
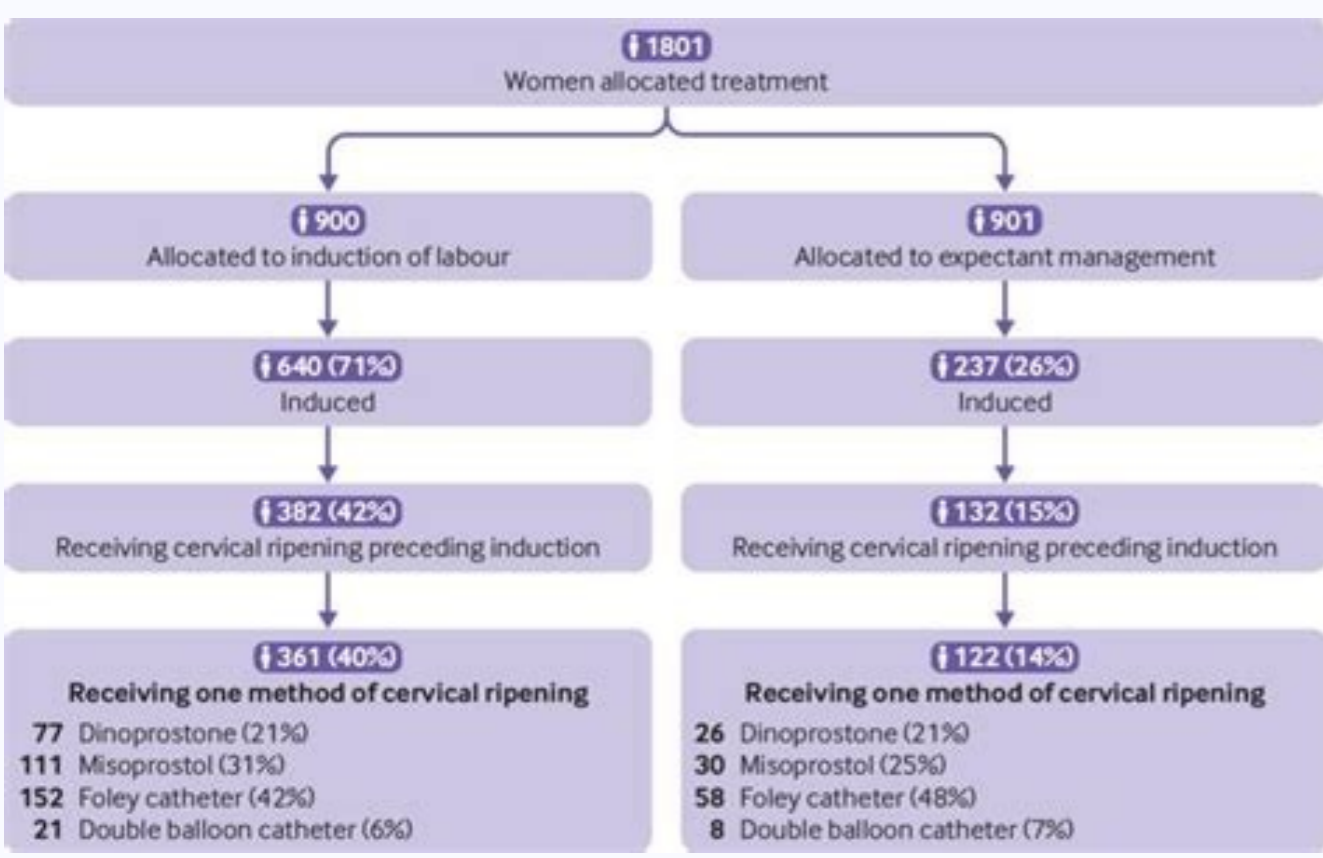


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Research Article

**Coupled Model of Artificial Neural Network and Grey Model for Tendency Prediction of Labor Turnover**

Yueru Ma and Lijun Peng

Business School, Central South University, Changsha, Hunan 410083, China

Correspondence should be addressed to Lijun Peng; penlijun@csu.edu.cn

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The tendency of labor turnover in the Chinese enterprise shows the characteristics of seasonal fluctuations and irregular distribution of various factors, especially the Chinese traditional social and cultural characteristics. In this paper, we present a coupled model for the tendency prediction of labor turnover. In the model, a time series of tendency prediction of labor turnover was expressed as trend item and its random item. Trend item of tendency prediction of labor turnover is predicted using Grey theory. Random item of trend item is calculated by artificial neural network model (ANN). A case study is presented by the data of 24 months in a Chinese matured enterprise. The model uses the advantages of "accumulative generation" of a Grey prediction method, which weakens the original sequence of random disturbance factors and increases the regularity of data. It also takes full advantage of the ANN model approximation performance, which has a capacity to solve economic problems rapidly, describes the nonlinear relationship easily, and avoids the defects of Grey theory.

1. Introduction

New classical economists are sticking to a fundamental assumption: the social and economic phenomenon can be predicted. The mathematical model can predict the long-term trend of the economic problem development and help rational decision-makers to achieve rapid development [1-3]. Due to the effect of social and economic cyclical, demographic characteristics and the causes of work-life balance, the human resource is one of the most unstable productive factors in enterprises [4, 5]. The mathematical model is needed to establish a set of index systems and analysis method. By the model we can find the inner logic and relatively stable structure of employee turnover, analyze the trend of human resource flow, identify potential crisis, shorten the difference time between searching and using the labor, reasonable plan, and control the strategy combination of human resource, as well as deposit the completion of sustainable productive tasks in enterprises [6-8]. Many models and technologies for forecasting the trends of economic problem, such as Grey model (GM), artificial neural network (ANN), time series analysis, and the combination model, were developed in the past years. However, the predictive models do not meet the

practical conditions with the characteristics of random and complex, nonlinear and volatility, as well as localization and contextualized [9, 10]. In this paper, the combinative model of grey model and artificial neural network (GM) is used to handle the Chinese enterprise employee flowing data and predict the current trend of Chinese enterprise employee.

In this work, the following aspects will be explained and analyzed: (1) designing concrete model to provide key indicators for economic data with characteristic of time series, which can be used to track the trend, change, and mutant of economic phenomenon. The model can explain the relationship between the current and previous data in economic problems and focus on the change in a specific period; (2) analyzing the annual turnover rate and the details and trends of annual turnover flow, and identifying or expecting the shortage or excess of employee number by the application of the model. Thus, it can provide the basis of hiring, allocating, or dismissing employee for rational decision makers. The rational decision makers can better control cost and comply with budget constraints.

The core of these methods is to establish the appropriate forecasting model. Because of the complexity of time series and the nonlinear characteristics of the tendency prediction

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