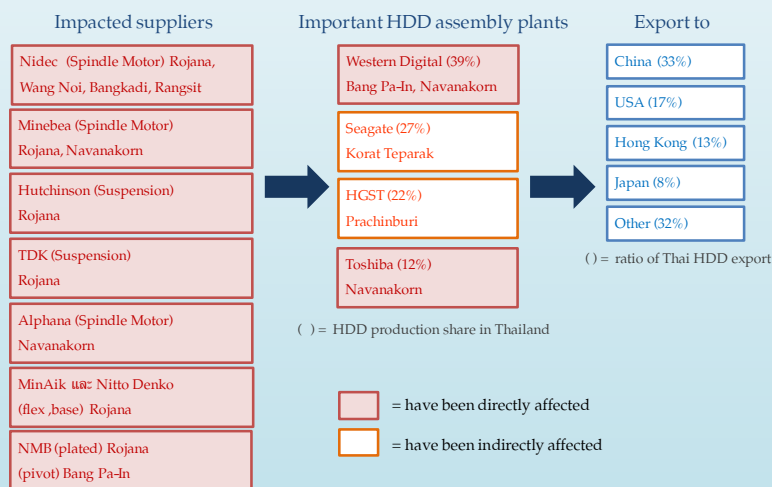


## The impact of the flood in Thailand on the global supply chain and the future of HDD and automotive production hubs in Thailand<sup>1</sup>

The flood in 2011 devastated not only the manufacturing sector in Thailand but also production worldwide including in Asia, America, and South Africa. This phenomenon reflects Thailand's importance as a major global production base, particularly for hard disk drives (HDD) and automobiles. Many producers and components suppliers for the HDD and automobile industries clustered in Ayutthaya and Pathum Thani. In normal circumstances, the clustering of plants and suppliers helps to facilitate transportation and production development, and allow for the use of "lean management system" where firms can keep inventories at minimum levels and produce just enough to meet orders, leading to a reduction in storage costs of products and raw materials. However, this advantage turned to be a major drawback when the flood hit the aforementioned areas. A large number of assembly plants and suppliers had to halt production abruptly, leading to the scaling down of or a stop in production in many non-flooded factories due to shortages of immediate inputs.

HDD, one of the hardest hit industries, suffered from supply chain disruption. As the world's largest HDD manufacturer, Thailand serves as a production base for 4 out of 5 major HDD

**Chart 1: Hard Disk Drive (HDD) industry structure**



Source: Compiled by Bank of Thailand

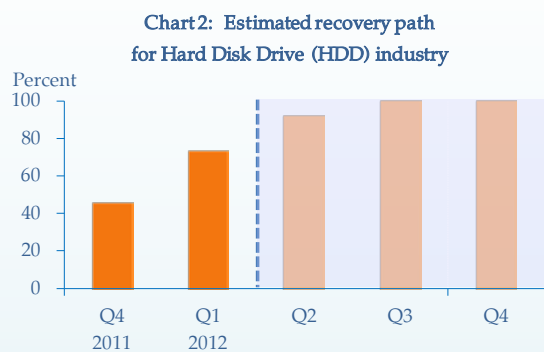
assembly companies as well as a production base for major component makers. Thailand's HDD production accounts for 41 percent of the global production, surpassing China's share of 25 percent. About 90 percent of Thailand's output is exported to China, U.S., Hong Kong, and Japan for production of downstream products such as computers and storage devices (see chart 1).

As a result of the deluge, both flooded plants (Western Digital and Toshiba) and non-flooded plants (Seagate and HGST) had to suspend or scale down their production, resulting in a plunge in the manufacturing production index (MPI) of HDD in Q4, 2011 by 55 percent over the same period last year. This, in turn, led to a global supply

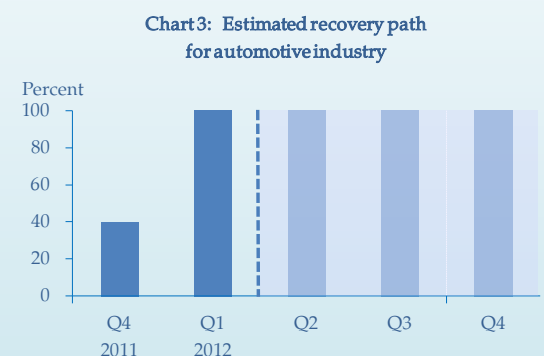
<sup>1</sup> For more detail regarding the importance of the Hard Disk Drive and Automotive industry toward global supply chain, please refer to the "Thailand's Economic Condition in 2011" in box "Thailand's Supply Chains and the Global Economy".

shortage of HDD. IHS iSuppli<sup>2</sup> reported that the global HDD shipment in 2011 Q4 dropped by 26 percent from same period last year, leading to a price hike of 28 percent.

Fortunately, the current severity of the supply chain disruption of HDD and computer has lessened after a robust recovery of the HDD factories and suppliers since December 2011. The swift recovery was attributed to the import of raw material and increased production of both Seagate and



Source: Estimated by Bank of Thailand



Source: Estimated by Bank of Thailand

HGST, and the fast reparation and utilization of existing machines by Western Digital. This resulted in a jump in improvement from the greatest decrease in production of 77.2 percent over the same period last year to a mere 9.9 percent decline in March, a level which is equivalent to around 87.3 percent of the pre-flood production level. The Bank of Thailand expects production to gradually trend up from the production level which stood at 90 percent of the pre-flood level as of Q2 to return to normal levels within 2012 Q3 (see chart 2).

The faster-than-expected recovery process and the increased production in unaffected plants abroad had contributed to the reduction of the severity of the global HDD shortage. From the latest released data, global HDD production in February 2012 was at 74.4 percent of the pre-flood level. Furthermore, Morgan Stanley forecasted that the global HDD shipment in Q1 and Q2 would be

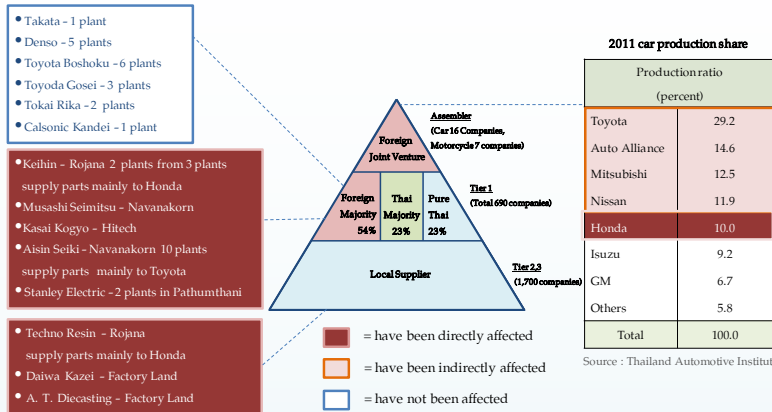
around 135 and 155 million units respectively, a level lower than the quarterly demand of 170 million units. Hence, the price of HDD would remain inflated until Q3 when the HDD production in Thailand returns to normal.

Another hard-hit industry was automobiles. Thailand was ranked the 14<sup>th</sup> largest car production in the world<sup>3</sup> (after losing the 12<sup>th</sup> rank to Russia and Iran due to the disruption in production from the flood in 2011) and an important Japanese car production network. Japanese automobile firms account for about 80 percent of cars produced in Thailand. Thailand also plays a crucial role in supplying automotive parts (see chart 4). As automobile parts makers in Thailand halted their production abruptly during the floods, many assembly plants at home and abroad had to subsequently scale down or even suspend production temporarily; for example, a 7.3-percent

<sup>2</sup> IHS iSuppli 10th February 2012

<sup>3</sup> Organisation Internationale des Constructeurs d'Automobiles (OICA) correspondents survey

Chart 4: Thailand automobile industry structure



drop in Japanese car production in November 2011 compared to the previous month led to a 30-50 percent cut in production of many car assembly plants around the world.

Nonetheless, the impact from the floods started to diminish when car production rebounded after the acquisition of raw material from alternative sources both from

domestic suppliers and abroad. The resumption of production of almost all Japanese car makers led to an annualized expansion in the MPI for automotive industry in February 2012 from an annualized contraction in the past four consecutive months. In February 2012, the MPI for automotive industry expanded by 10.7 percent over the same period last year, and production continued to improve in March with 14.7 percent growth over the same period last year. The overall automobile industry is expected to assume normal production levels in Q2 2012 after Honda resumes its operation in April (see chart 3). In addition, the recovery of the automotive part makers in January enabled many factories around the world to operate at normal production level. Honda plants in North America and in UK are now producing at normal levels whereas plants in Taiwan began production in February 2012.

Despite the disruptions caused by the flood in the HDD and automotive production, many investors continue to insist on using Thailand as a production base. This is evidence by firms' continuation of their capacity expansion plans in Thailand; for examples, Seagate is opening a new plant in Korat, HGST is importing new machinery for expansion, Toyota is continuing the construction of its new plant called Gateway Plant 2 in Chachoengsao, and Honda, which was directly affected by the flood, is planning to build additional plant in the East of Thailand. These ongoing investment plans reflect Thailand's comparative advantage in terms of its complex and robust production network, skilled labours and tax incentive from government. These advantages make relocation rather costly and continue to support Thailand in retaining its position as a production hub of HDD, automobile and automobile parts.

The severity of this flood impact has highlighted the significance of Thailand's HDD and automobile industries in the global supply chain. Both industries rebounded from the flood faster than anticipated. The production was expected to resume its normal level in accordance to the plan while investors continued expanding production capacity, as reflected by firms' import of new machinery to replace those damaged, and investing in new plants, albeit avoiding areas prone to flood. These actions illustrate the continued commitment of investors to Thailand. Going forward, both the government and private sector should not be complacent as many countries in Southeast Asia continuously strive to improve their attractiveness as investment destinations. Therefore, sound and concrete plans for flood management as well as infrastructure development are essential to boost and anchor investor confidence in Thailand.