

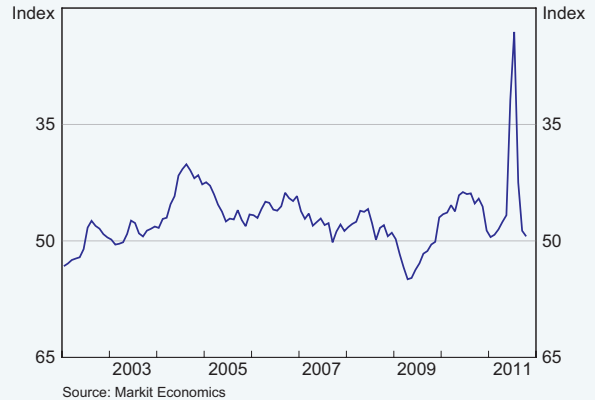
## Box A

# The Japanese Earthquake and Global Supply Chains

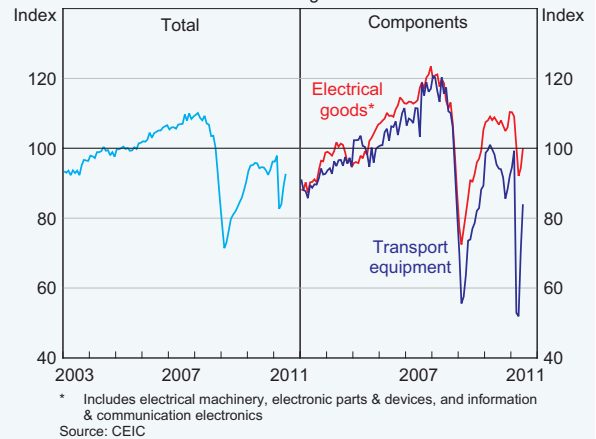
The Japanese earthquake has had a significant effect on industrial production not only in Japan, but in a number of other countries as well, as losses to Japanese output have disrupted international supply chains. These problems have arisen from several sources: some firms in the affected region were damaged by the earthquake and tsunami; some firms halted production due to concerns about electricity supply; and others shut down temporarily to assist the recovery effort. Given the highly integrated nature of domestic production networks and the use of just-in-time inventory management, this loss of production spread quickly throughout Japan as the time taken for supplies to be delivered to manufacturers increased significantly (Graph A1). The Japanese Government has estimated that, in areas not directly affected by the earthquake, supply-chain disruptions are likely to decrease GDP by ¼ per cent in the first half of FY2011. The output loss was particularly severe in the electronics and motor vehicle industries as component producers were more concentrated in the earthquake-affected areas and both have particularly integrated production processes (Graph A2).

In the motor vehicle industry, factory shutdowns were widespread following the earthquake, although all plants owned by major automotive manufacturers were operational again by mid April. However, supply-chain disruptions have been significant, reflecting damage to factories producing particular components, such as those owned by the firm Renesas, which produces electrical components for major automakers. Domestic production of vehicles fell by over 50 per cent in March and remained weak in April, with Toyota and Honda each recording falls of around 80 per cent (Graph A3).

**Graph A1**  
**Japan – Supplier Delivery Time**  
Inverted scale



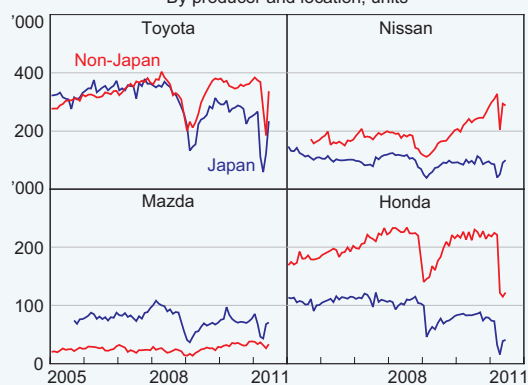
**Graph A2**  
**Japan – Industrial Production**  
2005 average = 100



This loss of production led to a decline in exports of motor vehicles of 60 per cent over March and April.

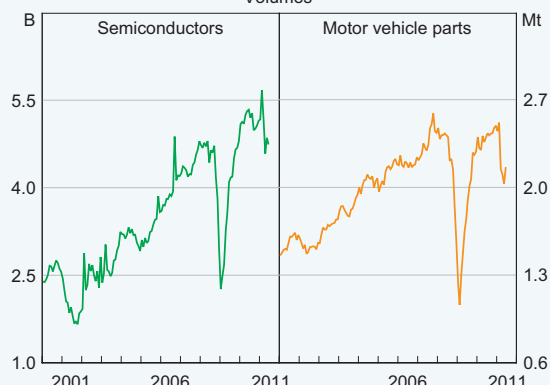
The supply-chain disruptions in Japan also affected production elsewhere, since more than half of the global motor vehicle production of Japanese firms occurs outside of Japan and Japanese-produced

**Graph A3**  
**Motor Vehicle Production\***  
By producer and location, units



\* Seasonally adjusted by RBA  
Sources: CEIC; RBA

**Graph A4**  
**Japan – Export of Component Parts\***  
Volumes



\* Seasonally adjusted by RBA  
Sources: CEIC; RBA

parts are integral to their production. With exports of motor vehicle parts from Japan declining by around 20 per cent between February and May, global motor vehicle production was also affected (Graph A4). The production effects were most evident in economies where Japanese manufacturers, especially Toyota and Honda, make up a significant share of production, such as in Thailand and Taiwan and, to a lesser extent, in Canada, the United Kingdom and the United States (Table A1). Production also fell

significantly in Australia, although this fall was partly due to an unrelated change to production levels at Ford. Nevertheless, while motor vehicle production fell by more than half in Japan over March and April, production by Japanese manufacturers outside Japan fell by less. This partly reflects the prioritisation of component production for export as Japanese firms sought to maintain market share in key export markets.

**Table A1: Japanese Motor Vehicle Producers**  
Market share and supply-chain effects, per cent

	Japanese vehicle brands in total domestic production	Imported Japanese vehicles in total sales	Motor vehicle production	Motor vehicle sales
	2009	2010	Growth over 2 months to May 2011	
Thailand	86	6	-38	-32
Taiwan	84	15	-14	-35
Australia	43	34	-13	-12
Canada	39	12	-12	-16
United Kingdom	50	5	-8 <sup>(a)</sup>	1
United States	37	13	-7	-10
Euro area	3	4	1	0

(a) Change from March to April; production rebounded in May

Sources: CEIC; European Automobile Manufacturers' Association; FCAI/WFACTS; International Organization of Motor Vehicle Manufacturers; RBA; Thomson Financial

With production down significantly, the reduced availability of Japanese motor vehicles has affected sales in many countries. Sales fell by 7 per cent in the United States in the June quarter, and have fallen significantly in east Asia, Canada and Australia. In the United States, the reduced availability of motor vehicles led to a reduction in discounting, with the price of new motor vehicles in the CPI increasing by 2.5 per cent in the June quarter. Prices also picked up in a number of other countries.

Outside of the motor vehicle industry, with electrical components and electronics manufacturers also affected by the earthquake, there was a widespread expectation that production of such goods would be impeded both in Japan and throughout east Asia. However, in contrast to the motor vehicle industry, there is less evidence that global supply chains in the electronics sector have been significantly impaired. Production has certainly been affected in Japan itself, with production of electronic goods falling by 16 per cent over March and April and exports of semiconductors falling by almost 20 per cent. However, the opportunities for global substitution in the electronics sector appear to have supported production elsewhere. Production and exports of electronics in the rest of east Asia have

continued to grow, with production of some specific electrical components having risen noticeably. This substitution is also likely to have cushioned supply-chain related falls in production of computers and consumer electronics in China. Despite a fall in Japanese exports of some electrical components to China, growth in Chinese production of computers and consumer electronics appears to have eased only a little in April and May, consistent with China substituting some of the loss in imported components from Japan.

With production in Japan rebounding in May and June, motor vehicle firms report that domestic production was back close to pre-earthquake levels in July and they expect to make up for lost production in the December quarter. Firms in other industries also report that production is normalising quickly. As a consequence, exports of component parts for motor vehicles increased in June, and have started to flow through to production elsewhere; motor vehicle production picked up in the United Kingdom, Thailand, Taiwan and Australia in June. Growth will be boosted modestly in the affected economies in the second half of 2011 as the international supply chains recover further and firms begin to make up for lost production. ✎

