

Dissertation Proposal

Abstract

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**Three Essays in Time Series and
Personnel Economics**

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Chapter 1: Recruitment of Seemingly Overeducated Personnel: Insider-Outsider Effects on Fair Employee Selection Practices, by Oliver Fabel and Razvan Pascalau

Generally, every US employer is free to employ individuals at his will. However, there are two important sets of regulations or institutional rules which affect the selection of employees. First, selection criteria must be validated and, in particular, qualification requirements must be set reasonably to avoid discrimination charges under Title VII of the Civil Rights Act of 1964. To the extent that members of minority groups, women, or disabled individuals can claim to have been socially excluded from obtaining the respective formal education or training, qualification requirements can be ruled excessively high and set for the purpose of preventing successful applications from these groups.

The constitutional imperative to ensure equal employment opportunities further combines with a second set of rules rooted in the employer's general duty to provide job security and career development given indefinite term labor contracts. Fair selection standards may thus require to be alternatively phrased in terms of formal educational requirements and substitute professional experience criteria - in particular, if firms do not operate employee training programs. Hence, civil service employees can typically demand administrative and often even judicial review of adverse employment decisions.

Therefore, human resources departments within firms must ensure compliance during the entire recruitment process - from advertising the job opening to the final contract negotiations. Consequently, setting qualification requirements in selection processes is subject to a twofold set of limitations: the standards themselves must be reasonable such as not to exclude qualified individuals. Moreover, professional experience gained in similar - typically, reflecting career tracks, hierarchically inferior - positions within the firm can substitute for a lack of formal education. Thus, economically speaking, these rules constrain the use of informative signals in employee selection processes that combine pre-selection according to documented educational degrees and professional experience with follow-up job-interviews or other testing procedures.

The contribution of our analysis is then twofold: first, we confirm the existence of an overeducation effect on hiring probabilities in an environment in which the firm perceives itself as a labor market monopsonist. Second, we show that - augmenting the career mobility approach - this selection behavior may actually be induced by institutional constraints. Thus, optimal selection implies that the expected level of formal education is higher for outsider than for insider recruits. Moreover, this difference in educational attainments increases with lower optimal minimum educational job requirements. Investigating data of a large US public employer confirms both of the above theoretical implications. Generally, the econometric model exhibits a good fit.

Chapter 2: Testing for a Unit Root in the Asymmetric Nonlinear Smooth Transition Framework, by Razvan Pascalaus

The present paper adds to both the literature on unit root testing and modeling time series nonlinearities. Given the poor power performance of the Dickey-Fuller (abbreviated DF) unit root test under the simple linear ARMA framework, researchers have sought to increase power by developing unit root tests that are robust to various nonlinearities present in the data. Given that any neglected nonlinearity of an otherwise stationary series may bias the DF unit root test towards accepting the null, these new tests may display increased power when the alternative is true but nonlinear around a level and/or trend.

Several studies recommend the use of the logistic function to model the smooth transition between a number of regimes of a regime-switching process. The logistic function appears particularly suited to characterize the asymmetric behavior of nonlinear processes like the business cycle for instance. Additionally, empirical applications concern the modeling of real exchange, unemployment, and real interest rates.

For example, the persistent failure of the standard DF test to reject the null of a unit root for bilateral and real effective exchange and real interest rates (as the purchasing power parity (PPP) and the mean reversion of the marginal product of capital theories would imply, respectively) researchers have modified the DF test in several ways.

This paper provides a simple and straightforward approach to approximating a process that is nonlinear (possibly asymmetric) but globally stationary. Thus, I use a third-order Taylor series approximation of the logistic function. The new test proposes the alternative of a nonlinear but globally stationary logistic (abbreviated as LSTAR) process. In contrast to previous research in this area, the testing framework of this paper expands the range of possible nonlinear alternatives. Additionally, the present paper investigates the small sample behavior of the test both with and without an explosive regime in the lower regime. Note, that the test proposed allows both for symmetric and asymmetric adjustment under the alternative.

Therefore, the contribution of this paper is threefold. First, the paper establishes the limiting nonstandard asymptotic distribution of the test. Second, it performs Monte Carlo simulations to highlight the increased power over the standard DF test when the alternative comprises a smooth transition regime. Third, it applies the new test to several OECD real exchange rate data and as expected, it finds more evidence of non-linear mean reversion.

Chapter 3: **A Comparison of Direct and Iterated Multistep Nonlinear Methods for Forecasting Macroeconomic Time Series, by Walter Enders and Razvan Pascalaus**

Forecasting with both linear and nonlinear models has seen a remarkable growth recently. However, this literature misses a large-scale empirical study to compare the direct versus the multistep iterated forecasting accuracy of nonlinear models. For the linear case, previous research has shown that forecasting using a multi-step approach performs better than using direct models. Thus, this essay aims to establish whether this finding is verified for the nonlinear models as well.

To ease the burden associated with identifying the proper nonlinear functional form, we consider series that have been analyzed extensively in the literature. For instance, researchers usually agree with real exchange rates as having some type of smooth transition from one regime to the other.