



Public defense to obtain the  
academic degree of

**DOCTOR IN ECONOMICS**

by Maarten Dossche

**“Essays on Inflation  
Dynamics”**

Advisor : Prof. dr. Freddy Heylen

Co-advisor : Prof. dr. Gerdie  
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**Thursday 4 December 2008 at 6pm**

Het Pand (Room Rector Vermeylen)  
Onderbergen 1 - 9000 Ghent

**Please confirm attendance by  
November 21 2008 at:  
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## **Doctoral Jury**

**Prof. dr. Marc De Clercq**  
Dean-President, Ghent University

**Prof. dr. Patrick Van Kenhove,**  
Academic Secretary, Ghent University

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Advisor, Ghent University

**Prof. dr. Gerdie Everaert**  
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**Prof. dr. Nils Gottfries**  
Uppsala University (Sweden)

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Wilfrid Laurier University (Canada)

**Prof. dr. Frank Smets**  
Ghent University  
European Central Bank

**Prof. dr. Raf Wouters**  
Université catholique de Louvain  
National Bank of Belgium

# Invitation



## Summary

*Inflation is always and everywhere a monetary phenomenon. (Milton Friedman)*

During the seventies and eighties inflation in industrialized countries has been remarkably high, volatile and persistent compared to other periods in history. It took until the end of the nineties before central banks in most industrialized countries could bring back inflation to levels consistent with price stability.

To understand the welfare effects of different inflation trajectories we need a micro-founded model that is explicit about how firms adjust prices in response to shocks. This is possible in the New Keynesian model that merges real business cycle features such as utility maximization and rational expectations with Keynesian features such as monopolistically competitive firms and costly price adjustment. Some aspects of the model are still not in line with macroeconomic and/or microeconomic stylized facts. This thesis aims at understanding what drove post-WWII inflation and prices and how we should adapt the New Keynesian model so that we can use it to improve future monetary policy.

In the first chapter we define the sources of inflation persistence at the business cycle frequency as either intrinsic, extrinsic, or expectations-based. To disentangle these different sources of persistence we formulate an unobserved component model and estimate it using the Kalman filter and Bayesian estimation techniques.

We find that inflation persistence, expressed as the half-life of a shock, can range from less than one quarter for intrinsic persistence, to several years for extrinsic or expectations-based persistence. This indicates that a significant part of the observed univariate inflation persistence is inherited and that price-setting frictions such as indexation to past inflation or backward-looking expectations are not the best way to match the empirical evidence.

In the second chapter we document producer price adjustment using a Belgian low-inflation micro price dataset. On average 24% of prices adjust each month, with an average increase/decrease of 6%. Producer prices adjust more frequently than consumer prices, but their size of adjustment is typically smaller. Sectoral heterogeneity in the frequency of price adjustment is strongly related to heterogeneity in the cost structure. Fluctuations in aggregate producer price inflation occur to a large extent through variation in the relative share of upward and downward price adjustment.

In the third chapter we estimate the curvature of the demand curve for a wide range of products. We use an extension of Deaton and Muellbauer's Almost Ideal Demand System and scanner data from a large euro area retailer. Our findings suggest that a sensible parameter value for the curvature of the demand curve, or the price elasticity of the price elasticity, is 4. This implies that the price elasticity of demand is higher for price increases than for price decreases.

This value is one to two orders of magnitude smaller than the value economists usually impose.

In the fourth chapter we show that in a New Keynesian model economy with sticky prices and high labor taxes, optimal inflation volatility is significantly higher than for an economy with low labor taxes. Because the marginal deadweight loss increases with taxes, the Ramsey planner needs to raise taxes more to finance the same adverse government spending shocks. This creates a larger tax distortion than under a low level of labor taxes. To minimize the tax distortion the planner changes taxes less than is needed to entirely finance the increase in spending and generates a surprise inflation to raise revenue from inflating the nominal public debt.

## Curriculum vitae

Maarten Dossche was born on June 17 1977, in Ghent. He holds a Licentiate in Economics degree from Ghent University (2000), and a Master of Science in Economics degree from the London School of Economics (2001). Since 2001 he works at the National Bank of Belgium. During the academic year 2006-2007 he was visiting the Economics Department of Universitat Pompeu Fabra. He published in *Economic Inquiry* and the *Scandinavian Journal of Economics*.