Daiwa Institute of Research

24 April 2015 (No. of pages: 19)

Japanese report: 16 Mar 2015

The Return to Japan: Future Prospects for Reshoring

Effects of the weak yen since fall of 2012 become manifest

Economic Intelligence Team
Satoshi Osanai

Summary

- The tendency in exchange rates towards a weaker yen became increasingly pronounced after the fall of 2012, but for some time this showed no signs of preventing corporations from shifting production overseas. However, during the second half of 2014, a number of corporations announced their intentions of shifting some of their production back to domestic locations. It appears that manufacturers are showing a growing interest in a return to Japan.

- Historical trends indicate that the rate of overseas capital expenditure and overseas sales tends to expand or contract 2-3 years after a new yen exchange rate tendency (strong yen or weak yen) takes hold. Another factor encouraging manufacturers to shift production facilities back to domestic locations is the narrowing of deviation between the real effective exchange rate and terms of trade (= export price / import price).

- We performed a regression analysis of the ratio of overseas capital expenditure using the following two explanatory variables: (1) the overseas production ratio, and (2) the real effective exchange rate. According to the results of this estimate, the ratio of overseas capital expenditure fell into a decline beginning in FY2014. It is expected to decline by 3.5%pt between FY2013 and FY2016. A survey of corporations also indicates a decrease in the ratio.

- Looking at trends in the activities of individual corporations, we see that production of electrical machinery has been shifting to domestic locations. Until recently, the trend was to carry out production in developing nations where costs were low, and then reimport products to Japan. But now we see a reversal of this tendency in which production is brought back to Japan where products are consumed. This is called the local production for local consumption model. In the case of automobiles, the return to domestic production locations is expected to bring an increase in exports to the US, while a certain amount of capital expenditure to increase capacity is also expected.

- Looking now at overseas economies we see that the decline in the value added ratio and the ratio of employees in the manufacturing industry is not unique to Japan. This tendency is in fact shared by the world's leading industrialized nations. In the case of the United States, the shale revolution in gas and oil has brought on a decline in energy prices, and with it an

increase in manufacturers returning production facilities to domestic locations. As a result, the above two ratios have been flat for the US manufacturing industry since around 2010.

- In regard to the shifting of production facilities overseas by the manufacturing industry, arguments vary as to whether nominal value or real value in adjusting price fluctuation of the effective exchange rate is most important. Corporate management tends to emphasize the former, while economists place more importance on the latter. In cases where there are major differences in salary levels such as is seen in China and Japan, the inflation differential does not have much influence on corporate decisions as to whether or not to shift production overseas. Rather than the real effective exchange rate, corporate management in those countries may prefer to place more importance on the nominal value.

1. Introduction

As globalization of Japan's manufacturing industry progressed, corporations increasingly transferred their production facilities overseas to developing nations where personnel expenses were cheaper, in order to keep production costs under control and maintain their price competitiveness. In recent years the concept of local production for local consumption has also been influential, leading to the increasing sense that production facilities should be nearby to the location where products are consumed. This is a major trend in business now, and most likely in the long-term, corporate decisions on where to locate production facilities will continue to be made based on a comparison of demand versus production costs in overseas locations and Japan. In comparison to Japan where domestic demand remains slow due to its declining population, overseas markets are sure to expand in the future. Due to this fact, corporations will continue to enter overseas markets. In the long-term, the ratio of overseas capital expenditure is expected to continue in a moderate growth trend.

On the other hand, changes in international price competitiveness associated with fluctuation in exchange rates will have a major influence on decisions whether to transfer production overseas. Looking at historical patterns, we see that Japan's domestic production suffered a decline in competitiveness after the surge in the yen's value subsequent to the Plaza Accord of 1985, as well as the appreciation of the yen in 1995 and 1999, and the development of a high yen after the US financial crisis of 2008. These events also contributed to the increasing tendency of Japanese corporations to transfer production overseas. But since the fall of 2012 exchange rates experienced a major shift in the direction of a weak yen. Amongst other things this was fueled by expectations regarding Abenomics and the effects of the BOJ's bold monetary easing policy, but for some time this showed no signs of preventing corporations from shifting production overseas. However, during the second half of 2014, a number of corporations announced their intentions of shifting some of their production back to domestic locations. It appears that manufacturers are showing a growing interest in a return to Japan (otherwise known as *reshoring*).

In this report, we examine three issues concerning the shift of production overseas, known as offshoring. First, we perform a comprehensive survey of trends in the ratio of overseas sales and the ratio of overseas capital expenditure of Japanese corporations. Then we look at the historical linkage between these two ratios and the effective exchange rate. The next step is to perform a factor analysis of the ratio of overseas capital expenditure of Japanese corporations using a regression analysis and from this consider the future outlook for overseas production. Finally, we shift our gaze to trends in overseas economies, comparing the value added ratio and the ratio of employees in the manufacturing industry in five major industrialized nations. Here we consider the current situation in the United States of the return of manufacturing to domestic production locations from the viewpoint of changes in employment. In the addendum, we examine arguments for nominal value versus real value in adjusting price fluctuation of the effective exchange rate as a decision-making tool in the shifting of production facilities overseas by the manufacturing industry

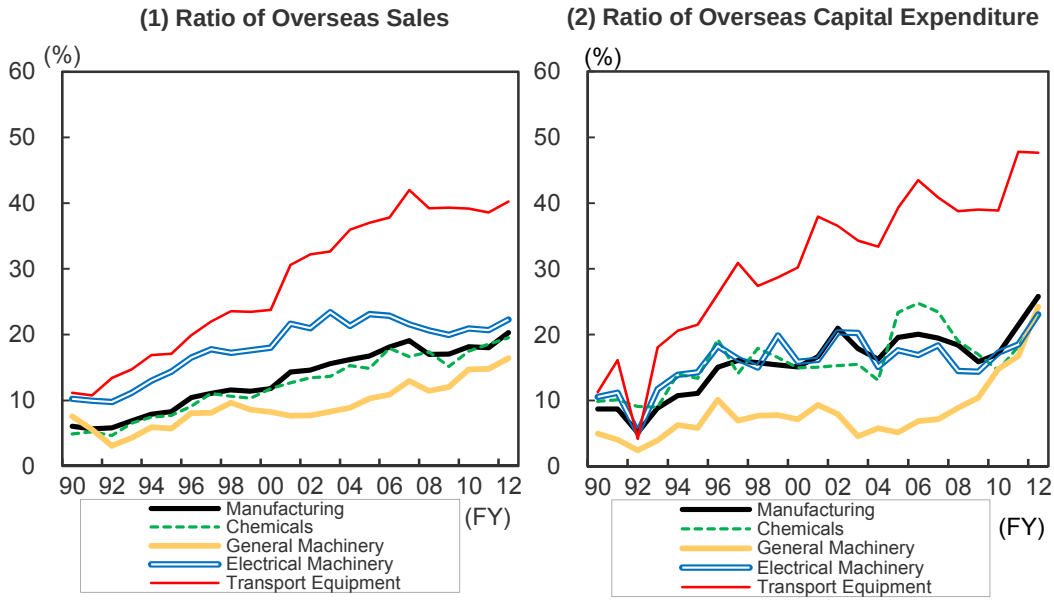
2. The Shift of Production Overseas as Seen Through the Ratio of Overseas Sales and the Ratio of Overseas Capital Expenditure of Japanese Corporations

The transport equipment industry provides a striking example of globalization

Trends in the ratio of overseas sales and the ratio of overseas capital expenditure can tell us much about the shift of production overseas by the major manufacturing industries[1]. First of all, in the long-term these ratios grow regardless of the particular industry. The raw data shows us that overseas sales and overseas capital expenditure is growing for all industries (Chart 1). In other words, the shift of production overseas is not limited to a particular industry. The ratio of overseas capital expenditure has been on the rise particularly since the appreciation of the yen in 1995 and the development of a high yen after the US financial crisis of 2008. This indicates that rapid fluctuations in exchange rates may have influenced decisions to move production overseas in the past.

Looking at individual industries we see that the expansion of local production facilities in overseas markets by automobile manufacturers has been a major factor in making the ratio of overseas capital expenditure in the transportation equipment industry larger than that of other industries. As will be covered in more detail later in this report, considering the fact that the export specialization ratio for this industry, which indicates the export competitiveness of passenger vehicles, is at a high level, the shift to overseas production in the transport equipment industry is not necessarily a negative factor as is suggested by the term “hollowing out”. Rather, it can be understood as a development which goes arm in arm with globalization and the international competitiveness attained from that[2]. On the other hand, the electrical machinery industry stands out as an area whose export specialization ratio and import penetration ratio sharply declined. It is therefore quite possible that the phenomenon of “hollowing out” is at least partly to blame here.

Ratios of Overseas Sales and Capital Expenditure of Major Manufacturing Industries **Chart 1**



Source: Ministry of Economy, Trade and Industry, Ministry of Finance; compiled by DIR.
Notes: 1) Ratio of overseas sales = overseas subsidiary sales / (domestic corporate sales + overseas subsidiary sales)
2) Ratio of overseas capital expenditure = capital expenditure of overseas subsidiary / (capital expenditure of domestic corporation + capital expenditure of overseas subsidiary).

[1] It should be noted that even in cases where these two ratios do not necessarily lead a corporation to shift production overseas, they still have a tendency to increase due to declines in domestic sales and capital expenditure. Moreover, there are additional indices which indicate the shifting of production overseas and which should be referred to in gaining an understanding of the situation. These include the ratio of domestic and overseas employees amongst others. It must also be kept in mind that the statistics used and their definitions also influence interpretation.

[2] Definitions of the term “hollowing out” vary. The definition according to the METI White Paper (2012) (English Translation not available) is “the condition in which domestic production, investment, and employment decline as a result of increased direct investment overseas.” Meanwhile, the definition according to the Cabinet Office economic report (2012) “Japan’s Economy 2012-2013” (English Translation not available) is “the phenomenon in which domestic production and employment decline as a result of the shifting of production overseas, while the technical level of domestic industry stagnates and declines.”

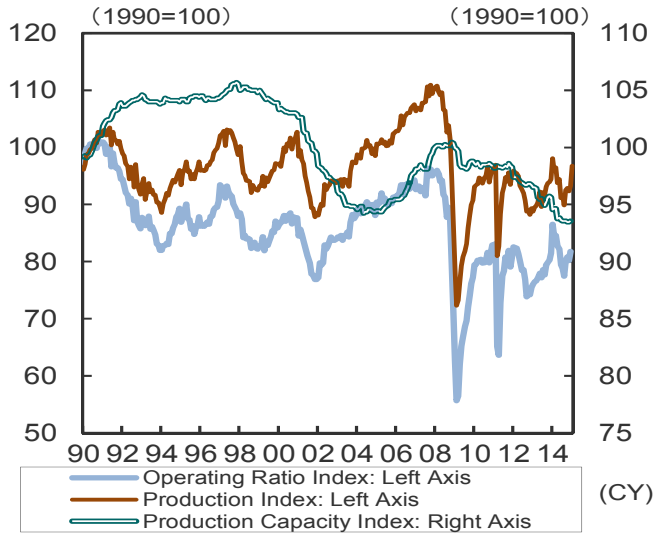
The shifting of production overseas is to at least some extent detrimental to domestic capital expenditure

When the shifting of production overseas progresses especially rapidly, domestic production and operating ratio tend to decline, threatening to bring reductions in domestic production capacity and declines in capital expenditure. The index of industrial production has been making a comeback, while the operating ratio index has been on an upswing as well. However, they are still relatively low in comparison to where they were before the US financial crisis of 2008 (Chart 2). Since that time, the production capacity index has been on a downswing. Corporations appear to have been making cutbacks in domestic production capacity.

According to corporate statistics regarding trends in capital expenditure on the part of manufacturers, corporations have been holding down the amount of capital expenditure relative to cash flow since the mid-1990s as part of their efforts to eliminate overcapacity and deal with the decline in return on investments (Chart 3). Corporate capital expenditure has been hovering at around the same amount as depreciation expenses of late. This indicates that corporations have not been carrying out capital increases. It also means that corporate management retains its cautious stance when it comes to capital expenditure.

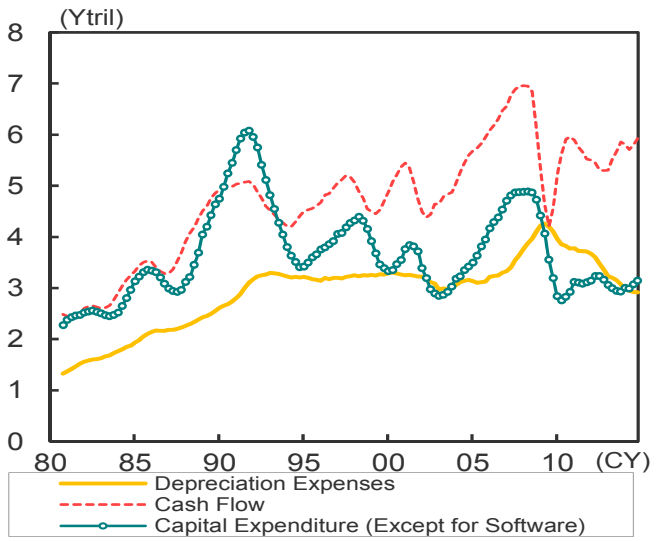
In light of the above-mentioned capital investment ratio and the increase in overseas capital investment, the trend for corporations to reduce domestic production capacity while holding down capital investment can be seen has having been influenced by stagnant domestic demand and the acceleration of the shifting of production overseas due to the strong yen. It is therefore essential that we obtain a clear grasp of the nature of the reshoring trends amongst manufacturers, as well as finding a means of projecting what the future of domestic capital expenditure might be.

Production, Operating ratio, and Production Capacity in the Manufacturing Industry
Chart 2



Source: Ministry of Economy, Trade and Industry; compiled by DIR.

Capital Expenditure, Depreciation Expenses, and Cash Flow in the Manufacturing Industry
Chart 3

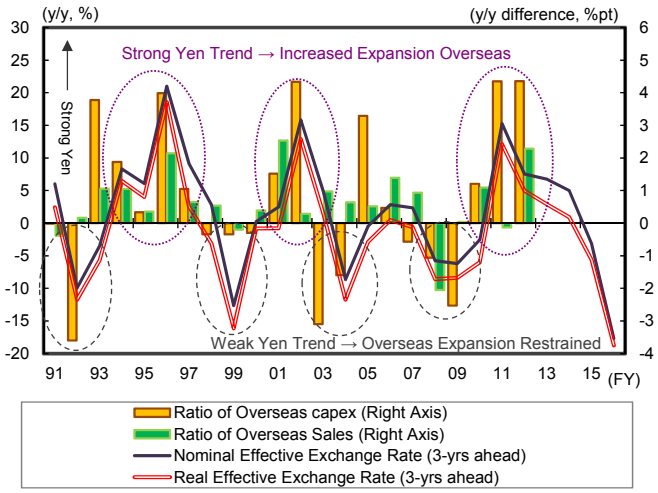


Source: Ministry of Finance; compiled by DIR.
Notes: 1) Cash flow = recurring profits / 2 + depreciation expenses.
2) 4-quarter moving average value.

Historical trends indicate that the shifting of production overseas is brought under control 2-3 years after a weak yen takes hold

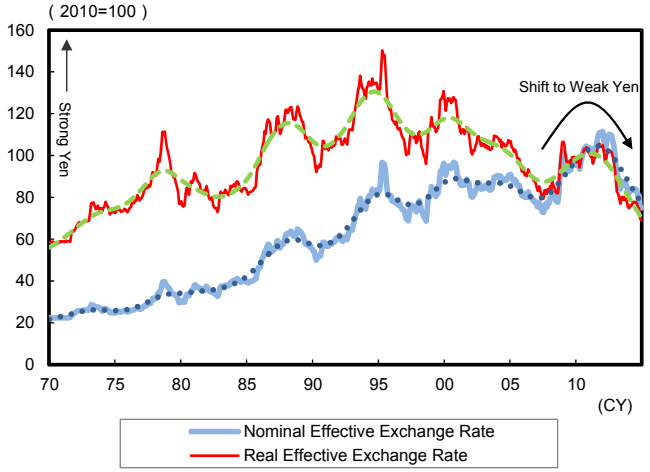
In this section we examine the nature of the relationship between the overseas sales ratio, the ratio of overseas capital expenditure, and the effective exchange rate. Looking at historical trends, we see that the rate of overseas capital expenditure and overseas sales tends to expand or contract 2-3 years after a new yen exchange rate tendency (strong yen or weak yen) takes hold (Chart 4). Since it generally takes several years for a capital expenditure plan to be implemented, it is easy to see why there is a delay between the time the effective exchange rate is established and the time when the change in the ratio of overseas capital expenditure actually takes place. Since the fall of 2012 the effective exchange rate experienced a major shift in the direction of a weak yen. Amongst other things this was fueled by expectations regarding Abenomics and the effects of the BOJ's bold monetary easing policy (Chart 5). Amidst these developments a number of corporations announced their intentions of shifting some of their production back to domestic locations. Hence it appears that the effects of the weak yen have gradually become manifest.

Manufacturing Industry's Ratio of Overseas Sales & Ratio of Capital Expenditure, and the Yen's Effective Exchange Rate **Chart 4**



Source: Ministry of Economy, Trade and Industry, Ministry of Finance, Bank of Japan; compiled by DIR.

The Yen's Effective Exchange Rate **Chart 5**

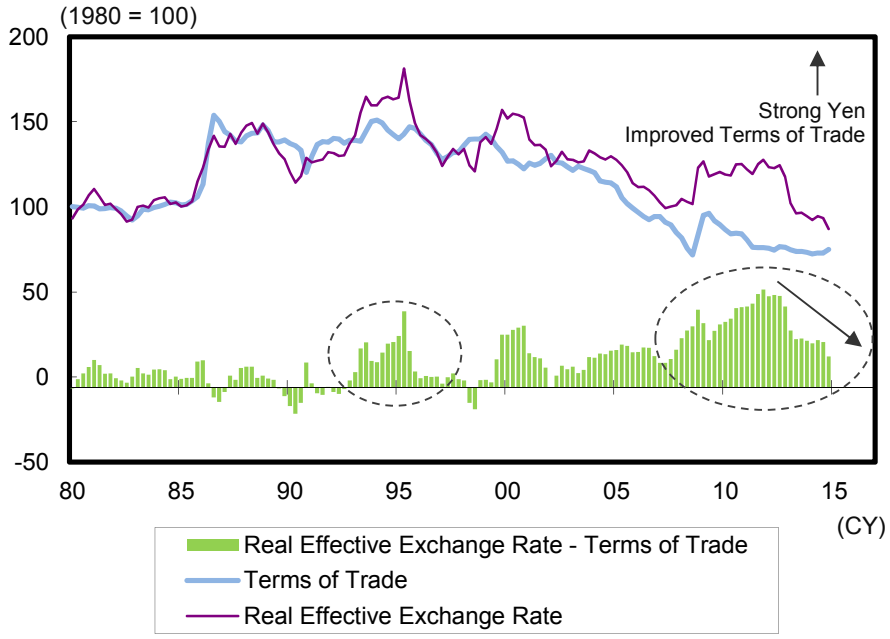


Source: Bank of Japan; compiled by DIR.
Note: Dotted line denotes trend using HP filter.

Narrowing of deviation between the real effective exchange rate and terms of trade

Another factor encouraging manufacturers to shift production facilities back to domestic locations is the narrowing of deviation between the real effective exchange rate and terms of trade (= export price / import price). Normally, the real effective exchange rate and terms of trade tend to move in tandem. When a new exchange rate takes hold (either a strong yen or a weak yen), terms of trade tend to either improve or worsen (see Chart 6). The reason that exchange rates and terms of trade together influence the competitiveness of domestic production is that their respective beneficial and detrimental effects tend to cancel each other out. This is because the structure of Japanese trade is such that fluctuations in prices of imported energy and other natural resources tend to be larger than fluctuations in export price. Concretely speaking, when the yen is high, import prices fall to a greater extent than export prices, and terms of trade improve as a result (in other words the ratio of export price to import price increases). In contrast, when the yen is weak terms of trade worsen.

The Real Effective Exchange Rate and Terms of Trade **Chart 6**



Source: The Bank of Japan; compiled by DIR.
Note: Terms of trade = export price / import price (yen basis)

Looking back at historical patterns, we see that after the onset of the high yen in 1995 and the further strengthening of the yen after the US financial crisis of 2008 terms of trade did not improve. During this time, deviation between the real effective exchange rate and terms of trade expanded. The domestic production operations of manufacturers were then placed in an especially disadvantageous position. Even after the weak yen took hold after the fall of 2012 terms of trade were still detrimental to manufacturers. Finally, terms of trade began to see some improvement after the collapse of the price of crude oil in the summer of 2014. As a result, the deviation between the real effective exchange rate and terms of trade began to shrink. This change in the competitive environment affecting domestic production is another factor encouraging the manufacturing industry to shift production back to domestic locations.

3. Factor Analysis of Overseas Capital Expenditure Ratio and Outlook for Future

The effect of the weak yen may bring a 3.5%pt decline in the ratio of overseas capital expenditure

In this section we consider the long-term increase in the ratio of overseas capital expenditure in the manufacturing industry and based on this historical factor, what the future might bring. Here we perform a factor analysis using the following two explanatory variables: (1) the overseas production ratio, and (2) the real effective exchange rate[3].

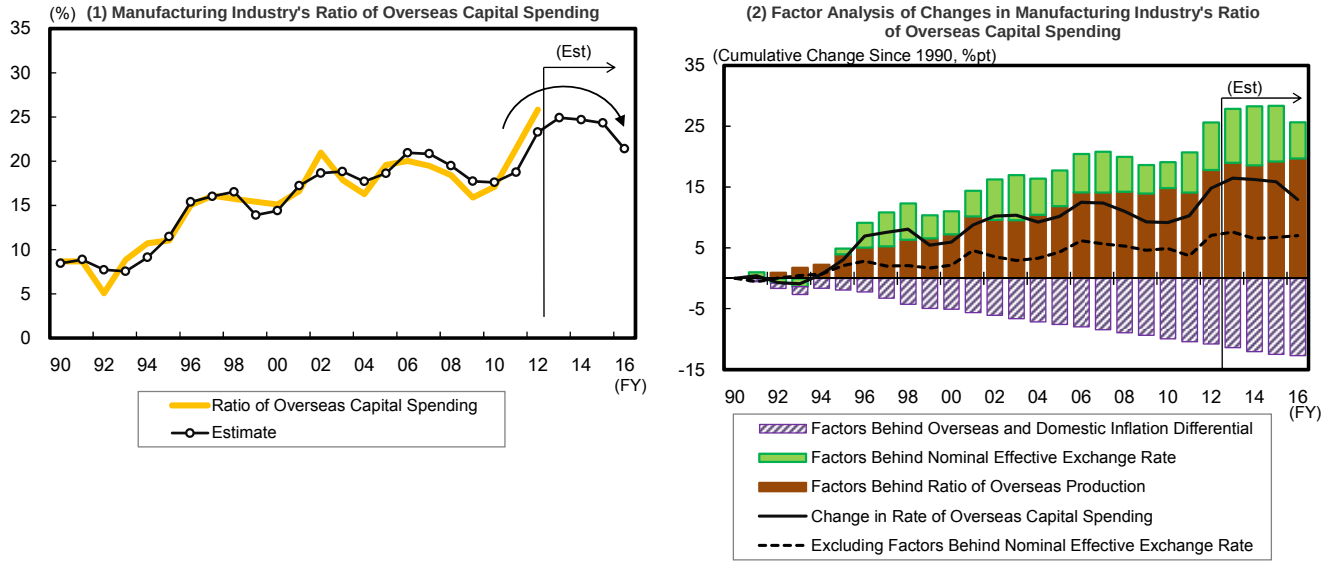
First of all, as has been mentioned earlier in this report, the ratio of overseas capital expenditure has continued its long-term growth trend despite short-term fluctuations (see Chart 7 (1)). A closer inspection of this factor explains how this has worked to continually increase the ratio of overseas capital expenditure. In structural terms, Japan's inflation rate is lower than that seen overseas, and this causes the inflation differential factor (≒ difference in growth rates in production cost) to bring a negative contribution to the situation. Meanwhile, the pace of growth in overseas markets is more

[3] The results of factor analysis of the ratio of overseas capital expenditure are influenced by the estimation method and the period of time covered by the data used. Hence results should be taken with a certain grain of salt. In performing the factor analysis, we have also analyzed real effective exchange rates based on (1) the nominal effective exchange rate, and (2) the inflation differential (nominal effective exchange rate / effective exchange rate ≒ difference in growth rates of production cost).

rapid than that of Japan's domestic market, which brings the overseas production ratio factor into play (≒ difference in demand in overseas and domestic markets) (see Chart 7 (2)). Meanwhile, despite fluctuations in the nominal effective exchange rate, the long-term trend has been toward a stronger yen, and this has helped to increase the ratio of overseas capital expenditure.

Next, we see that during strong yen phases in the past, the nominal effective exchange rate would increase considerably within 2-3 years after said exchange rate tendency took hold, and this has been a major factor in accelerating the shifting of production overseas. As has been pointed out earlier in this report, the tendency for Japanese corporations to locate their production facilities on a global basis is determined by the fact that in the long-term, overseas demand is higher than that of Japan's domestic market (≒ overseas production ratio factor), while production costs are lower (≒ inflation differential factor). However, the strong yen increased the ratio of overseas capital expenditure to the extent that it went way beyond what is thought to be normal for the trend, which is based on relative demand and production costs in Japan and overseas.

The Manufacturing Industry's Ratio of Overseas Capital Expenditure and its Factor Analysis Chart 7



Source: Ministry of Economy, Trade and Industry, Ministry of Finance, The Bank of Japan, Cabinet Office, and IMF; compiled by DIR.
Notes: 1) Overseas production uses data from The Cabinet Office's Annual Survey of Corporate Behavior.
2) The forecasting formula for the ratio of overseas capital expenditure is as follows:
Ratio of overseas capital expenditure (t) = -75.44 + 1.11 x overseas production ratio (t) + 16.55 x ln (real effective exchange rate) (t-3), all have significance of 1%. GMM method used in calculation of estimate. Instrumental variables: constant term, overseas production ratio (t-1), nominal GDP for world and Japan (t-3), and ln (real effective exchange rate) (t-3).
3) For future values, used GDP for world and Japan (based on PPP) (t-2) and nominal exchange rate (t-2) to estimate overseas production ratio and extended results.
4) Overseas and domestic inflation differential factor shown in right hand side of chart calculated using nominal effective exchange rate / effective exchange rate. When Japan's inflation rate (≒ increase in production costs) is lower than overseas it contributes pushing ratio down.

Finally, based on the IMF outlook for the world economy, as well as on recent nominal exchange rates, the ratio of overseas capital expenditure is expected to shift into a downward trend beginning in FY2014, due to the weak yen trend having taken hold since the fall of the year 2012. Using the results of the above-mentioned survey, we performed a mechanical calculation which forecasts the ratio of overseas capital expenditure to decline by around 3.5%pt between FY2013 and FY2016. It therefore appears that the shifting of production overseas, which rapidly increased due to the high yen trend in the past, will be kept under control to at least a certain extent in the future.

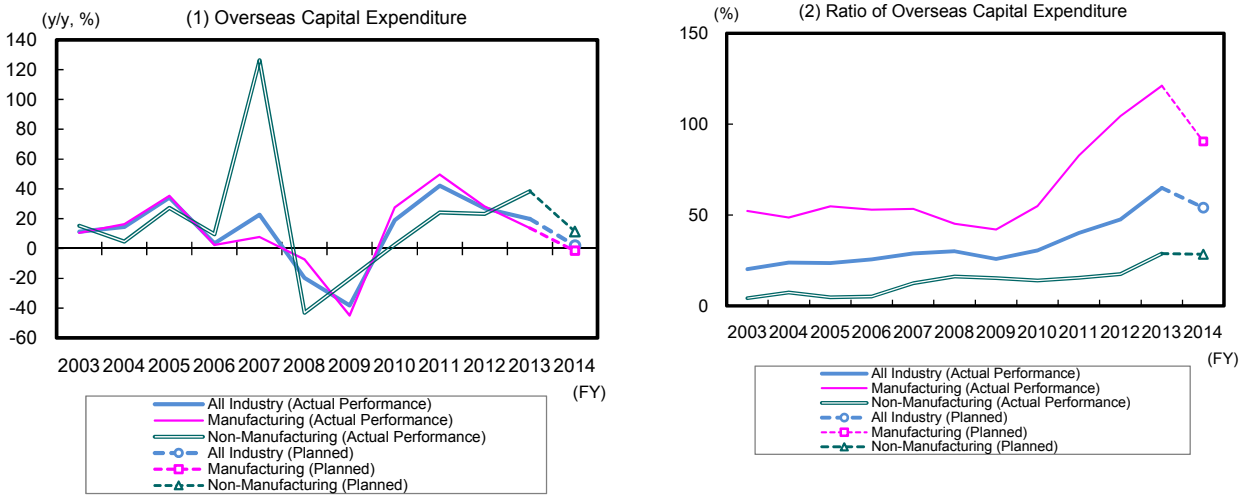
Survey of corporations indicates decrease in ratio of overseas capital expenditure

According to a survey carried out by the Development Bank of Japan on manufacturing industry plans for overseas capital expenditure, the growth rate in overseas capital expenditure shifted into negative

numbers during FY2014 for the first time in five years. The ratio of overseas capital expenditure is also expected to decline for the first time in five years (Chart 8). This is due to a decline in overseas capital expenditure on the part of the automobile manufacturing, non-ferrous metals, and chemicals industries, as well as the increase in domestic capital expenditure during the previous fiscal year.

The future outlook for the ratio of overseas capital expenditure as described above is echoed in the results of a regression analysis (DIR) and the Development Bank of Japan's survey of corporate activities. We believe that it can be deduced that overseas capital expenditure, which became excessive in the past due to the ongoing high yen exchange rate, will progressively return to domestic investments, indicating that the effects of Abenomics are gradually becoming manifest.

Survey: Trends in Overseas Capital Expenditure and the Ratio of Overseas Capital ExpenditureChart 8



Source: The Development Bank of Japan; compiled by DIR.

Is the reshoring trend genuine?

In evaluating the manufacturing industry trend in reshoring, there are two indices which are especially important to refer to. These are the import penetration ratio, which indicates the percentage of industrial products supplied to the domestic market which are accounted for by imports, and the trade specialization coefficient, which indicates export competitiveness. As Japan's manufacturers increasingly shifted production overseas, the import penetration ratio also moved into a growth trend, while the trade specialization coefficient went into a downtrend, especially for household durable goods such as electrical appliances. In determining whether the reshoring trend is genuine or not, the question will be whether or not the recent trends in these indices are reversed.

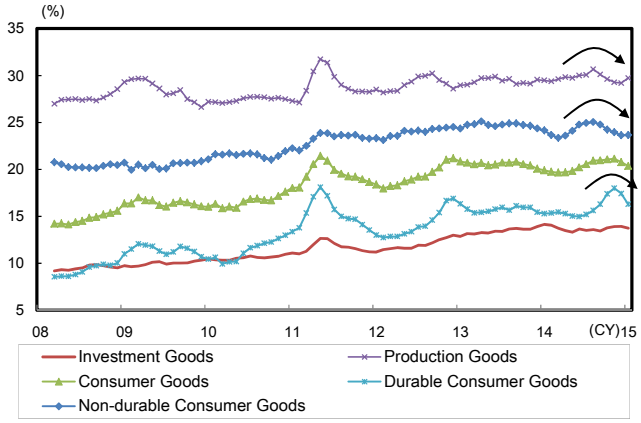
Looking at the import penetration ratio by types of goods, we see that the index has been in a long-term growth trend for investment goods, production goods, and consumer goods (Chart 9). This indicates how the ratio of imported goods has been in a growth trend which accompanied the tendency of the manufacturing industry to shift production overseas. However, movement toward a decline in the import penetration ratio has been observed recently for production goods, durable consumer goods, and non-durable consumer goods. This may be accounted for by the trend toward substituting imported products with domestic ones as the yen has become progressively weak, as well as influence of a portion of the manufacturing industry having returned production operations to Japan. However, it is still difficult to say whether these goods have clearly made the changeover to a growth trend. We suggest close monitoring of the situation as we move forward.

Similarly, a closer look at changes in the trade specialization coefficient of durable consumer goods over the long-term indicates that between 1985 when the yen rapidly appreciated after the Plaza

Accord and the mid-1990s the index suffered a decline, then after that point remained flat. It again commenced declining at a moderate rate after the US financial crisis (Chart 10). In the case of passenger vehicles, it is thought that they have been able to maintain export competitiveness because their trade specialization coefficient is already high. On the other hand, household electrical appliances have generally been marking time ever since 2009, but it should be mentioned here that this area already stood out as one reporting considerable negative numbers.

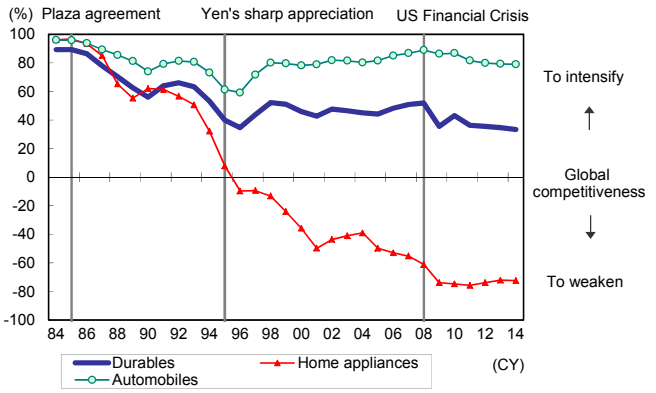
With this analysis in mind, it is difficult to say that the movement toward reshoring in the manufacturing industry has yet to become deeply rooted. However, the ratio of overseas capital expenditure is expected to move into a decline in the future as the weak yen progresses. Therefore the trends in the import penetration ratio and the trade specialization coefficient are expected to gradually make a turnaround in association with that tendency.

Import Penetration Ratio by Types of Goods **Chart 9**



Source: Ministry of Economy, Trade and Industry; compiled by DIR.
Note: 3-month moving average.

Trade Specialization Coefficient of Durable Consumer Goods **Chart 10**



Source: Ministry of Finance; compiled by DIR.
Note: Trade specialization coefficient = (exports – imports) / (exports + imports) x 100.

Electrical machinery settles on shift to domestic production: local production for local consumption

A look at recent trends in the activities of individual corporations as regards reshoring in the manufacturing industry indicates the following three developments (Chart 11). First of all, the shift back to domestic production of electrical machinery appears to be the case for most members of that industry. This is the "local production for local consumption" approach, which has brought companies back to domestic locations where their products are actually consumed. This contrasts with the older trend of locating production facilities in developing countries where costs are low and then "reimporting" the products to Japan. The new trend is expected to bring a decline in imports of electrical machinery to a certain degree as a result of having moved production back to domestic locations. But at the same time, an increase in exports is not necessarily promised. Moreover, news reports indicate that the move of corporations back to domestic locations will mean most likely making use of existing factories where operating ratio had fallen over the years, rather than investing in new factories. In other words, it is most likely that corporations will be contributing to an increase in capital expenditure by virtue of carrying out replacement investment rather than investing in capacity increase. On the other hand, in the case of the shift back to domestic production electronic parts and precision equipment, growth in exports is promised along with a decline in reimports. Possibilities are that in this case we will see capital expenditure for the purpose of capacity increase.

Secondly, in the area of passenger vehicles, reshoring is expected to bring an increase in exports to the US, and along with it an increase in capital expenditure for the purpose of capacity increase. However, judging from plans for shifting back to domestic production which have been announced as of this

point, there does not seem to be all that much growth in the number of units of passenger vehicles to be produced. Hence the effect on increasing capital expenditure may be somewhat limited. For this reason, possibilities that reshoring might continue to progress to the point of becoming a full-fledged development appear to be fairly limited still. As for reshoring of compact two-wheeler production, mainly a decrease in reimports is expected at this time, and will not necessarily lead directly to an increase in exports.

Reshoring in Manufacturing Industry: Trends in Activities of Individual Corporations **Chart 11**

Industry	Description	Major Effects	Announced
Electrical Machinery A	Plans on increasing domestic production ratio of air conditioners.	Reduction of reimports	Jul. 2014
Oil Wholesalers (5)	Plans on reducing production capacity of gasoline by 10% by FY2016.	Reduction in domestic capacity	Nov. 2014
Autos A	Will transfer some compact 2-wheeler production from Vietnam to domestic factory.	Reduction of reimports	Nov. 2014
Autos B	Plans on increasing domestic production by 100,000 units. Will also produce U.S. models.	Increase in exports	Dec. 2014
Autos C	Plans on producing some of next major U.S. model in Japan.	Increase in exports	Dec. 2014
Autos D	Considering returning production of models built in U.S. on consignment to Japan after contract ends.	Increase in exports	Dec. 2014
Pharmaceuticals A	Restructuring: will close two domestic factories and shift production to other factories.	Reduction and consolidation of domestic capacity	Dec. 2014
Precision Equip. A	Plans on increasing domestic production ratio by 60% over next three years.	Reduction of reimports + increase in exports	Jan. 2015
Electrical Machinery B	Will gradually switch to domestic production of multiple household electronic products now being reimported from China.	Reduction of reimports	Jan. 2015
Electronic Parts A	Considering plans to transfer 30% of parts now produced in China to domestic factories.	Reduction of reimports + increase in exports	Jan. 2015
Electrical Machinery C	Will transfer a portion of household electronics production such as air cleaners to domestic factories.	Reduction of reimports	Jan. 2015
Precision Equip. B	Plans on reactivating operations at idle domestic factories in environmental area.	-	Jan. 2015
Auto Parts A	Will restructure production operations including shutting down one domestic factory and moving operations elsewhere.	Reduction and consolidation of domestic capacity	Feb. 2015
Information & Telecommunications Equip. A	Will restructure production operations including shutting down two domestic factories and moving operations elsewhere.	Reduction and consolidation of domestic capacity	Feb. 2015
Electrical Machinery C	Plans on shutting down four domestic factories.	Reduction in domestic capacity	Mar. 2015

Source: News reports and public announcements of individual corporations; compiled by DIR.
Note: Major Effects determined by DIR economist based on news reports.

The third element is the flip side of the reshoring trend which has recently found its way into the news and is important to make note of. That is the fact that some corporations are actually closing their domestic factories and cutting back production capacity. One area affected by recent developments is oil wholesalers who are currently cutting back on excess domestic production capacity due to requirements of the law concerning Sophisticated Methods of Energy Supply Structures, as well as sluggish domestic demand. Some companies producing automobile parts and information and communications equipment are carrying out restructuring of their domestic production operations since demand is not expected to increase at any time in the future. Actions being considered include the closing or transfer of domestic factories. In addition, while on the one hand having shifted production of household electrical appliances back to domestic locations, major electrical machinery manufacturers have recently announced major closings of domestic factories due to deteriorating business results. Considering these trends, in order for domestic capital expenditure to recover completely, it is important to promote improvements in efficiency and energy saving in operating

domestic factories in an environment where international competitiveness is on the rise due to the weak yen.

4. Overseas Trends and Reshoring in US

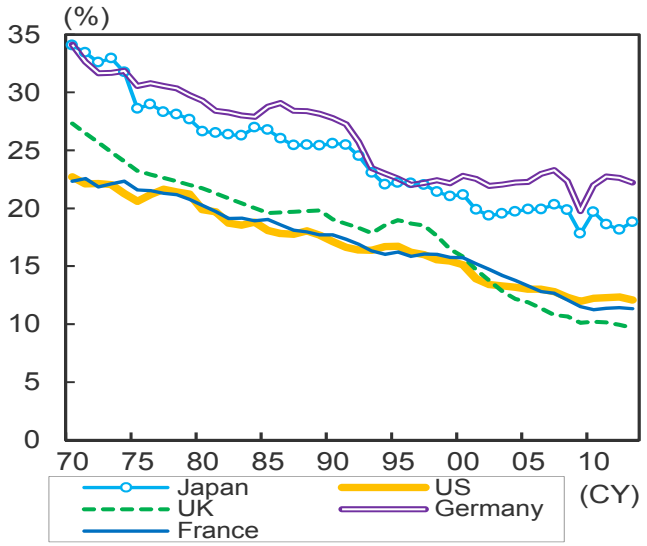
US stands out amongst major advanced nations in move toward reshoring

In this section we shift our attention to other major world economies to examine current trends in the shifting of production overseas by manufacturing industries. As for the situation as it stands in the five major industrialized nations (G5), a look at the overall domestic value added ratio accounted for by the manufacturing industry and ratio of employees in the manufacturing industry indicates the following[4]. First of all, we find that both of these ratios have been in a long-term decline in the manufacturing industries of all of the leading industrialized nations. The pace of that decline as experienced in Japan does not especially stand out in comparison with other major economies (see Chart 12 & 13). The decline in the value added ratio and the ratio of employees in the manufacturing industry is not unique to Japan. This tendency is in fact shared by the world's leading industrialized nations. One of the major reasons has been the shift to a focus on services in the economies of the advanced nations.

Compared to other G5 members, Japan and Germany have relatively high ratios for their manufacturing industries. This is most likely the result of the high competitiveness of manufacturing in these two countries. Since export oriented manufacturing industries are especially influenced by the volume of world trade transactions, the value added ratio accounted for by the manufacturing industries suffered major declines in both of these countries after the US financial crisis of 2008.

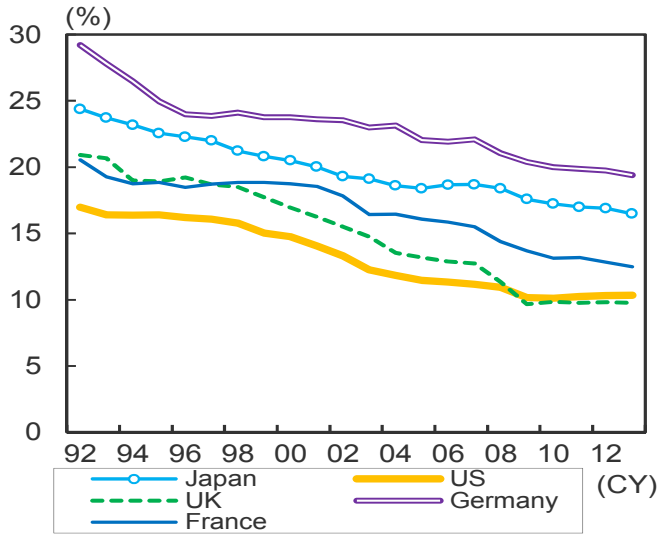
In the case of the United States, the value added and employee ratios of the manufacturing industry have been flat since around 2010. This is because the shale revolution in gas and oil has brought on a decline in domestic energy prices, and with it an increase in manufacturers returning production facilities to domestic locations. This has become a beneficial factor in US manufacturing and the trend toward decline in these ratios may very well have stopped.

Value Added Ratio Accounted for by the Manufacturing Industry **Chart 12**



Source: United Nations; compiled by DIR.

Ratio of Employees in the Manufacturing Industry **Chart 13**



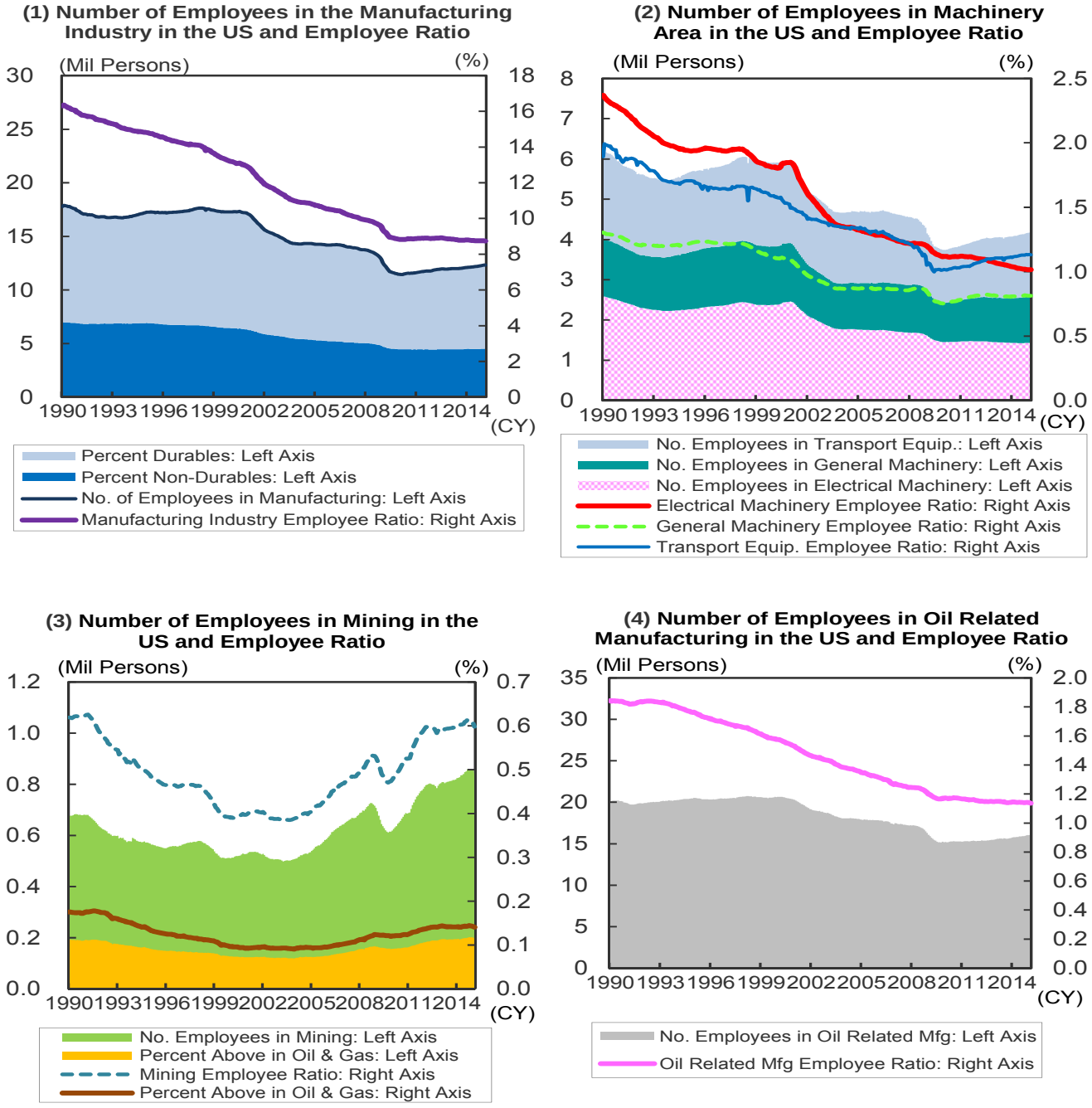
Source: International Labour Organization; compiled by DIR.

[4] Data on overseas subsidiaries is not always easily available in all countries as it is in the US. Therefore we examine this trend by making use of the overall domestic value added ratio accounted for by the manufacturing industry and ratio of employees in the manufacturing industry.

US reshoring as seen from the viewpoint of employment

In this final section we examine the US trend in reshoring, which is supported in part by the shale revolution in gas and oil, from the viewpoint of changes in employment. Since the year 2010, employment in the US manufacturing industry has been registering moderate growth. Looking at this statistic by type of goods produced, we see that growth in employment in the manufacture of durables alone has contributed considerably to overall growth (see Chart 14-(1)). The increase in employment has contributed to the bottoming out of the employment ratio in the manufacturing industry, which until recently had been in a long-term downtrend. More recently the ratio has been flat. Now looking at employment in a related industry, that of machinery, we see that employment in the area of electrical machinery is continuing a moderate decline, while on the other hand, employment in general machinery is growing (see Chart 14-(2)). In the area of transport equipment, the increase in local US production by Japanese automobile manufacturers is thought to have contributed to growth in employment in that sector. Meanwhile, employment in the area of electrical machinery is still on the decline due to tough price competition from the Asian emerging economies which have lower personnel expenses.

Trends in Employment in the US Manufacturing Industry — Chart 14



Source: US Department of Labor; compiled by DIR.
Notes: 1) Electrical machinery in part (2) of the chart comprises the total of computers, electronic and electrical products.
2) Oil related manufacturing industries shown in part (4) of the chart comprise the total of petroleum & coal products, chemical products, and plastic & rubber products.

Employment in the mining industry has grown considerably due to the increase in the price of natural resources, as well as the shale revolution in oil and gas. The employment ratio has also grown (see Chart 14-(3)). However, since the ratio of overall industry accounted for by mining is small, its influence on the overall US economy is limited. In the case of oil related manufacturing industries, the pace of growth in employment is slow, hence developments in this industry have not reached the point of contributing to growth in the employment ratio (see Chart 14-(4)).

In view of these trends in employment, there are a growing number of examples in the US where reshoring is occurring. However, the effects are not considered to be large enough to promote a major shift in domestic industry toward manufacturing. The dollar has increasingly shown signs of being in a

one-sided appreciation in the foreign exchange markets since the summer of 2014, and this could become a factor inhibiting further movement toward the reshoring of US manufacturing industries – a situation which should be closely monitored in the future.

5. Conclusion

In this report we considered a variety of factors surrounding the question of the shifting of production overseas in the manufacturing industry. These included the relationship between the ratio of overseas sales and the ratio of capital expenditure in the manufacturing industry, and effective exchange rates, as well as the factor of growth in the ratio of overseas capital expenditure. We provided an outlook for the future of reshoring versus overseas production for Japan's manufacturing industry, and took into consideration trends in the leading industrialized nations, with a special focus on the current status of reshoring in the US. An overview of the major points covered is provided below.

The ratio of overseas sales and the ratio of overseas capital expenditure have both been in a growth trend for all manufacturing industries. This is especially the case for transport equipment whose ratios are especially high due to the expansion in overseas production by automobile manufacturers. Looking at historical relationships, we see that the rate of overseas capital expenditure and overseas sales tends to contract 2-3 years after a weak yen exchange rate tendency takes hold. The recent movement toward reshoring in Japan's manufacturing industry is thought to have been encouraged by the weak yen which began to take hold after the fall of 2012. Moreover, the narrowing of deviation between the real effective exchange rate and terms of trade has provided additional support for a return to domestic production locations.

An investigation into the factors behind growth in the ratio of overseas capital expenditure reveals that in structural terms, Japan's inflation rate is lower than that seen overseas, and this causes the inflation differential factor to bring a negative contribution to the situation. Meanwhile, the pace of growth in overseas markets is more rapid than that of Japan's domestic market, which brings the overseas production ratio factor into play. One can see how this has helped to continually increase the ratio of overseas capital expenditure. The ratio of overseas capital expenditure is expected to shift into a downward trend beginning in FY2014, due to the weak yen trend having taken hold since the fall of the year 2012. However, as far as we can see by looking at the import penetration ratio and the trade specialization coefficient, it is hard to say that the move toward reshoring of Japanese manufacturing has yet to take hold.

Looking at trends in the shift of production overseas in the five leading industrialized nations, we see that the decline in the value added ratio and the ratio of employees in the manufacturing industry is not unique to Japan. This tendency is in fact shared by the world's leading industrialized nations. In the case of the United States, the shale revolution in gas and oil has brought on a decline in energy prices, and with it an increase in manufacturers returning production facilities to domestic locations since around 2010. In view of trends in employment in the US manufacturing industry, there are a growing number of examples where reshoring is taking place. However, the effects are not considered to be large enough to promote a major shift in domestic industry toward manufacturing.

Addendum: Arguments Regarding Nominal Value vs. Real Value in Considering Effective Exchange Rates

Opinions divided between corporate management and economists

In examining the relationship between the shifting of production overseas by the manufacturing industry and the effective exchange rate, there are ongoing arguments as to whether nominal value should be used, or whether priority should be placed on real value which makes adjustments for fluctuations in commodities prices. Opinions on this question are divided between corporate management and others involved in the practical end of business who tend to prefer the former, and researchers and economists, who tend to prefer using the latter. Why is opinion so divided between those who make the actual decisions as to whether or not to shift production overseas and those who analyze that phenomenon? In this section we examine the reasons behind this difference of opinion and consider which approach might be best. Meanwhile, it should be noted at the very beginning here that this writer is of the opinion that in those cases where there is an especially large difference in production costs including personnel expenses, nominal value does indeed seem to be the better choice.

First of all, it is possible that the division into two camps – nominal value or real value – may be due to the fact that the premises behind the argument for use of the real effective exchange rate are unclear. Concretely speaking, it is important to differentiate between the following two problems: (1) Which index is used to indicate changes in international price competitiveness due to fluctuations in exchange rates, and (2) Which index is influenced the most due to the decision to shift production overseas. These two factors are often used as if they were the same problem, but it is actually real value which is important in the first case. There are almost no arguments countering this assumption. And though it speaks for itself, the real nature of the problem is the latter. In other words, in making actual decisions as to whether or not to shift production overseas, considerations must be made as to whether or not this is a case in which real value, which indicates international price competitiveness, is more important than nominal value.

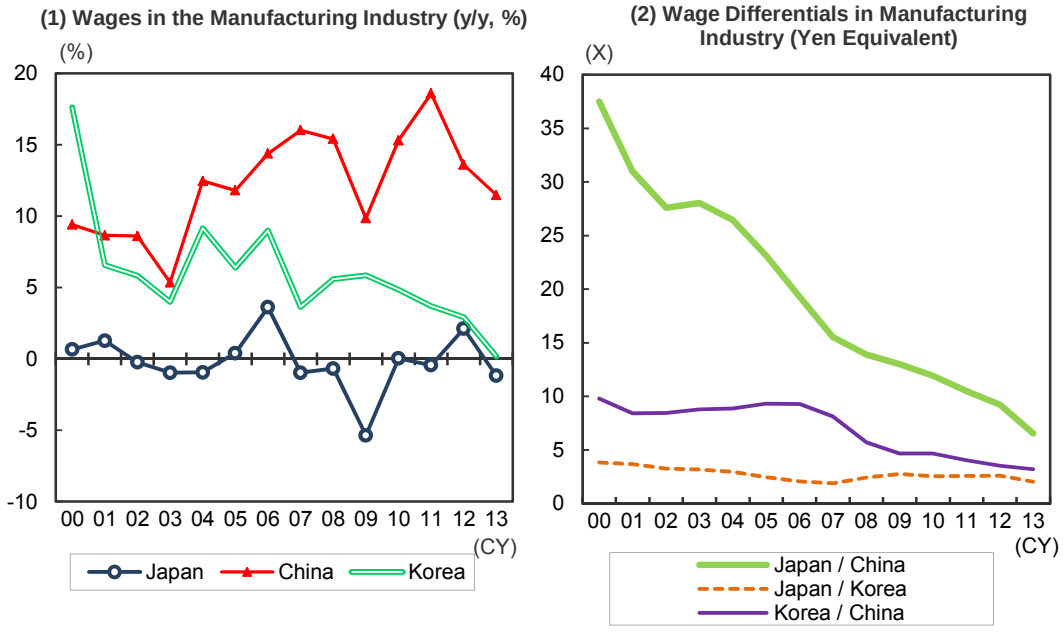
Next, we take a closer look at changes in the real exchange rate, breaking it down into two factors: (1) changes in the nominal effective exchange rate and (2) the inflation differential (≒ difference in growth rates in production cost). In doing so we will be able to examine cost as a variable (or fluctuating factor) in the context of corporate earnings[5]. Possibilities increase that corporate management can prioritize the nominal value over the real value in its decision making process as to whether or not to shift production overseas if fluctuations in production costs including personnel expenses do not have much influence on the situation. A situation where differences in production costs between Japan and the overseas location are especially large would fall under this description.

Looking at wage trends in the manufacturing industry in Japan and China, we can see that in contrast to Japan where wages have been stagnant, wages in China have been growing rapidly, and as a result, the wage differential between the two countries has been narrowing at a quick pace (Chart 15-(1) & (2)). However, if we compare wage levels in the two countries, we see that the differential is still quite large. If we assume that Japan's wage is fixed at Y3 mil during the period in which the wage differential between Japan and China decreases from 30x to 10x, that would mean that China's wage would grow from Y100,000 to Y300,000 during that time. However, considering how low China's wage level is (Y300,000 in this example), it would not make sense to return production facilities to a domestic Japan location where salary levels of major corporation are high (Y3 mil)[6].

[5] It should be noted that this is a fairly simplified hypothesis.

[6] The wage differential between Japan and Korea is much smaller than it is between Japan and China, so if wages in Korea were to grow a fair amount, possibilities are that corporations would consider shifting production back to domestic locations.

Wage Differential in Manufacturing Jobs Between Japan, China, and Korea **Chart 15**



Source: Ministry of Health, Labour and Welfare, National Bureau of Statistics of China, National Statistics Office of Korea; compiled by DIR.
Notes: 1) Data for Japan based on Basic Survey on Wage Structure, while data for China is based on the Statistical Yearbook of China (2005 and 2014) (urban units).
2) Data should be taken with a certain grain of salt, as different countries make use of different definitions.

In view of the above arguments, in cases where there is a great difference in wage levels between two countries as is the case with Japan and China, the inflation differential (≒ difference in growth rates in production cost) has little influence on corporate decisions as to whether or not to shift production overseas. In this case corporate management will likely prioritize nominal value over real value in which adjustments have been made for that fact. Southeast Asia, Central Asia and other emerging nations in addition to China also represent a similar situation.

But arguments up to this point have used a fairly simplified set of assumptions, and leave us with no more than a makeshift explanation. In order to carry out a more in-depth argument regarding the problem of nominal value and real value in the relationship between the shifting of production overseas and effective exchange rates, we need to put together a much more rigorous study, which would include a survey of major corporations. In either case, a study which bridges the gap between the two polarized opinions is desirable.

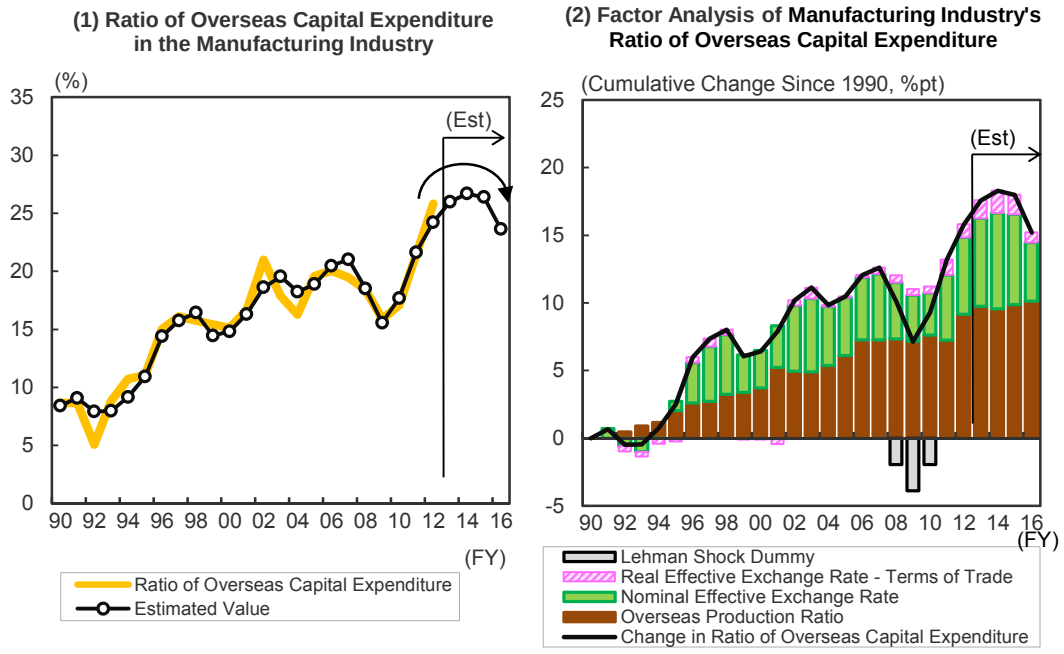
An alternative estimate of the ratio of overseas capital expenditure using nominal value

The estimate of the ratio of overseas capital expenditure used in the main part of this report makes use of the real effective exchange rate – the index preferred by researchers and economists in looking at this question. In light of the arguments included in this addendum, we have prepared an alternative estimate which makes use of the nominal effective exchange rate for reference purposes. Concretely speaking, we have changed the explanatory coefficient we use from the real effective exchange rate to the nominal effective exchange rate, and have added a coefficient to allow for changes such as price competitiveness. This additional coefficient is the real effective exchange rate – terms of trade.

There are no major changes in the basic implications. Since the long-term performance of the ratio of overseas capital expenditure is determined by the ratio of overseas production, it is expected to continue in a growth trend in the future as it reflects the difference in domestic and overseas demand (Chart 16-(1) & (2)). Meanwhile, due to the positive contribution of the nominal effective exchange rate, the real effective exchange rate and terms of trade associated with the progressively weak yen

since the fall of 2012, the ratio of overseas capital expenditure is expected to shift into a decline in FY2015 (or in FY2014 according to the estimate in the main part of this report).

The Ratio of Overseas Capital Expenditure in the Manufacturing Industry and its Factor Analysis (Alternative Estimate Using Nominal Value) **Chart 16**



Source: Ministry of Economy, Trade and Industry, Ministry of Finance, Bank of Japan, Cabinet Office, and IMF; compiled by DIR.

Notes: 1) The ratio of overseas production is from The Cabinet Office's Annual Survey of Corporate Behavior.

2) The forecasting formula for the ratio of overseas capital expenditure is as follows:
Ratio of overseas capital expenditure (t) = -43.36 + 0.57 x overseas production ratio (t) + 12.06 x ln(nominal effective exchange rate) (t-3) + 0.04 x (real effective exchange rate – terms of trade) (t-3) – 4.0 x Lehman Shock dummy, (real effective exchange rate – terms of trade) (t-3) has a significance of 5%, all the rest have significance of 1%. GMM method used in calculation of estimate. Instrumental variables: constant term, overseas production ratio (t-1), nominal GDP for world and Japan (t-3), and ln(nominal effective exchange rate) (t-3), (real effective exchange rate – terms of trade) (t-3), Lehman Shock dummy.

3) The difference between the real effective exchange rate and terms of trade is a calculated value, and is influenced by the reference year selected. The Lehman Shock dummy is as follows: FY2008 = 0.5, FY2009 = 1, FY2010 = 0.5, all other fiscal years = 0.

4) For future values, used GDP for world and Japan (based on PPP) (t-2) and nominal exchange rate (t-2) to estimate overseas production ratio and extended results.