

Economic Recovery in the Tohoku Region after the Great East-Japan Earthquake Disaster

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About “Tohoku University Earthquake Recovery Firm Survey” (TERFS)

- Aim: To keep records on the recovery process of the firms in Tohoku region.
 - Feature 1: Capturing the business activities including financial, logistical, and HR management.
 - Feature 2: Capturing the recovery process broadly (not just only sea-side, but including in-land area).
 - Feature 3: Capturing the cross-industry recovery process
 - Feature 4: Capturing the recovery process continuously (at least for 5 years).

About “Tohoku University Earthquake Recovery Firm Survey” (TERFS)

- Who conducts TERFS?: Regional Innovation Research Center, Faculty of Economics, Tohoku University
- Survey Target: Firms whose HQ are in disaster region (Iwate, Miyagi, Fukushima, Hachinohe). Excludes non-profit organizations.
- Survey Periods: July 2012, Aug. 2013, Aug. 2014, Oct. 2015
- Number of Firms: 30,000 (2012, 2013), 11,000 (2014, 2015)
- Number of Responses:
 - 2012 Survey: 7,021
 - 2013 Survey: 7,481
 - 2014 Survey: 5,713
 - 2015 Survey: 4,116

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Damages by the Disaster

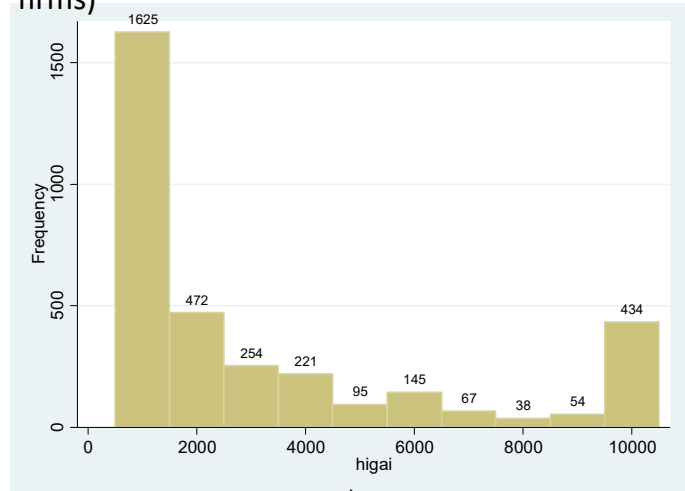
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Damage Status (2012 Survey)

Damage caused by the earthquake

	# of firms
Damaged	3,701
No Damage	1,655
Total	5,356

Distribution of Cost of Damage (Only damaged firms)



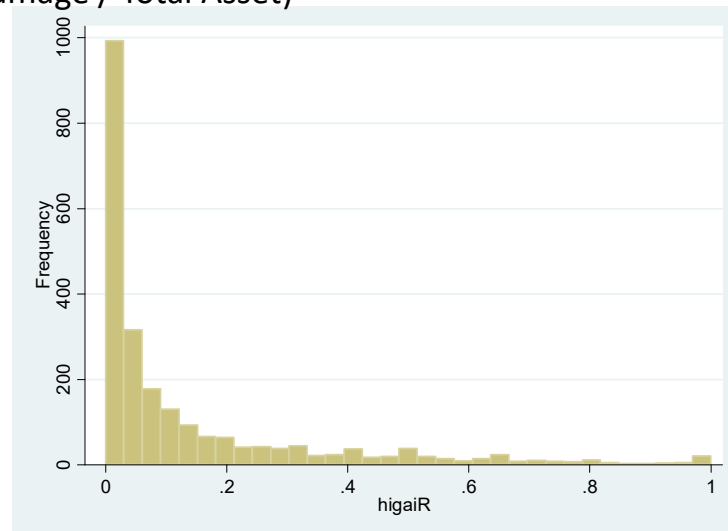
N=2,528 (Unit: approx. \$100)

- Here, “damaged” only refers to direct damage. Indirect damage not included.
- “Cost of Damage” refers to the cost of damage to physical capital.

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Damage Status (2012 Survey)

Distribution of Cost of Damage-Total Asset ratio (Cost of Damage / Total Asset)

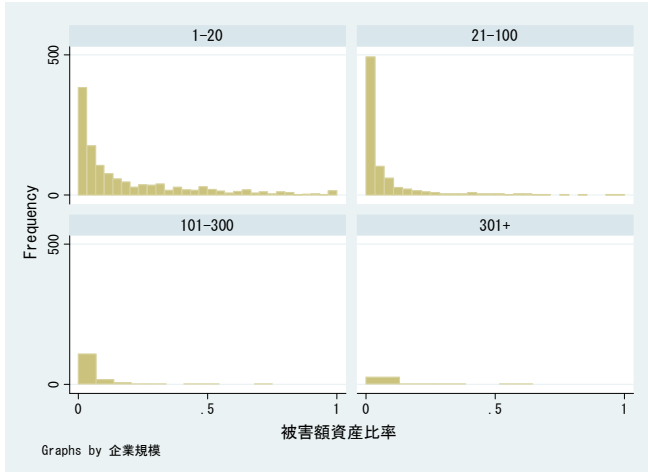


	# of Obs.	Median	Average	Std. Dev.
Total	2,198	0.045	0.138	0.204

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Damage Status (2012 Survey)

Dist. of Cost of Damage-Total Asset ratio by firm size



Cost of Damage-Total Asset ratio by Firm Size

	Obs.	Median	Average	Std. Dev.
Small	1,237	0.087	0.190	0.232
Medium	794	0.021	0.074	0.140
Medium-Large	137	0.014	0.051	0.100
Large	30	0.019	0.066	0.135
Total	2,198	0.045	0.138	0.204

- ✓ Cost of Damage-Total Asset ratio tends to be larger for smaller firms.

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Damage Status (2012 Survey)



Cost of Damage-Total Asset ratio by Region

	Obs.	Median	Average	Std. Dev.
Hachinohe	111	0.030	0.088	0.129
Iwate (Sea-side)	182	0.123	0.238	0.265
Iwate (In-land)	218	0.015	0.077	0.159
Miyagi (Sea-side)	857	0.085	0.183	0.224
Miyagi (In-land)	251	0.021	0.060	0.122
Fukushima (Sea-side)	302	0.051	0.145	0.213
Fukushima (In-land)	252	0.020	0.061	0.111
Fukushima (West-side)	25	0.017	0.046	0.074
Total	2,198	0.045	0.138	0.204

- Cost of Damage-Total Asset ratio is higher for sea-side, compared to in-land.

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Earthquake Insurance (2012 Survey)

- How were the firms covered by earthquake insurance?

Firm Size	With Insurance	No Insurance	Total
Small	1,610 (32.8%)	3,082 (62.8%)	4,910
Medium	409 (22.3%)	1,378 (75.1%)	1,834
Medium-Large	48 (21.5%)	173 (77.6%)	223
Large	15 (27.8%)	38 (70.4%)	54
Total	2,082 (29.7%)	4,671 (66.5%)	7,021

➤ In total, 29.7% of the firms had earthquake insurance.

➤ Smaller firms tend to join earthquake insurance more than larger firms.

➤ Why is that so?

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Earthquake Insurance Coverage (2012 Survey)

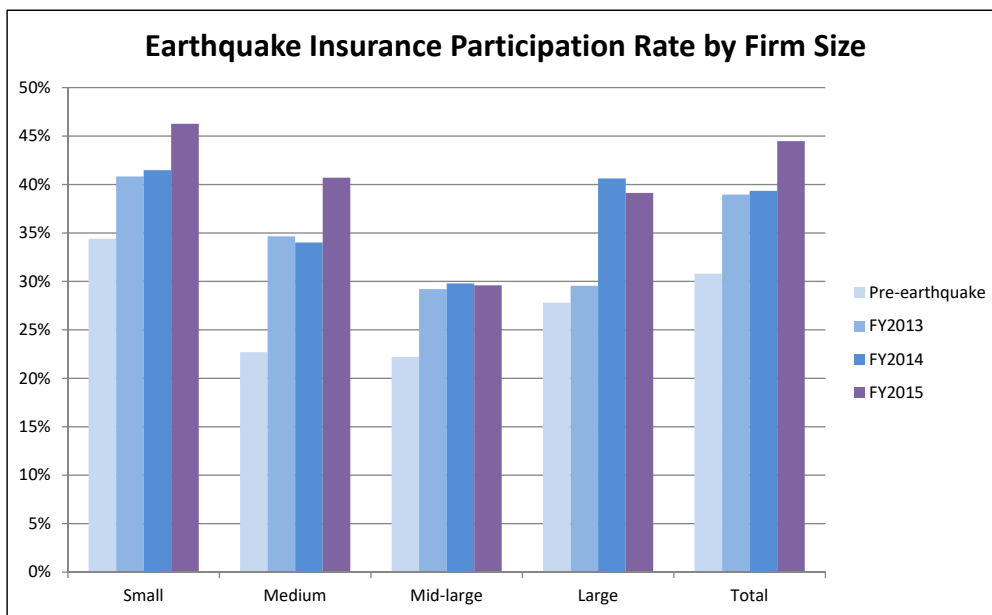
Earthquake insurance coverage against cost of damage

	Obs.	Average	Std. Dev.
Firms receiving insurance payment	768	0.529	0.458
Firms who held insurance	875	0.464	0.463
All the damaged firms	2,932	0.127	0.317

- On the average, the firms who held earthquake insurance were able to cover the cost of damage by 50% .
- Overall, however, earthquake insurance was able to cover only 13% of the total damage caused by the earthquake. This is due to low earthquake insurance contract rate.

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Earthquake Insurance Participation Rate

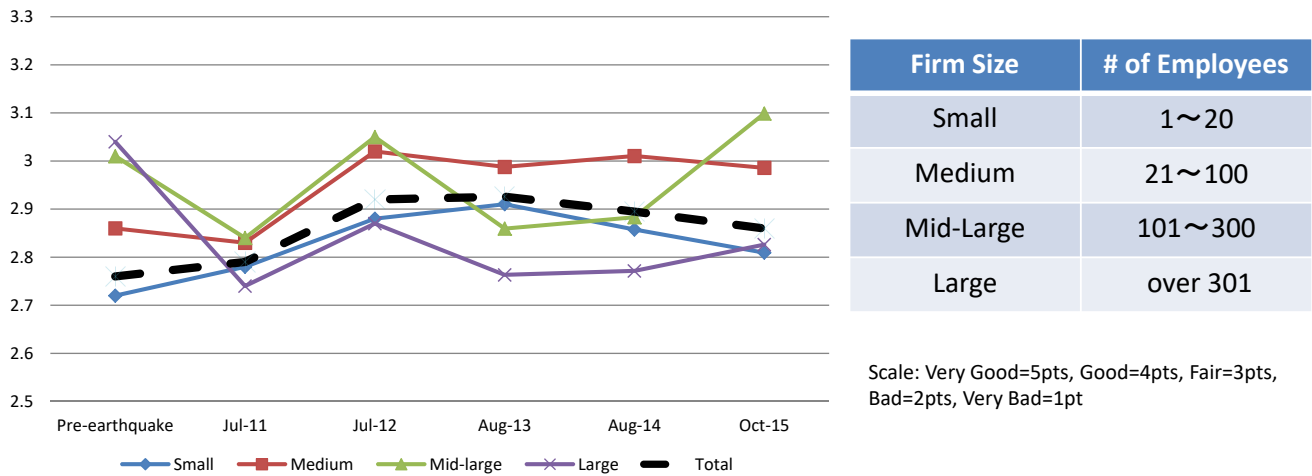


- Earthquake Insurance participation rate was around 30% before the earthquake, but increased to nearly 45% as of Oct. 2015.

Recovery Status of the Firms

Business Conditions

Business Condition by Firm Size

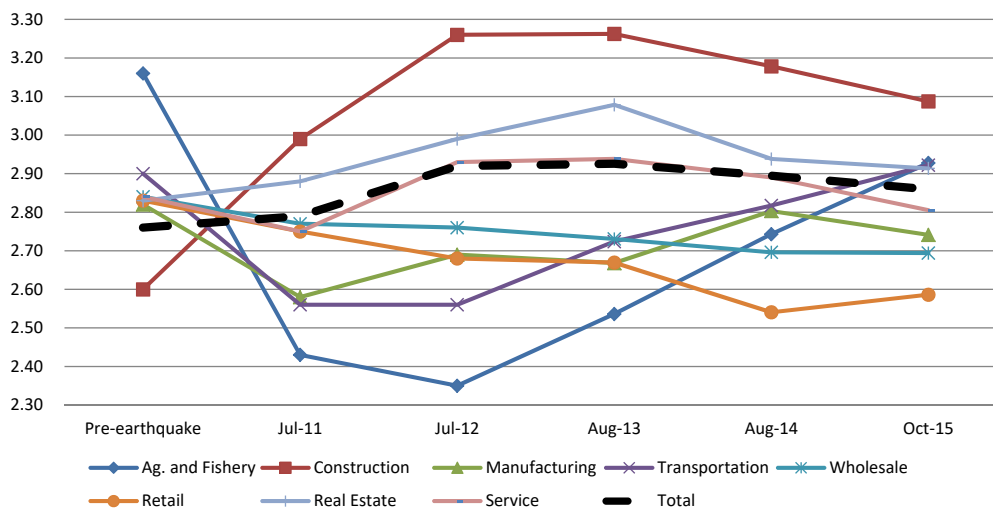


- Overall, business conditions of the firms are recovering after the earthquake, but slowed down slightly after 2014. Still better than pre-earthquake level.
- Mid-Large and Large firms getting better in 2015. Slowed down in Small and Medium firms.

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Business Condition

Business Condition by Industries

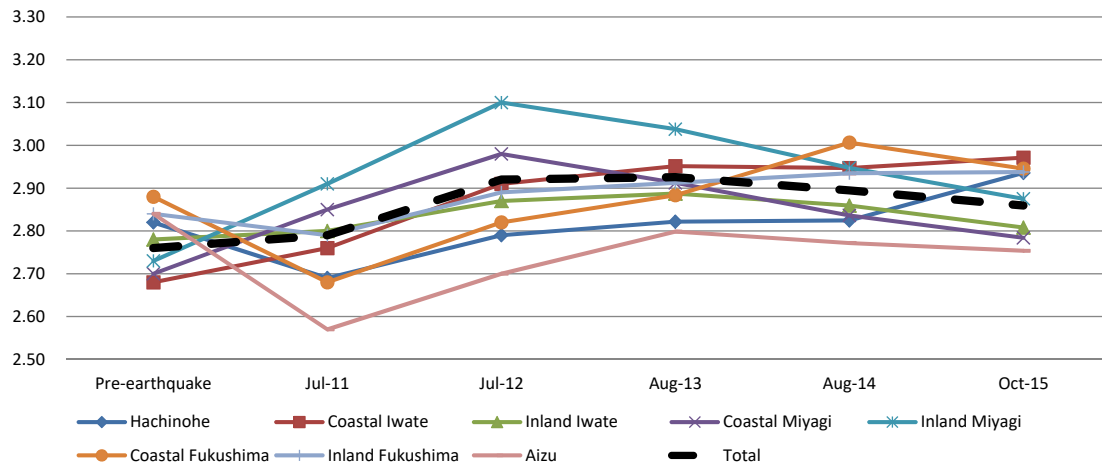


- Construction and real estate industry recovered significantly after the earthquake, but slowed down after 2014.
- Agricultural and fishery, manufacturing, transportation industry slowed down quite a bit after the earthquake, but recovering thereafter.
- Sluggish recovery in wholesale and retail sectors.

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Business Condition

Business Condition by Regions



- Inland and coastal Miyagi were recovering steadily until 2012, but somehow slowed down thereafter.
- Coastal Fukushima was affected significantly after the earthquake, but steadily recovering after the earthquake. Indeed, the business condition in coastal Fukushima is now higher than the average.
- The gap of business conditions widened until 2012, but shrinking thereafter.¹⁵

Sales Price and Purchase Price

Change of Sales Price in 2014 (by industries)

	Agri. & Fishery	Construction	Manufacturing	Transportation	Wholesale	Retail	Real Estate	Service	Total
Increased	6.06%	4.52%	4.49%	4.94%	6.22%	4.51%	3.82%	4.17%	4.67%
Slightly increased	25.76%	28.50%	28.22%	30.56%	28.74%	25.39%	30.92%	26.65%	27.97%
No change	50.00%	46.70%	47.76%	41.67%	46.22%	48.80%	42.75%	49.48%	47.10%
Slightly decreased	15.15%	16.45%	14.47%	18.83%	15.97%	17.77%	16.41%	15.53%	16.25%
Decreased	3.03%	3.83%	5.07%	4.01%	2.86%	3.53%	6.11%	4.17%	4.01%

Change of Purchase Price in 2014 (by industries)

	Agri. & Fishery	Construction	Manufacturing	Transportation	Wholesale	Retail	Real Estate	Service	Total
Increased	16.92%	15.39%	14.49%	15.38%	15.82%	14.49%	14.50%	13.97%	14.92%
Slightly increased	40.00%	45.35%	45.77%	46.15%	44.05%	44.16%	41.98%	47.11%	45.24%
No change	33.85%	29.96%	31.56%	29.85%	30.78%	31.93%	32.44%	30.02%	30.75%
Slightly decreased	4.62%	7.47%	6.31%	7.08%	7.65%	9.00%	9.16%	6.58%	7.37%
Decreased	4.62%	1.82%	1.87%	1.54%	1.70%	0.42%	1.91%	2.31%	1.71%

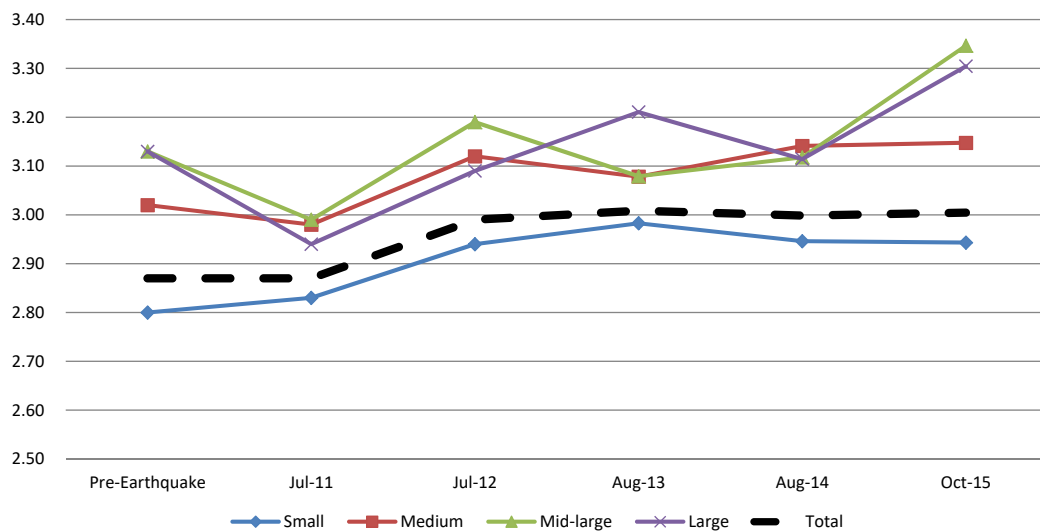
- Sales price increased for 32% of the firms, whereas purchase price increased for 60% of the firms. Implies that profit margins are shrinking for many firms.
- This trend is common for all the industries.

Financial Conditions

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Financial Condition

Ease of Borrowing by Firm Size

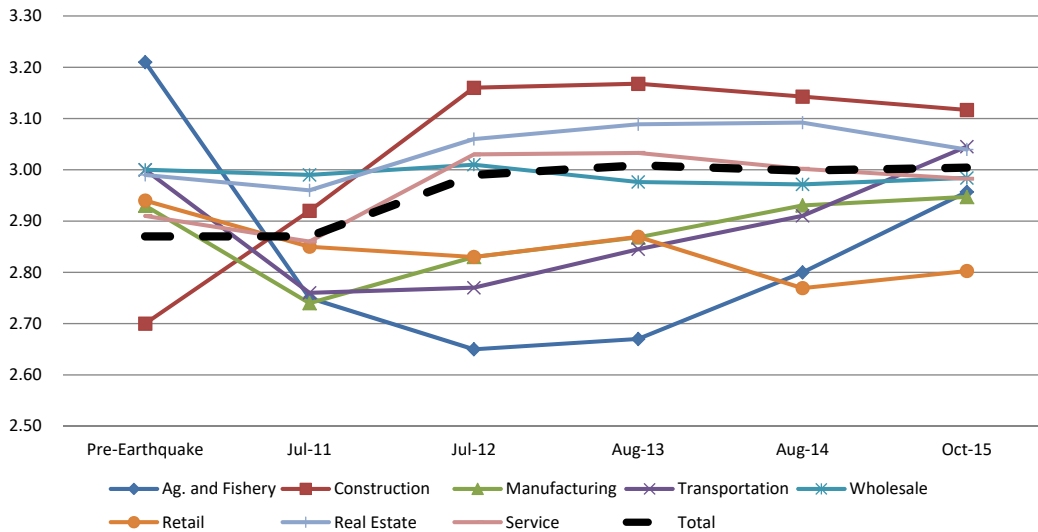


- Overall, relatively easier to borrow money from financial institutions after the earthquake.
- Small firms relatively more difficult to borrow funds compared to other larger firms.

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Financial Condition

Ease of Borrowing by Industries

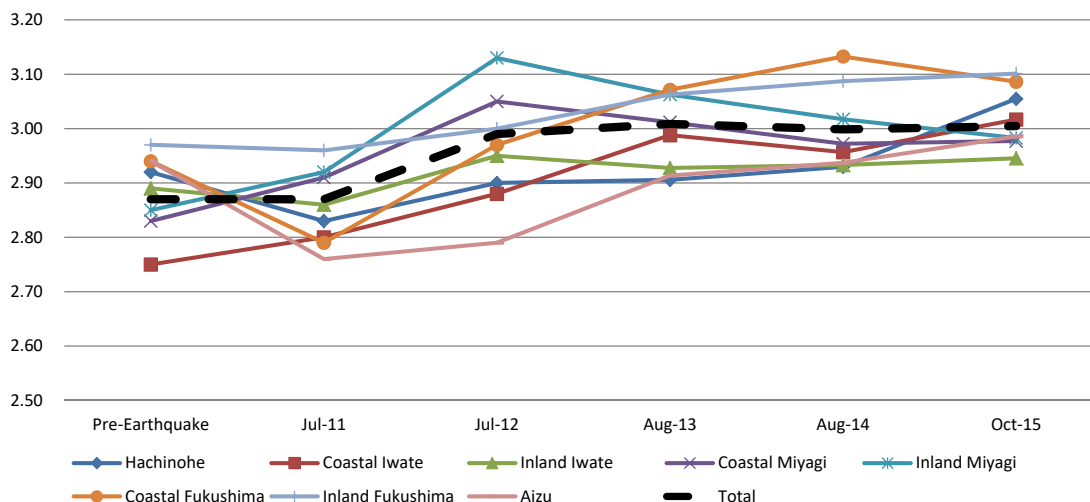


- Construction and real estate industries are in good condition.
- Agricultural and fishery, manufacturing, transportation industries experienced some difficulties right after the earthquake, but now getting easier to borrow money.
- Retail sector experiencing difficulties after 2014 compared to other sectors.

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Financial Condition

Ease of Borrowing by Regions



- Inland and coastal Miyagi were at ease in borrowing funds after the earthquake, but became difficult after 2012.
- Coastal Fukushima experienced some difficulties after the earthquake, but became easier to borrow thereafter.
- Financial condition of coastal and inland Fukushima is better than the average as of Oct. 2015.

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Financial Conditions in 2015

By Firm Size

	Small	Medium	Mid-large	Large	Total
Financed enough amount	37.17%	56.69%	74.47%	81.82%	43.50%
Financed necessary amount	57.34%	40.38%	24.47%	18.18%	51.83%
Not able to finance necessary amount	5.49%	2.93%	1.06%	0.00%	4.67%

By Industries

	Ag. and Fishery	Construction	Manufacturing	Transportation	Wholesale	Retail	Real Estate	Service
Financed enough amount	41.82%	41.51%	46.09%	44.09%	50.26%	36.79%	51.14%	42.75%
Financed necessary amount	54.55%	55.09%	48.48%	51.82%	45.64%	55.19%	44.32%	52.42%
Not able to finance necessary amount	3.64%	3.40%	5.43%	4.09%	4.10%	8.02%	4.55%	4.83%

- More than 90% of the firms were able to finance the necessary amounts of money in 2015, regardless of firms size or industry.
- Financial conditions of the firms seem to be OK. However, financial intermediaries might be too lax in lending the money to the firms.

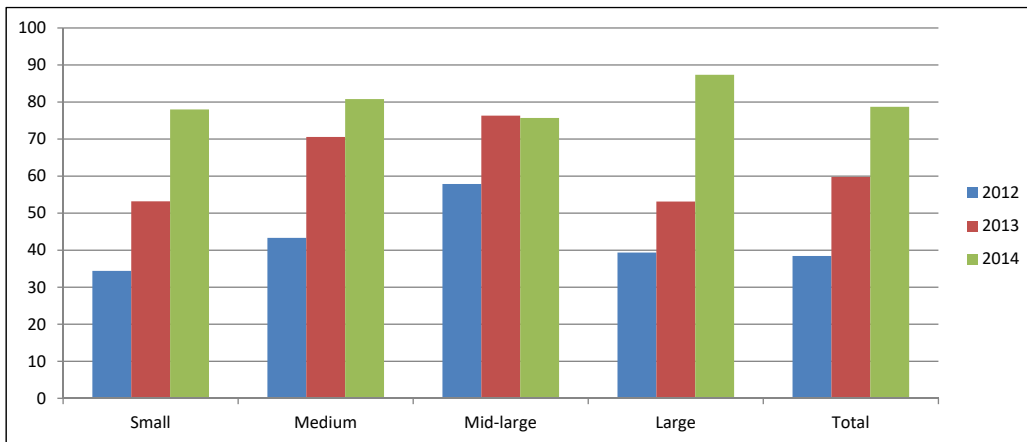
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Physical Capital Conditions

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Physical Investment

Physical Investment for Recovery (by firm size, average %)

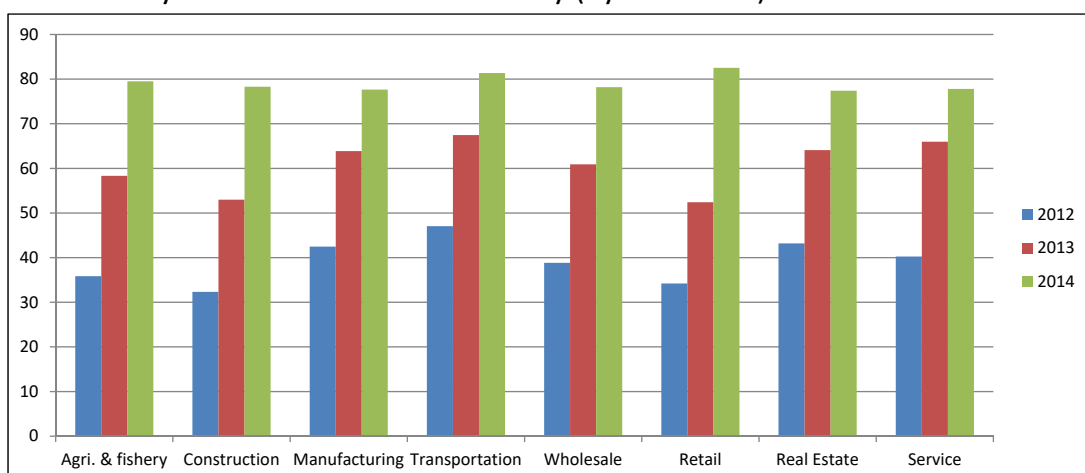


- Overall, physical investment for recovery is proceeding steadily, reaching 79% achievement level at 2014.
- Small firms were lagging behind until 2013 only achieving 50% level, but have caught up with other larger firms at 2014. Regardless of the firm size, physical investment for recovery is proceeding well.

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Physical Investment

Physical Investment for Recovery (by industries)

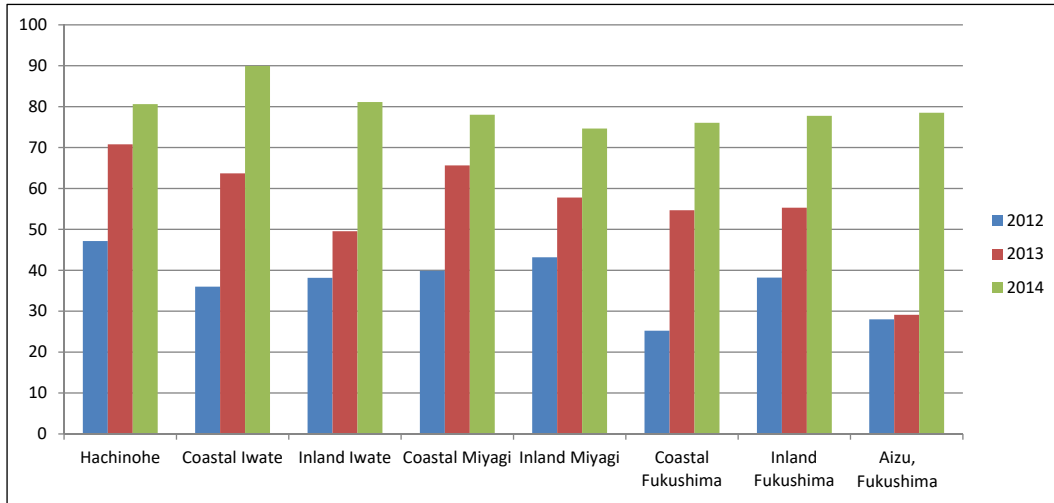


- Physical investment for recovery is proceeding steadily for all the industries.
- Achievement level is more or less 80% for all the industries.

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Physical Investment

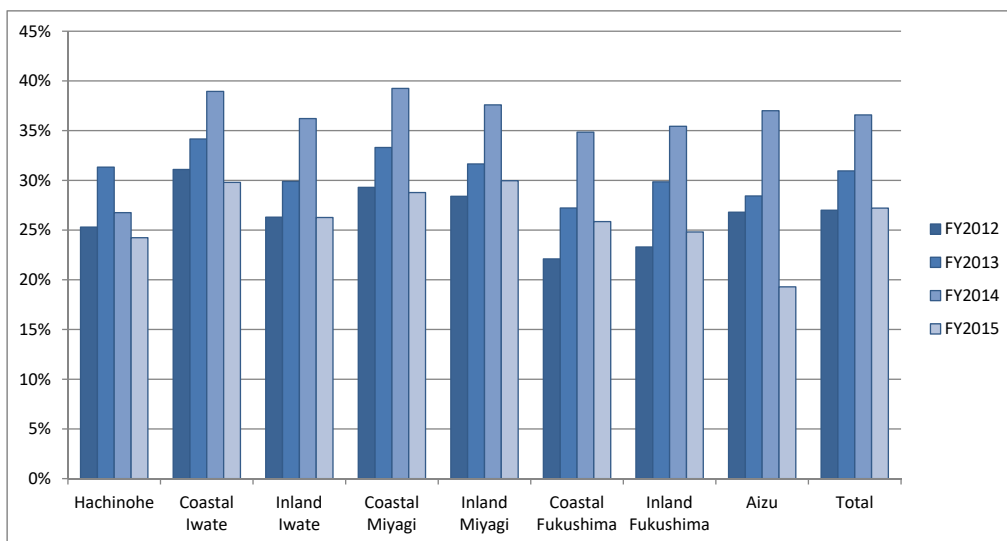
Physical Investment for Recovery (by regions)



- Physical investment for recovery is proceeding steadily for all the regions.
- Hachinohe, coastal Iwate, inland Iwate relatively high in achievement level, but not too different from other regions.

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Shortage of Construction Materials



- Overall, nearly 30% of the firms say that their business are affected by the shortage of construction materials as of Oct. 2015.
- Most of the regions are affected by the shortage of construction materials, but somehow eased in 2015.

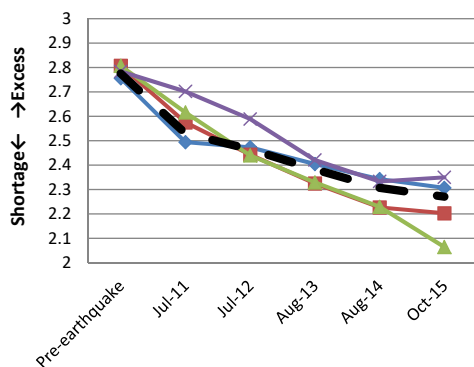
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Labor Force Status of the Firms

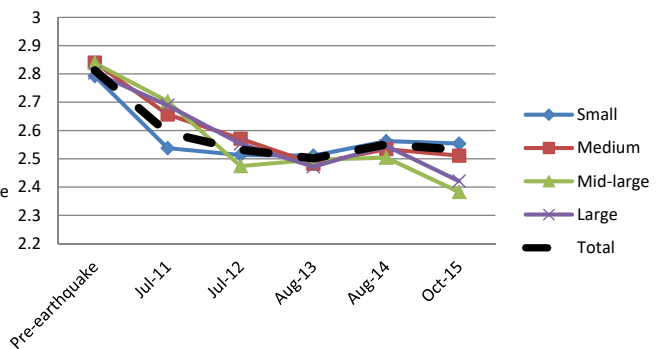
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Shortage of Labor Force

Amount of Regular Employees (by firm size)



Amount of Non-regular Employees (by firm size)

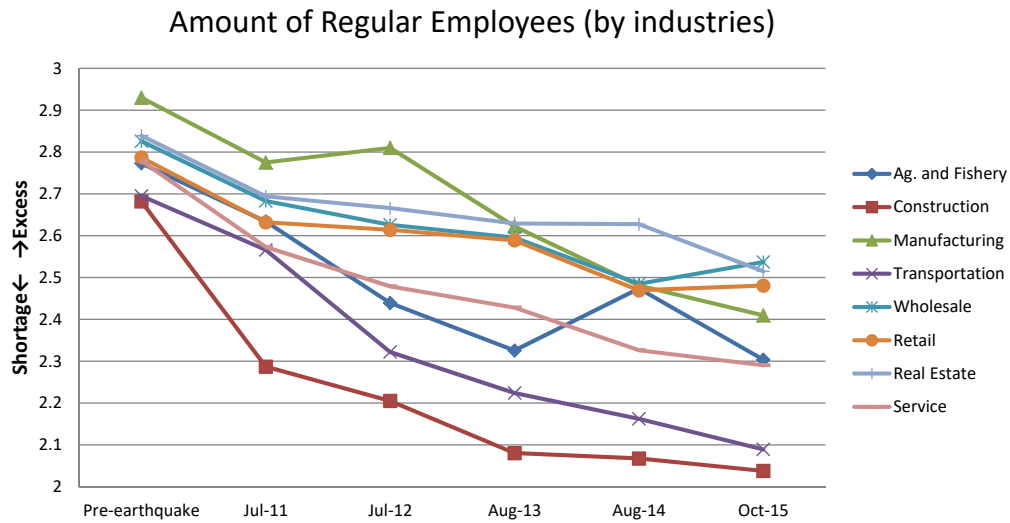


Scale: Excess=5pts, slightly excess=4pts, adequate=3pts, slightly shortage=2pts, Shortage=1pt

- Shortage of regular employees are getting severe after the earthquake.
- Non-regular employees also in shortage, but somewhat alleviated after 2014.
- Regardless of firm size, labor force are in shortage.

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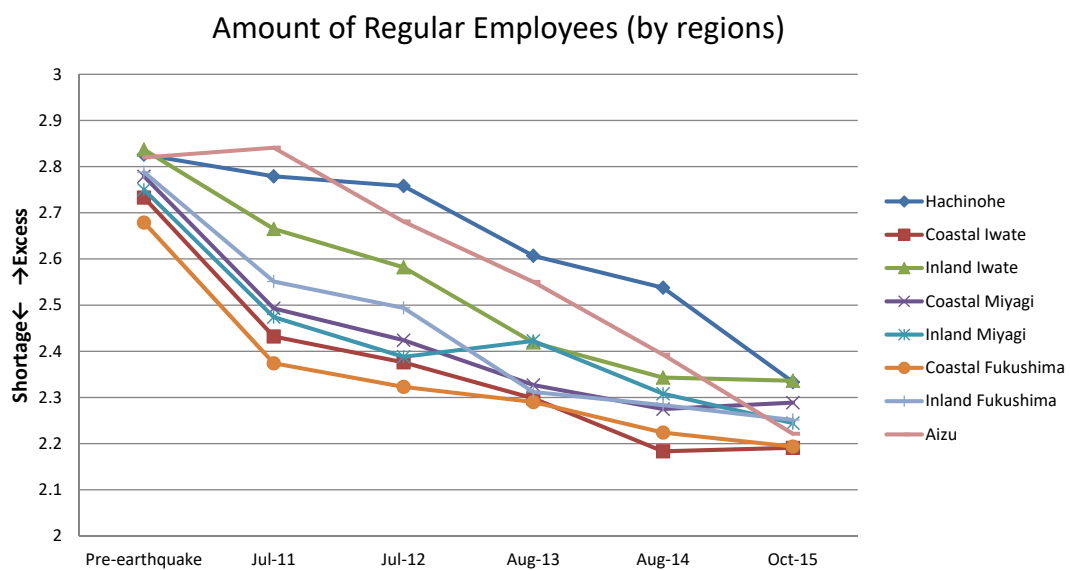
Shortage of Labor Force



- Shortage of employees especially strong in construction and transportation industries.
- Shortage are getting severe after the earthquake in most of the industries.

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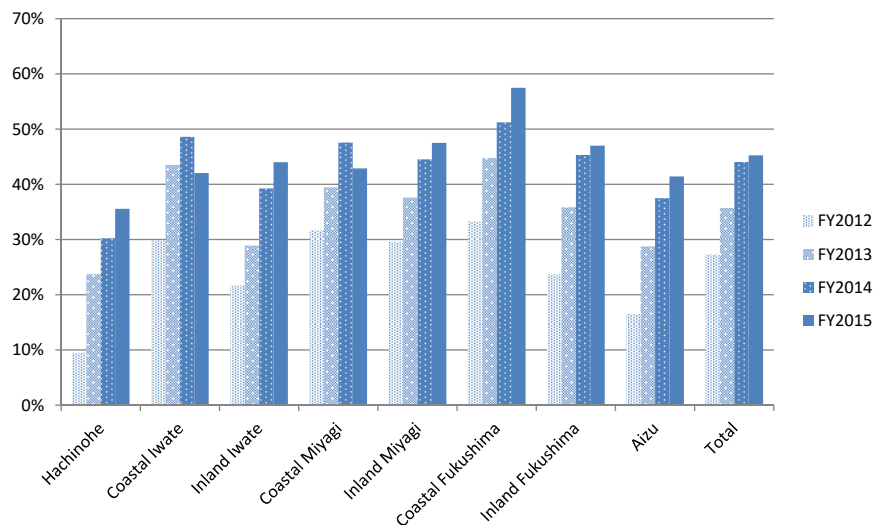
Shortage of Labor Force



- Shortage are severe in coastal areas.
- Shortage are getting severe in all the regions after the earthquake.

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Labor Shortage affecting Business



- Overall, more than 40% of the firms say that their business were affected by labor force shortage.
- The number is steadily increasing from 27% (2012) to 45% (2015).
- This trend is common for all the regions, especially strong in coastal Fukushima.

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Labor Costs

Change in labor costs in 2014 (by industries)

	Agri. & Fishery	Construction	Manufacturing	Transportation	Wholesale	Retail	Real Estate	Service	Total
Increased	7.46%	7.92%	8.74%	8.00%	9.02%	8.04%	8.27%	8.32%	8.28%
Slightly increased	58.21%	40.59%	43.27%	42.46%	41.90%	40.92%	38.35%	41.50%	41.52%
No change	32.84%	44.58%	40.69%	41.85%	43.74%	43.27%	44.74%	44.05%	43.39%
Slightly decreased	1.49%	6.05%	6.02%	6.15%	5.01%	6.93%	6.02%	4.97%	5.79%
Decreased	0.00%	0.87%	1.29%	1.54%	0.33%	0.83%	2.63%	1.16%	1.02%

Change in labor costs in 2014 (by regions)

	Hachinohe	Coastal Iwate	Inland Iwate	Coastal Miyagi	Inland Miyagi	Coastal Fukushima	Inland Fukushima	Aizu Fukushima	Total
Increased	8.79%	7.63%	9.95%	8.45%	7.44%	6.53%	8.02%	8.33%	8.28%
Slightly increased	40.07%	43.79%	40.62%	43.07%	41.82%	42.19%	40.59%	35.42%	41.52%
No change	44.95%	39.83%	42.87%	42.48%	43.71%	43.59%	44.66%	48.44%	43.39%
Slightly decreased	4.56%	7.63%	5.54%	4.90%	6.08%	6.53%	6.23%	6.25%	5.79%
Decreased	1.63%	1.13%	1.03%	1.10%	0.94%	1.17%	0.51%	1.56%	1.02%

- Overall, nearly 50% of firms experienced an increase in labor costs in 2014.
- This trend is common for all the industries and regions.

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Recovery Status: Summary

- Business conditions of the firms peaked out at 2012 to 2013. However, “reconstruction boom” is fading away after 2013.
- Financial conditions of the firms are still in good condition as of 2015.
- Physical investment for recovery is proceeding steadily.
- Labor shortage is getting more and more severe after the earthquake, becoming the biggest impediment for firm recovery. Also the labor cost is rising recently.

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Tasks Ahead

1. Business conditions of the firms are slowing down, especially for construction industries (perhaps due to fading reconstruction projects by the government sector). The lesson from Hanshin-Awaji Earthquake at 1995 is that when the reconstruction boom was over, many firms went bankrupt. Same phenomenon is expected for Tohoku region as well.
2. Need the firms or industries (which do not rely on reconstruction boom) that can become the new engine for economic growth in Tohoku.
3. Financial conditions are still quite good for all the industries in the region, but expected to be tight in the near future. Also, financial sector in the region should be vigilant to non-performing loans problems which can occur in the near future.
4. Labor force shortage and a rise of labor costs are the major factors impeding the recovery. Need IT and physical capital investment to replace labor force.

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