University of Oxford
Department of Economics
Manor Road Building
Oxford, OX1 3UQ
United Kingdom

Curriculum Vitae
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RADOSLAW (RADEK) L. STEFANSKI

Personal Data

Mailing Address
Department of Economics
Manor Road Building, Manor Road
Oxford, OX1 3UQ
United Kingdom

Telephone Numbers
Mobile: +44 7832 632106
Office: +44 1865 271064
E-mail: radek.stefanski@economics.ox.ac.uk
URL: www.economics.ox.ac.uk/members/radek.stefanski

Citizenship: Poland and South Africa

Major Fields of Concentration

Macroeconomics, International Trade, Growth and Development

Current Employment

Sept. 2009-present	Postdoctoral Research Fellow, Oxford Centre for the Analysis of Resource Rich Economies, Department of Economics, University of Oxford.
Oct. 2009-present	Junior Research Fellow, New College, University of Oxford.

Education

Degree	*Field*	*Institution*	*Year*
Ph.D.	Economics	University of Minnesota	2009
M.A.	Economics	University of Minnesota	2006
B.S.	Economics and Mathematics (with Honors, *summa cum laude*)	University of Richmond	2004

References

Professor Timothy J. Kehoe
Department of Economics
University of Minnesota
4-101 Hanson Hall
1925 Fourth Street South
Minneapolis, MN 55455-0462
United States
Phone: +1 612 363-5096
e-mail: tkehoe@umn.edu

Professor Fabrizio Perri
Department of Economics
University of Minnesota
4-177 Hanson Hall
1925 Fourth Street South
Minneapolis, MN 55455-0462
United States
Phone: +1 612 625-7504
e-mail: fperri@umn.edu

Professor Anthony J. Venables
Department of Economics
University of Oxford
Manor Road Building
Manor Road
Oxford, OX1 3UQ
United Kingdom
Phone: +44 (1865) 271066
e-mail: tony.venables@economics.ox.ac.uk

Professor Rick van der Ploeg
Department of Economics
University of Oxford
Manor Road Building
Manor Road
Oxford, OX1 3UQ
United Kingdom
Phone: +44 (1865) 281285
e-mail: rick.vanderploeg@economics.ox.ac.uk

Dissertation

Title: Essays on Structural Transformation in International Economics
Dissertation Advisors: Professor Timothy Kehoe and Professor Fabrizio Perri

Academic Appointments

Summer 2007	Research Intern, Research Department, International Monetary Fund, Washington, DC.
2005 - 2007	Visiting Scholar, Research Department, Federal Reserve Bank of Minneapolis, Minneapolis, Minnesota.

Honors, Awards and Grants

2010	International Growth Center Research Award: "Harnessing Oil Revenues in Ghana" (with Rick van der Ploeg), University of Oxford, UK. (35,728 GBP)
2008	Graduate Research Partnership Program Fellowship, University of Minnesota, Minneapolis, Minnesota.
2008	Distinguished Instructor Award for Outstanding Teaching, Department of Economics, University of Minnesota, Minneapolis, Minnesota.
2008	Travel Grant, two times, Department of Economics, University of Minnesota, Minneapolis, Minnesota.
2006-2007	Graduate School Block Grant, University of Minnesota, Minneapolis, Minnesota.
2003-2004	Herman P. Thomas Scholarship for exceptional economics majors, University of Richmond, Richmond, Virginia.
2003	Research Experiences for Undergraduates Grant, given by the National Science Foundation, University of Richmond, Richmond, Virginia.
2002-2004	Phi Beta Kappa, Academic Honors Society, University of Richmond, Richmond, Virginia.
2000-2004	University Scholar, scholarship for outstanding undergraduate students, University of Richmond, Richmond, Virginia.
2000-2004	International Student Scholarship, merit based scholarship for international students, University of Richmond, Richmond, Virginia.

Teaching Experience

2010-Present	Guest Lecturer, Oxford University Business Economics Programme, University of Oxford, Oxford, UK.
2009-Present	Class Teacher, Department of Economics, University of Oxford, Oxford, UK. Graduate Macroeconomics.
2006-2009	Guest Lecturer, Department of Economics, University of Minnesota, Minneapolis, Minnesota. Principles of Microeconomics.
2005-2009	Instructor, Department of Economics, University of Minnesota, Minneapolis, Minnesota. Principles of Microeconomics, Principles of Macroeconomics, Growth Theory, Senior Project Seminar, Undergraduate Writing in Economics.
2005-2009	TA, Department of Economics, University of Minnesota, Minneapolis, Minnesota Principles of Macroeconomics, Principles of Microeconomics and Intermediate Microeconomics.

Professional Activities

Referee for *American Economic Review*, *The Economic Journal*, *Journal of Economic Studies*, *Journal of European Economic Association*, *Journal of Environmental Economics and Management*, *Journal of International Economics*, *Oxford Economic Papers*, *Review of Economics Dynamics*

Invited Presentations

2011	Warsaw School of Economics, University of the Basque Country, University of Amsterdam
2010	Delhi School of Economics, University of Southampton
2009	University of Oxford, University of Otago, Pitzer College, Indiana University (SE), University of Uppsala, École Polytechnique Fédérale de Lausanne, DIW DC
2008	Federal Reserve Bank of Minneapolis, IMF, La Pietra-Mondragone Workshop (reserve)

Conference Presentations

2011 Midwest Macro Meetings, European Meetings of the Econometric Society

2010 Overlapping Generations Days, Monte Verita Conference on Sustainable Resource Use and Economic Dynamics, World Congress of Environmental and Resource Economists, Tsinghua Workshop in Macroeconomics, Macroeconomic Dynamics: Theory And Applications

2009 Society for Economic Dynamics, European Meetings of the Econometric Society, Tsinghua Workshop in Macroeconomics, Royal Economic Society Meetings

2008 North American Summer Meeting of the Econometrics Society, Washington University Third Annual Graduate Student Conference, Guanajuato Workshop in Macroeconomics, UNU WIDER Workshop (Rise of China and India), Warsaw International Economic Meetings

2004 Eastern Economic Assoc. Meeting, Meetings of the American Mathematical Assoc.

Outreach/Media

September 2011 Interview for China Business Network TV on *The impact of 9/11 on oil markets*

August 2011 Oxford Sovereign Wealth Fund Blog on *Harnessing Oil Revenues in Ghana*

Languages

English (native), German (fluent), Polish (native), French (good), Afrikaans (good), Spanish (working) Dutch (basic)

Papers

"**Windfalls, Structural Transformation and Specialization**" (joint with Karlygash Kuralbayeva)

Revise and Resubmit, Journal of International Economics

Job Market Paper

Macro cross-country data and micro US county data indicate that resource rich regions have *small and productive manufacturing* sectors and *large and unproductive non-manufacturing* sectors. We suggest a process of specialization to explain these facts. Windfall revenue induces labor to move from the (traded) manufacturing sector to the (non-traded) non-manufacturing sector. A self selection of workers takes place. Only those most skilled in manufacturing sector work remain in manufacturing. Workers that move to non-manufacturing however, will be less skilled at non-manufacturing sector work than those who were already employed there. Resource induced structural transformation thus results in higher productivity in manufacturing and lower productivity in non-manufacturing. We construct and calibrate a two sector, open economy model of self-selection and show that exogenous cross-country variation in natural resource endowments is large enough to explain the direction and magnitude of sectoral employment and productivity differences between resource rich and resource poor regions. The model implies that low aggregate productivity found in some resource rich countries is *not caused* by a resource induced decline of a relatively productive manufacturing sector. Rather, the higher manufacturing productivity in those countries is a *consequence* of manufacturing's smaller size.

"**Structural Transformation and the Oil Price**"

Under Submission

What part of the high oil price can be explained by structural transformation in China and India? Will continued structural transformation in these countries result in a permanently higher oil price? To address these issues I identify an inverted-U shaped relationship in the data between aggregate oil intensity and the extent of structural transformation - countries in the middle stages of transition spend the highest fraction of their income on oil. I construct and calibrate a multi-sector, multi-country, general equilibrium growth model that accounts for this fact by generating an endogenously falling aggregate elasticity of substitution between oil and non-oil inputs. The model is used to measure and isolate the impact of changing sectoral composition in China and India on world oil demand and the oil price in the OECD. Structural transformation in China and India accounts for 26% of the oil price increase in the OECD between 1970 and 2010. However, the impact of structural transformation is temporary. Continued structural transformation induces falling oil intensity and an easing of the upward pressure on the oil price. Since a standard one sector growth model misses this non-linearity, to understand the impact of growth on the oil price, it is necessary to take a more disaggregated view than is standard in macroeconomics.

"**Structural Transformation and Pollution**"
It has been argued that CO2 emissions of poorer nations should rise above the developed world's on a per capita basis due to their ongoing industrialization. This can only occur if poorer countries have higher emission intensities than rich countries. As such, I assess how different starting dates of structural transformation affect a country's emission intensity. I document two facts: Countries exhibit hump shaped CO2 emission-intensities, but energy-intensities that fall. These facts are explained by a changing fuel-mix associated with a shift from clean agriculture to dirty non-agriculture as well as improvements in energy-efficiency. I construct and calibrate a two-sector, general-equilibrium model of structural transformation that reproduces these facts by generating an endogenously changing fuel mix. I then use the model to show that timing of structural-transformation matters for emission intensity and hence emission profiles: emission intensities of late developers: a) peak later; b) peak at lower levels and c) tend to be lower than in earlier developers. Industrialization is thus no excuse for relatively higher emissions in poor countries than in rich countries. Instead, I show that higher levels of emission intensity in developing countries are symptomatic of distortions in either energy prices or the non-agricultural sector.

"**On the Mechanics of the Green Solow Model**"
Brock and Taylor (2010) argue that the Environmental Kuznets Curve (EKC) - a hump shaped relationship between emissions and income per capita - is driven by falling GDP growth rates associated with Solow type convergence. I test the importance of their mechanism as a driver of emissions by performing a "pollution accounting" exercise that decomposes emissions data into pollution intensity and GDP growth effects. The "Green Solow" framework assumes that emission intensities decline at a constant rate and hence that all changes in emissions growth rates are driven by changes in GDP growth rates. Yet, in the data, emission intensities are hump shaped for a wide range of countries and pollutants, implying declining emission intensity growth rates. Furthermore, this decline in emission intensity growth rates is up to an order of magnitude larger than changes in GDP growth rates. The Green Solow model - which assigns all the weight to changing GDP growth and ignores changes in emission intensity growth in its explanation of emissions - cannot be the right way to think about emissions profiles of countries. Models that aim to explain the EKC, must - first and foremost - explain the hump shape intensity curve and hence falling intensity growth rates. I suggest a simple model of structural transformation as one possible mechanism capable of generating both a hump shaped EKC curve and a hump shaped emission intensity curve.

"**Resources and Relative Prices: A New Puzzle?**" (joint with Torfinn Harding)
Standard models of Dutch Disease predict that resource rich regions should experience higher relative prices of non-tradable to tradable products. In this paper we investigate the impact of Dutch Disease triggers like oil exports and foreign aid windfalls on price levels, and find no evidence for a positive effect on the relative prices of non-tradable products. Instead, we find a strong, negative relationship. We examine whether this stems from a misclassification of traded versus non- traded products in the data, or whether existing models are failing to capture some aspect of the process of de-industrialization.

"**Harnessing Oil Revenues in Ghana**" (joint with Rick van der Ploeg and Sam Wills)
Ghana has recently started producing oil from the offshore Jubilee field. This paper addresses the question of how Ghana should best harness these oil revenues. This is done in two sections. In the first, it considers whether Ghana should spend or save the windfall, comparing spending rules under a range of assumptions to the permanent income (PI) benchmark. On balance we find that Ghana should bring spending further forward than is suggested under PI, to promote development. In the second, it considers how the windfall should be used, comparing the alleviation of capital scarcity, accumulation of foreign assets and investment in domestic public capital to boost growth and development. We find that the problem of capital scarcity should be alleviated first if Ghana is facing a premium on borrowing costs. The remainder of the windfall should primarily be used to invest in domestic capital, but some funds may temporarily be parked in foreign assets if there are absorption constraints in the non-traded sectors.

"**Money and Development**" (joint with Antonio Mele)
The inverse of velocity of money - the share of money in GDP - increases with income. We argue that this drop in velocity takes place because of a process of structural transformation - a shift of the economy away from agriculture towards non-agriculture. In particular we argue that agricultural goods in poor countries are characterized by a large degree of barter trade, whilst non-agricultural goods require money. We then explore the impact of varying interest rates on the start of structural transformation. We show that, in the data, governments of poorer countries tend to set higher nominal interest rates. Since, a positive nominal interest rate acts as a tax on cash-goods, agents substitute away from (monetary) non-agricultural products towards (non-monetary) agricultural products and thus delaying structural transformation. If TFP growth rates are low in the agricultural sector and high in the non-agricultural sector, there is an additional cost to deviations from the Friedman Rule (i.e. zero nominal interest rates) - a delay in structural transformation which results in lower growth rates.

Research in Progress and other Papers

"Short Sale Restrictions in the Oil Futures Market and Oil Price Volatility: Is Moral Hazard in Insurance Markets Causing Volatile Oil Prices? "
"Structural Transformation and Inequality"
"Real Analytic Functions and the Factorization of n-dimensional Polynomials"