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**Title:**

# The Japanese economy in crises: A time series segmentation study

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**Abstract:**

The authors performed a comprehensive time series segmentation study on the 36 Nikkei Japanese industry indices from 1 January 1996 to 11 June 2010. From the temporal distributions of the clustered segments, we found that the Japanese economy never fully recovered from the extended 1997-2003 crisis, and responded to the most recent global financial crisis in five stages. Of these, the second and main stage affecting 21 industries lasted only 27 days, in contrast to the two-and-a-half-years-across-the-board recovery from the 1997-2003 financial crisis. We constructed the minimum spanning trees (MSTs) to visualize the Pearson cross correlations between Japanese industries over five macroeconomic periods: (i) 1997-1999 (Asian Financial Crisis), (ii) 2000-2002 (Technology Bubble Crisis), (iii) 2003-2006 (economic growth), (iv) 2007-2008 (Subprime Crisis), and (v) 2008-2010 (Lehman Brothers Crisis). In these MSTs, the Chemicals and Electric Machinery industries are

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