

## Quantitative Finance &gt; General Finance

# Inflation and unemployment in Japan: from 1980 to 2050

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*(Submitted on 1 Feb 2010)*

The evolution of inflation,  $p(t)$ , and unemployment,  $UE(t)$ , in Japan has been modeled. Both variables were represented as linear functions of the change rate of labor force,  $dLF/LF$ . These models provide an accurate description of disinflation in the 1990s and a deflationary period in the 2000s. In Japan, there exists a statistically reliable ( $R^2=0.68$ ) Phillips curve, which is characterized by a negative relation between inflation and unemployment and their synchronous evolution:  $UE(t) = -0.94p(t) + 0.045$ . Effectively, growing unemployment has resulted in decreasing inflation since 1982. A linear and lagged generalized relationship between inflation, unemployment and labor force has been also obtained for Japan:  $p(t) = 2.8*dLF(t)/LF(t) + 0.9*UE(t) - 0.0392$ . Labor force projections allow a prediction of inflation and unemployment in Japan: CPI inflation will be negative (between -0.5% and -1% per year) during the next 40 years. Unemployment will increase from ~4.0% in 2010 to 5.3% in 2050.

Comments: 15 pages, 10 figures

Subjects: **General Finance (q-fin.GN)**Cite as: **arXiv:1002.0277v1 [q-fin.GN]**

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