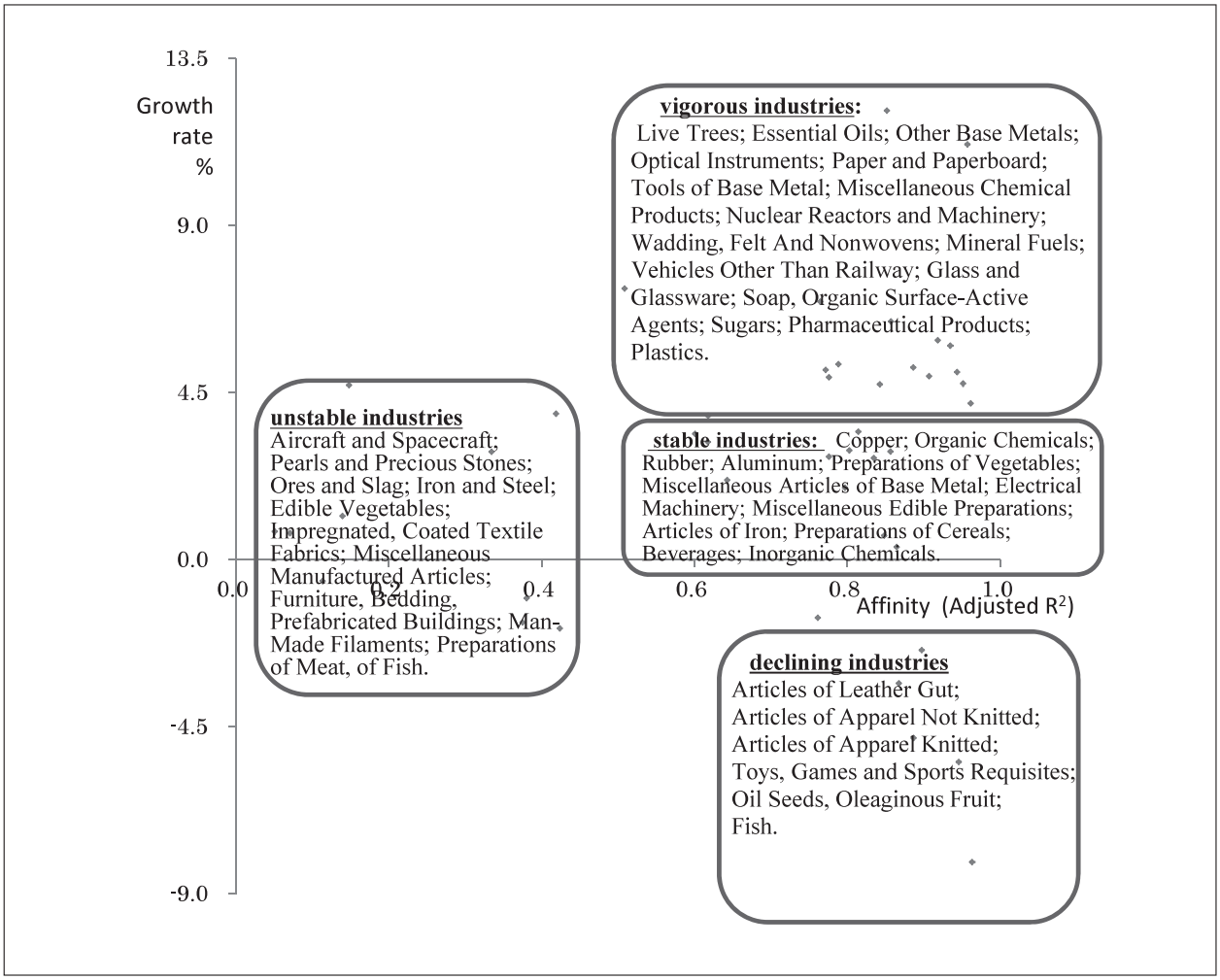
In the choice of South Korea's industries exporting to Japan, we will use the HSK2 classification. HS (Harmonized System) refers to the Harmonized Commodity Description and Coding System which is the new international standard of products classification. HSK refers to the South Korea's classification of ten digits, where four digits (or units) from the South Korea Customs Service are added to universal six digits. The digits 1 and 2 of the HS categorize all commodities by material (type of material) and by function. Thus, HSK2 classification indicates the classification of industries by material and by function in Korea. For the analysis, we take industry unit HSK2 exporting to Japan among detailed classification of industries.

The initial HSK2 classification of industries exporting to Japan includes 96 unit industries, which are too many and complicated to select the target industries for the analysis. For simplicity, we pick up the industries with more than 0.25% in the share of each industry out of Korea's exports to Japan in 2010. It is a lot difficult to catch the characteristics of the industries unless we try to resort the calculation results. We provide four kinds of categories based on the indices of average growth rate and variability (or affinity: adjusted R^2) of the 44 industries in question.

The four-category classification can be obtained in South Korea's industries exporting to Japan as follows: (a)vigorous industries, (b) stable industries, (c) unstable industries, and (d) declining industries. Figure 4 shows the targeted industries classified by the four categories. In sum, according to the results, South Korea's industries exporting to Japan can be classified on the

basis of the indices of growth rate and variability (or the affinity: adjusted R^2) by four categories. We discuss each industry at the following Section 4 in more detail.

Figure 4: Four categories of South Korea's industries exporting to Japan



Source: Calculated and drawn from the trade statistics of KITA (2012).

4. South Korea's industries exporting to Japan

4.1. Vigorous industries

'Vigorous industries' are those with high average growth rate and low variability. As mentioned at Section 3, the low variability or high stability is represented by the high value of adjusted R^2 when we estimate the equation (1). The average growth rate of 44 targeted industries was at 2.06%. We define here vigorous industries as those which show growth rates of more than twice the average growth (2.06%). Table 1 summarizes South Korea's vigorous industries exporting to Japan in ordering of their growth rate.

Table 1: South Korea's vigorous industries exporting to Japan

Vigorous industries	Growth Rate %, t-value in ( )	Affinity (Adjusted R^2)	Share in Value %
Live Trees, Other Live Plants, Bulbs, Cut Flowers, Ornamental Foliage	12.09 (10.50)	0.852	0.25
Essential Oils and Resinoids, Perfumery, Cosmetic or Toilet Preparations	11.18 (20.64)	0.957	0.34
Other Base Metals, Cermets, Articles Thereof	7.29 (4.55)	0.509	0.39
Optical, Photographic, Cinematographic, Measuring, Checking, Precision, Medical or Surgical Instruments and Apparatus, Parts and Accessories Thereof	6.94 (7.91)	0.764	4.87
Paper and Paperboard, Articles of Paper, Pulp of Paper or of Paperboard	6.41 (10.72)	0.857	0.79
Tools, Implements, Cutlery, Spoons and Forks, of Base Metal, and Parts Thereof	5.9 (14.65)	0.918	0.55
Miscellaneous Chemical Products	5.76 (16.50)	0.935	1.79
Nuclear Reactors, Boilers, Machinery, and Mechanical Appliances Parts Thereof	5.26 (8.47)	0.788	9.83
Wadding, Felt and Nonwovens, Special Yarns, Twine, Cordage, Ropes	5.17 (12.21)	0.886	0.25
Mineral Fuels, Mineral Oils, Bituminous Substances, Mineral Waxes	5.11 (8.08)	0.772	12.93
Vehicles Other Than Railway or Tramway Rolling-Stock, and Parts Thereof	5.05 (17.87)	0.944	1.91
Glass and Glassware	4.94 (13.65)	0.907	0.53
Soap, Organic Surface-Active Agents, Waxes, Candles, Modeling Pastes	4.91 (8.17)	0.776	0.28
Sugars and Sugar Confectionery	4.74 (19.27)	0.951	0.39
Pharmaceutical Products	4.71 (10.13)	0.842	0.34
Plastics and Articles Thereof	4.20 (21.80)	0.961	5.48

Note: The industries less than 0.25% in value are excluded.
Source: Calculated from the trade statistics of KITA (2012).

As can be seen in Table 1, the vigorous industries include the following ones when we write them with simplicity: Live Trees; Essential Oils; Other Base Metals; Optical, Photographic and Medical Instruments; Paper and Paperboard; Tools of Base Metal Parts; Miscellaneous Chemical Products; Nuclear Reactors, Boilers, Machinery; Wadding, Felt and Nonwovens; Mineral Fuels; Vehicles Other Than Railway; Glass and Glassware; Soap, Organic Surface-Active Agents; Sugars and Sugar Confectionery; Pharmaceutical Products; Plastics etc. We take account of vigorous industries separately at the aspects of: (a) vigorous industries with particularly high growth rate; and (b) vigorous industries with the high growth rate and the high percentage share out of total South Korea's exports to Japan.

The vigorous industries with particularly high growth are those that show growth rate of 5-6 times higher than the average (2.06%). As we can see at Table 1, those industries are: Live Trees; Essential Oils. The growth rate of Live Trees (specifically, Live Trees, Other Live Plants, Bulbs, Cut Flowers, Ornamental Foliage) is 12.09%, extremely high growth rate. In addition, the growth rate of Essential Oils (specifically, Essential Oils and Resinoids, Perfumery, Cosmetic or Toilet Preparations) shows 11.18%, also very high growth rate. The percentage shares of both industries of Live Trees and Essential Oils are low, however: the former's share is 0.25%; the latter's share is 0.34%.

The vigorous industries with the high growth rate and the high share out of total South Korea's exports to Japan are those with growth rate more than twice as high as the average growth rate, and with the relatively high share in South Korea's exports to Japan. Those industries are: Optical, Photographic and Medical Instruments (4.87%); Nuclear Reactors, Boilers, Machinery (9.83%); Mineral Fuels (12.93%); and Plastics (5.48%)[4], where the percentages in parentheses show the share of each industry out of Korea's total exports to Japan. It would be needed to take efforts for the development of these vigorous industries to improve trade balances of South Korea with Japan.

4.2. Stable industries

'Stable industries' indicate those with low average growth rate and low variability. As is the case of vigorous industries mentioned above, the low variability or high stability is represented by the high value of adjusted R^2 when we estimate the equation (1). Stable industries are here defined as industries which show growth rate of less than twice the average growth (2.06%) as well as higher than the value of 0.6 in adjusted R^2. South Korea's stable industries exporting to Japan are presented in Table 2.

Table 2: South Korea's stable industries exporting to Japan

Stable industries	Growth Rate %, t-value in ( )	Affinity (Adjusted R^2)	Share in Value %
Copper and Articles Thereof	3.87 (5.63)	0.618	0.78
Organic Chemicals	3.44 (9.18)	0.814	3.58
Rubber and Articles Thereof	3.38 (5.44)	0.601	1.27
Aluminum and Articles Thereof	3.16 (5.63)	0.617	0.99
Preparations of Vegetables, Fruit, Nuts, Other Parts of Plants	2.94 (8.85)	0.803	0.36
Miscellaneous Articles of Base Metal	2.91 (10.68)	0.856	0.25
Electrical Machinery and Equipment and Parts Thereof	2.77 (8.17)	0.776	22.23
Miscellaneous Edible Preparations	2.74 (9.84)	0.835	0.44
Articles of Iron or Steel	2.14 (5.93)	0.643	3.48
Preparations of Cereals, Flour, Starch, Milk Pastrycooks Products	1.94 (8.69)	0.797	0.34
Beverages, Spirits, Vinegar	0.65 (10.35)	0.848	0.87
Inorganic Chemicals, Compounds of Precious Metals, Rare-Earth Metals	0.34 (11.06)	0.865	1.29

Note and Source: See Table 1.

As can be seen in Table 2, the stable industries include the following ones when we write them with simplicity: Copper; Organic Chemicals; Rubber; Aluminum; Preparations of Vegetables; Miscellaneous Articles of Base Metal; Electrical Machinery and Equipment; Miscellaneous Edible Preparations; Articles of Iron or Steel; Preparations of Cereals; Beverages; Inorganic Chemicals. Among those industries, we focus on the industries which are both highly stable (or, high value of adjusted R^2) and large shares out of Korea's exports to Japan as well.

The stable industries exhibit not only growth rates higher than the average growth rate (2.06%) with high adjusted R^2 but also show comparatively high shares out of Korea's exports

to Japan. Those industries include: Organic Chemicals; Electrical Machinery and Equipment (specifically, Electrical Machinery and Equipment and Parts Thereof); and Articles of Iron or Steel. The percentage shares of these industries out of Korea's total exports to Japan and their values of variability represented by adjusted R^2 are respectively 3.58% and 0.814 for Organic Chemicals; 22.23% and 0.776 for Electrical Machinery and Equipment; and 3.48% and 0.643 for Articles of Iron or Steel. In particular, in the case of Electrical Machinery and Equipment among those industries, while its growth rate is somewhat higher at 2.77% than overall average growth rate at 2.06%, the industry enjoys the highest export share (22.23%) out of the export-industries of South Korea to Japan (in reference, its adjusted R^2=0.776).

4.3. Unstable industries

'Unstable industries' are those with strong dispersion in terms of growth or high degree of variability. That is to say, their adjusted R^2 values are low in the estimation of equation (1). Some industries among them are characterized by comparatively low growth rate including the industries which display negative growth, while there are other industries with growth rate that surpasses the average growth rate (2.06%) for all industries exporting to Japan. Table 3 shows South Korea's unstable industries exporting to Japan.

Table 3: South Korea's unstable industries exporting to Japan

Unstable industries	Growth Rate %, t-value in ( )	Affinity (Adjusted R^2)	Share in Value %
Aircraft, Spacecraft and Parts Thereof	4.70 (2.07)	0.148	0.41
Pearls, Precious or Semi-Precious Stones, Precious Metals, Coin	3.93 (3.83)	0.419	3.42
Ores, Slag, Ash	2.90 (3.25)	0.335	0.25
Iron and Steel	1.17 (2.02)	0.140	10.1
Edible Vegetables, Roots, Tubers	0.75 (1.42)	0.051	0.27
Impregnated, Coated, Covered or Laminated Textile Fabrics	0.71 (2.57)	0.071	0.28
Miscellaneous Manufactured Articles	-0.58 (-1.32)	0.114	0.26
Furniture, Bedding, Mattresses, Cushions, Lamps & Lighting Fittings Prefabricated Buildings	-1.04 (-3.56)	0.381	0.45
Man-Made Filaments	-1.69 (-3.52)	0.375	0.33
Preparations of Meat, of Fish, of Crustaceans Mollusks, Other Aquatic Invertebrates	-1.85 (-3.87)	0.424	0.35

Note and Source: See Table 1.

The categories of the industries are here defined as those which illustrate unstable situation at the value of adjusted R^2 is lower than 0.5. The unstable industries include the industries with both positive and negative growth rate as shown Table 3. They consist of the following ones: Aircraft and Spacecraft; Pearls and Precious Stones; Ores, Slag, Ash; Iron and Steel; Edible Vegetables; Impregnated, Coated Textile Fabrics; Miscellaneous Manufactured Articles; Furniture, Bedding, Prefabricated Buildings; Man-Made Filaments; Preparations of Meat, of Fish. We try to break the unstable industries down into: (a) industries with comparatively high growth rates as well as high variability; (b) industries with high share out of Korea's total exports to Japan but high variability; and (c) industries with low growth rates but high variability.

The industries with comparatively high growth rates as well as high variability (low value of adjusted R^2) are composed of: Aircraft and Spacecraft and Parts Thereof; Pearls and Precious Stones (specifically, Pearls, Precious or Semi-Precious Stones, Precious Metals, Coin); Ores, Slag, Ash. The average growth rates and adjusted R^2 are respectively 4.70% and 0.148 for Aircraft and Spacecraft; 3.93% and 0.419 for Pearls and Precious Stones; 2.90% and 0.335 for Ores, Slag, Ash. These industries can be characterized as industries with potentially merit efforts for conversion into vigorous industries if South Korea takes efforts to lessen the degree of variability.

The industry with high share out of Korea's total exports to Japan but high variability is the industry of Iron and Steel. Although the Iron and Steel industry has a low growth rate of 1.17% and high variability (the value of adjusted R^2 is 0.140), it shows quite high share out of Korea's total exports to Japan at 10.1%.

The industries with low growth rates (including some industries with negative growth rates) but high variability (low value of adjusted R^2) are composed of: Impregnated, Coated Textile Fabrics[5]; Miscellaneous Manufactured Articles; Furniture, Bedding, Prefabricated Buildings[6]; Man-Made Filaments; Preparations of Meat and, of Fish[7]. The average growth rates and adjusted R^2 are respectively 0.71% and 0.071 for Impregnated, Coated Textile Fabrics; -0.58% and 0.114 for Miscellaneous Manufactured Articles; -1.04% and 0.381 for Furniture, Bedding, Prefabricated Buildings; -1.69% and 0.375 for Man-Made Filaments; -1.85% and 0.424 for Preparations of Meat, of Fish.

4.4. Declining industries

'Declining industries' are those which have a strong downwards tendency showing negative growth or secular stagnation with high value of adjusted R^2. Table 4 illustrates South Korea's declining industries exporting to Japan.

Table 4: South Korea's declining industries exporting to Japan

Declining industries	Growth Rate %, t-value in ( )	Affinity (Adjusted R2)	Share in Value %
Articles of Leather or of Animal Gut, Harness, Travel Goods, Handbags	-8.15 (-22.32)	0.963	0.12*
Articles of Apparel and Clothing Accessories, Not Knitted or Crocheted	-5.45 (-18.24)	0.946	0.41*
Articles of Apparel and Clothing Accessories, Knitted or Crocheted	-4.81 (-12.23)	0.887	0.84
Toys, Games and Sports Requisites, Parts and Accessories Thereof	-3.33 (-11.19)	0.867	0.24
Oil Seeds, Oleaginous Fruit, Industrial or Medicinal Plant, Straw, Fodder	-2.44 (-12.93)	0.897	0.27
Fish, Crustaceans, Mollusks, Other Aquatic Invertebrates	-1.57 (-7.85)	0.761	2.35

Note: * These two industries are included to show the drastic decrease, though the industries with the share of less than 0.25% out of Korea's total exports to Japan are excluded in the classification.
Source: Calculated from the trade statistics of KITA (2012).

Declining industries not only illustrate the negative growth rates but also suffer from a strong trend in negative growth over the last 20 years. Their strong negative trends are backed up by the high adjusted R^2 value, as can be seen at Table 4. The declining industries include

the following ones when we write them with simplicity: Articles of Leather or of Animal Gut; Articles of Apparel Not Knitted; Articles of Apparel Knitted; Toys, Games and Sports Requisites; Oil Seeds, Oleaginous Fruit; Fish, Crustaceans, Mollusks. Their growth rates are[8]: -8.15% for Articles of Leather or of Animal Gut; -5.45% for Articles of Apparel Not Knitted; -4.81% for Articles of Apparel Knitted; -3.33% for Toys, Games and Sports Requisites; -2.44% for Oil Seeds, Oleaginous Fruit; -1.57% for Fish, Crustaceans, Mollusks. All of these declining industries have high values of adjusted R^2 as appeared in Table 4..

Nearly all of the declining industries in South Korea described above are labor-intensive industries. Watanabe (1980) points out that Japan was faced with challenges from the Asian countries, including South Korea, in 1960 to 1970s. The declining industries in South Korea have been eclipsed in terms of competitiveness by counterparts in China, Southeast Asia nations, and other developing countries.

5. Industries with strong potentials in Japanese market

Many existing studies, including Kim (2009), Rajan (1996), and Chou and Shih (1991) among others, focused on macroeconomic side about the trade deficit without considering industrial structures in detail. South Korea has had the export-oriented industrial structure that induced its imports from Japan, which has significantly caused its trade deficits with Japan to appear. In order to improve current trade balances between Japan and Korea, Yoon and Ahn (2008) suggest that Korea maintain the technical superiority of main items such as parts or materials. Kim and Noh (2008) also assert that Japanese companies invest to Korea, and for that to happen, Korea improve conditions for investment in the country by establishing dedicated apartment complexes for Japanese parts and materials companies.

The studies such as Yoon and Ahn (2008) and Kim and Noh (2008) are those emphasized on the movement of Japanese capitals or materials industries into South Korea. They do not indicate, however, what kinds of industries should be invested into South Korea in concrete. Our study takes account of the movement of South Korea's merchandises and services into Japan, and recommends what kinds of the industries should be taken into consideration. The measures that South Korea enhances its exports to Japan are expected to improving trade balances between the two countries.

In the previous Section 4, we could obtain the four-category classification in Korea's industries exporting to Japan: vigorous industries, stable industries, unstable industries, and declining industries. In order to expand South Korea's exports to Japan or to narrow trade gaps between the two countries, it would be needed for Korea to foster 'star' industries with not only high growth rate but also high market share in Japan. One of suggested measures to raise the status of exports to Japan, for instance, can be the development of industries with a strong potential for the exports to Japan such as the industries of electrical machinery and equipment, and their parts etc. There have not appeared Korea's star industries in Japanese market so far, which requires that Korea make efforts to nurse star industries. How will South Korea be able to foster star industries or to expend its exports to Japan? We propose some measures to nurse the industries with strong potentials.

Firstly, two candidates can be chosen for enhancing exports to Japan among the vigorous industries. One candidate is the industries which stand out for their especially high growth such as Live Trees (specifically, Live Trees, Other Live Plants, Bulbs, Cut Flowers, Ornamental

Foliage) and Essential Oils (specifically, Essential Oils and Resinoids, Perfumery, Cosmetic Or Toilet Preparations). The growth rates of Live Trees and Essential Oils are 12.09% and 11.18% respectively. This result implies that though the two industries stand out in growth rate, they have limitations that the percentage shares are quite low.

The other candidate is the industries with high growth rate and high percentage shares out of Korea's total exports to Japan. Those industries are: Optical, Photographic and Medical Instruments (4.87%); Nuclear Reactors, Boilers, Machinery (9.83%); Mineral Fuels (12.93%); and Plastics (5.48%), whose percentage shares appear in parentheses. These industries can play an important role for improving Korea's trade balances with Japan.

Next, we may find other measures among stable industries which display relatively high growth rate and high stability (high value of adjusted R^2). Those industries include the following ones: Organic Chemicals (3.58% and 0.814); Electrical Machinery and Equipment (22.23% and 0.776); and Articles of Iron or Steel (3.48% and 0.643), where the percentage shares of each industry out of Korea's total exports to Japan and the values of adjusted R^2 are written in parentheses respectively. In particular, among these industries, note that the industry of Electrical Machinery and Equipment boasts the highest export share at 22.23%, the growth rate (2.77%) of which is higher than overall average growth rate (2.06%). This industry has a strong potential to be a star industry.

Finally, we may also find some measures among unstable industries which display high growth rate but high variability (low value of adjusted R^2). Those industries consist of: Aircraft and Spacecraft and Parts Thereof (4.70% and 0.148); Pearls and Precious Stones (3.93% and 0.419); Ores, Slag, Ash (2.90% and 0.335), where their growth rates and the values of adjusted R^2 are shown in parentheses respectively. Taking efforts to convert these industries into vigorous ones would result in the effects for improving trade balances if South Korea could lessen the degree of variability. On the other hand, Iron and Steel sector shows high percentage share out of Korea's total exports to Japan but exhibits high variability. The growth rate of the sector is just at 1.17% and the value of adjusted R^2 records low at 0.140, but the percentage share out of Korea's total exports to Japan is very high at 10.1%.

6. Concluding remarks

South Korea has chronically recorded huge trade deficit with Japan. The excessively skewed trade towards a particular country can make bilateral trade undesirable and lead to inefficiencies because economic activity options of the country that is deeply dependent on another country are limited so much. This paper analyzed South Korea's industries exporting to Japan, reviewing bilateral trade relations between the two countries. The four categories could be obtained in Korea's industries exporting to Japan based on the classification of HS (Harmonized System): vigorous industries, stable industries, unstable industries, and declining industries.

Yoshimatsu (2001) examines antidumping policy and trade policy preferences of the Ministry of International Trade and Industry (MITI) in Japan. According to Yoshimatsu (2001), MITI bureaucrats sought to settle dumping issues swiftly by encouraging the industries in the 1980s. As Japan has experienced trade disputes, however, they have strictly applied the rule-governed principles to antidumping behavior over time. This discussion implies that the role of policy authorities is important in whether to promote trade or not. It has passed more than a decade since the Japan-South Korea Joint Research Committee issued its joint research report on

the bilateral Free Trade Agreement (FTA) as of 2003, yet economic collaboration between the two countries still remains inadequate[9].

This paper recommends some measures to raise the status of Korea's exports to Japan through the development of industries such as electrical machinery and equipment for fostering them as star industries. It would be noteworthy that Japan is a society that has accumulated huge volumes of asset, technology and capital, but these stocks are not being sufficiently put to use. Conversely, South Korea boasts economic dynamism but runs short of accumulated stocks compared to Japan. Korea can also make positive use of accumulated technology and capital in Japan for enhancing their trade volumes and for vitalizing their economies. A deepening recognition that Japan and South Korea are strategic partners each other can offer reciprocal benefits for their companies and play a role for the revitalization of the Japanese economy.

We just made use of the official data provided by Japan and South Korea, not taking account of the trade features of value chains through other countries other than the two countries. Also we utilized the data at the level of HSK2 categorization in analyzing the characteristics of South Korean industries exporting to Japan. If we considered the value chain effects through other countries and HS classification in detail besides HSK2 categorization, then more concrete policy implications might be derived.

* I am grateful to helpful comments from an anonymous referee and the participants of the Economic Research Institute for Northeast Asia on 3 December 2011 and of the symposium on Japan-Korea Economic Cooperation on 21 December 2010. Remaining errors that can occur are my own.
† Professor, Department of Economics, Yokohama City University

1 Watanabe(1980) states that Japanese industry has the structure of characteristics with self-sufficient nature comparing to the United State and Germany.
2 Besides the indices of growth rate and the stability, other indicator that shows regional disparity is also used to evaluate tax system. Refer to Ishi (2001) in the case of Japan.
3 The share of each industry is based on the data during January to October in 2010.
4 Refer to Table 1 about specific ranges of these industries.
5 Specifically, Impregnated, Coated, Covered or Laminated Textile Fabrics.
6 Specifically, Furniture, Bedding, Mattresses, Cushions, Lamps & Lighting Fittings Prefabricated Buildings.
7 Specifically, preparations of meat, of fish, of crustaceans mollusks, other aquatic invertebrates.
8 Refer to Table 4 about specific ranges of these industries.
9 Cheong (2013) emphasizes that trade liberalization measures could be political, social and economic issues reviewing recent FTA policy in Korea.

References

Cheong, I. (2013): "Importance of public outreach to the FTA Policy: The case of Korea". *The Northeast Asian Economic Review*, 1(1), pp.41-50.
Chou, W.L., and Y. C. Shih. (1991): "Asian NICs' persistent trade deficit with Japan". *International Economic Journal*, 5(3), pp.59-74.
Gentry, W. M., and H. F. Ladd. (1994): "State tax structure and multiple policy". *National Tax Journal*, 47, December, pp.747-772.
Ishi, H. (2001): *The Japanese Tax System,* 3rd Edition, Oxford University Press.
Japan-South Korea Joint Research Committee. (2003): *Bilateral Research Committee Report on Japan-South Korea Free Trade Agreement*. October [in Japanese].
KITA (Korea International Trade Association) (2012): *Trade statistics*. KITA, Seoul [online; citied February 2012.] Available from http://www.kita.net/statistic/index.jsp
KITA (Korea International Trade Association) (2014): *Trade statistics of Korea*. KITA, Seoul [online; citied May 2014.] Available from http://stat.kita.net/
KOSIS (Korean Statistical Information Service) (2012): *Statistical database*. KOSIS, Daejeon [online; citied

February 2012] Available from http://kosis.kr/eng/database/database_001000.jsp
KOTRA (Korea Trade-Investment Promotion Association) (2010): *Promising Sectors and Strategies for Investment in the Japanese Market*. KOTRA, Seoul [in Korean].
Kim, A. (2009): "An empirical analysis of Korea's trade imbalances with the US and Japan", *Journal of the Asia Pacific Economy*, 14(3), pp.211-226.
Kim, J. Y., and W. J. Noh. (2008): *Reasons for the Chronic Trade Deficit with Japan.* Research Department, Bank of Korea, BOK research 2008-27, September, [in Korean].
Kook, J. (2001): "A comparative study of tax systems between Korea and Japan". *The Korean Journal of Public Finance*. 15(2), pp.251-286.
Ministry of Finance in Japan (2014): *Trade Statistics of Japan* [online; citied May 2014.] Available from http://www.customs.go.jp/toukei/sankou/howto/krei.htm.
Mizuno, J. (2010): "The Problem of South Korea's Trade Deficit with Japan". *JETRO (Japan External Trade Organization) - IDE (Institute of Developing Economies) Interim Report*, 2009- Ⅳ -30 [in Japanese].
NIPSSR (National Institute of Population and Social Security Research) (2012): Population Statistics. Tokyo [online; citied February 2012.] Available from http://www.ipss.go.jp/p-info/e/Population%20%20Statistics.asp
Oh, J. W., Y. S. Kang, Y. S. Lee, and O. K. Kweon (2011): *A Research Study on Factors of Success and Failure of South Korea's Companies Entering Japan*. Korea-Japan Cooperation Foundation for Industry and Technology, Japan Study 11-02 [in Korean].
Pan, L. (2009): "A study on the possible causes of china's trade deficits with South Korea after their establishment of diplomatic relation", *Asian Social Science*. 5(11), pp.147-150.
Rajan, R.S. (1996): "Singapore's bilateral merchandise trade linkages with Japan and the United States: trends, patterns and comparisons". *Asian Economic Journal,* 9(2), pp.133-163.
Research Department of BOK. (2009): *South Korea's Current Account Balance: Focusing on Structural Analysis and Improving Measures.* BOK (Bank of Korea) [in Korean].
Simandjuntak, D.S. (1991): "The roles of Japan in Asian Economies". *Asian Economic Journal,* 5(1), pp.40-55.
Watanabe, T. (1980): "An analysis of economic interdependence among the Asian NICs, the ASENAN nations, and Japan". *The Developing Economies*, 18(4), pp. 393-411.
White, F. C. (1983): "Trade-off in growth and stability in state taxes". *National Tax Journal* 36, March, pp.103-114.
Yoon, S. K., and D. J. Ahn. (2008): "Analysis of Factors to Affect Current Account Balance". *MONTHLY BULLETIN*, Research Department, Bank of Korea, November, pp.24-58 [in Korean].
Yoshimatsu, H. (2001): "Trade policy in transition? Political economy of antidumping in Japan". *Journal of the Asia Pacific Economy*, 6(1), pp.22-46.

GUIDELINES FOR CONTRIBUTIONS (abstract)

Please send papers as email attachments or on a CD, in Microsoft Word or other text-file form. Papers should be double-spaced and not more than 5,000 words in length.

All papers must have an abstract of not more than 150 words, with keywords of from three to six terms following it, highlighting the main topics of the paper.

The title page should contain the title of the paper, the full names and addresses of the authors, their contact information (telephone number, facsimile number and email address) and their professional affiliation. As the name of the author is to be withheld from the referees *the title of the paper only* should be repeated on the first page of the main text.

Please refer to the "Guidelines for Authors" on ERINA website (http://www.erina.or.jp/index.html.en) regarding the other matters for the authors of papers we would like to be observed.

Once manuscripts have been anonymously peer-reviewed, their acceptance or rejection rests with the Editorial Committee.
The anonymity of both authors and referees will be maintained throughout the reviewing process.

The copyright of accepted papers will belong to the author. Please refer to the "Guidelines on Copyright" regarding the copyright for accepted papers.

GUIDELINES FOR CONTRIBUTIONS (abstract)

Please send papers as email attachments or on a CD, in Microsoft Word or other text-file form. Papers should be double-spaced and not more than 5,000 words in length.

All papers must have an abstract of not more than 150 words, with keywords of from three to six terms following it, highlighting the main topics of the paper.

The title page should contain the title of the paper, the full names and addresses of the authors, their contact information (telephone number, facsimile number and email address) and their professional affiliation. As the name of the author is to be withheld from the referees *the title of the paper only* should be repeated on the first page of the main text.

Please refer to the "Guidelines for Authors" on ERINA website (http://www.erina.or.jp/index.html.en) regarding the other matters for the authors of papers we would like to be observed.

Once manuscripts have been anonymously peer-reviewed, their acceptance or rejection rests with the Editorial Committee.
The anonymity of both authors and referees will be maintained throughout the reviewing process.

The copyright of accepted papers will belong to the author. Please refer to the "Guidelines on Copyright" regarding the copyright for accepted papers.