

# Fernando Duarte

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CONTACT INFORMATION	Federal Reserve Bank of New York Research and Statistics Group 33 Liberty Street New York, NY 10045	Tel: (+1) 857-928-7344  duarte@alum.mit.edu <a href="https://www.newyorkfed.org/research/economists/duarte">https://www.newyorkfed.org/research/economists/duarte</a> <a href="https://fernandoduarte.github.io/">https://fernandoduarte.github.io/</a>
EDUCATION	<b>Massachusetts Institute of Technology</b> , Cambridge MA <i>Ph.D. in Economics</i> Committee: Ricardo Caballero, Leonid Kogan, Guido Lorenzoni	<b>2011</b>
	<b>Massachusetts Institute of Technology</b> , Cambridge MA <i>Bachelor of Science in Mathematics</i>	<b>2005</b>
PROFESSIONAL EXPERIENCE	<b>Federal Reserve Bank of New York</b> , NY <i>Senior Financial Economist, Capital Markets Function, Research Department</i>	<b>2011 – present</b>
	<b>University of California Berkeley</b> , California <i>Visiting Scholar, Department of Economics</i>	<b>2016 January-June</b>
	<b>Yale University</b> , Connecticut <i>Participant, Systemic Risk Institute</i>	<b>2014 June-August</b>
PERSONAL	Date of Birth: September 14, 1981 Citizenship: United States	
PUBLICATIONS	<b>“Fire-Sale Spillovers and Systemic Risk”</b> (with Thomas Eisenbach) <i>The Journal of Finance</i> , 76: 1251-1294, February 2021  <i>Abstract:</i> We identify and track over time the factors that make the financial system vulnerable to fire sales by constructing an index of aggregate vulnerability. The index starts increasing quickly in 2004, before most other major systemic risk measures, and triples by 2008. The fire-sale-specific factors of delevering speed and concentration of illiquid assets account for the majority of this increase. Individual banks’ contributions to aggregate vulnerability predict other firm-specific measures of systemic risk, including SRISK and $\Delta\text{CoVaR}$ . The balance sheet-based measures we propose are therefore a useful early indicator of when and where vulnerabilities are building up.  <b>“Time-Varying Inflation Risk and Stock Returns”</b> (with Martijn Boons, Frans de Roon, and Marta Szymanowska) <i>Journal of Financial Economics</i> , Volume 136, Issue 2, Pages 444-470, May 2020  <i>Abstract:</i> We show that inflation risk is priced in stock returns and that inflation risk premia in the cross-section and the aggregate market vary over time, even changing sign as in the early 2000s. This time variation is due to both price and quantities of inflation risk changing over time. Using a consumption-based asset pricing model, we argue that inflation risk is priced because inflation predicts real consumption growth. The historical changes in this predictability and in stocks’ inflation betas can account for the size, variability, predictability, and sign reversals in inflation risk premia.  <b>“NKV: A New Keynesian Model with Vulnerability”</b> (with Tobias Adrian, Nellie Liang and Pawel Zabczyk) <i>AEA Papers and Proceedings</i> , vol. 110, Pages 470-76, May 2020  <i>Abstract:</i> We present a New Keynesian model with endogenous risk. The conditional output gap volatility depends on the price of risk, giving rise to a vulnerability channel of monetary policy. Lower interest rates not only shift consumption intertemporally but also shift conditional output risk. The	

model fits estimates of the conditional output gap distribution 1 to 12 quarters ahead and suggests an intertemporal risk return trade-off for policymakers. Via the impact on risk taking, easy monetary policy lowers short-term downside risks to growth but increases medium-term risks. The framework can be used to jointly consider macroprudential and monetary policy.

**“Comment on ‘Forward guidance: Communication, commitment, or both?’ by Marco Bassetto”**

*Journal of Monetary Economics*, Volume 108, Pages 87-92, December 2019

*Abstract:* Forward guidance can be cheap talk in an infinitely repeated game with the public. Asymmetric information is necessary for cheap talk to be useful. The central bank can build credibility over time to make cheap talk credible. When to use forward guidance instead of general transparency remains unclear. Adding a lower bound on interest rates does not change the main conclusions.

**“Monetary Policy and Financial Conditions: A Cross-Country Study”** (with Tobias Adrian, Federico Grinberg and Tommaso Mancini-Griffoli)

*Advancing the Frontiers of Monetary Policy*, Chapter 7, Tobias Adrian, Doug Laxton and Maurice Obstfeld, editors, *International Monetary Fund*, Washington DC, Pages 83-105, April 2018

*Abstract:* Loose financial conditions forecast high output growth and low output volatility up to six quarters into the future, generating time varying downside risk to the output gap which we measure by GDP-at-Risk (GaR). This finding is robust across countries, conditioning variables, and time periods. We study the implications for monetary policy in a reduced form New Keynesian model with financial intermediaries that are subject to a Value at Risk (VaR) constraint. Optimal monetary policy depends on the magnitude downside risk to GDP, as it impacts the consumption-savings decision via the Euler constraint, and the financial conditions via the tightness of the VaR constraint. The optimal monetary policy rule exhibits a pronounced response to shifts in financial conditions for most countries in our sample. Welfare gains from taking financial conditions into account are shown to be sizable.

**“The Equity Risk Premium: A Review of Models”** (with Carlo Rosa)

*Federal Reserve Bank of New York Economic Policy Review*, Volume 21, Number 2, Pages 39-57, December 2015

*Abstract:* We estimate the equity risk premium (ERP) by combining information from twenty models. The ERP in 2012 and 2013 reached heightened levels —of around 12 percent— not seen since the 1970s. We conclude that the high ERP was caused by unusually low Treasury yields.

WORKING  
PAPERS

**“Financial Vulnerability and Monetary Policy”** (with Tobias Adrian)

November 2020

*Abstract:* We present a microfounded New Keynesian model that features financial vulnerabilities. Financial intermediaries’ occasionally binding value at risk constraints give rise to variation in the pricing of risk that generates time varying risk in the conditional mean and volatility of the output gap. The conditional mean and volatility of the output gap are negatively related: during times of easy financial conditions, growth tends to be high, and risk tends to be low. Monetary policy affects output directly via the IS curve, and indirectly via the pricing of risk that relates to the tightness of the value at risk constraint. The optimal monetary policy rule always depends on financial vulnerabilities in addition to the output gap, inflation, and the natural rate. We show that a classic Taylor rule exacerbates deviations of the output gap from its target value of zero relative to an optimal interest rate rule that includes vulnerability. Simulations show that optimal policy significantly increases welfare relative to a classic Taylor rule. The model provides a microfoundation for optimal monetary policy frameworks that include financial stability.

**“Monetary and Macroprudential Policy with Endogenous Risk”** (with Tobias Adrian, Nellie Liang, and Pawel Zabczyk)

November 2020

*Abstract:* We extend the New Keynesian (NK) model to include endogenous risk, microfounded using

diagnostic expectations and intermediation frictions captured by a Value-at-Risk constraint. Lower interest rates not only shift consumption intertemporally but also conditional output risk via their impact on risk-taking, giving rise to a vulnerability channel of monetary policy. The model fits the conditional output gap distribution and can account for medium-term increases in downside risks when financial conditions are loose. The policy prescriptions are very different from those in the standard NK model: monetary policy that focuses purely on inflation and output-gap stabilization can lead to instability. Macroprudential measures can mitigate the intertemporal risk-return tradeoff created by the vulnerability channel.

**“Empirical Network Contagion for US Financial Institutions”** (with Collin Jones)

*October 2019*

*Abstract:* We construct an empirical measure of expected network spillovers that arise through default cascades for the US financial system for the period 2002-2016. Compared to existing studies, we include a much larger cross-section of US financial firms that comprises all bank holding companies, all broker-dealers and all insurance companies, and consider their entire empirical balance sheet exposures instead of relying on simulations or on exposures arising just through one specific market (like the Fed Funds market) or one specific financial instrument (like credit default swaps). We find negligible expected spillovers from 2002 to 2007 and from 2013 to 2016. However, between 2008 and 2012, we find that default spillovers can amplify expected losses by up to 25%, a significantly higher estimate than previously found in the literature.

**“How to Escape a Liquidity Trap with Interest Rate Rules”**

*January 2019*

*Abstract:* I study how central banks should communicate monetary policy in liquidity trap scenarios in which the zero lower bound on nominal interest rates is binding. Using a standard New Keynesian model, I argue that the key to preventing self-fulfilling deflationary spirals and anchoring expectations is to promise to keep nominal interest rates pegged at zero for a length of time that depends on the state of the economy. I derive necessary and sufficient conditions for this type of state contingent forward guidance to implement the welfare maximizing equilibrium as a globally determinate (i.e., unique) equilibrium. Even though the zero lower bound prevents the Taylor principle from holding, determinacy can be obtained if the central bank sufficiently extends the duration of the zero interest rate peg in response to deflationary or contractionary changes in expectations or outcomes. Fiscal policy is passive, so it plays no role for determinacy. The interest rate rules I consider are easy to communicate, require little institutional change and do not entail any unnecessary social welfare losses.

**“Institutional Investors’ Intrinsic Trading Frequency and the Cross-Section of Stock Returns”** (with Sahar Parsa)

*May 2013*

*Abstract:* We show a novel relation between the institutional investors’ intrinsic trading frequency — a commonly used proxy for the investors’ investment horizon — and the cross-section of stock returns. We show that the 20% of stocks with the lowest trading frequency earn mean returns that are 6 percentage points per year higher than the 20% of stocks that have the highest trading frequency. The magnitude and predictability of these returns persist or even increase when risk-adjusted by common indicators of systematic risks such as the Fama-French, liquidity or momentum factors. Our results show that the characteristics of stock holders affect expected returns of the very securities they hold, supporting the view that heterogeneity among investors is an important dimension of asset prices.

**“Cross-sectional inflation risk in menu cost models with heterogeneous firms”** (with Jonas Mishara-Blomberger)

*December 2012*

*Abstract:* We show that firms in models with menu costs, when calibrated to have the empirically observed frequency and size of individual-goods price adjustments, have stock returns that are always positively correlated with inflation. The cross-sectional dispersion in this correlation is almost negligible, even though firms have very diverse micro-level pricing behavior. Because in this class of models positive nominal shocks are good states of nature and the correlation between stock returns

and inflation is positive, agents are willing to pay a premium to hold assets whose returns covary negatively with inflation. In contrast, we empirically find that the dispersion in the correlation between stock returns and inflation is about 100 times larger than in the model, and that correlations are negative about half the time. Furthermore, and also at odds with sticky-price models, investors require a premium to hedge against states of high inflation.

**‘Aggregate Investment and Stock Returns’** (with Leonid Kogan and Dimitry Livdan)  
*April 2012*

*Abstract:* We study the relation between returns on the aggregate stock market and aggregate real investment. While it is well known that the aggregate investment rate is negatively correlated with subsequent excess stock market returns, we find that it is also positively correlated with future stock market volatility. Thus, conditionally on past aggregate investment, the mean-variance tradeoff in aggregate stock returns is negative. We interpret these patterns within a general equilibrium production economy. In our model, investment is determined endogenously in response to two types of shocks: shocks to productivity and preference shocks affecting discount rates. Preference shocks affect expected stock returns, the aggregate investment rate, and stock return volatility in equilibrium, helping the model reproduce the empirical relations between these variables. Thus, our results emphasize that the time-varying price of aggregate risk plays an important role in shaping the aggregate investment dynamics.

WORK IN  
 PROGRESS

**‘Long-Run Consumption and Inflation Risks in Stock and Bond Returns’** (with Leonardo Elias and Marta Szymanowska)  
*November 2020*

*Abstract:* We propose a long-run risk model with real effects of inflation that matches a broader set of empirical moments than has been previously possible, while simultaneously keeping risk aversion and the elasticity of intertemporal substitution low. The moments we match capture the joint dynamics of stock returns, bond returns, bond yields, and macroeconomic fundamentals. We also match moments that have remained elusive in the literature—including those from predictability regressions of stock returns, consumption, and dividends on the price-dividend ratio—as well as some that have been only matched piecemeal by a collection of different versions of the long-run risk model. The key element that we introduce in the model is that inflation non-neutralities are time-varying in a manner consistent with the data, with inflationary shocks predicting higher or lower real consumption growth depending on the current state of the economy.

**‘The Past is Present: Optimal Monetary Policy at the Effective Lower Bound’** (with Benjamin Marrow)  
*September 2020*

*Abstract:* We use a New Keynesian model with an effective lower bound (ELB) and a general stochastic process for the natural rate to study optimal monetary policy. The central bank has perfect commitment and an interest rate smoothing term in its loss function. Despite the ELB binding occasionally and endogenously, we can derive a closed-form solution for the optimal interest rate: it is the maximum of zero and a weighted average of all past realizations of the output gap. This implies that the optimal interest rate (i) takes a simple form, (ii) is path dependent at all times, (iii) should be pre-emptively lowered when close to the ELB—or kept at zero if at the ELB—if and only if the weighted average of past output gaps is negative, and (iv) behaves very differently from the Taylor rule. We illustrate these insights by solving for key variables in the New Keynesian model using a neural network.

PRESS COVERAGE  
 AND SOCIAL  
 MEDIA

**‘What’s Up with Stocks?’**, in Liberty Street Economics blog, December 2020. Coverage: Financial Times

**‘How Has COVID-19 Affected Banking System Vulnerability?’**, in Liberty Street Economics blog, November 2020 (with Kristian Bickel, Matteo Crotti, Thomas Eisenbach, Fulvia Fringuelli and Anna Kovner).

**“Banking System Vulnerability: Update”**, in Liberty Street Economics blog, December 2019 (with Kristian Blicke, Thomas Eisenbach and Anna Kovner).

**“How Large Are Default Spillovers in the U.S. Financial System?”**, in Liberty Street Economics blog, June 2019 (with Collin Jones and Francisco Ruela).

**“Assessing Contagion Risk in a Financial Network”**, in Liberty Street Economics blog, June 2019 (with Collin Jones and Francisco Ruela).

**“Ten Years after the Crisis, Is the Banking System Safer?”**, in Liberty Street Economics blog, November 2018 (with Dong Beom Choi, Thomas Eisenbach and James Vickery).

**“How to Escape a Liquidity Trap with Interest Rate Rules”**  
Coverage: Wall St. Journal

**“Quantifying Potential Spillovers from Runs on High-Yield Funds”**, in Liberty Street Economics blog, February 2016 (with Nicola Cetorelli, Thomas Eisenbach and Emily Eisner). Coverage: NY Times, Financial Times

**“Are Asset Managers Vulnerable to Fire Sales?”**, in Liberty Street Economics blog, February 2016 (with Nicola Cetorelli and Thomas Eisenbach). Coverage: Financial Times, Bloomberg, Wall St. Journal

**“What Can We Learn from Prior Periods of Low Volatility?”**, in Liberty Street Economics blog, October 2014 (with Juan Navarro-Staicos and Carlo Rosa).

**“On Fire-Sale Externalities, TARP Was Close to Optimal”**, in Liberty Street Economics blog, April 2014 (with Thomas Eisenbach).

**“A Way With Words: The Economics of the Fed’s Press Conference”**, in Liberty Street Economics blog, November 2013 (with Carlo Rosa).

**“Are Stocks Cheap? A Review of the Evidence”**, in Liberty Street Economics blog, May 2013 (with Carlo Rosa). Coverage: The Economist, NY Times, Wall St. Journal

#### TEACHING

##### **Massachusetts Institute of Technology**

*Lecturer, International Economics*  
(undergraduate, course 14.54)

**2008**

*Teaching assistant, Advanced Financial Economics*  
(Prof. Leonid Kogan, graduate course 15.440J)

**2009 – 2010**

*Head teaching assistant, Principles of Macroeconomics*  
(Profs. P. Willen, F. Giavazzi and V. Guerrieri, undergraduate course 14.02)

**2008 – 2009**

*Teaching assistant, Differential Equations with Theory*  
(Prof. Mihalis Dafermos, undergraduate course 18.034)

**2003**

#### FELLOWSHIPS, GRANTS, AWARDS

MIT Hennessy Scholar

**2004-2007**

MIT Graduate Fellowship

**2006-2007**

Second Place, MIT Undergraduate Journal of Economics

**2005**

3rd place, MERCOSUR Mathematical Olympiad

**1998**

Top 1% in Argentinean Mathematical Olympiad

**1995-1997**

