STUDENT ECONOMIC REVIEW 2014

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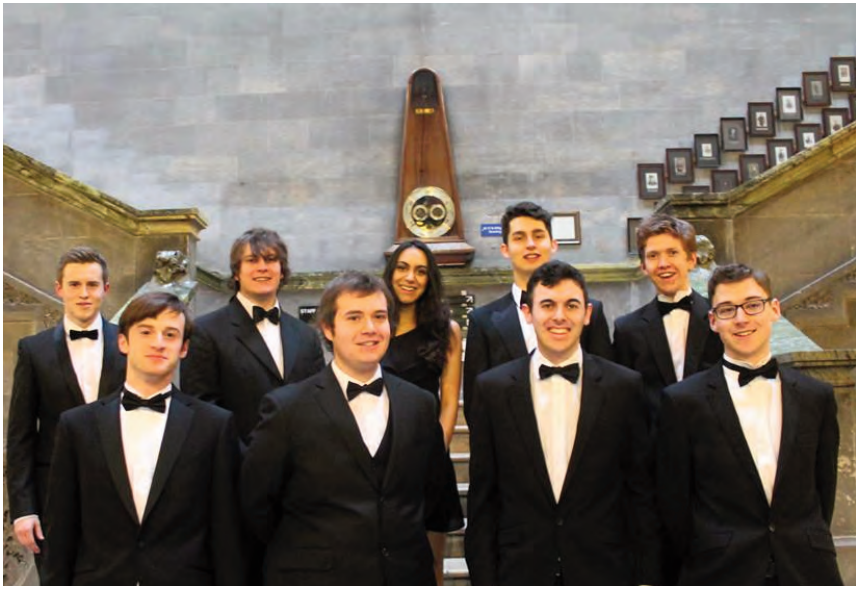

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Prize-Winning Essays of the Student Economic Review 2014

Best Overall Essay: Dermot McAleese Medal

The Anchoring Bias in Forecasts of U.S. Employment

Sean Tong

Best International Essay

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The Free Provision of Anti-Malarial Nets: Inefficient and Counterproductive Aid?

Catalina de la Sota

Best Freshman Essay

The Whitaker Turn: Overrated?

William Foley

EDITORS AND GENERAL MANAGERS OF THE STUDENT ECONOMIC REVIEW 1987 - 2014

Year	Editor	General Manager
1987 (Vol. I)	John Fingleton	Paddy Waldron
1988 (Vol. II)	Kevin Carey	Finbar McDonnell
1989 (Vol. III)	Jonathan Wright	Joe Dennehy
1990 (Vol. IV)	Philip Lane	C.J. O'Neill
1991 (Vol. V)	Paul O'Connell	Billy Stamp
1992 (Vol. VI)	Alan White	Addo C. Barrows III
1993 (Vol. VII)	Gareth Davis	David Butler
1994 (Vol. VII)	Alan Dunne	Donagh Butler
1995 (Vol. IX)	Fergal Shortall	Myles H. Clarke
1996 (Vol. X)	Geoffrey Gill	Suzanne O'Neill
1997 (Vol. XI)	Sarah Rowell	Carol Newman
1998 (Vol. XII)	Richard Doyle	Charlotte Hess
1999 (Vol. XIII)	Michael McMahon	Niamh McDonagh
2000 (Vol. XIV)	Ana Carrie	Colette Murphy
2001 (Vol. XV)	Ronan Lyons	Charles Larkin
2002 (Vol. XVI)	Ivan McAdam	Janine Boyd O'Connell
2003 (Vol. XVII)	Rowena Gray	Elaine Doyle
2004 (Vol. XVIII)	Denis Tkatchenko	Tara McIndoe
2005 (Vol. XIXI)	Cormac O'Dea	Paul Sammon
2006 (Vol. XX)	Deirdre Reilly	Melinda Simonffy
2007 (Vol. XXI)	Niamh Crilly	Charlie Nolan
2008 (Vol. XXII)	Nathalie Ennis	Kieran Curtis
2009 (Vol. XXIII)	Jean Acheson	James Walsh
2010 (Vol. XXIV)	Jason Somerville	Amandine Lobelle
2011 (Vol. XXV)	Robert Farhat	Áine Ní Shúilleabháin
2012 (Vol. XXVI)	Tony O'Connor	Debbie Blair
2013 (Vol. XXVII)	Brian Higgins	Marielle Grigsby-Rocca
2014 (Vol.XXVIII)	Féidhlim McGowan	Cián Mc Leod

Guest Speakers at the Launch of the Student Economic Review 1990 - 2014

Speaker	Organisation	Year
Richard Lipsey	Simon Fraser University	1990 (Vol. IV)
Charles Goodhart	London School of Economics	1991 (Vol. V)
Peter Sinclair	Brasenose College, Oxford	1992 (Vol. VI)
David Greenway	Nottingham University	1993 (Vol. VII)
Hamish McRae	The Independent, London	1994 (Vol. VII)
John Sutton	London School of Economics	1995 (Vol. IX)
John Martin	OECD	1996 (Vol. X)
Alan Tait	IMF	1997 (Vol. XI)
David O'Sullivan	European Commission	1998 (Vol. XII)
Paula Donovan	World Bank	1999 (Vol. XIII)
Dermot McCarthy	Department of An Taoiseach	2000 (Vol. XIV)
Donal Donovan	IMF	2001 (Vol. XV)
Margaret Doyle	The Economist	2002 (Vol. XVI)
Tom Healy	Irish Stock Exchange	2003 (Vol. XVII)
Gerry Foley	ITV PLC.	2004 (Vol. XVIII)
John Fingleton	Competition Authority	2005 (Vol. XIXI)
Marius Brülhart	HEC University of Lausanne	2006 (Vol. XX)
Cliff Taylor	Sunday Business Post	2007 (Vol. XXI)
Alan Barrett	ESRI	2008 (Vol. XXII)
Patricia Callan	Small Firms Association	2009 (Vol. XXIII)
Jane Williams	Forfás	2010 (Vol. XXIV)
Tom O'Mahony	Department of Transport	2011 (Vol. XXV)
Kyran McStay	Key Capital Limited	2012 (Vol. XXVI)
Alan Gray	Indecon Economic Consulting Group	2013 (Vol. XXVII)
Anke Heydenreich	Attestor Capital LLP	2014 (Vol. XXVIII)

STUDENT ECONOMIC REVIEW DEBATES 1996 - 2014

Year	Opposition	Topic	Victor
1996	U.C.D.	Third-Level Fees	Trinity
1998	U.C.D.	EMU Withour Britain	Trinity
1999	Oxford	The Euro: The Way Forward?	Oxford
2002	Oxford	Boston or Berlin?	Trinity
2003	Cambridge	The Euro is a Success	Cambridge
2004	U.C.D.	Free Trade and Development	U.C.D.
2005	Oxford	Third World Debt	Trinity
2006	Cambridge	Common Agricultural Policy	Trinity
2007	Oxford	Environmental Responsibility	Trinity
2007	Yale	Boston or Berlin?	Trinity
2008	Harvard	Mass Emigration and Labour	Trinity
2008	Cambridge	Britain's Place in Europe	Cambridge
2009	Yale	Boston or Berlin?	Yale
2009	Oxford	Bank Nationalisation	Trinity
2010	Cambridge	Should Ireland Have Joined the Euro?	Trinity
2010	Harvard	The Decline of U.S. Economic Dominance	Harvard
2011	Oxford	Ireland Owes a Debt of Gratitude to Britain	Oxford
2011	Yale	It's All America's Fault	Trinity
2012	Cambridge	Ireland Should Rejoin the Sterling Area	Trinity
2012	Harvard	The U.S. State Does Not Care for its Sick	Harvard
2013	Oxford	Deserting the Euro	Trinity
2013	Yale	Tax is Theft	Trinity
2014	Cambridge	United States of Europe?	Cambridge
2014	Harvard	U.S. Education System	Trinity

'The Student Economic Review is the only student-run economics journal that I know of at any university. It has succeeded beyond anyone's wildest expectations when it first came out… As recent events have highlighted, economics is still a young discipline, and the economics profession still has much to learn, but the opportunities and questions are exciting. The Student Economic Review is an unparalleled vehicle for getting students involved in research in economics and related fields.'

Prof. Jonathan Wright
John Hopkins University, formerly Board of Governors US Federal Reserve, SER Editor 1989

'The Student Economic Review gives many student their first opportunity to publish a piece of academic written work. It thus suports and promotes the rigorous analysis, excellence in learning and persuasion that are essential building blocks for future careers and broader intellectual contribution. The collected contributions … constitute an elegant contribution to scholarship and erudition of which Trinity College can be proud.'

John Fingleton,
Chief Executive at the Office of Fair Trading in the UK
SER Editor 1987

'In my 1st year at Trinity, I read the Student Economic Review with awe. There were so many thought-provoking articles, written to such a high calibre. In my ensuing years I tried to emulate the standard the Review set, though not always successfully! This publication is truly a testament to the passion and dedication that Trinity's students and faculty have to economics and to higher learning. It is an honour to get to continue to be involved with the Review as a graduate.'

Aoife Cunningham,
Apache Corporation
SER Finance Manager, 2008

'I feel very lucky to have been part of the SER. It was a unique opportunity to extend and encourage economic thinking outside the lecture hall; and the quality of the essays and debates that resulted was a real testament to the economics department, the talent of the students, and the dedication of the other committee members.'

Jean Acheson,
Economist with the Office for National Statistics (UK)
SER Editor 2009

THE STUDENT ECONOMIC REVIEW

Prelude

Behavioural Economics

Economic History

Monetary Thought and Policy

Economic Policy

Applied Economics

Development Economics

Economic Research

THE STUDENT ECONOMIC REVIEW

Welcome to the Review

On behalf of the committee of the 28th edition, it is my greatest pleasure to welcome you to the 2014 Student Economic Review.

The Student Economic Review has served as a vehicle for discourse and learning of Economics throughout the undergraduate academic body over its rich history. Many contributors to this review have gone on to forge careers in economics and business, and there is no doubt that some of the authors, whose pieces of work you will find in this edition, will continue to add to this list of esteemed alumni.

2014 saw the SER hosting debates against competitive teams from Cambridge and Harvard in association with the Philosophical society. In a year in which the future of Europe was vigorously debated, the SER hosted workshops on "Banking Union and the Future of Europe" with economist and journalist Dan O'Brien, as well as hosting the British Ambassador to Ireland, Dominick Chilcott, and political editor of the Irish Times, Stephen Collins, on the topic of "Britain, Ireland and Europe". The culmination of this year, as always, has been the publication of this Review which sees the publication of 21 exciting essays on topics from all areas of economics, contributed by young authors on various stages of their journey through this exciting subject.

The committee would like to sincerely thank the President of the Student Economic Review, Professor John O'Hagan, for his tireless dedication to the review, not only this year but for each of the previous years. When appointed to the committee, I thought that Professor O'Hagan was just the name above the Review's door. However, the previous year has shown us all that not only is he the name above the door, but he is the one who ensures that door is always open for advice, guidance or even just a humorous tale from his years at the helm of the SER. There is no doubt that without his presence, the Review would not be the respected institution it is today.

In addition, the committee would like to extend our gratitude to the patrons of the Review in the Economics departments: Dr Michael King, Dr Tara Mitchell, and Professor Philip Lane. Their additional support and guidance is much appreciated. We would also like to thank the entire staff of the Economics department, in particular Siobhán O'Brien for her assistance throughout the year. Her hard-work and assistance has seen the addition of various features on the SER website and for the first time, the inclusion of every previous edition in our online archive.

None of this would be possible without the continued support of our generous sponsors. We would like to extend our gratitude to our chief sponsor for almost ten years, Harry Hartford. His continued support has allowed the Review to pursue the heights it has reached today. Next, I would like to thank the main sponsor of the debates, Mr Vinay Nair. Mr Nair, as debates manager of the SER, began the tradition of debates against the international opponents of Harvard, Yale, Oxford and Cambridge. It was a fitting tribute

for Mr Nair to return to present the Vinay Nair Cup to the winning Trinity team in our Harvard Debate this year. We would also like to thank Mr Alan Gray and Ms Aoife Cunningham for their sponsorship. Both are Economics graduates who have continued to support the strong tradition of the SER within the department and whose sponsorships allows us to host such exceptional events each year. Finally, I would like to thank Bord na Mona for their sponsorship of the review both this year and into the future.

The workload of the manager is inversely proportional to the excellence of his committee, and I believe the minimal nature of my work serves as a fitting testament to their dedication and effort this year. It has been a pleasure to act as manager of such a fantastic committee and I would like to take the opportunity to thank each of them for their hard work throughout the year.

Firstly, I would like to thank our debates managers Conor Parle and Shane Byrne for their efforts in organising this year's outings against Cambridge and Harvard. The high calibre of judges and speakers who took to the floor on each of the nights demonstrates their organisational capabilities as the debates played out to packed chambers in the GMB on both of the nights. Our workshop manager, Conor McGlynn, has been particularly busy this year securing top speakers such as The British Ambassador to Ireland Dominick Chilcott, journalist Stephen Collins, and economist Dan O'Brien as well as organising our annual Schols workshop. A determined and enthusiastic mind ensured each of our workshops ran seamlessly this year.

I would like to thank our production manager, George Sorg-Langhans, for his work in ensuring the publication of the Review. The fact that you are reading these words serves as proof of his eye for detail and unflappable organisation. Disha Patel, our launch manager, has done tremendous work in organising the launch of the SER 2014 ensuring that the culmination of this year's efforts is celebrated in style. I must commend our finance manager, Finbar Ring, for his ability to say no even in the face of abundant efforts by our committee to ensure otherwise.

Lastly, I would like to thank the work of our editorial committee of Féidhlim McGowan, Eoghan O'Neill, and Conor McGlynn for their tireless work of reading, selecting and editing the ninety six submissions we received this year for the Review. Their determination has ensured that the Review has maintained its high standards.

It has been my absolute pleasure to act as the general manager of the Student Economic Review 2014 and I have enjoyed leading the committee through each of our events of the year. All that is left to do now, is to invite you, the reader, to read this year's review and sample some of the academic excellence that currently sits in Trinity. I hope you find it as stimulating and enjoyable as I did.

Cián Mc Leod
General Manager, Student Economic Review 2014.

THE STUDENT ECONOMIC REVIEW

LETTER FROM THE EDITOR

It is my pleasure to welcome you to this year's edition of the Student Economic Review. Now in its 28th year, the Review continues to be at the heart of economic discourse within the university. It affords students the opportunity to engage meaningfully with a wide range of economic issues, regardless of whether or not they are part of course curricula.

The record number of 96 submissions we received this year is testament to the popularity of the Review on campus, and as always the standard of submissions was remarkably high. Unfortunately, this means that many excellent essays had to be left out. To meet the criteria for publication, the chosen essays displayed not only a robust understanding of the economic theory, but also originality of thought and the ability to write lucidly. I will now outline the seven categories in this year's Review.

Due to the huge interest in this field evidenced by the submissions received, Behavioural Economics makes its first ever appearance as a distinct section in the Review. It opens with a fascinating discussion by Kit Mattock on the cognitive biases that influence spending behaviour when using a foreign currency. This is followed by Sean Tong's exemplary paper, titled "Anchoring bias in forecasts of U.S. employment". This paper was selected for the Best Overall Essay Prize for the way it skilfully applies econometric techniques to unearth evidence of biases amongst supposedly rational forecasters. Indeed, a strong argument could be made to include it alongside the other economic research essays, but we felt that this section was most appropriate given the paper's theoretical foundations.

For the Best Freshman Essay Prize, we selected a provocative but meticulously researched piece by William Foley on the economic legacy of T.K. Whitaker. He makes a compelling argument that the impact of Whitaker's policies on Irish economic growth was vastly overstated. This essay is accompanied in the Economic History section by an account of Chinese economic reforms after the death of Mao, and an essay describing the negative effects of the Gold Standard on India's economy. This section finishes with a highly original counterfactual essay on the genesis of the Industrial Revolution.

Monetary Thought and Policy forms the third section, and is brimming with novel ideas about how currencies and banking may operate in the future. Firstly, Sam Logan questions whether there are policy lessons to be gleaned from Islamic banking. Gearóid Gibbs then gives us a absorbing account of the virtual currency Bitcoin. The final essay in this section looks backward rather than forward; Paul Kelly recounts how an overly conservative mindset which considered the Gold Standard sacrosanct was responsible for deepening the Great Depression.

The fourth section is concerned with economic policy issues. Two diverging arguments on paternalism are presented, the first grounded in philosophy, the second in pragmatism. This section closes with a thought provoking essay on the EU Labour Market.

Following on, the next section of the Review demonstrates some practical applications of economics in the world today. We learn about the exciting potential of smartphone apps to transform the taxi industry, the possibility for solving road traffic problems using driverless cars, and the necessary steps which should be taken to prevent a repeat of the 2010 ash cloud crisis.

Essays on the paramount importance of institutions and education for sustainable economic growth are found in the penultimate section on Development Economics. Catalina de la Sota then contributes an incisive essay on the use of anti-malarial nets as a component of foreign aid. This piece was selected for the Best International Essay Prize for the confident and cohesive manner in which the author presented her case.

Economic Research is the seventh and final section of the Review, wherein fee-paying schools, the impact of smoking on one's wage and the trends in Ireland's bilateral trade are all scrutinised with the aid of advanced econometric techniques.

At this juncture, I would like to offer my sincere thanks to Conor and Eoghan, my fellow members on the Editorial Team, who worked tirelessly while selecting and editing the submissions for the Review. The selection process had many positive externalities, one could say, as we learned an astonishing amount about many different fields within economics.

I wish to also express my appreciation to my colleagues on the Managerial Team for their commitment in putting together some wonderful workshops and events. A special word of thanks goes to our General Manager, Cián, whose assistance in maintaining anonymity during the selection process was indispensible. In addition, I am certain that Cián's incredible level of organisation is the reason for the smooth running of this year's SER. I would also like to thank George, our Production Manager, for the many late nights he put in to ensure the Review was published on time.

We are extremely grateful to all those who submitted. Our aim to produce a Review which could inspire and inform in equal measure would not have been possible without your dedication and imagination.

Finally, we owe a great debt of gratitude to the supporters of the Review within the Economics department: Dr King, Dr Mitchell, and especially Prof. O'Hagan. Your continued commitment to the Review is much appreciated; we were extremely fortunate to have your counsel to guide us throughout the year.

Without further delay, I urge you the reader to turn the page and begin this year's Review. I hope you find the collection of essays as enlightening and insightful as we did. Perhaps an idea contained within this Review, or an idea sparked through the reading of it, will one day prove to be of great benefit to all of society.

Féidhlim McGowan
Editor, Student Economic Review 2014

WORKSHOPS

The Student Economic Review held three workshops during the 2013-2014 academic year. The first of these, the Schols workshop, took place early in Michaelmas term. Towards the end of the first term we were delighted to welcome Dan O'Brien, Chief Economist at the Institute of International and European Affairs. Our final workshop in Hilary term saw the visit of Dominick Chilcott, British Ambassador to Ireland, and Stephen Collins, Political Editor of the Irish Times, to Trinity Long Room Hub.

"Schols" Workshop

23 October 2013

The annual Student Economic Review Schols Workshop is by now a standard waypoint for those preparing for Scholarship Examinations. Past Scholars in Economics, Business, Politics, Sociology and Philosophy talked through the subject papers for potential Scholarship candidates. The SER has become a leading authority on Schols for students, and those present received invaluable tips and insights into their chosen papers.

Dan O'Brien, Chief Economist IIEA

4 December 2013

The Student Economic Review welcomed Dan O'Brien, Chief Economist at the Institute of International and European Affairs, to speak on the topic of 'Banking Union and the Future of the Euro'. Mr O'Brien gave an enlightening and engaging address, arguing that the Eurozone crisis was caused not by low interest rates, but by an explosion in cross-border capital flows.

The question and answer session saw Mr O'Brien defend this analysis, asserting that the crisis was a failure of finance as opposed to capital. He also described the government's exiting of the bailout programme as a 'purely political move' without real economic significance. The Student Economic Review would like to thank Dan O'Brien for a highly informative and interesting evening.

Ambassador Dominick Chilcott & Stephen Collins, Political Editor of the Irish Times

20 February 2014

The third workshop of the year saw the visit of Dominick Chilcott, the British Ambassador to Ireland, and Stephen Collins, the Political Editor of the Irish Times. They led a stimulating and entertaining discussion on British, Irish, and European relations.

Ambassador Chilcott drew attention to British exceptionalism with regard to the EU, and to the different functions that the EU plays for Britain. He also made the point that within

From left to right: Jürgen Barkhoff, John O'Hagan, Stephen Collins, Dominick Chilcott, Conor McGlynn

the EU power doesn't always have to flow from the sovereigns to Europe, and that the exchange of power can, and sometimes should, happen in both directions.
Stephen Collins focused on the implications for Ireland if Britain did make an exit from the EU. He spoke about the role of the EU in improving the relationship between Britain and Ireland over the last 40 years. He also talked about the loss to Europe if Britain was to leave.

A lively question and answer session followed, with participants making points about the role of EU legislation in shaping attitudes in Britain, as well as the potential of a nuclear armed Iran.

After a highly successful evening the Student Economic Review would like to thank Ambassador Chilcott and Stephen Collins for taking the time to talk to us in Trinity. We would also like to thank Professor Juergen Barkhoff, Director of Trinity Long Room Hub, for introducing the discussion, and all of the staff of the Hub for allowing us to use the venue for the evening.

I would finally like to express my appreciation to the rest of the SER committee, whose help ensured that the preparation for these workshops was a rewarding and enjoyable experience. Special thanks to Prof John O'Hagan for making these events possible, and to the whole economics department for their continued support.

Conor McGlynn
Assistant Editor & Workshops Convenor

The SER Debates

Since their inauguration in 1996 The SER debates have come to be one of the most exciting events in the Trinity calendar. This year's saw Trinity face Cambridge and Harvard and proved to be one of the most exciting years yet with each debate played out to packed chamber. Our sincerest gratitude is extended to The University Philosophical Society and their president Rosalind Ní Shúilleabháin and secretary Sarah Mortell, with whom we organised these events. We also wish to extend our thanks to Mr Vinay Nair, founder of the international debates against Harvard, Yale, Cambridge and Oxford.

Trinity Vs. Cambridge

The first of the two SER debates this year was held in coordination with the Phil in a packed to capacity GMB chamber on the 14th November 2013 against Cambridge University. The motion at hand was "This House Would Welcome a United States of Europe", with Trinity proposing and Cambridge opposing. The Trinity team consisted of a trio of experienced debaters from rather varying backgrounds – Jonathan McKeon (JS PPES), Ronan O'Connor (SF Economics and Sociology) and their captain Gavin Tucker (JS Medicine. The Trinity team faced an impressive multicultural Cambridge team, consisting of two postgrad students – American Clara Spera and Australian Naomi Hart, alongside the now head of the Cambridge Union, Michael Dunn Goekjian.

The debate got off to a rather competitive start, with the Trinity team opening with Jonathan McKeon outlining the potential of the European Union and the European Project as a whole – outlining that the motion doesn't compel us to force this on Europeans, and isn't that much different to what we already have, whilst also exploring the philosophical nature of sovereignty as whole and posing the question as to how much sovereignty we already really have. McKeon continued outlining how this would be more democratic and represent more fully the wills of all Europeans.

Naomi Hart was next up to reply on behalf of the Cambridge team, and rather quickly set about rebutting Trinity's opening arguments – asking how democratic would such a "USE" be, and how would we expect countries such as Greece and Germany to possibly exist under one united country – and that the majority of residents certainly would not want that. Her points were further expanded upon by bringing up the idea of how pooled sovereignty will create a democratic deficit – not extra power, particularly for countries such as the UK who would have their votes diluted – and emphasised the fact that the centralised government would not represent them.

Next up to speak was Ronan O'Connor from the TCD team. Ronan established a number of more detailed economic points – bringing the debate down a more technical economic pathway. In his speech he rather succinctly managed to emphasise the idea that

a common market is impossible without a fiscal union, and that a USE would help to solve a number of problems which caused the recent economic crisis. He further continued on Jonathan's trend, bringing up the idea of the potential the EU had to strengthen all countries – and protect against poor domestic political decisions.

However, Michael Dunn from Cambridge was rather quick to rebut the first two Trinity speakers, who individually had announced that they weren't sure what the makeup of a USE would be - pointing out that the Cambridge team did – and that this would quite simply involve the uniting of Europe into one political unit – something which they were not willing to stand for. Indeed, he made the point that countries had elected to join the EU, not a USE, and making it a United Europe would be like asking someone on a date and suddenly expecting marriage!

Rounding off the debate for Trinity was captain Gavin Tucker – who poked fun at the idea of being a med student in an economics debate, joking that he originally thought an OCA was an STI. Gavin further added weight to the idea that a political union was much more attractive, and that countries would care more about EU issues/not make short term decisions which would be damaging in the long term.

However, Clara Spera provided a rather exquisite closing performance for Cambridge, which saw her awarded the gold medal for best speaker on the night. She agreed with the Trinity side that the EU isn't perfect, and also agreed that the ECB should be able to have more power – but emphasised that this does not equate to a United States of Europe, with Spera pointing to the upcoming EU referendum in the UK to show that there is already a sense that the current European project has gone too far, let alone a further united Europe.

While the Judging panel retreated to deliberate on the debate, we were treated to a number of floor speeches from William Dunne, Owen Murphy, Brendan O'Nolan and James Wilson, with use of Irish amusing the crowd, whilst bemusing the visitors. The sense of occasion was added to by the presence of Senior Lecturer Patrick Geoghegan, who chaired the debate in his usual charismatic and humorous manner.

After roughly 20 minutes of deliberation, the experienced judging panel of Aine Lawlor (RTE Presenter), Paddy Smyth (Foreign Editor, Irish Times), John Webster (British Embassy) and Clodagh McDonnell (Dept of the Environment) returned to the chamber to announce their decision – and were quite critical of both sides, however they came to the unanimous decision of awarding Cambridge with victory, and alongside it the Vinay Nair cup.

Trinity Vs. Harvard

Thursday, February 6th

Back (L-R): Dylan Hardenbergh (Harvard), Nathaniel Donahue (Harvard), Fanele Mashwama(Harvard), Sarah Mortell (TCD),William Dunne(TCD),Ruth Keating (TCD), John O'Hagan
Front (L-R): Vinay Nair, Michael Keating,Frances Ruane, Laurence D'Arcy

Debating teams from Trinity College Dublin and Harvard University took part Thursday night (February 6) in the Student Economic Review (SER) debate chaired by the Provost Dr Patrick Prendergast. The debate was the second in the SER international debates series which saw Cambridge overcome Trinity in Michaelmas Term in opposition to the motion: "This house believes in a United States of Europe". Debating the motion: "This house believes the US education system has failed its citizens", the Trinity team this time narrowly defeated their Harvard rivals in the overall debate which saw Harvard's Fanele Mashwama win the Best Speaker Gold Medal.

The debate, which was hosted by the University Philosophical Society, featured a distinguished panel of judges which included Laurence D'Arcy, Director of Crimson Tide Plc, Michael Keating, Deputy CEO of Bord Iascaigh Mhara, Professor Frances Ruane, Director of the Economic and Social Research Institute (ESRI), and Vinay Nair, Head of International Business Development at Acumen and former SER debates manager. The SER was especially honoured to welcome back Mr Vinay Nair who, in his 1999 tenure as Debates Manager, succeeded in promoting the SER debates from the national to the international debating circuit.

It was the contention of Trinity's team, which consisted Thursday night of Ruth Keating (SS Law), William Dunne (JS PPES), and Sarah Mortell (SF BESS), that the Amer-

ican system fails its citizens fundamentally by failing to address and even by exacerbating entrenched social inequalities and is found lacking on the high rhetorical standard that America sets for itself. Trinity insisted that systemic failings were manifest in consistent US underperformance by standardised international measures of basic literacy and numeracy in spite of high educational investment per capita and vast national income.

A formidable outfit from Harvard University in Dylan Hardenbergh (Sophomore, Linguistics and Neurobiology), Nathaniel Donahue (Junior, Economic History), and Fanele Mashwama (Freshman, Philosophy) maintained however that the American education system, in virtue of its decentralisation, can boast a dynamism and innovative character that other systems lack. The system, they argued, succeeds in equipping its students with the entrepreneurial and critical thinking skills that they will need to get ahead in the real world. The entrenched social inequalities which Trinity identified as particularly damning features of the US system, Harvard retorted, provided evidence not of the failings of the education system but of other aspects of government policy as well as severe historical disadvantage which the education system cannot be expected to redress.

Before delivering the verdict of the judging panel, Chair of Judges Professor Frances Ruane identified as crucial in the debate the trade-off that existed between equity and excellence in education policy. Citing the clarity and coherence of the arguments of the Trinity team, Professor Ruane then called the debate narrowly in favour of Trinity.

The Student Economic Review would like to extend our sincerest thanks to both Trinity and Harvard teams, to the distinguished judges, to the Provost, to the University Philosophical Society, to Professor John O'Hagan, and to all those in attendance on the evening for making this event a success and a hugely enjoyable occasion!

Conor Parle & Shane Byrne,
SER Debates Managers.

EYJAFJALLAJÖKULL AND THE 2010 CLOSURE OF EUROPEAN AIRSPACE: CRISIS MANAGEMENT, ECONOMIC IMPACT, AND TACKLING FUTURE RISKS

ELIN THORA ELLERTSDOTTIR
Senior Sophister

The 2010 eruptions at Eyjafjallajokull in Iceland struck fear into the hearts of airline executives and news presenters alike. In this essay, Elin Thora Ellertsdottir describes the poor response of the relevant authorities to this crisis and the extent of the economic fallout. She concludes by making a compelling case for better preparation in the future, because the prospect of another eruption is not a matter of if, but when.

Introduction

In April 2010, global attention shifted towards Iceland, a remote northern island resting on the Mid-Atlantic Ridge. Eyjafjallajökull had erupted for the first time since 1823, spewing a massive ash cloud and causing the largest shutdown of European airspace since World War II (Oxford Economics, 2010). Every second, the eruption unleashed 750 tonnes of volcanic matter into the atmosphere, with its ash plume rising over 30,000 feet (Budd et al. 2011). The crisis highlighted society's demand for unaffected mobility, as well as aviation's vulnerability to natural hazards (Langmann et al. 2011). An estimated seven million passengers were left stranded, with the shutdown's effects extending to trade, business, and general production. The response to the crisis was widely considered a policy fiasco, in need of critical improvement in the event of another eruption. Subsequently, a conference was held in Reykjavik, outlining the future dangers posed by Iceland's vigorous volcanic activity and the need for preparation (Oxford Economics, 2010).

In the following sections we examine the immediate response to the disaster, as well as its management. Furthermore, we explore the economic consequences of the airspace closure, specifically for the airline industry, destinations, and international trade. Finally, we assess the lessons learned from aviation's first crisis since it became the pillar of international transport. We address the risks of future eruptions disrupting air travel and investigate potential ways to minimise the negative impact.

However, we begin by outlining aviation's first hazardous encounter with volcanic ash and the subsequent safety measures taken.

Background

The first recorded danger to aircrafts from volcanic ash was during the eruption of the Indonesian volcano of Galunggung. A British Airways jet lost engine power and dropped over 12,000 feet before restoring power and landing in Jakarta. The cause of the near-catastrophic incident was confirmed to be high concentrations of volcanic ash in the atmosphere. All of the aircraft's warning systems had failed to warn the crew of the imminent danger (Prata and Tupper, 2009). Subsequently, a study into the threat of volcanic ash clouds was conducted, which reached the conclusion that volcanic ash in the troposphere could cause jet engine failure, with the potential for loss of life (Casadevall, et al., 1996). Furthermore, global wind circulation's ability to rapidly spread ash over large distances, paired with the unpredictable nature of volcanic activity, heightens the hazard to aviation (Prata and Tupper, 2009).

In response to the incident of 1982, the International Airways Volcano Watch (IAVW) was formed by the International Civil Aviation Organization (ICAO). The watch monitors volcanic ash in the atmosphere and issues warnings to the aviation community. This is achieved through nine Volcanic Ash Advisory Centres, which are strategically distributed around the globe. The centres are operated by the local weather forecasting organisations of the countries in which they are situated. They collect and circulate information regarding ash clouds that may endanger aircrafts (Abeyratne, 2012).

Crisis Response and Management

The Eyjafjallajökull eruption on April 14th occurred beneath a layer of glacial ice, which contributed towards the transformation of lava into small glass particles believed to be harmful to aircraft engines. The glass-rich volcanic ash was carried by strong north-westerly winds, prompting European aviation authorities to shut down air traffic for fear of public safety (EVACEG, 2010). Scottish and Norwegian airspace was the first to close down on the evening of the eruption. By April 18th, the skies reaching from Norway to the Canary Islands, and Ireland to Ukraine were virtually closed, with less than a fifth of flights operating (Budd et al. 2011). The extensive shutdown lasted until April 21st, with air traffic resuming close to normal levels on April 22nd (Sammonds, et al., 2010).

The United Kingdom took the lead in managing the crisis, because of its relative proximity to Iceland and its location within the path of the ash cloud. Due to lack of preparedness, their management of the disaster was purely reactive (Alexander, 2013). Authorities faced difficulties due to the absence of data outlining the ash tolerance of aircrafts. Furthermore, there was a lack of consensus among international safety regulators, airlines,

aircraft engineers and manufacturers as to what constituted a safe concentration of ash. Many considered the complete closure of airspace to be an overreaction and demanded a revision of normal procedures in order to 'get Europe going' (Budd, et al., 2011). On April 20th, in response to this demand, the European Union's Transport Ministers adopted a short-term solution. They declared that a volcanic ash concentration of up to 2 mg/m3 was deemed 'safe' for flight operations, provided that certain risk mitigation measures were applied (IVATF, 2010). However, the 'safe' concentration was determined arbitrarily during the course of the emergency and faced criticism for having no basis in science (Alexander, 2013).

The seven million passengers stranded by the volcanic ash crisis were facing significant delays and monetary costs. This was mitigated by the European Regulation 241/2004, which established the responsibility of airlines to compensate passengers in the event of a flight cancellation (European Union, 2004). However, low-fare carriers vehemently contested this guaranteed right to compensation by airlines. They felt the regulation was not drafted in consideration of a natural hazard, and that it imposed an unfair strain on the aviation industry during the unprecedented crisis. The airlines were adamant that since the situation was out of their control, the burden of compensation should not lie with them. Still, the European Commission remained convinced that 'if airlines carried passengers they had a responsibility to not abandon them' (Alexander, 2013, p.13).

Economic Impact

The air traffic suspension resulted in over 108,000 flights being cancelled (Alexander, 2013). The 8-day period of April 15th to April 22nd accounted for 104,000 of those cancellations, which amounted to 48 per cent of expected traffic during those days. Overall, low-fare air transport was hit the hardest, losing 61 per cent of flights over the main period. This could be due to a less flexible business model and higher geographical exposure. In contrast, business aviation was the least affected, owing to its adaptable business model where each flight is customised to the needs of a small number of people. Apart from Iceland, the three countries worst affected by the crisis were the UK, Ireland, and Finland. Over five days, these countries experienced a 90 per cent decrease in air traffic. Correspondingly, the worst affected airports were in Manchester, Edinburgh, Dublin, and Helsinki. Despite air travel being negatively impacted in Iceland for thirteen days, the overall effects on its aviation sector were not as serious as in Finland. This can be attributed to Iceland having been able to sustain a number of flights to North America (Eurocontrol, 2010).

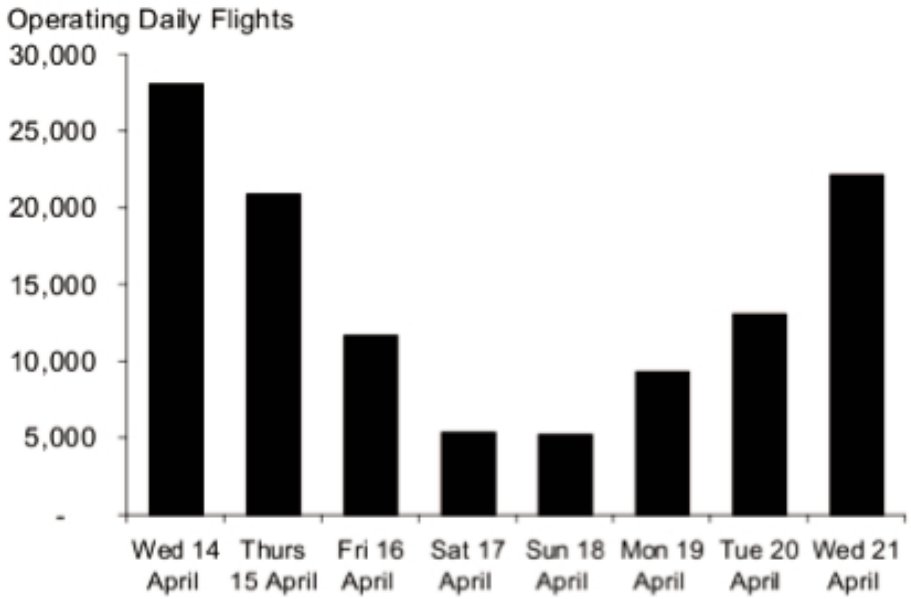

Figure 1: Air traffic in Europe during the crisis (Eurocontrol, 2010)

The global GDP losses, resulting from the prolonged inability to move people or goods, are estimated at approximately 4.7 billion US dollars. This figure incorporates net airline industry and destination losses, along with general productivity losses (Oxford Economics, 2010). Furthermore, the seven million people grounded across Europe resulted in extreme pressure on buses, trains, taxis, and car hire. Some hotels stood empty while others were at capacity, leaving crowds of people without accommodation (Alexander, 2013). A study conducted in Norway indicated that shortly after the crisis most travellers felt uncertain about the impact on future travel. The occurrence of another eruption could cement this uncertainty, causing people to choose destinations reachable by other modes of transport besides air travel. Still, research indicates that, currently, the disruption has not deterred people from flying (Brechan, 2010).

The Airline Industry and Destinations

Due to numerous offsetting factors, it is difficult to determine the overall economic impact on the airline industry. For example, the International Air Transport Association (IATA) evaluates that the shutdown caused the demand for aircraft fuel to fall by 1.2 million barrels, saving around 110 million US dollars (Mazzocchi, et al., 2010). Nevertheless, Oxford Economics (2010) estimates the total financial impact at about 1.4 billion US dollars. British Airways and Air France-KLM reported a loss of 20 million pounds per day during

the five most disruptive days (Mazzocchi, et al., 2010). The extensive losses suffered by the airline industry in a week of suspended flights, indicate that a longer shutdown could easily send aviation companies into bankruptcy (Alexander, 2013).

An estimated gross impact on European destinations suggests a cost of 2.8 billion US dollars. However, offsetting factors, such as the spending of stranded passengers and the money spent on alternative means of transport must be considered. While some hotel operators reported losses of approximately 10 million US dollars per day, others described a large amount of customers willing to pay high rates. Taking these factors into account, the economic impact on European destinations is estimated at 867 million US dollars. Thus, the accumulative negative impact on the airline industry and destinations comes to 2.2 billion US dollars for the main crisis period (Oxford Economics, 2010).

International Trade

The air transport disruptions had serious consequences for international trade. Although some trade can be postponed, other products such as perishable goods and important parts and equipment cannot withstand a delay in transportation. Deferring the trade of these products results in lost revenue for producers and potentially for customers relying on their delivery. Many African countries are the producers of perishable goods such as flowers, fruit, and vegetables. The World Bank president in 2010, Robert Zoellick, estimated that African countries could lose 65 million US dollars as a result of the airspace shutdown. In April 2009, Africa provided over half of the monthly value of fresh-cut flowers imported into the EU, amounting to 46 million US dollars. Accordingly, a weeklong cancellation of flights could indicate losses of about 11 million US dollars for the flower industry in Africa. Furthermore, in the same month Africa accounted for over 90 per cent of the monthly value of fresh fruit and vegetables exported to the EU. A week of air travel disruption suggests losses of around 3.9 million US dollars (Oxford Economics, 2010).

An increasing number of firms require their suppliers to provide them with crucial 'just-in-time' electronic parts and machine components, which are usually high in value but low in weight. This demands the quick and reliable delivery promised by aviation. Eurostat data indicates that in April 2009 three quarters of the monthly value of components imported into the EU came from Asia-Pacific. Following the ash crisis, the Korea International Trade Association estimated the losses for local domestic companies at 112 million US dollars during the height of the crisis (Oxford Economics, 2010).

Tackling Future Risks

> *"The havoc arising from the eruption of Eyjafjallajökull has been presented in many circles as being a consequence of the event being both unprecedented and unex pected – neither is the case."(Sammonds et al. 2010, p.8)*

A historic examination of Iceland's volcanic activity indicates the frequency of eruptions is at 20-25 per century (Langmann et al. 2011). Among Iceland's volcanoes, Katla is one of the most dangerous. Historically, an eruption in Katla has followed within a few years of Eyjafjallajökull. Her eruption would be capable of grounding European air traffic to a much larger extent than Eyjafjallajökull (Alexander, 2013). Further ash hazards to Europe include the volcanically active regions of Italy, the Canary Islands, and the Azores (Sammonds et al. 2010). This warrants the formation of extensive contingency measures in order to minimise the economic and social effects of air travel disruptions (Langmann et al. 2011). Furthermore, the unpredictability of volcanic activity calls for clear and concise rules regarding the safe conditions to operate flights (Alexander, 2013). In order to correctly assess risks, the following factors need to be taken into account: the type and age of the aircraft, the engine make, the flight path, pilot behaviour, the frequency of service, and ground maintenance capabilities. The risk analysis could be managed by an independent expert panel, in charge of determining safe conditions. This could avoid the detrimental effects of a 'no fly' blanket approach and facilitate a balance between precaution and pragmatism, while avoiding the influence of commercial pressures and vested interests (Sammonds, et al., 2010).

Further improvements need to be made with regards to international decision-making. While the International Airways Volcano Watch is a strong warning mechanism, actual decision-making tends to happen at a national rather than a continental level. This led to a fragmented response to the Eyjafjallajökull crisis. In the event of air transport disruptions, Europe should have coordinated crisis response strategies, which provide a substitutive mode of transport. Moreover, it is important to prepare flexible strategies in order to have a clear idea of the options available to minimise disruptions. For example, in the event of air traffic grounding, political and business meetings could be conducted in a virtual manner through video links. In any case, it is necessary for businesses with substantial international components to plan for situations where air transportation could be unavailable, and design alternative arrangements (Alexander, 2013).

Conclusion

At the 2008 meeting of the International Airways Volcano Watch Operations Group, the threat of Icelandic ash clouds to the aviation industry was acknowledged. The group noted that volcanic eruptions in Iceland 'could have a major impact on aircraft operations over

the NAT [North-Atlantic] Regions since Icelandic volcanoes were situated close to important air routes' (IAVWOPSG, 2008: 6.2.2). This acknowledgement, paired with the British Airways experience with volcanic ash in Indonesia, makes it difficult to understand why authorities were not better prepared. Their response was entirely reactive and rendered an ineffective management of the crisis. This resulted in seven million passengers stranded, economic losses of around 4.7 billion US dollars, and severe consequences for international trade. However, the Eyjafjallajökull crisis presents an opportunity to prepare. In the future, effective contingency planning needs to find a balance between three key factors: plans, procedures, and improvisation. An element of hazard forecasting is also important, and could help minimise the detrimental effects of volcanic eruptions. In 2010, unpreparedness resulted in simple risk aversion, which brought about significant economic and social costs. Another volcanic ash crisis is inevitable, the question is: will we learn from our mistakes?

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THE ECONOMICS OF SMARTPHONE TECHNOLOGY AND THE TAXI MARKET

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The discussion of deregulation in the taxi industry has always been hampered by the possible negative effects on pricing, safety and quality of service. In this intriguing essay, Jamie Wilson outlines how the widespread use of smartphone apps such as Uber and Hailo may act to circumvent these problems. Ending on an optimistic note, he states that these apps could provide the means by which the efficiency of this industry could be greatly enhanced.

Introduction

The taxi industry has long been characterised by its extraordinarily high levels of regulation. A cornerstone of regulation in many taxi markets is the quantitative restriction of driver licences which prohibits market entry. Other key regulations often include; fixed pricing, vehicle specifications, rules on safety and driver examinations (Bekken, 2007). For many, these strict regulations are deemed necessary as it's argued that the unique aspects of the market mean that liberalisation could have disastrous consequences. For example, in 2007 The European Conference of Ministers of Transport (ECMT) proposed a number of negative impacts from taxi deregulation which included suggestions that deregulation could lead to, amongst other things: chaos on streets, an increase in accidents, a decline in vehicle standards, and control of the sector by monopolistic dispatch centres (ECMT, 2007).

This negative view of deregulation of the taxi market is, however, hotly contested. There are a number of examples of jurisdictions who have loosened regulations in the market without experiencing the doomsday scenarios as previously set out by the ECMT and others opposed to such moves. In fact, deregulation in some cases, like in Ireland, has led to extremely positive results with the Irish market seeing customer waiting times plummet and the taxi sector being elevated in importance as a form of public transport (Barrett, 2010).

What this discussion aims to explore is the role technology can play in this debate around taxi regulation. In particular we will be looking at the increased prevalence of what are known as 'Transportation Network Companies', 'Real Time Ridesharing Services', or, as will be referred to here, 'Digital Dispatch Services' which have recently en-

tered the market (State of California, 2013; District of Columbia, 2014). By looking at how these companies harness smartphone applications, we can see how such technology solves some of the key problems which proponents of regulation often use in their arguments. Specifically, this piece will focus on the key topics of: passenger safety, quality of service, and the issues around pricing. In addition, an analysis of how the industry has reacted to these companies will be addressed. Firstly, however, we will delve into the details of these Digital Dispatch Services.

Digital Dispatch Services

The birth of the internet has helped transportation develop in a number of areas such as the airline industry, where it facilitated disintermediation and helped truly open aviation to the masses. Thanks to the mobile nature of smartphone technology we are now seeing the benefits associated with the internet trickle down to the taxi market. The proliferation of smartphones into everyday life for consumers in developed economies has seen the market for smartphone taxi applications or 'apps' (as they will now be referred to) flourish. 'Uber' , 'Hailo', 'Gett ', 'Green Tomato Cars' and 'MyTaxi' are but a few of the major players in the market. These brands offer a broadly similar service whereby companies link up customers and taxi drivers to each other via their smartphone's GPS technology which allows customers in real-time to order a taxi to their current or desired location. This process is known as 'e-hailing'.

In less than five years these companies have had a significant impact on the marketplace. It is reported that Uber, established in 2009, recorded an estimated $1 billion dollars in bookings in 2013 (Panzarino, 2013). Similarly, Hailo, incorporated in 2011, boasts of an e-hail accepted every five seconds somewhere in the world and annual sales of over $100 million (Sawers, 2013). The location of these apps is focused around the larger cities of the United States, Europe and Asia. The scale of these businesses explains how this technology has already had a significant effect on how people take taxis.

Safety

The umbrella term of 'Safety' is often used in the tag lines or mission statements of taxi regulators and lobby groups. Although this term includes a variety of customer safety risks with hiring a taxi, such as vehicle collision or vehicle failure, the type of safety which will be examined here is with regards to the possibility of customers being violently or sexually attacked by drivers. If we consider the intimate nature of taxi driving, vulnerable customers such as lone women or the elderly could be seen to be at risk of driver attack. British Police figures reveal that every year around 200 to 250 cases of sexual assault by cab drivers are reported in London. It's worth mentioning however that these crimes are committed by unlicensed cab drivers which the police point out are used by customers due to the lack of legal taxi services (Metropolitan Police, 2012).

Although there is little conclusive data on the rate of these types of crimes in officially licenced taxis or if such rates even increase following deregulation, this issue is often used in defence of regulated taxi markets. For example, in response to proposed market liberalisations in Australia, the Victorian Taxi Family Group emotively claims: 'PASSENGER SAFETY JEOPARDIZED WITH TAXI INDUSTRY DEREGULATION' (Victorian Taxi Family, 2013). Regardless of rates however, certain unfortunate cases do undoubtedly occur and thus reducing the capacity for such crimes should be held in extremely high importance for those in control of the sector.

For a large proportion of the previously mentioned apps a key aspect of their service is the implicit safety features which they provide. For most of these apps, in order for customers and drivers alike to avail of the service, both sets of stakeholders must register online profile accounts. Details on profiles include; names, addresses, credit card details and in the case of drivers, their licence identification. When customers successfully avail of these services a record of the trip is registered with the affiliated company as well as with the passengers and drivers. These records include all the details on transactions such as date, time, price paid, location (pick up and drop off) and the specifics of the drivers and customers profiles. What this means is that if a violent crime were to occur, there is clear evidence which places both the driver and the customer together at that specific time, which obviously highly increases the risk of detection.

By increasing the risks of detection, these apps apply the criminology theory of 'Situational Crime Prevention'. This is where the capacity for crimes to occur is greatly reduced where efforts are in place which increases the likelihood of offenders getting caught (Cornish and Clarke, 2003). What this feature also does is work inversely and provides protection for the taxi drivers. Although rates of driver attacks on customers are unclear, what is certain is that taxi drivers are in serious risk of attack. In the USA, taxi drivers are twenty times more likely to be murdered on the job than other workers (OSHA, 2010).

Quality

The way in which the traditional taxi market operates means that there exists a view that if taxi markets were to be deregulated a decrease in quality of service would likely ensue. The ECMT, who were referred to in our introductory paragraph, explain this concern:

> *"Another argument for regulation arises from the fact that taxi users cannot have prior knowledge of the quality of the service offered. An unsafe vehicle or incompetent driver cannot normally be identified by the customer in advance. In this sense as well, taxi service constitutes a "credence good"."(ECMT, 2007, p.158)*

It is believed that this aspect of quality is particularly applicable to the cruising taxi market (rather than the telephone booking market where drivers represent company reputations) because individual taxis pick up and drop off customers on a 'one off' basis, so as such, the importance weighted towards repeat custom is low and thus the incentive to provide an exemplary service is greatly reduced (Heyes and Liston-Heyes, 2007).

The solution posed by the smartphone based companies to alleviate this problem is quite simple. A central aspect to their service offering is the idea of driver feedback. At the end of each taxi journey, along with the driver and customer details being recorded the customer has the opportunity to provide both quantitative and qualitative feedback on their experience to the company in question. This feedback can constitute all aspects of service, from driver interaction to the condition of the vehicle. This means that drivers are now held accountable for their 'one off' customers as feedback is based on the aggregated experience of all trips used through the apps. Not only does this greatly increase the incentive to provide good quality customer service but it also means that the potential for the service to be considered a 'credence good' is greatly diminished as poor quality drivers are essentially screened out of the market.

Pricing

Along with the restriction of market entry, another area which is highly regulated by those in control of taxi markets is pricing. Fixed fares are often put in place with rates usually being based on some formula of fixed cost, distance and/or time of journey.

Christian Seibert, in his paper 'Taxi Deregulation and Transaction Costs' discusses why the high transaction costs in searching for a taxi may make deregulated pricing inappropriate (Seibert, 2006). Seibert states that in a market where prices are deregulated, while finding a cheaper taxi fare would provide benefit to customers, it also imposes a transaction cost in terms of the time taken and the effort expended in locating the cheapest fare. This can mainly be attributed to imperfect competition and co-ordination problems in a deregulated taxi market. To illustrate, Seibert proposes an example:

> *"A customer may be standing on a street corner hailing down taxi after taxi trying to find a taxi with a fare with which they are satisfied, a process that takes time and effort. All the while, there may be a taxi prepared to charge a satisfactory fare, but it is driving down a street one block away so the customer will not be able to hail it."(Seibert, 2006, p.72)*

These smartphone technology applications have the capabilities to remove these imperfect competition and co-ordination problems that Seibert discusses. Through these apps customers are able in real time to search for taxis which are near their location, or near a location where they wish to be collected. With the available technology the fare can be negotiated with the taxi driver or the company through the software on the appli-

cation. Not only would the comparative levels of effort be greatly reduced in searching for an appropriate fare, but the problems of imperfect competition and coordination would also be removed. However, as a large proportion of developed economies fix prices for most taxi services, such a pricing system would be prohibited.

Many would argue that even with the advantages of pricing through smartphone technology, with deregulation prices would become distorted as a monopolistic market would emerge amongst the Digital Dispatch Service companies. This fear is based on experiences of such conditions developing within the somewhat similar telephone dispatch market (Darbéra, 2012; Heyes and Liston-Heyes, 2007). However, thanks to mobile internet even if a monopolistic market were to develop the likelihood for monopoly pricing to occur is highly unlikely. Already there exist smartphone applications in the taxi market such as 'Kabee' which run price comparisons on nearby taxi companies, therefore allowing consumers to choose the lowest fare. This is similar to how technology is used in other price deregulated markets like the airline industry, with services like 'Skyscanner' and 'Google Flights' key to ensuring firms compete on price (Buhalis and Law, 2008).

When we look at how the previously mentioned app 'Uber' prices its trips we see how smartphone applications not only alleviate deregulation concerns but can in fact vastly improve the efficiency of current systems. Because Uber only uses 'Private Hire Vehicles' (unlike taxis these cannot be hailed from the street but must be pre booked) it has allowed the company to bypass many jurisdictional fixed pricing laws (Darbéra, 2007). The pricing strategy that Uber operates is known as 'Surge Pricing'. This is where at times or areas which have greater demand for Uber drivers (such as Saturday nights or specific areas in a city) the rate of fares go up. Similarly, at times of low demand or areas of low demand, prices fall (Uber, 2012). Because the company records the details of all trips it knows in real time exactly what and where demand is and as such can price accordingly.

In effect, how Uber calculates its fares is how most other markets in the economy establish prices, i.e. by using the basic economic theory of supply and demand. During times of high demand and undersupply, companies or in this case, taxi drivers, are encouraged to enter the market because of higher prices. This flexible pricing allows supply to meet demand and the market to reach equilibrium.

Compare this pricing to the fixed pricing currently used by most regulators. Although proponents of such a system could argue that prices may at times be lower in monetary terms, customers are in fact forced to pay with their time rather than their money. This is because during periods of severe under supply there are no tools in the market to deal with such conditions which obviously results in more time spent waiting for a taxi. With no incentive to increase supply, customers are forced to wait for lengthy periods. Under surge pricing, although prices may be higher at times of high demand, certain customers will be willing to pay money for the time that would otherwise have been lost waiting for a taxi under the fixed price system. Even if other customers wouldn't be will-

ing to pay peak prices, by increasing the reward for drivers, supply is encouraged to quickly enter the market which promptly results in demand being met and the deflation of prices back to normal levels (Chow, 2014). The efficiencies of such a system are apparent and it's clear that with smartphone technology the potential to far eclipse the current methods of pricing are now available to us.

Industry Response

It's worth noting the adverse reaction from the taxi industry towards these new smartphone based businesses. In many states in the USA, lobbyists have successfully persuaded regulators to effectively ban such companies from the market. The International Association of Transportation Regulators has dubbed Digital Dispatch Services as: 'The Rogue Apps' (IATR, 2013). In Paris, major protests took place to remove the firms from the market as drivers attacked Uber vehicles leaving some passengers with minor injuries (Shontell, 2014). The incumbent's main argument is that the apps are breaking certain technical definitions of the law. Rather than such an argument supporting their position many believe this is posing to show how such rules have well past their sell by date (Downes, 2013).

The industry's scathing response of this new technology does little to curb the impression that the taxi market is an industry dominated by 'Regulatory Capture'. This is where a regulatory agency advances the concerns of interest groups rather than acting in the public interest (Stigler, 1971). Many economists, even those in favour of regulation, have admitted that a major reason behind high regulation is due to the rent seeking abilities of the incumbents. By restraining supply with explicit or implicit barriers to entry, the incumbent taxi drivers and firms are allowed to reap the supernormal profits from a market relatively free from competition. Such an opinion is all but supported by the industry's hostile reception, as the sector attempts to protect the regulations which benefit the producer at the expense of technological improvements which so clearly enhance the welfare of the consumer.

Conclusion

By alleviating many of the fears associated with a deregulated taxi sector, Digital Dispatch Services greatly promote the view of market liberalisation. In addition, the new technology essentially reveals the true colours of the sector's incumbents and supports the idea of regulatory capture. This view posits that monopolistic rewards are the real reason behind regulations with the issues of safety, quality and pricing being used as a guise. As we have examined, these issues are dealt with by smartphone technology and in many cases such as pricing the Digital Dispatch Service system has enormous potential to improve upon current market efficiencies. In effect, these innovations have jeopardized the supernormal

profits earned by incumbents by removing justifications for regulations which have shielded the sector from market forces which affect nearly all other areas of the economy.

As French taxi economist, Richard Darbéra points out to us: 'When looking back through history, the taxi industry seems to evolve from crisis to crisis, punctuating more or less lengthy periods of stillness' (Darbéra, 2010). It would seem that we are now experiencing one of these moments of 'crisis' with Digital Dispatch Services. The hope is that as the substantial benefits we have examined become more and more apparent for consumers, regulators will be forced into allowing this technology fully operate and thus truly enhance the efficiency of taxi driving as a form of transport.

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A GLIMPSE INTO THE FUTURE: ROAD PRICING & DRIVERLESS CARS

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Futurology is a field of study more often characterised by its failures than its successes. Jake Russell-Carroll's contribution to this volatile area is a compelling look at the future of road travel. This thoughtful and well-informed essay examines one possible direction from which a solution to our traffic problems may come.

Introduction

According to the transport economist George Smerk *'It is obvious and inevitable, with larger numbers of people on the move, that the paths leading to the focal point of their movement will be crowded'* (1965).

With growing populations, agglomeration towards cities, and rapid growth of car ownership worldwide it is hard not to agree with Smerk's assertion that we will always be plagued by traffic congestion and its associated externalities. This assertion is further strengthened by the relatively limited success of road pricing to date, the widely believed best available solution. But what if Smerk was wrong?

With advancing driverless or autonomous vehicle (AV) technologies we are now at the dawn of a transport revolution that could provide a far superior solution to the externalities of driving. Consequently, this paper will compare the current effectiveness of road pricing in solving congestion to the potential impact of the AV. However, this by no means is an attempt to show that road pricing will ultimately become redundant. Quite contrary, the latter half of this essay argues that road pricing will likely become more important and effective in our driverless future, with the practices of the new Taxi Company 'Uber' indicating what this might be like. Firstly though, In order to provide context I will delve through what exactly is an AV, and also briefly explore the theory behind road pricing.

What Exactly Is An AV?

In 2013, the USA National Highway Transportation Safety Administration (NHTSA) defined five levels of automation, ranging from level 0 with no automation to level 4 with full self-driving automation, designed to operate completely independent of driver intervention. Much of the excitement on this topic has derived from the developments of

Google's prototype AV that has already driven autonomously for over 500,000 miles. This car handles all safety critical functions, monitoring the environment around it and only ceding control to the driver in certain difficult situations. This classes at a level 3, so in terms of technological advancement the horizon for AV introduction is not overly distant. For comparison purposes, the rest of this paper will deal with the potential benefits that could arise from the widespread adoption of level 4 AVs.[1] If still skeptical that this technology will ever emerge, when reading the remainder of this piece, consider the words once uttered by Lord Kelvin in 1899, 'Radio has no future. Heavier-than-air flying machines are impossible (and) X-rays will prove to be a hoax.'

The Theory Behind Road Pricing

Without road pricing there lays a gap between an individual's costs of driving (fuel, insurance, wear-and-tear etc.), and the externalities or social costs of driving; congestion, accident, environment, and road damage costs. As more cars enter a road, although average cost decreases, the marginal social cost rises and road is allocated by queuing (congestion), which is allocatively inefficient (Button, 1993). The theoretical basis for road pricing is thus to close the gap between individual and social costs. In the same way to users of any other scarce resource, this can be achieved by making people pay for their use. Only then would the correct decisions on whether, when, and how one should travel can be made, or in other words the road system can move towards allocative efficiency.

Road Pricing vs. The AV: Solving Congestion Externalities

Congestion Costs

A 2012 Texas Transportation Institute report based on data from 498 urban areas in the USA estimated that traffic congestion in 2011 resulted in almost 5.5 billion hours (628,000 years) of excess travel delay in the USA, and nearly 2.9 billion gallons of excess fuel consumption, equating to a total cost of about $121 billion (Schrank et al., 2012).

Singapore was one of the first places to tackle congestion with road pricing. Traffic entering the central-business-district after implementation dropped 44 per cent, and speeds rose from 11mph to 21mph, and despite an increase in vehicle ownership of 77 per cent a decade later, traffic levels remained 31 per cent below original volumes (Keong, 2002).

In London, traffic entering the charging zone decreased by 17 per cent, with chargeable vehicles down 31 per cent. 50-60 per cent of travelers switched to public transport, 20-30 per cent diverted around the zone, and the remainder made different adaptations. However, while these examples have proven to be somewhat effective, the

1. It is assumed that prices of AVs have declined to the extent to which they are widely affordable, like cars today.

reach and implementation of road pricing on a wide or nationwide scale has been limited (largely due to political and technological factors), and thus it hits far below its optimal potential for solving congestion externalities. Consider London, although it is noted for having a successful congestion charging zone, this is only in the city centre and the average commuting Londoner still spends 66.1 hours stuck in traffic annually.

AVs offer a far more potent and widespread solution. While road pricing can create greater throughput on some roads (less cars=less stop/start conditions), AVs can potentially provide this for all roads. Through finely controlled and coordinated breaking and acceleration, AVs could facilitate significantly higher throughput at peak travel hours. Research suggests that platooning[2] of vehicles could raise motorway capacity by as much as 500 per cent (Fernandez and Nunes, 2012, as cited in KPMG and CAR, 2012). Driverless technology uses a combination of LIDAR (Imaging/sensor) technology with vehicle-to-vehicle and vehicle-to-infrastructure wireless technology. This 'smart infrastructure'[3] could eventually eliminate the need for road markings, signals, and traffic lights. The 2012 KPMG report claims that simulations of intelligently controlled intersections indicate a superior performance of some 200-300 times that of our current system.

As discussed below, AVs will likely be used as part of a shared mobility system rather than being privately owned (especially in cities), meaning that vehicles may be in use over 70 per cent of the time. This reduces the need to search for parking, which according to Donald Shoup of UCLA causes a lot of unnecessary miles; 'In one 15-block business district in LA, cruising for curb parking creates about 950,000 vehicle miles of unnecessary travel per year, equivalent to 38 trips around the Earth or four trips to the moon.'

A significant point to make is that regardless of whether AVs create time savings for travelers, since a person is now free to engage in productive activities while in transit, the opportunity cost of driving is largely alleviated. Thus, AVs would decrease the time costs of congestion even if congestion were not majorly improved. Driverless cars may be customized to become mobile offices, sleep pods, or entertainment centers, and those billions of hours wasted in traffic become opportunities for productivity increases.

Accident Costs

Globally, 1.2million deaths occur each year resulting from car related accidents and another 50 million are seriously injured. Road accident costs, which encapsulate injuries, property damage, and lost productivity, are estimated at $518 billion globally, costing in-

2. Platooning is where vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) wireless communication allows cars to pack tightly together, moving in train-like formation.

3. 'Smart' infrastructure consists of V2V and V2I technology, where vehicle information will be organized on a cloud system and structured to make optimal traffic decisions.

dividual countries from 1-2 per cent of their annual GDP. Significantly, human error is the critical reason for 93 per cent of accidents (Johnson, 2013).

In its current form road pricing is limited in terms of reducing accidents. Since accident numbers increase as congestion increases, road pricing's ability to reduce crashes relies on decreasing the number of cars on the road. The London congestion charge has resulted in a decline in fatalities and accidents, but as mentioned road pricing is only utilised in the city centre, and in 2011 a total of 24,443 road traffic accidents occurred in London. Of these, 159 were fatally injured, 2646 seriously injured, and 26,452 slightly injured (TFL Report, 2012).

Again however, AVs offer a much more effective solution. AVs don't get tired, drink drive, or break the speed limit. Frank Sgambati, a director at Robert Bosch LLC, explains that, 'Bosch is developing next-generation driver assistance systems as it pursues a vision of collision-free driving.' According to the USA Department of Transport, the aforementioned 'smart infrastructure' could mitigate up to 80 per cent of all crashes (KPMG, 2012).

A 2013 report by Eno Transportation Foundation estimated that 21,700 of the 32,367 fatalities in the USA every year could be prevented with a 90 per cent adoption rate of AVs. Hayes suggests that road accident fatalities could eventually approach those seen in aviation and rail, about 1 per cent of current rates; and KPMG and CAR predict an end goal of 'crash-less cars' (Hayes, 2011, as cited in Eno Report, 2013). In addition, according to the NHTSA traffic accidents account for about 25 per cent of all congestion delays. In this regard, an even greater amount of traffic delays could be eliminated (Anderson et al, 2012).

Environmental Costs

Although cars are becoming more fuel efficient, 2.9 billion gallons of fuel are still being expended in the USA alone due to congestion delays. While road pricing is an option regarding internalizing this externality, it is widely accepted that a more cost effective and efficient method is to increase fuel taxes (Fahey, 2004).

In contrast, the adoption of an AV smart infrastructure would see far superior fuel efficiency than even the most fuel conscious driver could achieve today. Platooning would decrease the effective drag coefficient of following vehicles, reducing fuel use by up to 20 per cent. Furthermore, in a virtually crash-free environment, the need for safety features such as reinforced steel bodies, crumple zones, and airbags means that vehicles can become much lighter. A 20 per cent reduction in weight corresponds to a 20 per cent rise in efficiency (Eno, 2013). These lighter vehicles also correspond to less road damage costs, as trucks, which cause nearly all road damage can become significantly less heavy.

The Future Of Road Travel And Road Pricing

After exploring how AVs potentially offer a superior solution to the externalities of driving, one could be forgiven for questioning whether road pricing could become redundant. However, the widespread adoption of AVs will not be without its own problems, and this section actually aims to display how the future will likely see road pricing become more important, effective, and most significantly, viewed in a different way. But before addressing these problems, we must first explore how people will use and view road travel in the future, as only then can we fully build a picture of the future of road pricing.

Mobility-On-Demand

Of all the changes AVs will cause, one of the most significant ones is with regards car ownership. In the future, we may not need to own cars but simply hail one to fulfill all our transport needs. Brad Templeton, adviser to the Google Self-drive car project "call(s) it mobility-on-demand. You pop out your mobile phone, say where you want to go and how many people and in a short amount of time a vehicle rolls up."

Sound familiar? Although the vehicles are not driverless, this mobility-on-demand idea is actually already in practice today. Taxi companies such as 'Hailo' and 'Uber' use 'Smartphone' applications to coordinate a fleet of cars to cater for peoples travel needs on-demand (but significantly, Uber also uses it to coordinate prices). As these companies still require human labour, using their services for all your travel needs is not currently financially feasible. However, remove drivers from the equation and the costs of this mobility-on-demand drop significantly.

Columbia University conducted a case study comparing the impact of having a driverless shared-mobility system over privately owned vehicles in Ann Arbour, Michigan (population-285,000: area-130miles). In 2009, there were a total of 200,000 passenger vehicles, an average of 740,000 trips daily, and vehicles were in use about 5 per cent per day. The study showed that with a fleet of 18,000 AVs, consumers could expect to wait under one minute for a vehicle to arrive, and the vehicle would be used 70 per cent of the time on average between 7am-7pm. AAA estimated that ownership and use of a medium sized car driven 15,000 miles per-year-per-mile costs $0.59 (car, insurance, fuel, repair etc.) compared to $0.41 with a shared fleet of 18,000 in Ann Arbour, a 31 per cent decrease. Furthermore, parking costs would significantly decline as the fleet is in use 70 per cent + of the time.

The Problems:

Induced Demand

As seen in the Ann-Arbour case, with mobility-on-demand one would anticipate a decline in vehicle numbers. However, as having an AV infrastructure increases the capacity of roads significantly we are likely to encounter the problem of induced demand. In the past

governments have increased the supply of infrastructure with the logic that this will result in more space for the current level of cars. But this approach leads to market failure, as the supply and demand for road space do not equate (Fahey, 2004). In essence, increasing the supply of road makes it more attractive to start driving as congestion costs have decreased, and thus it acts only as a short-term solution. This problem is even worse with an AV system. Firstly, those currently under the legal driving age or those unable to drive (disabled, elderly etc.) can now be added to the demand for road space. Secondly, now that it is cheaper, more convenient, and productive to use an AV, those currently taking public transport will have incentive to switch to AVs. As people switch from public transport, a scenario of increased fares and declining service will likely occur, which further exacerbates AV demand. Thirdly, due to a reduced need for parking (which takes up to 1/3 of space in urban areas), cities are likely to become even denser in population, thus further increasing the demand for travel.

Reduced Revenues

Another problem is shrinking government revenues. According to the European Commission (2012), declining government revenues has already become a problem; 'As vehicles become more energy efficient and use alternative fuels' less fuel tax is paid and thus 'the capacity of governments to finance transport infrastructure.. is seriously hampered.' Furthermore, the significantly lower demand for parking with AVs means less pay-and-display and parking fine revenue. When you consider that local authorities in England made £594 million in profits from parking in 2012 this marks a substantial loss in revenue (BBC, 2013). Considering these two problems road pricing takes on a new level of importance, especially regarding raising revenues. To put it into perspective, only £1.2 billion has been raised from the London congestion charge since its introduction in 2003.

How Road Travel & Pricing Could Resemble The Uber Service

By combining the benefits of driverless technology, mobility-on-demand, and these problems, the future of road pricing begins to take shape, and it looks a lot like a large driverless Uber service. The key here is Uber's pricing method. They use 'surge'/dynamic pricing for their mobility-on-demand taxi fleet, which in essence just applies the laws of supply and demand. Prices increase when supply of taxis is low and prices decrease when supply is high. A person can view the price of their intended journey on the Uber app, which also displays how many taxis are available and where they are located. Apply this 'pay-as-you-drive' dynamic pricing system to a shared mobility-on-demand network (essentially the aforementioned 'smart' infrastructure) and the effectiveness of road pricing dramatically increases. Prices change constantly as supply and demand changes, meaning that the externalities of road travel can be accurately internalized.

When roads start moving towards congestion conditions, prices rise significantly, deterring those less in need of the road space to undertake the AV journey.

The obvious obstacle facing this scheme is the same one that has prevented nationwide pay-as-you-drive road pricing schemes to be implemented over the last decade; lack of political will. Simply, paying money for something that used to be free is naturally unpopular, and many also consider road pricing as regressive.

However, a key thing to consider is that people are unlikely to view these road pricing costs in the same way as they do for current road pricing; as an additional cost to the individual cost of driving. As displayed by the Ann Arbour case, the costs per mile of driving with a shared fleet is much lower than the overall cost of buying and having ownership of a car. Thus, people may come to view road pricing as paying for the service of road travel. If one considers that cars are only utilised on average 5 per cent of the time, paying to have it 100 per cent of the time seems clearly allocatively inefficient. Furthermore, with declining government revenues, the obvious efficiency savings of AVs, and potentially lower costs of road travel for individuals, perhaps the incentives will be adequate to facilitate the necessary political will and social acceptance for this road pricing system to become feasible.

Conclusion

This paper attempts to offer a glimpse into the future, firstly highlighting how AVs could offer a far superior solution to the externalities of driving then the current forms of road pricing. But it is also identified that in order to preserve benefits and prevent declining government revenues, road pricing may take on a new level of importance. The second conclusion is that road travel will likely become to be viewed and used in a manner much different of that today, and with this, road pricing has the potential to be implemented far more effectively.

It is important to point out that both these conclusions entail major societal transitions, and will no doubt provoke major resistance. The enormity of the transition to AVs in particular means that nothing can be said with absolute certainty, and the full scale of the economic, political, and social implications cannot be captured within the scope of this essay.

For instance, how will economies deal with the displacement of all those currently employed in unskilled driving (3 per cent of the USA workforce)? How will public transport be affected? And how will AVs be regulated?

Some optimism towards overcoming these obstacles can be found if we look back to the emergence of the first automobiles, where the transition wasn't entirely smooth either.

According to the New York Times in 1902, admiration for the automobile was quickly "succeeded by open hostility." "The cars were scaring the horses and the farmers were shooting the cars" (Silberg, 2013). If the necessary political will and social acceptance can be achieved, the AV provides hope that we one day may prove Smerk's assertion of perpetual congestion to be untrue.

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CONSUMER SPENDING AND FOREIGN CURRENCY

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In January 2002, Italy changed its currency at an exchange rate of 1936.27 lira to one euro.Were there any psychological effects of such a large nominal change in currency on the spending habits of its inhabitants? In this essay, Kit Mattock deftly contrasts two competing theories in behavioural economics in an attempt to discern whether one is more thrifty, or profligate, when using an unfamiliar currency.

Introduction

This essay will outline the components of decision-making exhibited by a consumer when faced with an unfamiliar currency, and analyse attempts to reach a conclusion on the subject. A simple prediction is that the higher a currency's numerosity (i.e. the lower its unit value) relative to an individual's 'home currency', the more likely the consumer is to shy away from purchases bearing the apparently inflated price mark. Indeed, one model predicts this formally - applying a combination of the money illusion phenomenon and the adjustment from an anchor heuristic. Others have found the opposite to be true, however, and use similar biases to explain the apparently common 'play money' effect of holding a budget in a low-value foreign currency.

Theories

Money Illusion and Anchoring

The best example of money illusion is the case of salary change. In one possibility, a 2 per cent rise in salary is received in times of 4 per cent inflation. In the other, a 2 per cent cut is suffered, but there is no inflation. Despite the two instances being mathematically identical in terms of real salary change (and so identical in their supposed impact upon the employee's livelihood), the employee favours the first, because nominal salary rises (Shafir, Diamond and Tversky, 1997, p. 347). Money illusion is, as in this example, an inclination to assess the real value of an economic transaction with a reliance on the nominal factors (Shafir et al., 1997, p. 348). This propensity of people to rely on absolute figures is not necessarily logical or beneficial - it is induced from a desire for speed, ease and simplicity.

In the case given above, if one were to remove the instance of inflation, the choice would not be distorted, and there would be no money illusion. This is not to say, however,

that money illusion is extinguished when there is no inflation to muddy the agent's choices. In fact, money illusion may be beneficially extrapolated to other areas (Shafir et al., 1997, pp. 367-368). The phenomenon can be usefully applied to analyse the behaviour of a consumer when dealing with an unfamiliar currency – or in any other instance where nominal diverges from real.

The unfamiliarity of a foreign currency leaves consumers at a partial loss as to its value in real terms. Raghubir and Srivastava (2002) found that people tend to underspend when the nominal value (the face value) of the foreign currency is a multiple unit of the currency they are accustomed to. Conversely, when faced with an unfamiliar currency holding a face value just a fraction of their home currency, consumers tend to overspend (Raghubir and Srivastava, 2002, p. 346). This they put down to the 'face value effect'. It can be analysed as a combination of the aforementioned money illusion phenomenon and the 'adjustment from an anchor' heuristic.

Research in decision-making tells us that consumers make decisions on and form opinions of the price of goods in relation to a number of factors: the prices of other goods around them and the availability of certain information. 'Heuristics' used in uncertain situations can be regarded as separate to budget constraints. They have been found to be systematic, and therefore predictable. These cognitive shortcuts can tell us a number of things about spending behaviour, and of particular interest in this case (and, indeed, central to Raghubir and Srivastava's face value effect) is the anchor heuristic.

Tversky and Kahneman detail the anchor heuristic as a reliance on 'an initial value that is adjusted to yield a final answer' in the face of uncertainty (1974, p.1128). Citing a number of studies, they conclude that the process 'is usually employed in numerical prediction when a relevant value is available' (1974, p. 1131). This relevant value, used as a reference point, can come in a number of forms. Research presented subjects with random numbers to begin with – these numbers were then seen to influence future judgements. In one such study, estimations as to the percentage of African countries in the United Nations were consistently biased depending on a random number generated from a wheel of fortune (Tversky and Kahneman, 1974, p. 1128). 'Different starting points yield different estimates, which are biased toward the initial values' (1974, p. 1128).

This anchoring heuristic ties in well with money illusion, as Shafir et al. point out in their example of someone trying to sell a house in noninflationary times: 'This person, even if aware of the true value of houses, may anchor on the (historical) price that he paid for the house and may be reluctant to sell the house for less than that nominal anchor' (1997, p. 347). Furthermore, when using an unfamiliar currency, people are even more susceptible to the heuristic (Mussweiler and Englich, 2003, p. 287). The strength of the money illusion bias depends on the salience of the nominal and real representations of a price (Shafir et al., 1997, p. 348), and it is when dealing with a foreign currency that the real price of a product becomes especially obscured. 'A consumer is said to suffer from

money illusion if an increase in his monetary means causes him to feel better off and buy more regardless of what has happened to money prices' (Green, 1976, p. 52). Although this explanation may have been specified towards the behaviour of a consumer under inflation – as was the original description by Shafir et al. (1997) – one can see parallels to the case of the consumer with a foreign currency; the increase in the nominal value of the consumer's monetary means (due to a higher numerosity currency) makes them blind.

Currency

When applied to the instance of a consumer faced with a price in a foreign currency, then, Raghubir and Srivastava (2002) argue that people use the nominal value of the price of a product as an anchor (this is the available 'relevant value'). Having used this '[more] accessible and perceptually salient information' as a starting point, one then inadequately adjusts for the exchange rate (Ibid, p. 336). Raghubir and Srivastava's face value theory can be exemplified thus: a consumer with a home currency of Euros travels to Japan and is faced with the option of purchasing a hamburger for ¥400 – this '400' remains the consumer's anchor. In this uncertain situation (this consumer is unfamiliar with Yen), the consumer finds a 'real' value in Euros – about €2.80. Due to money illusion, the consumer is biased towards the nominal '400' value - with the anchor heuristic amplifying this bias - and underspends. The adjustment to find the real value using the exchange rate is inadequate. A study to explore such reasoning leads the two authors to reach the conclusion that underspending is common in a 'multiple' foreign currency, and overspending is common in a 'fraction' foreign currency (Ibid).

Money illusion is at its strongest under time pressure, and this holds true for the face value effect. As one would expect, the longer a consumer has to adjust to a foreign currency and contemplate the transactions they are doing, the lower the effect (Raghubir and Srivastava, 2002, pp. 343-344). Once one is aware of an anchoring bias, can it be avoided? Not really; Wilson, Houston and Etling make the point that 'they would not know how much to adjust their answer to correct for the bias' (1996, p. 390). The consumer would not know to what extent their purchasing decision had been swayed by the initial anchor and so wouldn't be able to act as if it did not exist. Almost paradoxically, some suggest that high levels of motivation towards making the correct and rational decision may actually increase the effect of such heuristics (Pelham, Sumarta, and Myaskovsky, 1994, p.128). Mussweiler and Englich found that, whilst this is true, the overall effect lessens over time; as is the case with the introduction of the Euro: 'The better people have adapted to the Euro, the less uncertain they should be in making price estimates in Euro, and the less susceptible they should be to the anchoring bias.' (2003, p. 287).

Other conclusions have been reached on the behaviour of a consumer when using a foreign currency. Raghubir and Srivastava's face value effect ignores consumer budgeting,

and arguably to its detriment. By considering that when spending abroad, as at any other time, a consumer assesses their overall budget, Wertenbroch, Soman and Chattopadhyay found that a consumer faced with 'low numerosity' currency (relative to their base currency) spends less than when they are faced with a 'high numerosity' currency (2007, p. 5). This conclusion is in opposition to the one given earlier. The reasoning for this incorporates, as in the previously analysed argument, the consumer's propensity to lean on nominal values:

> "*...a low numerosity currency yields less perceived purchasing power than a high numerosity currency because the difference between the overall budget and category-specific spending (i.e., what is left over in the overall budget after spending in the category) is nominally smaller." (Wertenbroch et al., 2007, p. 5).*

Going back to our Japanese hamburger example, a consumer might have previously allocated a budget to spend on food and other shopping on their travels. This consumer has a monthly income of €3,000 - the budget set aside for shopping when abroad is €500, and in line with the standard theory of budget constraints, the consumer evaluates transactions relative to this reference standard (it is salient and easily compared to). When converted to yen, a 'high numerosity' currency, this budget becomes ¥66,500. The ¥400 hamburger leaves the consumer with a budget of ¥66,100. It is this high-value residual that Wertenbroch et al. reason gives the consumer a heightened sense of purchasing power (2007, p. 5). In other words, the hamburger doesn't seem to leave much of a dent in the tourist's budget – they are left with a high nominal value of ¥66100. The consumer anchors on this high value before insufficiently adjusting for the exchange rate and finding out the real value of their remaining budget (Wertenbroch et al., 2007, p. 3). Conversely, if the consumer were to instead travel to the UK and face the option of buying a hamburger for £2.50, the same action would leave them with a budget of 'only' £417.50. The consumer's perceived purchasing power is diminished.

The real difference between these conclusions, then, is that the former suggests an inadequate nominal adjustment of the price of a product in an unfamiliar currency (thus their 'face value effect'). The latter group found that the inadequate adjustment occurs when converting a residual budget back to the familiar currency. This difference, of course, completely flips the conclusion. Both groups put the inadequacy down to both the money illusion phenomenon and the anchor tendency – the mechanism is the same.

If one were to subscribe solely to the view that budget constraints are managed by ratio assessment, then the above theory would not really hold, as the ratio of hamburger to budget is the same no matter what currency the consumer deals with (about 167:1 in our example). Spending by ratio assessment says that consumers base purchasing decisions on a rough calculation of how many of a certain good they can consume with a given

budget. But Wertenbroch et al. argue that consumers instead compare prices to budget by difference assessment: 'Consumers may take the difference between their budget and the price, showing how much money they will have left over in their budget after the purchase' (2007, p. 3). This allows for the above proposition – that the consumer anchors on the nominal difference between the price and their budget in a foreign currency. It also stands to reason that, when dealing with an unfamiliar currency, a consumer budgets in such a way (for a holiday, a business trip) setting aside an amount for spending and regularly checking its level.

Raghubir and Srivastava do take a similar proposition into account, and acknowledge the 'common wisdom' of the 'play money' effect, where a consumer spends more with a higher numerosity currency because they perceive it as going further (2002, p. 339), but they never formally analyse it or counter-argue - other than to contend that their evidence says the opposite. As pointed out by Wertenbroch et al., their research doesn't bring into account any budget reference point (2007, p.6), which diminishes real-world applicability.

Mental Budgeting

The two theories, the face value effect and what one might call the budget value effect, reach different conclusions primarily because, as discussed above, they assume differing treatment of the consumer's budget. The former assumes the budget is not considered at all, whereas the latter insists it is the budget residual that is the victim of the biases. This conflicting conclusion could be put to good use by considering which kind of person might have a tendency to favour which device.

One study found that mental budgeting, the set of cognitive operations used by people to keep track of financial activities, is less common amongst wealthier individuals:

> *"The financial situation of the household also affects mental budgeting. Less wealthy re spondents (lower household income, smaller net value of the house, and less savings) with more debts practice mental budgeting more often than the wealthy. Possibly, there is less need for mental budgeting as an instrument to economize and to keep control over expen diture, if there is enough money available." (Antonides, Manon de Groot, and Fred van Raaij, 2011, p. 552).*

Mental budgeting is the process by which consumers set budgets for various expense accounts, for example, the 'travelling expense' account this essay is interested in. As money is spent, people assign their expenses to appropriate accounts and periodically re-calculate

the amount of money left in each budget (Heath and Soll, 1996, p. 41). This process is in line with the 'spending by difference assessment' idea, one that supports the theory put forward by Wertenbroch, et al. (2007), and is part of the wider class of consumer behaviour known as mental accounting (Thaler, 1985, p. 207). As quoted above, then, Antonides, et al. found that this is practiced more by less wealthy individuals. As the budget value effect rests on the premise of mental budgeting, it can be concluded that it is more likely a characteristic of less wealthy people.

Conclusion

Whilst money illusion and the anchor heuristic can provide broad insight into consumption behaviour when using a foreign currency, the various theories considered in this essay show that conclusions drawn from such insight can differ vastly. One cause of such difference, the treatment of budget, has been studied in more detail to conclude that the latter of our main consumption theories - spending is higher with a high numerosity currency – holds particularly true for less wealthy consumers. Limited experimentation in the area to date leaves this hypothesis untested.

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The Anchoring and Adjustment Bias in Forecasts of U.S. Employment

Sean Tong
Senior Sophister

The anchoring bias is prevalent in many areas of human behaviour, as auctioneers and car dealers know all too well. However, we assume that professional forecasters should be immune to its effects. In this essay, Sean Tong conducts an elegant and highly original econometric analysis of U.S employment forecasts to reveal substantial evidence of this bias. He concludes by outlining the truly tantalising prospects in the emerging field of behavioural finance.

Introduction

Forecast Rationality

Given the extent to which they inform the activities of investors, expectations play a crucial role in the functioning of financial markets. When data releases differ from those that are forecasted, the effects on asset prices can be substantial (Campbell and Sharpe, 2009). It is of great interest, therefore, to investigate whether these forecasts are accurate – and the nature of the underlying bias if not.

It is typically assumed that expectations are formed rationally, and incorporate all relevant information appropriately. If this were the case, then the expectation error conditional upon the available information set should be a random variable with a mean of zero (Bofinger and Schmidt, 2003):

$$\xi_t = A_t - E_{t-1}\left[A_t \mid \Omega_{t-1}\right] \ , \ \xi_t \sim \left(0, \sigma^2\right)$$

Tests of this hypothesis typically proceed by regressing the actual data release, At, on the forecasted value, Ft. If these forecasts are made rationally, then the result should be a zero intercept and slope coefficient of one:

$$A_t = \alpha + \beta_1 F_t + \varepsilon_t$$

This form of testing has a long history, and the majority of papers reject the null hypothesis of rationality with a slope estimate that exceeds one (Schirm, 2003). This suggests that

consensus estimates of future data are typically too cautious, though findings vary from market to market. At any rate, it seems that professional forecasters do not efficiently process the available information when making their estimates.

ANCHORING AND ADJUSTMENT

Having established the biased nature of financial forecasts, can we make any suggestions as to the foundations of this irrationality? The answer may lie in the seminal work of Tversky and Kahneman (1974), who describe a pervasive heuristic known as anchoring and adjustment. In short, this refers to the tendency for individuals to give excessive consideration to an initial piece of information when making subsequent judgements. Adjustments made away from this "anchor" are typically insufficient, so estimates are biased towards it.

Tversky and Kahneman illustrated this by splitting participants into two groups that observed the outcome of a rigged spinning wheel. In one group the wheel was designed to stop at the number 10, while the other stopped at 65. The groups were then asked to estimate the percentage of African countries that are members of the UN – an assessment that should not have been influenced by the preceding outcome of the spinning wheel. In spite of this, participants in the second group gave significantly higher estimates than those in the first group, as their judgements were anchored to a higher initial value. Monetary reward does not reduce this bias, and neither does accountability (Brewer, Chapman, Schwartz and Bergus, 2007).

These findings have since been extended to a number of domains, using anchors of varying relevance (Ariely, Loewenstein and Prelec, 2003). The cause is simple: when a salient anchor is presented, it serves as the starting point for future estimates. Individuals then adjust away from this point until a plausible value is reached (Epley and Gilovich, 2006). Almost invariably, this point of plausibility does not deviate sufficiently from the initial anchor, and is different from the unbiased estimate that would have been produced if the anchor had not been provided.

Despite the financial and reputational importance of market forecasts, it is not implausible that analysts may produce estimates that are biased in this manner. Indeed, Northcraft and Neale (1987) have shown that experts are just as susceptible as amateurs to the anchoring heuristic, though they are less willing to admit it. The bias is particularly evident when the problem at hand is complex and opaque, as many financial estimates certainly are (Tversky and Kahneman, 1974).

Though the existing literature is relatively embryonic, the initial results are broadly supportive of this hypothesis. Evidence of an anchoring bias has been found in different markets, different countries, and across different periods of time. Bofinger and Schmidt (2003) looked at forecasts of the Euro/US Dollar exchange rate from 1999 to

2003, and found that these forecasts performed no better than a random walk. Significant evidence was found that these forecasts were influenced by past exchange rates; indeed, they were actually more strongly correlated with previous rates than with future ones.

Similarly, Cen, Hilary and Wei (2013) found evidence of anchoring in financial analysts' estimates of firm earnings-per-share (EPS). In this case, the anchor was found to be the forecasted EPS of industry peers. This meant that analysts underestimated the future earnings of firms with forecasted EPS higher than the industry EPS, as estimates were 'dragged' down towards this anchor. Anchoring was also found by Fujiwara, Ichiue, Nakazono and Shigemi (2012), who showed that the forecasts of Japanese equity analysts were biased towards their own past forecasts. In other words, when making estimates of stock prices at some fixed point in the future, analysts showed a tendency to stay close to the forecasts they had given previously – even if material information had arisen in the interim.

In each of these cases, the anchor is one of perceived importance. It is known that the reliance of individuals on the anchoring and adjustment heuristic is directly related to the salience of the potential anchor (Czaczkes and Ganzach, 1996). Thus, values such as past prices or past forecasts are likely to represent suitable anchors in the minds of analysts.

With that in mind, this paper uses Bloomberg survey data to investigate whether there is evidence of an anchoring and adjustment bias in consensus forecasts of monthly U.S. nonfarm payroll employment data. The proposed anchor will be past realisations of these employment figures. Nonfarm payroll data is analysed because of its great significance as a monthly release: it produces the largest interest rate reaction out of all macroeconomic releases, and is currently of particular significance to Federal Reserve monetary policy (Balduzzi, Elton and Green, 2001).

This paper contributes to the existing literature in two ways: firstly by incorporating a consideration of forecast standard deviations into the analysis, and secondly by proposing an alternative to the testing procedure that has typically been used.

The Data

The change in the number of U.S. civilians employed in nonfarm industries is typically announced on the first Friday of each month by the United States Department of Labor. Consensus forecasts and actual realisations of this change were retrieved from the Bloomberg Professional service.

Monthly figures are available from December 1996 to December 2013 inclusive, representing 205 observations. Consensus forecasts are drawn from a Bloomberg survey of market professionals, with a median of 75 participants over the period being considered. The mean, median, maximum, minimum, and standard deviation of these estimates are reported.

EMPIRICAL APPROACH

The empirical approach is comprised of two separate tasks. Firstly, the nonfarm payrolls data will be examined to determine whether the associated forecasts are rational. If they are not, the second task is to determine whether this bias can be explained by the anchoring and adjustment heuristic.

Test of Rationality

In keeping with previous literature, the accuracy of the forecasts will be assessed by regressing the actual monthly data on the median forecasted value:

$$A_t = \alpha + \beta_1 F_t + \varepsilon_t$$

If forecasts are rational, then an intercept of zero and a slope coefficient of one are to be expected. As identified by Aggarwal, Mohanty and Song (2012), this test will be biased towards rejection if the actual or forecasted series follow a unit root process – something that many papers have overlooked. Thus, it is necessary as a preliminary measure to test for stationarity of the series using an augmented Dickey-Fuller test.

Test of Anchoring

Within the limited existing literature, a few different approaches to testing for evidence of anchoring in financial forecasts have been proposed. When fixed-horizon forecasts are considered, as is usually the case in the foreign exchange and equities markets, the authors typically make inferences from the nature of forecast revisions. When forecasts are made on a rolling basis, however, there are no revisions from which to make these inferences, so the problem must be tackled in another manner. The prototype in this regard is the work of Campbell and Sharpe (2009), who considered forecasts of eight macroeconomic variables between 1991 and 2006.

Campbell and Sharpe propose that forecasts are comprised of both an unbiased estimate and (potentially) some consideration of the previous data release:

$$F_t = \lambda E_{t-1}\left[A_t\right] + \left(1-\lambda\right)A_{t-1}$$

If forecasts are truly unbiased then λ should equal one. On the other hand, anchoring would manifest itself in a λ of less than one. If the data "surprise" is defined as the difference between the actual release and the forecasted value, then by substitution it can be shown that the surprise is a function of the forecasted month-on-month change in nonfarm payrolls:

$$E_{t-1}\left[A_t - F_t\right] = \gamma\left(F_t - A_{t-1}\right)$$

Campbell and Sharpe suggest that by estimating this regression, it is possible to infer the underlying value of λ. If the slope coefficient γ is positive, then this implies that λ is less than one – in other words, that forecasts are anchored to past data releases.

Though this method of testing has been used by several authors since Campbell and Sharpe, it should be noted that it makes a very strong assumption about the formation of forecasts: specifically, it assumes that forecasts are perfectly rational in the absence of anchoring. If this is not the case, then the test will be biased towards the null hypothesis. Intuitively, it can be seen that the slope of the proposed regression will be negative any time analysts incorrectly predict the direction in which next month's data will move relative to last month's: if the forecasted change is negative while the actual change is positive, then the surprise term will also be positive.

Thus, incorrect forecasts of the direction of the series are taken as evidence against anchoring, irrespective of how close the forecast is to the previous month's release. Taking even the extreme case where this month's forecast equals last month's realisation, the proposed regression would return a slope of zero and a failure to reject the null hypothesis. It is little surprise, therefore, that Campbell and Sharpe fail to find significant evidence that forecasts of U.S. nonfarm payrolls are anchored on the previous month's release.

Instead, this paper suggests an alternative approach to testing for the presence of anchoring in financial forecasts. The distribution of forecasts will first be compared to that of the actual data series so as to illustrate the pervasive herding and overconfidence that characterise these estimates.

Secondly, it will be shown that forecasts gravitate towards past data. To this end, the correlation between forecasts and previous releases will be compared with the correlation between the true data and its own past. The absolute deviation of forecasts from the previous month's release will also be compared to the absolute changes in the true series from month to month.

Finally, a regression will be run to test whether the data surprise is a function of the previous period's surprise and the change in the true series:

$$\left(A_t - F_t\right) = \alpha + \beta_1\left(A_{t-1} - F_{t-1}\right) + \beta_2\left(A_t - A_{t-1}\right)$$

It is expected that both slope coefficients will be positive. In the first case this would imply that the forecast surprise is a positive function of the previous surprise – in other words, periods of excessive optimism or pessimism tend to follow one another. In the second case, this would suggest that pattern of forecast surprises is consistent with anchoring to past data.

If analysts' estimates exhibit anchoring, then increases in the true series should be associated with positive surprises, and decreases should be associated with negative surprises. Taken in isolation, none of the previous tests would be sufficient to conclude that analysts are susceptible to the anchoring and adjustment bias. As a collective, however, it is hoped that the weight of evidence will be suitably consistent so as to support or reject the underlying hypothesis.

RESULTS

Test of Rationality

The augmented Dickey-Fuller tests rejected the null hypothesis of unit root and non-stationarity for the actual data series ($Z = -8.12$, $p < 0.001$) and the median forecast series ($Z = -3.79$ $p < 0.01$).

Having established the stationarity of these series, the regression of actual non-farm payroll data on the median forecasted level was run. The Breusch-Pagan test suggested that heteroscedasticity may be present in the data ($\chi 2 = 7.52$, $p < 0.01$), so robust standard errors were used. The results are presented in Table 1.

$Y = A_t$	Coefficient	Standard Error	*t*-statistic	*p*-value
F_t	1.1826	0.0512	23.10	< 0.001
Constant	–25.0414	9.3265	–2.68	< 0.01

Table 1: Regression of actual data on median forecast

Consistent with previous research, the null hypothesis of rational forecasts was overwhelmingly rejected at the 5% significance level. The slope coefficient exceeds one, as Schirm (2003) suggested was typical. The next task is to establish whether this bias is consistent with anchoring and adjustment, as hypothesised.

Tests of Anchoring

A brief inspection of the available data is enough to suggest that some degree of forecast inertia is present. Data surprises seem highly persistent: during the financial crisis, for instance, analysts' forecasts were overly optimistic for sixteen consecutive months. Indeed, the relationship between average forecast errors and GDP is quite striking, as illustrated in Figure 1.

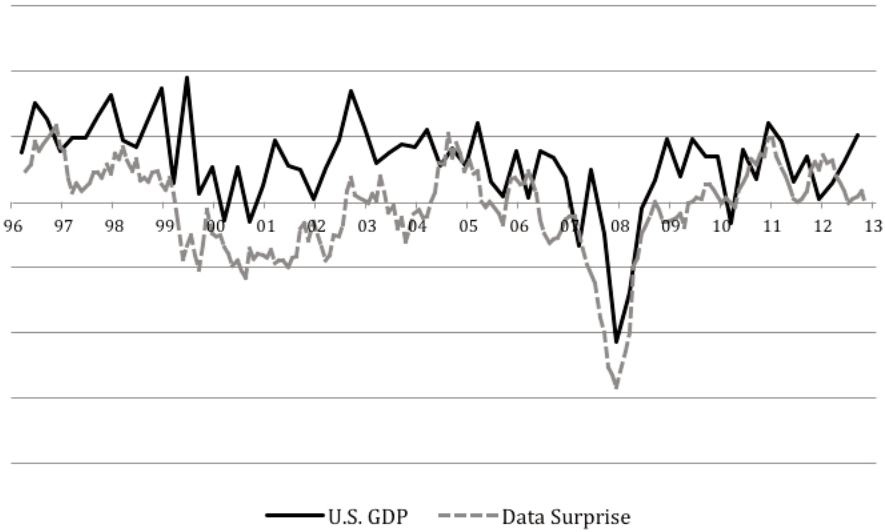

Figure 1: Average data surprise vs. quarterly GDP

The persistent periods of optimism and pessimism depicted in this chart are a reflection of the herding that is prevalent in analysts' estimates. The distribution of estimates across the many analysts who are surveyed by Bloomberg is very narrow, and implies a degree of confidence that is not warranted by the available information set.

To illustrate this, Table 2 reports the percentage of monthly observations for which the associated forecast error is greater than the indicated number of survey standard deviations. Half of the consensus forecasts were more than two standard deviations away from the true release, and a third were greater than three standard deviations away. Incredibly, almost 40% of actual nonfarm payroll releases were larger than the maximum estimate or smaller than the minimum estimate in the survey that month. If nothing else, this illustrates the "strength in numbers" mentality of financial analysts.

Size of Forecast Error	Percentage of Observations
> 1 standard deviation	67.20%
> 2 standard deviations	50.00%
> 3 standard deviations	33.33%
> 4 standard deviations	22.04%
> 5 standard deviations	15.59%
Outside max-min range	38.83%

Table 2: Forecast errors and standard deviations

As well as being biased, therefore, it is clear that analysts' forecasts can often deviate substantially from the true change in unemployment. Are these deviations consistent with reliance on the anchoring and adjustment heuristic? In order to test this, the relationship between the true, forecasted and previous values were analysed.

It was first found that analysts' forecasts are more highly correlated with the previous month's data release ($r = 0.8650$) than the actual data series was with its own past ($r = 0.7136$). This difference was significant at the 5% level ($Z = 4.69$, $p < 0.001$), suggesting that the relationship between forecasts and previous realisations is stronger than would be the case if these forecasts were unbiased.

The second consideration was the extent to which analysts' estimates deviate from the previous month's release. Comparing the mean absolute value of this deviation ($Ft - At\text{-}1$) with the mean absolute change in the data series itself ($At - At\text{-}1$), it was found that analysts' forecasts are too closely tied to past changes in employment ($\mu 1 = 90.5$, $\mu 2 = 109.9$, $t = 2.22$, $p < 0.05$). In other words, the estimates seem to gravitate towards the observable data rather than deviating to the extent that the true series does.

The final aspect of the testing procedure is to regress the current data surprise on the previous month's surprise and the month-on-month change in nonfarm payrolls, as described previously. Heteroscedasticity was once again deemed to be a concern ($\chi 2 = 33.78$, $p < 0.001$), so robust standard errors were used. The results are presented in Table 3.

$Y = (A_t - F_t)$	Coefficient	Standard Error	*t*-statistic	*p*-value
$(A_{t-1} - F_{t-1})$	0.5971	0.0621	9.61	< 0.001
$(A_t - A_{t-1})$	0.5801	0.0838	6.92	<0.001
Constant	-3.6117	4.7838	–0.75	> 0.05

Table 3: Regression of surprise on previous surprise and monthly change

The model was significant at the 5% level ($F = 46.22$, $p < 0.001$, $R2 = 0.60$), and the Variance Inflation Factor values were substantially below those that would indicate a multicollinearity problem. As expected, both slope estimates were found to be significantly positive.

The relationship between the current surprise and the previous one is consistent with the persistence of forecast errors that was previously depicted in Figure 1. It implies that positive surprises follow one another, as do negative surprises. This is a reflection of the apparent inertia of analysts' expectations, as they are slow or unwilling to incorporate new information.

The positive relationship between the surprise term and the change in the true series is also consistent with anchoring. It suggests that forecasts are typically too low

when this month's change in nonfarm payrolls is greater than that of the previous month, and are too high when the series is declining. In conjunction with the previous findings, this suggests that analysts' estimates are biased towards the previous realisation.

Conclusion

Consistent with the existing literature, it has been found that professional forecasts of U.S. employment data are significantly biased. This bias is such that estimates do not deviate sufficiently from past observations, and their error terms are a function of the observable data. In both these respects, the evidence is supportive of the hypothesis that financial analysts are susceptible to the anchoring and adjustment heuristic, as described by Kahneman and Tversky.

Though the empirical testing of this hypothesis is complex, the weight of evidence presented here is certainly consistent with it. In isolation, the alternative tests described in this paper are insufficient to conclude the precise form and foundation of the forecasting bias; in conjunction, however, they certainly provide a basis for such a claim. Given the complexity of the problem, there is little doubt that the appropriate testing methodology could be further refined and modified. Future research may concern itself with the possibility of alternative anchors, such as a moving average of past data realisations or the forecasts of peers.

It is also surprising that the existing studies focus almost exclusively on the relationship between data forecasts and the 'true' values that are initially announced. Given that these initial releases are often mere estimates that are subsequently revised and updated by the relevant institutions, it would be interesting to investigate whether forecasts are similarly biased with respect to these more final data announcements.

As one of the more recent endeavours within behavioural finance (itself a relatively new field), the search for causes of expectation biases is far from complete. Indeed, there is much still to be discovered: as new concepts and methods are unearthed, it will be exciting to see how these are applied to long-standing issues within the study of finance as a whole.

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The Free Provision of Anti-Malarial Nets: Inefficient and Counterproductive Aid?

Catalina de la Sota
Senior Sophister

By drawing upon a range of academic literature, Catalina de la Sota makes the hypothesis that the free provision of Insecticide-Treated Nets (ITNs) may have no adverse effects on usage of ITNs provided households are well educated with regard to the correct usage and potential benefits of ITNs. Furthermore, the author postulates that this free provision may lead to more sustained use of ITNs and benefit long term development.

"Give a man a fish and you feed him for a day; teach a man to fish and you feed him for a lifetime."

Introduction

Numerous Least Developed Countries (LDCs) have remained in a poverty trap despite having received important amounts of foreign aid. This has led various observers to conclude that aid has been largely inefficient and might have done more harm than good. An illustration often repeated in criticisms of aid is that of free provision of anti-malarial nets. Their free provision is allegedly inefficient, because it leads to misuse, and counterproductive since it prevents the development of a local mosquito net retailing market.

This paper will draw from experimental economics to assess the impact of free net distribution on short and long-term development. It will first present the arguments whereby free distribution is an example of a poor aid policy. Then, the essay will succinctly touch upon the mechanisms behind the claims of those advocating free distribution or those supporting cost-sharing programmes. These views will finally be assessed in the light of various experiments conducted in malaria-ridden regions.

It is not in the scope of this paper to address the broad question of humanitarian aid's effectiveness, but field studies will allow assessing of the performance of the individual aid policy of anti-malarial prevention. This paper will stress that education is key to any free distribution scheme. Providing a fishing rod is beneficial, as long as the fishing instructions are sent alongside.

Ineffective and Counterproductive Humanitarian Aid?

Fierce criticisms of foreign aid can be found, among others, in the works of William Easterly and Dambisa Moyo. Both take the free provision of mosquito nets as an illustration of the inefficiencies and harmful effects of aid.

For Easterly, free net distribution often conduces to the misuse or wastage of nets since people do not value equally an item they were given for free and one they paid for. It is, then, not surprising to see images of mosquito nets being used as fishing nets. Since these were provided for free, they were inefficiently allocated and ended up being wasted. More broadly, large amounts of foreign aid are misallocated and sent for projects that are not necessarily valued or useful to solve local problems (Easterly, 2006).

In her much-commented Dead Aid, Dambisa Moyo scales up the above criticism by stating that aid can hurt long-term development. The author presents the example of an African mosquito-net producer who is forced out of business after the market was flooded with free nets by a "vociferous Hollywood movie start." (Moyo, 2009: p.44) In the short-term, the intervention was urgently needed for a positive impact on malaria prevention; yet it turned out to be detrimental to sustainable development. Similarly, many other aid programmes hinder long-term development.

Is aid inefficient? Has it done more harm than good? "Sadly we don't know, and worst of all, we will never know," as Esther Duflo put it (Duflo, 2010). One can analyse how LDCs have performed during decades of aid provision. But no definite conclusion on the impact of aid on such a performance can be drawn since the counterfactual case, (i.e. the scenario where no aid whatsoever was granted during the same period), is unknown. By contrast, the impact of individual aid projects can be determined through experimentation. Experimental economics, by using randomized controlled trials, has thus gained increasing attention. The free provision of mosquito nets has been evaluated in various experiments.

Malaria, Insecticide-Treated Nets (ITNs), and the Debate Underlying their Distribution

Malaria led to 660,000 deaths in 2010, 90 percent of which occurred in the African continent. No successful vaccine has been found to date, and the most popular prevention means remains mechanical through devices such as ITNs (Economist, October 12 2013). An ITN is a "net that repels, disables and/or kills mosquitoes coming into contact with insecticide on the netting material" (World Health Organization, 2007: p.2). Since over half a million deaths a year could be prevented if bed nets were widely available, and given their rather modest provision costs, ITNs are formidably cost-effective (Heierli and Lengeler, 2008: p.7).

Retailing at four to six dollars, what appears cheap from the perspective of a donor agency is unaffordable to most poor households, leading observers such as Jeffrey Sachs to advocate free distribution. Sachs noticed that rural poor households in Kenya "cannot afford the bed nets, which [...] are too expensive even when partially subsidized" (Sachs, 2005: 230). Given the prevalent below target coverage level, the World Health Organization (WHO) has recommended free distribution since 2007. Coverage of over 50 percent is needed for a strong incidence on mortality according to Hawley et al. (2003: p.126). No cost-sharing system has proved the ability to achieve this target so far.

As was previously touched upon, others such as William Easterly state that nets should be partially funded rather than entirely free. First, pricing triggers a selection effect, whereby nets go "to those who both value them and need them" (Easterly, 2006: p.12). There can also be psychological effects from not using a purchased product if households experience sunk costs (Arkes and Blumer, 1985). Price may be interpreted as a signal for quality, leading to greater wastage of nets distributed for free since households do not value them much (Bagwell and Riordan, 1991). While pricing may influence usage of nets, it can additionally induce long-term development issues. Local producers of anti-malarial nets may for instance go bankrupt if the market is flooded with free nets as was already suggested (Moyo, 2009).

Three Questions for Field Experiments

There are three major questions to address so as to determine the impact of ITN free provision on short and long-term development.

(i) Will a free distribution scheme or a cost-sharing scheme allow the attainment of the minimum coverage needed to effectively fight malaria?
(ii) If anti-malarial nets are provided for free, will households adequately use them?
(iii) Will the free provision of nets interfere with long-term sustainable development advances?

Various field experiments provide conclusive evidence on these matters.

(i) Price and Demand for ITNs

Jessica Cohen and Pascaline Dupas test the impact on usage and net-uptake of ITNs under free provision compared to cost-sharing in Kenya (Cohen and Dupas, 2010). They find that demand slumps as the price turns positive. With an increase from 0 to $0.60, a price still corresponding to a 90 percent subsidy, uptake of ITNs drops by 60 percentage points. The authors consider this finding surprising and mention it as the "main result of the paper" (Ibid: 20).

Since Kenyan households are aware of the effectiveness of anti-malarial nets, they should unambiguously attempt to purchase a highly subsidized ITN. However, it seems

likely, as proponents of free distribution posit, that extremely poor households trade long-term disease prevention for immediate subsistence needs. Sachs noted how destitute households cannot afford to pay a small amount for a life-saving device (Sachs, 2005). Various studies additionally grant support to this proposition. An experiment in India found that a significantly higher number of households purchase an ITN when able to do so through a micro-loan scheme as opposed to relying on personal cash. Nevertheless the micro-loan option leads to a far weaker coverage than free distribution (Tarozzi et al., 2013). Similar results appear for other health products such as deworming devices. A study showed how a free deworming drug programme in Kenyan primary schools led to a far greater uptake, and ultimately positive impact on health, than any of the cost-sharing schemes that the authors analysed (Kremer and Miguel, 2007).

Therefore, Cohen and Dupas' finding of the impact of price on uptake may not be necessarily surprising. It does however offer conclusive evidence to answer the first question at hand. With a system whereby households pay only a negligible fraction of the price of an ITN, uptake is significantly lower than under a free provision scheme.

(ii) Price and Usage of ITNs

Cohen and Dupas' study truly marks a milestone when no indication is found that charging a positive price reduces the likelihood of misuse. Selection and psychological effects were insignificant and women who were given a free ITN were not less likely to hang it than women who had paid for one. The authors justly dismiss qualitative effects. ITNs have been heavily advertised and Kenyan households are aware that the actual unsubsidized price of nets is much higher, implying that they value equally a free net and a partially free one (Cohen and Dupas, 2010: pp.5-6).

Yet the prevalent awareness of ITNs among the experiment's subjects might be a caveat. The authors admit that given the study's particular context, the results might not be applicable to other less known health products. But the analysis might not be generalisable to nets themselves. In malaria-ridden regions where knowledge of ITNs is not widespread, qualitative effects could enter the equation. Free distribution could be interpreted as a signal of suboptimal quality, increasing the likelihood of wastage. It follows that in order to make a generalisable conclusion, (i.e. to achieve external validity), it would be interesting to replicate Cohen and Dupas' study in other regions where education on ITNs has been minor.

Two conclusions could ensue from the new experiment. Either price has no effect on usage regardless of anti-malarial net awareness, meaning that qualitative effects can be eliminated altogether, or price has no impact as long as households are aware of the benefits of anti-malarial nets, suggesting that the occurrence of qualitative effects is contingent on ITN educational level. The second scenario is more likely given how qualitative effects can be expected to play out. Thus, if qualitative effects prove to be significant,

the answer to question (ii) would state that price has no impact on ITN usage, as long as households are widely aware of ITN benefits.

An experiment conducted by Ashraf, Berry and Shapiro finds that price may have an effect on the usage of water-treatment products (Ashraf et al., 2010). The finding could be interpreted as evidence in support of the hypothesis that education is key to any free distribution scheme. Water treatment products are less known than ITNs and this could explain the variation in use between individuals having paid a different price. It would be enlightening to conduct the same experiment after an awareness campaign on the benefits from using water-treatment devices. It can be posited, given the above reasoning, that such an experiment would find no evidence of an impact of price on usage.

Yet, the finding that price has no effect on use might not be replicable to health products of a different nature such as curative ones. Pricing appears to trigger a selection effect in the case of malarial remedies. After a highly subsidized distribution programme of malarial pills, close to half of the medicine was found to be allocated to individuals who did not have malaria (Cohen et al., 2013). This study seems to prove Easterly's case by showing the potential inefficiencies of free distribution. Curative campaigns appear much more complex to successfully carry out than preventive ones given issues such as misdiagnosis (Adhvaryu, 2012). Further research on the issue would be insightful to determine the extent to which the finding that price has no effect on ITN usage can be mirrored to curative health products.

(iii) Price and Long-Term Development

If free distribution is efficient when it is accompanied by awareness education, might it not hurt sustainable development? Similar concerns have lead various observers to advocate cost-sharing to ensure the development of a sustainable local commercial market (Mushi et al., 2003). Additionally, aside from potentially hindering the local production of nets, free distribution schemes carry an underlying risk of being short-lived and even fickle depending on the donor, thus threatening positive advances in malaria prevention.

The main mechanism underlying a potential negative relationship between short-term subsidies and long-term uptake lies in a reference-dependence, or anchoring effect. The highly subsidized - or zero - price sets a precedent and becomes the price households expect in the future for the same product, whether it is subsidised or not. Dupas tested the impact of short-run subsidies on long-run uptake of nets in Kenya and could not verify this reasoning. No indication was found that a once-off subsidy decreases households' willingness to purchase a net later. The experiment further showed that the subsidy rather surprisingly increased net purchase intentions. The author linked this observation to the playing out of a learning effect. The use of an ITN triggers a form of learning-by-doing mechanism also benefiting the wider community through social learning. This ultimately increases the demand for nets and overrules the occurrence of anchoring

effects (Dupas, 2013).

This study may exhibit a similar caveat to Cohen and Dupas', since it was conducted in the same environment with a widespread awareness of ITN benefits. Households might be more inclined to buy an ITN regardless of the initial subsidy. However, the result is compelling and suggests that "people don't get used to handouts, they get used to nets" (Duflo, 2010). Following the previous reasoning, it would be insightful to replicate the experiment in a different context. However, qualitative effects might prove less important in this case. While awareness campaigns on the benefits of using nets may be key to the success of anti-malarial programmes, the greatest learning likely comes from a household's daily use of a mosquito net. If households discover the benefits ITNs by having one, and if they get accustomed to using it, they are likely to purchase a new net after the previous one wears out. Hence it can posited that the free provision of ITNs is unlikely to hurt long term development. However, more importantly, it might foster sustainable development through learning mechanisms.

Free Distribution in Light of the Evidence

We are now in a position to suggest preliminary answers to the three questions initially offered.

(i') Given the strong demand elasticity of ITNs deriving from poor households' cash constraints, only distributing nets for free will allow the attainment of the coverage needed to effectively fight malaria.

(ii') If anti-malarial nets are provided for free, and as long as awareness of the benefits of ITNs are widespread, households are likely to adequately use them.

(iii') The free provision of nets is unlikely to interfere with long-term sustainable development advances. It might further encourage the emergence of local markets after the playing out of learning effects.

These answers are preliminary given that further research is needed to determine to what extent findings ii') and iii') can be generalised. While the experiments analysed in this paper allows us to infer these answers with a certain degree of confidence, it would be insightful to replicate the studies in different settings as suggested earlier. Statement i') can be considered significant since it has largely been supported by evidence from numerous studies previously touched upon. The general conclusion tends to agree with proponents of free distribution. In fact, Cohen and Dupas' paper marked a turning point in the debate. Easterly acknowledged "I originally thought there was some evidence for charging being better than free. Some new studies suggest free is more likely to get the bed nets out there" (Easterly, October 4 2011).

Lengeler et al. nevertheless note how the complexities arising in the fight against

malaria mean that there is no "one size fits all" solution (Lengeler et al., 2007). While Cohen and Dupas' (2010) as well as Dupas' (2013) results offer optimistic implications for malarial humanitarian interventions, there is a slight possibility that the results do not apply similarly to other experimental settings. However, this paper hypothesizes that such differences would be due to different awareness levels. After a significant awareness campaign, the findings should come closer to the those observed in the studies conducted in Kenya and analysed in this essay. More importantly, while free distribution is certainly the optimal solution to achieve a strong impact against the disease, it may not be realistic to assume it will always be feasible. Donor money may not necessarily be expected to flow during an extended time frame. Thus, limited cost-sharing programmes may still be needed. These should be carefully designed so as not to deny the poorest households access to anti-malarial nets.

Conclusion

This paper attempted to assess whether or not the free provision of anti-malarial nets is an illustration of an inefficient and counterproductive aid policy as William Easterly and Dambisa Moyo have hypothesised. Three major questions were posited so as to guide the research into various field experiments, and certain answers called for further research to be conducted.

It was first found that it is only truly with free distribution that the coverage needed to effectively fight malaria will be attained. The second finding stated that if anti-malarial nets are provided for free, and as long as awareness of the benefits of ITNs is widespread, households are likely to adequately use them. Finally, it is demonstrated that the free provision of nets is unlikely to interfere with long-term development, and might further encourage the emergence of local markets.

The second set of findings, while compelling, was deemed preliminary since it was mostly based on studies conducted where awareness of ITNs was widespread. It is important to replicate the experiments in different settings to determine to what extent the answers would differ. This paper hypothesizes that as long as educative campaigns on ITNs are efficiently conducted, the answers would not significantly change.

The key to a successful free distribution scheme is education. One should not provide the fishing rod without the instructions. Therefore, while one cannot empirically test the general arguments of Easterly and Moyo's respective books, it can be concluded that their use of ITN free distribution as an example of an inefficient and counterproductive aid policy is not justified.

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EDUCATION DEVELOPMENT: IMPORTANCE, CHALLENGES AND SOLUTIONS

COLIN POWER
Junior Sophister

Colin Power investigates the necessity of education for fostering economic development in this thorough and highly informative essay. He examines the multitude of important effects that education has on health and welfare within a country and raises a number of salient issues which need to be addressed in order to best promote development worldwide.

Introduction

Education can be seen as both an objective and component of development, as well as "fundamental to the broader notion of expanded human capabilities that lie at the heart of the meaning of development" (Todaro and Smith, 2011, p.359). This essay argues that investment in education is essential for development, but also that the form this investment takes is of critical importance in addressing the key challenges to educational outcomes in less developed countries (LDCs) and indeed in the achievement of developmental goals. This essay will discuss the importance of education, and the problems that tend to occur in this sector within many LDCs, with a particular focus upon absenteeism and gender inequality, as well as possible solutions to these problems. This essay will finally discuss some of the possible policies that may be implemented by governments in LDCs, particularly the efficacy of conditional cash transfer programs, as well as simple and cost-effective policy proposals to enhance educational outcomes within LDCs.

Academic Foundation

Aside from the intrinsically important goal of the expansion of human capabilities, there is both significant theoretical and empirical basis for the assertion that human capital, and education in particular, is essential for both economic growth and development; numerous models of economic growth include human capital as an important explanatory variable in the achievement of economic growth. Most notably endogenous growth theory asserts that investment in human capital will significantly contribute to economic growth, and indeed foster development (Romer, 2011). Furthermore, Mankiw et al. demonstrate that an augmented Solow model of economic growth that includes human capital is superior

in its predictive power of growth (Mankiw et al., 1992). And similarly, Jones asserts that extending the original Solow model to include the investment of resources in skills accumulation, as well as in physical capital, is superior in explaining variation in wealth across countries (Jones, 2002). The effect of human capital upon aggregate income and development can thus be seen to be of "central importance" to policymakers and economists when considering the essential nature of human capital in development outcomes (Acemoglu and Angrist, 2000).

Educational Effects

Educational Effects on Income

Investment in education is widely considered to be of vital importance to development (Kremer, 2003) for myriad of reasons; indeed human capital and particularly education is arguably the most significant factor in regional differences in development (Gennaioli et al., 2011). Increased income levels are both a cause of, and indicative of, economic growth and development in a country and investment in education maintains a positive effect on both private (Acemoglu and Dell, 2010; Duflo, 2002) and aggregate levels of income (Acemoglu and Angrist 2000). While individual income levels are also a result of numerous other factors such as labour market structures (Pugatch, 2011), political system and stability, level of education remains the most significant explanatory factor in levels of income within countries (Acemoglu and Dell, 2010) and thus investment in education contributes to higher levels of both private and public income; increased income allows for greater autonomy and purchasing power for individuals, and a state which is better able to achieve its developmental goals.

Educational Effects on Human Capacity

Investment in education can also significantly contribute to the expansion of human capabilities, which is a key aspect of development. This idea is expressed by Sen who asserts that a person benefits from education "in reading, communicating, arguing, in being able to choose in a more informed way, in being taken more seriously by others and so on" (Sen in Todaro and Smith, 2011, p. 359); this could even include better decision-making, more engagement in the political process and positive spillover effects to those around the educated person, in reading to others, or providing beneficial innovations to a wider community (Todaro and Smith, 2011, p. 365). This increased human capability as a result of education is vital to consider as part of the significant benefits of investment in education, and its essential place at the heart of development.

Educational Effects on Foreign Technology Assimilation

Investment in education also allows for easier assimilation of foreign technology, and both convergence and development are assisted as technology transfer is made more efficient with greater education (Jones, 2002, p.63). According to Jones, technological progress can be viewed as the 'engine of economic growth'; this technological progress can be significantly catalysed by the introduction and efficient adoption of foreign technologies (Jones, 2002, p. 63, 120), and human capital maintains a vital role in this process (Todaro and Smith, 2011, p.359).

Educational Effects on Health Outcomes

The close relationship of the health and education elements of human capital leads to numerous externalities in both policy areas that affect the other (Todaro and Smith, 2011, p.361-2) and policy performance in one of these areas almost necessarily impacts the other. This essay acknowledges that the health sector is a key component of development, and its relationship with education is one of huge significance in encouraging development. Health is undoubtedly a "prerequisite for productivity" (Todaro and Smith, 2011, p.359) in any state, and low levels of health should be regarded as a significant constraint on aggregate production and development (Todaro and Smith, 2011, p.359). Indeed Schultz argues that low levels of health is the single most significant human capital factor that has hindered development in Africa (Schultz, 1999). One of the most significant externalities of education is in its capacity as a foundation for further learning; many health programmes in LDCs are reliant on basic skills learned in schools such as literacy and numeracy, and improvement in these areas of education could yield large positive effects in the health sector (Todaro and Smith, 2011, pp.361-2). Similarly, educational quality maintains important externalities in the further training of health professionals, who are often reliant on skills learned through previous schooling in later training; schools are also able to use their capacities to teach basic sanitation and hygiene to huge numbers of people in LDCs, thereby reducing the spread of disease and also reducing pressure on the health systems of the state (Todaro and Smith, 2011, pp.361-2). Other educational externalities that should be considered are the positive relationship between education and later childbirth and fertility rates, as well as the effects of higher income on health as a result of increased education (Todaro and Smith, 2011, pp.361-2). Education can thus be seen to have a central role in loosening the tight constraint of low levels of health on developmental progress, and in alleviating the insidious and challenging 'disease burden' of many LDCs (Todaro and Smith, 2011, pp.390-1); the presence of numerous educational externalities also suggest an important role for governments and policymakers in educational investments.

Challenges to Education

Absenteeism

One of the most damaging problems that affects development in the human capital sectors in LDCs is that of absenteeism; particularly the absenteeism of service providers in education which is "widespread and unpredictable" (J-PAL, 2009, p.1) and contributes to low levels of educational outcomes. This prevalence of absenteeism is negatively correlated with economic development and income and thus poorer countries suffer more than wealthier states (J-PAL, 2009, pp.1-3). However, there is significant evidence that some relatively low cost and targeted investments can be highly effective in combating service provider absenteeism in LDCs, particularly through the implementation of external monitoring, accompanied with impersonal and direct incentives for attendance as well as punishment for absenteeism (J-PAL, 2009, pp.1-3). This is further supported by Duflo, et al. who tested the effects of monitoring, where attendance is monitored using a tamper-proof camera, as well as financial incentives, on teachers' absenteeism; they found that absenteeism decreased significantly with the introduction of this relatively simple monitoring system, and observed an increase in students' test scores (Duflo et al., 2010). The problem of absenteeism also extends to students in many LDCs, where absence is often caused by health problems such as malnutrition and disease that are a far higher cause of student absenteeism in LDCs than in developed countries and this exacerbates the already existing gap in years of schooling between these regions and states (Todaro and Smith, 2011, pp.360). Miguel and Kremer's analysis of a relatively simple and cheap school 'deworming' scheme in Kenya found evidence that this 'deworming' had a positive effect on both school and health participation, as well as decreasing student absenteeism by up to 25per cent (Miguel and Kremer, 2004). Investments in education are of vital importance to development, and investments in solutions to the problem of absenteeism, such as those outlined above, that are cost-effective and dynamic in their application can play an enormous role in ameliorating human capital and fostering development within LDCs.

Educational Gender Gap

There exists an extensive gender gap in educational sectors in many LDCs (Todaro and Smith, 2011, pp.373) which is a significant problem as, besides the intrinsic injustice of its existence, it is a considerable hindering factor in the effectiveness of human capital as an essential component and driver of development. There exists a particularly large gender gap in education, which hinders economic development mostly in 3 ways: firstly, the rate of return on expansion of basic education of females is extremely high, considerably higher than mens' in most LDCs (Psacharopolous, 1994); higher even than the return on investment in many large public infrastructural projects (Todaro and Smith, 2011, pp.374-5). Investment in women's education also results in numerous other benefits including greater labour force participation, later marriage and childbirth, lower fertility rates and hugely

improved child nutrition and overall health (Todaro and Smith, 2011, pp.374-5; Glewwe, 1999). Thirdly, according to Todaro and Smith "because women carry a disproportionate burden of poverty, any significant improvements in their role and status via education can have an important impact on breaking the cycle of poverty and inadequate schooling" (Todaro and Smith, 2011, pp.374-5). The existence of this gender gap is somewhat indicative of, and symptomatic of a larger issue of inequitable distribution of resources throughout LDCs, particularly in education, and it is a topic that should be of definite concern in the discussion of human capital investment being essential for development.

Policy Implications

Role for Government

This essay argues in favour of educational investments in LDCs as a means of encouraging development. However, it is also the argument of this essay that the method, structure and focus of these investments is hugely important in determining how effective developmental outcomes of any such investment will be, and therefore a focus on the role and responsibility of policymakers and government in education provision is of vital importance in determining the efficacy of investment in this sector. The necessity of focusing upon the role of government intervention in education provision is largely a result of four factors: the fact that higher private incomes do not necessarily lead to improvements in education (Todaro and Smith, 2011, p.360, 403), the existence of market failures leads to outcomes in educational provision that are socially sub-optimal, the fact some government policies can lead to distortions in education provision and even act to perpetuate and exacerbate inequities in education systems (Todaro and Smith, 2011, p.403) and finally the concept that resources alone are not enough to ensure beneficial outcomes in education, that the structure and implementation of investments are enormously salient in the encouragement of development through educational investments (Banerjee et al., 2007).

Conditional Cash Transfers

There are numerous policies that this essay would support in order to encourage more socially optimal outcomes in education, and that could be undertaken to best ensure that investments in education promote development most effectively. The first of these is the implementation of conditional cash transfer (CCT) schemes; whereby welfare payments are directly made to people in poverty with conditions attached, such as payments in exchange for children's school attendance or completion of vaccination schemes. The distributions of income, educational opportunities and services across LDCs are highly unequal, and CCTs are a highly effective method of combating this inequity through targeted redistribution. The effectiveness of CCTs in yielding improved development outcomes, largely through improvements in human capital outcomes, is widely supported by empirical evidence across LDCs, and indeed across multiple policy areas; as Rawlings

and Rubio note, they are effective at "increasing enrolment rates, improving preventive health care, and raising household consumption" (Rawlings and Rubio, 2005 pp.29). In Brazil for example, CCTs have incentivised and therefore increased school attendance (The Economist, 2008); they have also been more effective at reaching those regarded as the 'most poor' than almost all previous social welfare schemes in the country (The Economist, 2005). There is also some evidence to suggest that CCT's may be able to redress the gender imbalances that exist in LDCs as discussed earlier in this essay; they can be used to redistribute more education towards females, the benefits of which have also been discussed earlier in this essay. The cost of this would arguably be outweighed by the social benefits alone (Todaro and Smith, 2011, pp.375), such as in Brazil, where money from CCTs is given to women, thus giving them more control over spending decisions as they are seen as more likely to spend money on children (and particularly female children) than men (The Economist, 2005).

Information Provision

Another cost-effective and relatively simple policy that this essay argues would be beneficial for policymakers in many LDCs to pursue would be to combat informational and perception problems, particularly those concerning education. As noted in Jensen's study of the Dominican Republic, there often exists a significant gap between perceived returns to schooling and the actual rate of returns; very cost-effective and simple government information distribution schemes can be effective in diminishing this information gap and increasing school attendance (Jensen, 2010).

Schooling Costs

This essay also agrees with Jensen's support of decreasing costs of education in LDCs, which is empirically and intuitively an effective policy for increasing educational attendance. Indeed as Kremer asserts, using a stylized model of education, simple and cost-effective policies such as decreasing costs of education and provision of school meals can yield significant results in increasing school attendance and expanding educational involvement (Kremer, 2003).

Conclusion

This essay has argued that investment in education is essential for development; largely by discussing the problems that occur as a result of sub-optimal levels of education that are highly damaging to development, as well as some of the challenges facing effective educational provision in LDCs, and the possible policy implementations to combat this. This essay has argued that a focus on educational investment is necessary for development due to its positive effects on income, human capacity, technology transfer, and in improving health outcomes. This essay has also focused on the highly debilitating problems of ab-

senteeism and gender inequalities in education. This essay has argued that government intervention in the educational sector is necessary, but with the caveat that the form of their intervention and investment must be cognizant of recent empirical findings such as those included in this paper. Finally, this essay has suggested possible policies such as the implementation of CCTs that, if adopted by policymakers, may catalyse improvement educational outcomes, and therefore foster development within LDCs.

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Do Institutions Rule?

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Senior Sophister

The quality of institutions has a profound impact on the rate of economic growth and development in a country. In an essay ambitious in both scope and purpose, Elin Thora Ellertsdottir outlines the importance of different types of institutions with regard to issues such as foreign aid and the resource curse. Her conclusion emphasises the futility of trying to analyse an institution in isolation from other important factors.

Introduction

> *"I wish to assert a much more fundamental role for institutions in societies; they are the underlying determinant of the long-run performance of economies."*
> *(North, 1990, p.107)*

Institutions can be defined as the 'rules of the game' and are widely believed to be important for economic growth and development. We live in a world that is uncertain and institutions are an attempt to control our environment and minimize transaction costs (Soysa and Jütting, 2006). They are 'humanly devised constraints that shape human interaction' (North, 1990, p.3). In order to address the question of whether institutions rule, we will examine their importance for economic growth and development. Moreover, we will discuss the potential ways of improving institutions to achieve greater development and the challenges we face in doing so. Finally, to further determine the importance of institutions we explore their relationships with foreign aid and natural resources. Although, first it is important to outline different types of institutions and how they interact with each other.

Classification

Institutions can be divided into formal and informal types, and categorised by the areas of economics, culture and politics (Soysa and Jütting, 2006). Formal institutions are the written 'rules of the game' and consist of laws and regulations, constitutions, charters, property rights and even governance. They are enforced in an official manner by a third party, which is usually state-governed, such as the police, courts, judges, and bureaucrats. Enforcement procedures can involve fines or criminal punishment. In contrast, informal institutions are unwritten, socially shared rules that are created and enforced in an unofficial manner (Helmke and Levitsky, 2003). They include socially sanctioned norms of be-

haviour, such as attitudes or traditions. Furthermore, they consist of extensions, elaborations and modifications of society's formal rules that exist outside of the official structure. Informal institutions are mostly self-enforcing through a system of cooperation, obligation, shaming, boycotting, gossip and internalized norm adherence (Soysa and Jütting, 2006).

Initially, the study of institutions was focused on formal institutions. Since then, the equal importance of informal institutions has come to light. Informal institutions can be divided into four categories according to their interactions with formal institutions. Complementary informal institutions enhance the effectiveness of formal institutions and address problems that are not dealt with in the written rules. Examples include operating procedures and norms that help complex formal institutions to function successfully. Accommodating informal institutions have a tempering effect on formal rules and are useful for actors who dislike outcomes of written rules but are unable to change them. So although accommodating institutions may not enhance efficiency, they can moderate the desire for change and thus increase the stability of formal institutions. An example is when Costa Rican party leaders created 'informal devices' to convince legislators to participate in constituency service despite the ban on re-election. Competing informal institutions create incentives that are incompatible with formal rules. This can occur with the introduction of ineffective formal institutions that fail to take values, customs and other informal institutions into account. An example is when imposition of European legal systems in many post-colonial countries created 'multiple systems of legal obligation'. Finally, substitutive informal institutions aim to achieve outcomes that formal institutions have failed to bring about. An example is when the Peruvian army abandoned highland territories during the Shining Path insurgency and peasants decided to create various informal institutions to provide public goods and keep order (Helmke and Levitsky, 2003).

To sum up, studies of informal institutions in developed countries tend to concentrate on complementary and accommodating institutions due to formal institutions being more effective in advanced countries. In contrast, studies of informal institutions in developing and post-communist countries focus mainly on substitutive and competing institutions (Helmke and Levitsky, 2003).

Institutions and Development

Institutions are believed to positively affect economic growth and thus promote development. Yet, the determinants of development are complex and interconnected. Positive development outcomes depend strongly on the interaction between institutional outcomes, human behaviour and exogenous factors like environmental conditions, geography, and history (Soysa and Jütting, 2006).

Most modern OECD countries have developed effective institutions to protect property rights, enforce contracts and ensure peace and stability. They have implemented formal institutions to control state power, such as parliaments, judiciaries, or federalist

institutions. Moreover, they established norms and values that promote cooperation. This encourages exchange between people and interest groups. Still, only a small number of countries developed these effective institutions. Most other countries have ineffective institutions that are detrimental to development and economic growth (Shirley, 2005). This raises the question: why were few countries able to establish effective institutions which promote growth? The new institutional economics perspective lists four reasons for underdeveloped institutions. These are:

- Colonial heritage, where countries inherited poor institutions from their col onizers.
- Colonial heritage plus, where countries had valuable resources or people that could be enslaved, which attracted colonizers to design institutions to extract resources.
- Political conflict, where countries had little political competition and allowed their rulers build institutions designed for their own selfish interests.
- Beliefs and norms, which were hostile to markets or generated mistrust, dis couraging the building of institutions that foster investment and trade (Shirley, 2005).

Identifying which institutions have a positive effect on development is difficult. A large number of variables turn out to be significant, including political rights and democracy, property rights, civil liberties, and institutions that encourage cooperation (Aron, 2000). Despite the large number of studies conducted on the impact of institutions on development and growth, there are still a few important gaps in the literature. Often, there is a lack of clear and consistent definitions of institutions. Their definitions range from narrow to broad. Furthermore, studies that address the effect of institutions in a country case study are frequently missing an analytical framework. Also, these studies often lack specific policy recommendations (Jütting, 2003).

In conclusion, formal and informal institutions work together to shape development outcomes. If the main goal of institutions is to lower transaction costs and help people cooperate, governments have an obvious incentive to encourage institutional building in order to stimulate development. Still, governments often cause more harm than good by imposing their will on the people. They would be better off by fostering open environments that allow people to cooperate in solving collective problems (Soysa and Jütting 2006).

Reforms

Changing formal institutions without considering the underlying informal institutions, such as cultural norms and values can have detrimental consequences. The implementation

of democratic formal institutions in developing states has proved ineffective in achieving the governance outcomes associated with democracy in richer countries. This can be due to cultural factors concerning education, governance, corruption, or gender relations being very resistant to change (Bauer, 1988). Furthermore, beliefs and norms are incredibly difficult to change, which could also explain why underdeveloped countries cannot achieve growth by simply importing institutions that have proved successful elsewhere (Shirley, 2005). Once again, in the words of Douglass North (1994):

> "*Economies that adopt the formal rules of another economy will have very different per formance characteristics than the first economy because of different informal norms and enforcement. The implication is that transferring the formal political and economic rules of successful Western economies to third-world and Eastern European economies is not a sufficient condition for good economic performance." (North, 1994: 366)*

There are several examples of this failure, including former French colonies in Africa adopting the French educational and bureaucratic systems, and Latin American countries copying the United States' constitution (Shirley, 2005).

Changing a country's institutional system requires caution and consideration for its existing cultural and religious norms. There is no single blueprint that is guaranteed to deliver development. Policies that are optimal in one country may fail miserably in others (Soysa and Jütting, 2006).

Attempting to impose the blueprints of idealised versions of Western institutions on developing countries is called institutional monocropping (Evans, 2004). Its attractiveness as a model for institutional change is understandable due to the basic institutions of OECD countries being, in fact, related to development in those countries. They are also institutions that richer countries can understand, which might attract foreign investors. Nevertheless, it is not difficult to understand why monocropping has failed. Imposing a new set of formal rules without simultaneously reshaping the distribution of power can be troublesome. Ha-Joon Chang (2002) refers to monocropping as 'kicking away the ladder'. He argues that the institutions being imposed on developing countries are not those that characterized today's richer countries during their periods of development. Lastly, clear evidence for the ineffectiveness of monocropping is the decline in the growth rates of developing countries over the past twenty years. If the method were effective for achieving development, we would expect to have seen increasing growth rates (Evans, 2004).

The disappointing results of monocropping indicate that moving towards increased local input and experimentation might be the best option for securing institutional quality. Economists such as Amartya Sen and Dani Rodrik argue than an alternative solution to monocropping would be to foster institutions that improve citizens' ability to make

their own choices and encourage public discussion. Several economic examples suggest this could improve developmental performance. Two of the best-known examples are from the state of Kerala in India, and the city of Porto Alegre in Brazil (Evans, 2004).

To conclude, changing formal institutions involves changing the written 'rules of the game' and although it may be challenging, it is certainly possible. Changing informal institutions, however, can prove to be incredibly difficult. Still, governments do have the power to influence mass audiences through educational content and campaigns. However, they often struggle to affect religious practices, traditions, or family life. Civil society groups have been successful in changing some types of behaviour, for example, Amnesty International has worked to spread the norms of human rights across borders (Soysa and Jütting, 2006).

Institutions and Foreign Aid

Aid accounts for a very high percentage of some countries' government budgets, especially in Sub-Saharan Africa (Bräutigam and Knack, 2004). Still, there has been much debate over the effectiveness of foreign aid to developing countries. William Easterly (2001) went so far as to argue that 'the 1000 billion dollars spent on aid since the 1960s, with the efforts of advisors, foreign aid givers, the International Monetary Fund, and the World Bank, have all failed to attain the desired results' (Easterly, 2001: 1). In contrast, the advocates of aid argue that Africa is stuck in a poverty trap and requires foreign aid to escape that trap (Birdsall, 2007). Theory provides conflicting evidence on the matter. On one hand, aid can help governments escape binding revenue constraints, allowing them to strengthen local institutions and grant wage increases to civil servants. Furthermore, aid personnel often provide an important service by managing government programs. Foreign aid success stories include South Korea, Taiwan and Botswana (Carlsson, Somolekae and van de Walle, 1997). On the other hand, continuous aid over long periods of time could potentially hinder the development of good governance in two ways. Firstly, through the weakening of institutions: this can occur due to the high transaction costs accompanying aid, the problem of 'poaching', the effect of aid on the budget process, and the obstruction of opportunities to learn. Secondly, large amounts of aid can create incentives that impede solutions to collective action problems (Bräutigam and Knack, 2004).

The institutional destruction inflicted on weak African countries by foreign aid has not gone unnoticed by researchers. Furthermore, the aid community itself seems to acknowledge the problem (Bräutigam and Knack, 2004). The World Bank stated that 'donors may fragment central capacity for policy formation, entering with ministries into bilateral deals on multiple projects without determining whether their cumulative effects are collectively sustainable or mutually consistent' (World Bank, 1997: 84).

Institutions and Natural Resources

The relationship between a country's natural resources and its income levels has been the topic of several empirical studies. These studies often observed that countries rich in natural resources tend grow more slowly than resource-poor countries. This is often referred to as 'the curse of natural resources' (Sachs and Warner, 2001). Sachs and Warner did not acknowledge the role of institutions in this resource curse. However, Mehlum, Moene and Torvik (2006) test the hypothesis that institutions are a deciding factor for the resource curse. They first note that many countries with high growth rates, such as Australia, Canada, Norway, and Botswana, are rich in natural resources. This raises the question: why, among countries with high levels of natural resources, do some experience high growth rates and others low growth rates? To address this question they tested their theory that the quality of institutions is a determining factor. They used data from 1965 to 1990 on average economic growth and resource abundance. Their sample contained 42 countries which are rich in natural resources. They examined the relationship between GDP growth and natural resources in all the countries. The results show that, in general, a resource curse does exist. However, when they divide the sample into countries with bad or good institutions, the results indicate that this curse is only present in countries with bad institutions (Mehlum, Moene and Torvik, 2006).

Conclusion

Institutions can be divided into formal and informal institutions. Formal institutions are written rules and consist of property rights, laws, constitutions and governance. They have official enforcement mechanisms, which are usually state-governed. In contrast, informal institutions are the unwritten rules of society. They include norms, beliefs, values, attitudes, and traditions, and are mostly self-enforcing. Institutional quality is an important determinant of economic growth and goes a long way in explaining the variation in incomes across countries. Furthermore, it is believed that institutions positively influence development. However, identifying which institutions have this effect proves to be challenging. Several variables turn out to be significant, including democracy, property rights, and institutions that encourage cooperation. So, how can we reform the institutions of developing countries in order to stimulate their economic growth? When changing formal institutions we must consider underlying institutions such as cultural norms and values. Therefore, we cannot simply impose blueprints of idealized Anglo-American institutions on developing countries and hope for growth. This method is called monocropping and has proved incredibly unsuccessful and detrimental to developing countries so far. An alternative solution could be to seek ways of fostering institutions that improve citizens' ability to make their own choices and encourage public discussion.

Foreign aid accounts for a high portion of some developing countries' GDP and there has been much debate over its effectiveness and influence on institutions. Some be-

lieve aid is necessary for underdeveloped economies, while others believe it is destructive to their institutions, thus causing more harm than good. Much research has also been done on the relationship between a country's natural resources and its income levels, culminating in the theory of 'the resource curse'. Some scholars find no decisive role for institutional quality in 'the curse', while others believe it is a deciding factor in whether countries rich in natural resources are able to sustain high growth rates or not.

It is clear from the existing literature that institutional quality wields great power over economic growth and development. When examining ways to stimulate growth in developing countries, it is imperative to consider institutions, both formal and informal. Designing formal institutions for underdeveloped countries that take into account each country's norms, values and traditions could go a long way in promoting development. Thus, we can conclude that institutions are of utmost significance.

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Monetary Policy and the Indian Economy During the Inter-War Years

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In this essay, Niall Murphy delves into the murky world of colonial monetary policy to determine whether Britain may have allowed India, the supposed jewel in its crown, to become tarnished for its own benefit. He recounts the problems India faced while trying to uphold the Gold Standard, and the negative consequence thereof. At a broader level, Murphy poses tough questions for those who attest that British rule was conducive to economic growth.

"Cecily, you will read your political economy in my absence. The chapter on the fall of the Rupee you may omit. It is somewhat too sensational. Even these metallic problems have their melodramatic side." (Wilde, 1895)

Introduction

Recent research in the field of development economics has become preoccupied with 'one-size-fits-all' answers to the 'big questions'; what role for trade, geography or institutions in explaining why some countries are rich and others are poor[1]? Often neglected in these studies is the role of short run government policies and their effect on development[2]. An historical example of the importance of short run government policy is Indian monetary policy during the interwar period; O'Rourke has gone as far as to ascribe the electoral success of the Indian National Congress in the late 1930s to the deflationary impact of monetary policy (2007, p.469). By examining the role of Indian monetary policy in the poor performance of the Indian economy between the wars through the lens of the principal-agent problem this essay aims to show how short run government policy can be a crucial ingredient in an economy's development and that neglecting this insight can lead to a misdiagnosis of an economy's binding constraints.

First this essay will consider the arguments of those who have highlighted the economic benefits of British imperialism. Second, the important role of India in the in-

1. For example see Acemoglu, Johnson and Robinson's (2001) attempt to attribute 500 years of divergence to the differing quality of institutions across the globe.

2. See Haussmann, Rodrik and Velasco (2005) for an alternative 'diagnostics' approach

ternational gold standard will be considered. The negative consequences of the high exchange rate for trade will then be examined followed by a discussion of how monetary policy was used to facilitate Indian debt remittances to Britain. Finally, there will be a brief comparative discussion of how the deflationary monetary policies pursued by the Indian authorities were incompatible with the Great Depression.

Economic performance in Imperial India

Niall Ferguson (2003: p.1) has argued that "while it is convenient for contemporary rulers in countries like Zimbabwe to blame their problems on the 'legacy of British rule', the reality is that British rule was on balance conducive to economic growth." Drawing on modern-day research in the field of development economics, he illustrates that enforced openness to trade could have been a force for convergence (Sachs & Warner, 1995) and that capital flows could have also acted as a channel for economic development (Clemens & Williamson, 2000). He also supports the proposition by Cain and Hopkins (1993) that Britain's "gentlemanly capitalism" placed a heavier emphasise on finance than British exports and extrapolates from this that British imperial policy offered "at least the opportunity of economic convergence," by creating macro institutions which conformed to a "London Consensus" emphasising property rights and liberal economic policies (Ferguson 2003, p.19). Writing on Indian finance, Sunderland (2013, p.213) argued that "the IO [India Office], the Bank of England, the Treasury and City institutions were well aware that they stood or fell together" and thus they were willing to extend "costly favours on the understanding that these would eventually be reciprocated."Thus on balance financial policy was largely favourable to India's interests.

Yet an interesting caveat to the pro-imperialism thesis is recognised by Ferguson himself; the case of India. Ferguson asks; "why was Indian economic performance so much worse than that of the Dominions?"While the world economy generally performed worse during the interwar years than in the years before the outbreak of the First World War, India fared particularly badly. As the figures below demonstrate, growth in real GDP per capita was demonstrably lower than in most other countries. Meanwhile, India's percentage share of the value of world trade (in gold dollars) fell from 3.75 per cent in 1913 to 2.5 per cent in 1937 (Tomlinson, 1979: p.30).

Growth in real GDP per capita (average annual rates of growth), 1913 – 1950							
	Western Europe	USA	Latin America	Japan	China	**India**	USSR
1913 – 1950	0.8	1.8	1.4	0.9	-0.8	**-0.3**	1.1
1921 – 1938	2	0.8	1.4	1.8	N/A	**-0.1**	N/A
1921 – 1929	3.5	3.3	2.6	2	N/A	**0.9**	N/A
1929 – 1938	0.7	-1.3	0.4	1.7	0	**-1**	4.9

Table 1: Maddison 2001: pp.104-111, pp.180-187

Ferguson offers "the insufficient scale of British interference in the Indian economy" by way of explanation (2003: pp.21-24). By not investing sufficiently in human capital, the Indian state failed to reap the potential benefits of imperialism. However this conclusion seems unsatisfactory; while many economists have written on the importance of education to development (Duflo, 2001; Psacharopoulos, 1995; Shultz, 2003), the lack of investment in education in other dominions and even in Britain itself did not hinder GDP growth in the same way as it did for India: between 1857 and 1947 Indian per capita GDP grew by just 19 per cent, compared with an increase in Britain of 134 per cent (Ferguson, 2003: p.21). This essay argues that, among the myriad possible reasons for the poor performance of the Indian economy under colonialism, one possible explanation for the inter-war years was that the agent (the India Office) pursued monetary policy objectives which benefitted two of her principals (HM Treasury, Bank of England) but not the other (the Secretary of State for India). Thus in the specific case of monetary policy in the inter war years, it was the excessive interference of the British government in Indian affairs, and not the lack thereof as Ferguson claims, which was one of the problems facing the Indian economy.

The role of India in the International Gold Standard

A key objective of monetary policy in British India was to stem the flow of gold into the country. Post-war British policymakers had made the decision to return to the gold-standard at the pre-war peg (Eichengreen, 1999, p.57). However, the absorption of gold by both France and Germany meant that the Bank of England (BoE) was constantly "under the harrow" according to its interwar governor Montagu Norman (ibid, p.65). As gold flowed to other central banks, the BoE was forced to raise interest rates in order to attract gold into England. This policy of monetary contraction was particularly problematic in a post-war era where structural rigidities in the economy meant that unemployment was high (Feinstein et al. 2008: pp.10-20). Meanwhile, officials in India were becoming in-

creasingly aware that Indian gold absorption rose during a global boom and fell during a slump (Balachandran, 1996: pp. 38-42). Thus since the global economy was experiencing an expansion around the time that Britain was attempting to restore convertibility, policy instruments which could stem the flow of gold from India became desirable. Balachandran quotes Viceroy Willingdon; "for the first time … Indians are disgorging gold … we have sent … to London in the past 2 or 3 months … £25,000,000 sterling and I hope the process will continue!" (1996, p.181). While Niemeyer[3] stated that if "more gold can be loosened… in India … or elsewhere … and sent to a place where it will … tend to come into the hands of monetary authorities, the better for everyone including India." (1996, p.182). As the graph below demonstrates, from just before 1925[4] Indian net gold imports fell substantially and India eventually became a net gold exporter. This continued right up until 1932 when Britain left the gold standard.

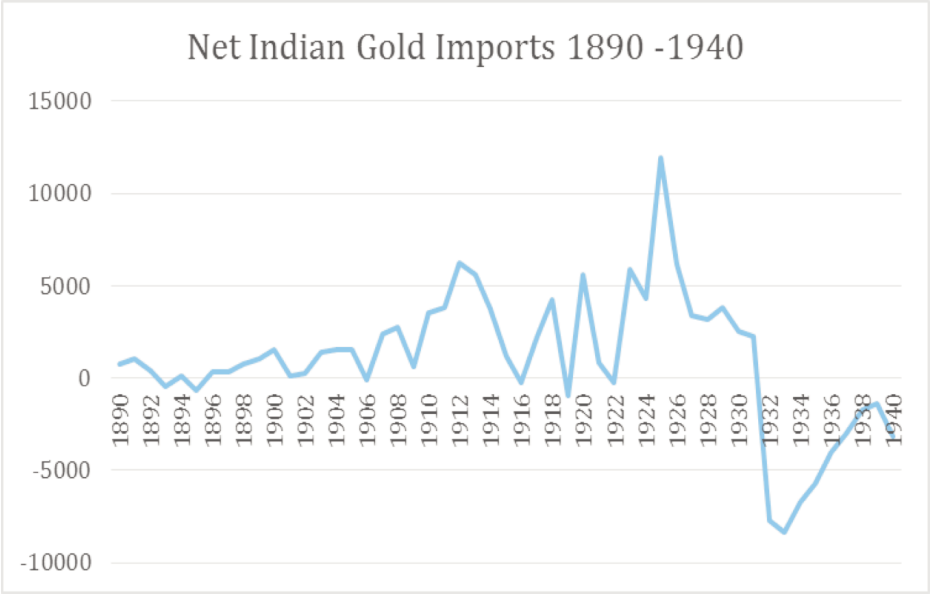

Figure 1: Reserve Bank of India 1954: p.970). Note: '000 standard ounces up to 1921 and '000 fine ounces thereafter.

3. An official at the BoE

4. When Britain returned to the Gold Standard

The exchange rate as an instrument for stemming the flow of gold; the Babington-Smith committee

In 1919 the world price of silver was rising. Since silver coin played a prominent role as a means of exchange in India, the intrinsic value of coin was rising, forcing the exchange rate to rise with it. The Babington-Smith committee was established to find an exchange rate to deal with the crisis. In his contributions to the committee, J.M. Keynes[5] advocated revaluing the rupee to 2 shillings (Rothermund 1993, p.77). Keynes' logic was that a high exchange rate would act as a bulwark against inflation. However if the "natural rate" continued to rise above 2 shillings, the peg should not follow it. Keynes reasoned that if silver became more valuable than the exchange rate, then some coin would be melted down and sold as bullion. This release of bullion onto the market would lower the price of silver causing it to fall back towards the exchange rate (ibid 1993, p.77). Thus, with Humean vigour, Keynes highlighted the self-adjusting nature of the price of silver. The majority report of the committee recommended that the rupee be pegged to gold at 2 shillings (so one gold pound sterling was equal to 10 rupees) justifying its decision on the basis of the need to protect the Indian economy from inflation. (Balachandran, 1996, p.83) The committee also recommended that a gold standard be set up in India (Tomlinson, 1979: p.69).

However, the IO persevered with an exchange rate of 2s 4d right until a dramatic fall in the price of silver forced it to change tact, while no attempt was made at establishing a gold standard in India. Why did the IO attempt to set such a high exchange rate, one which went far beyond the recommendations of the committee? One explanation could be Francis Lucas' evidence to proceedings where he pointed out that if India continued to demand more gold than the world could supply then the international trade and payments system would begin to breakdown. Lucas' solution was to encourage the use of silver in Indian monetary affairs (Balachandran 1993, pp.79-80). To make this possible, the government of India would fix the exchange rate at a level "high enough to offer parity valuation" which would enable the Indian government to offer up to $1.38 for an ounce of standard silver (ibid 1993, pp.79-80). Lucas viewed that a high price of the rupee against gold would encourage Western monetary agencies to sell silver to India (ibid 1993, pp.79-80). The high exchange rate preserved the role of silver as a token coin and would prevent India replacing silver with gold, something which would be contrary to the interests of the global economy. Furthermore, a revalued rupee would depress incomes in India and reduce demand for gold and possibly even encourage distress sales of gold; during the hearings, Gubbay confirmed that high prices strengthened the role of precious metals as a store of value (ibid, p.89). This emphasis on the importance of gold also explains why no gold standard was ever established. Viewed from this perspective, we can see that due

5. Considered an authority on Indian monetary affairs due largely to his celebrated publication "Indian Currency and Finance" (1913)

to a principal-agent problem, Indian monetary interests were placed second in line to those of the global payments system of which Britain played a key role.

The Exchange rate and trade

The downside of this policy was highlighted by the only Indian member of the committee, Dadiba Dalal, who protested that the exchange rate was too high and hurting Indian exports while stimulating British exports to India. (Rothermund 1993, p.77). Furthermore, the justification for using a high exchange rate to prevent inflation also seems unwarranted; while price inflation was clearly a problem in 1918-19 when prices rose faster than USA/UK prices, it was only 3 per cent in 1919-20 when the committee was in the middle of its deliberations; in the same year British prices rose by 20 per cent (Balachandran 1996, p.78).

At the Hilton-Young Commission[6], Sir Purushottamdas Thakurdas made a similar point to Dalal while advocating a 1s 4d rate. The Bombay cotton exporters had always advocated a cheap money policy as this would stimulate their exports and inflation which they figured would raise internal purchasing power (Rothermund 1993, p.78). Furthermore wages of workers in Bombay soared during the war and early post war years but had not fallen back in line with prices. Cotton producers argued for inflation to be used to lower real wages making the industry more competitive.

They also argued that if prices were too low that the burden of debt on agricultural classes was aggravated in a typical example of the debt deflation effect illustrated by Irving Fisher only a few years later (1931).

Growth of value of merchandise exports at constant prices (annual average rates)				
	1870 - 1913	1913 - 1929	1929 - 1950	1950 - 1973
Western Europe	3.23	0.21	-0.32	8.03
USA	4.86	3.33	1.68	6.27
USSR	N/A	-4.66	3.08	9.98
Latin America	3.4	3.89	1.46	4.1
China	2.59	2.9	0.06	2.74
India	**2.37**	**-1.02**	**-1.9**	**2.46**
World	3.35	0.89		7.88

Table 2:Value of Merchandise Exports

6. A currency commission created in 1925 to once again advise on the correct exchange rate for the rupee.

The chart above shows how merchandise exports declined dramatically during this period in India; more than any other region[7]. While there are any number of possible reasons for this, the figures add weight to the arguments of Indian exporters that the exchange rate was far too high and damaging their exports and the prospects of the Indian economy. If monetary policy was being formulated with the interests of the Indian economy in mind, then the exchange rate peg would most likely have been devalued.

The 'currency crisis' and the importance of debt repayments

The events which occurred in the run up to Britain going off the Gold Standard are illustrative of the consequences of imperial monetary policy on the well-being of the Indian economy. In 1930, the world economy was heading into a deflationary spiral; there was a decline in demand for India's exports and there was a flight of capital from India; all of which put considerable pressure on the set exchange rate of 1s 6d. With the terms of trade turning against India, internal prices became depressed (Tomlinson, 1979b). At this point, a devaluation would have seemed a reasonable response, however such a move would require approval from London; in another illustration of the principal-agent problem, the main concern of London was payment of the home charges[8], all of which were paid for by Indian revenue raising and through sterling. Any rupee devaluation would make these obligations more expensive to pay. However with prices falling across the economy, and tax revenue falling with it, the Secretary of State for India was left with fewer and fewer options for meeting its obligations. To pay the debt due to London, the Secretary decided to remit money from the currency reserves; between April 1929 and March 1932 over £35 million of the debt was paid in this way[9]. The consequences of this was to contract the money supply in India which further lowered prices and raised the interest rate and so a vicious cycle was begun (Tomlinson, 1979b). Yet again, the Indian economy was being put to the sword so as to serve the interests of an agent with aims which had negative repercussions for the Indian economy.

Monetary policy and The Great Depression in India

This exchange rate policy continued into the Great Depression; the only devaluation respite came when sterling came off the Gold Standard and since the rupee was subsequently pegged to sterling at its previous rate, the real value of the currency had fallen. Yet despite that, during the great depression in India prices still fell by a factor of four or more (Roy 2011: p.98), while the table below demonstrates the dramatic fall in some of India's major export commodities.

7. With the exception of the USSR which decided to halt exports during the era for political reasons

Major Export Commodities (million rupees)							
	Raw cotton	Cotton Textiles	Raw jute	Jute products	Opium	Rice	Tea
1910 - 1919	349	136	184	330	53	217	161
1920 - 1929	692	116	493	493	20	309	260
1930 - 1939	327	46	274	274	NA	215	214

Table 3: Rothermund 1993: p.81

In contrast, Rothermund (1995: p.100) gives the example of Sweden; there the currency was devalued and no deflationary policy was pursued. Prices were stabilised by a constant money supply while the central bank provided credit to its banking system to maintain confidence in its credit system. Diaz Alejandro (1984) emphasises that many Latin American states adopted countercyclical policies to smooth the business cycle. Debt defaults, expansionary monetary policies and government works programs all helped stimulate domestic demand which as Bulmer-Thomas (2003) has pointed out, played a key role in allowing Latin American economies recover in the period 1932-39.

None of these options were available to the Indian government for reasons which have already been elaborated upon. Whether these policies would have been effective or not is a discussion for another day; the main point here is that these options were not even up for consideration to the Indian authorities due to the principal-agent problem.

Conclusion

This essay has demonstrated, by considering the pro-imperialism arguments, the important role of India in the international gold standard, the negative consequences of the high exchange rate for trade, the importance of Indian debt repayments in deciding monetary policy and finally, and the deflationary monetary policies pursued by the Indian authorities during the Great Depression in a comparative context, that monetary policy must be integrated into a wider narrative explaining the poor performance of the Indian economy during the interwar years. While Ferguson and other supporters of British economic policy in the colonies during the geriatric years of European imperialism have sought to explain the problems of the Indian economy using the 'bigger picture' approach of 'one-size-fits-all' development policies which sweep across vast swathes of time and space, this essay

8. The cost of running the IO and the current expenditure on the Indian military and civil service.

9. Approximately 1/3 of the total outstanding value of the debt according to Tomlinson (1979b)

has demonstrated the important role of short run government policy in explaining the poor performance of developing economies. This is an important lesson for development economists today as it reminds us that having multiple explanations is not necessarily a vice, that country and time specific examples are useful, that nuance is good and complexity important when we attempt to explain why some countries perform better than others.

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HOW DUTCH WAS THE INDUSTRIAL REVOLUTION?

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Why did the Industrial Revolution take off in Britain, and could it have happened in the Dutch Republic? Through creative use of counterfactual models, Peter Nicolai Prebensen supplies us with one answer to these questions, and clearly identifies the key determinants of industrialisation in Britain.

Introduction

> *"To ask why an historical event that seems a priori feasible because it did happen elsewhere did not take place is useful analytically: why did Canada not have slavery? Why did the U.S. not have a successful socialist movement? Why did the Soviet Union fail to develop the microprocessor? These seem useful questions." (Mokyr, 1999, p.1)*

Allen's argument for the economic determinants of the Industrial Revolution is watertight, and as Pat Hudson says in the opening sentence of his review, "This work is ground-breaking" (Hudson, 2009, p.242). With this being the seminal work on the determining economic factors, we take the findings as given. Lesser explored in this work are the international forces and particularly the events behind these economic factors. The focus of our argument will be the economic and political relationship between the British and the Dutch, and furthermore the role the Dutch played in the British Industrial Revolution. In approaching this argument, an outline and context of the economic determinants of the Industrial Revolution is given. When the primary differentiating factor for the Revolution occurring in Britain rather than the Dutch Republic is found to be coal, a counterfactual narrative is used to assess whether the Dutch could have harnessed the power of coal and thus, industrialized. This rather outlandish counterfactual, of whether Industrialization could have been Dutch, is then replaced with the more reasonable question of how much of the British Industrialization was owed to the Dutch. The counterfactual here focuses on the economic consequences of the political Glorious Revolution of 1688, when the Stadtholder of the Dutch Republic became the English monarch, replacing an absolutist system with one of representation.

Economic Determinants of the Industrial Revolution

The successful textile and manufacturing sectors of the of the Low Countries and Britain in the seventeenth-century, commonly known as the draperies, led to a high urbanization rate and high wages in commercial urban centres. Complexity was achieved in the early modern British economy, and England "became a net exporter of agricultural goods, making it capable of supporting a far-reaching division of labour" (Pincus, 2009, p.51). The Dutch had preceded them forming the first highly diversified spatial economy of "considerable complexity" in the early modern era (de Vries and van der Woude, 1997, p.433). There were positive externalities to these high wages. Although it was not found to be statistically significant in Allen's model, the literacy rates were far higher in Britain (50%) and the Dutch Republic (70%) than in most other parts of Europe (Allen, 2009:107). The other, more significant, externality was the consumer revolution.

High wages are indicative of "purchasing power" above and beyond "basic needs". There were a multitude of "ways to spend [this] surplus" and thus a consumer revolution occurred, a precursor to the Industrial Revolution (Allen, 2009, p.46). The consumer revolution is given "statistical evidence" by "the increased consumption of luxuries", which also "included tropical foodstuffs and imported Asian manufactures", and importantly for British industry, "British manufactures". It is often overlooked that the consumer revolution "also characterized the Low Countries" (Allen, 2009, p.49). Trade and a greater focus on manufactures in Britain powered the continuing economic expansion in Britain after the seventeenth-century. This focus on manufactures was very nearly reversed by the foreign policies of James II in the period leading up to the Glorious Revolution of 1688, as we will see later.

The expected reaction to a high wage economy is the specialisation and division of labour, as occurred in both the Republic and Britain. Furthermore it is expected that industries will attempt to be more capital intensive or, in the case of Britain, fuel intensive. Incomes in the Dutch Republic in the late seventeenth-century were "30 to 40 percent" greater than those of the British, encouraging a move towards fuel. The most influential factor though is not the wage rate, it is the ratio of the wage rate to the cost of fuel, and nowhere was fuel cheaper than in the peripheral cities of the Western and Northern British Isles, giving them a far larger incentive to exploit and expand the coal industry of Britain. There can be no doubt when one sees the figures, coal was the engine of industrialization. "Between 1560 and 1800" British coal "output increased sixty-six-fold" (Allen, 2009, p.81). As coal seems to be the defining difference between the Republic and Britain, we look at a counterfactual in the next section where the Dutch do gain access to coal, and consequently whether this stimulates the Industrial Revolution to occur in the Republic.

> *"A fixed point at last: Britain was first because Britain had coal – a fact of nature, not an artefact of History." (Allen, 2009:81)*

A Counterfactual Narrative: The Dutch Access Coal

The first counterfactual separates into two threads; first we entertain the possibility of the Dutch gaining autonomy over British coal, and following that the Dutch utilizing the Ruhr coalfields. The use of these narratives is to help explain why the Republic was never incentivised to take advantage of coal as a cheap fuel source in the way that Britain was. The first counterfactual is shown to be highly unlikely and can be quickly dismissed. More consideration is given to the second and more plausible notion of the Dutch exploiting the coalfields of the Ruhr; this notion is however also dismissed, in part due to peat being a backstop technology, and in part due to the limited colonial and domestic demand for Dutch goods.

The first thread looks at autonomy being gained over the coal deposits in the northeast of England. Political factors rule this out, as the Dutch could never have gained autonomy over the English state given their inward looking and complex republican system. Even if these factors hadn't ruled it out, the high transport costs would've resulted in coal prices similar to those of London, giving a similar price to peat for the end user in Amsterdam. Most buyers of coal required a '50 percent discount' to select coal over a cleaner burning alternative, for example peat (Allen, 2009, p.88). Coal could not have been brought in from England at this much of a discount, thus ruling out this first thread.

The second thread is concerned with the exploitation of the Ruhr coalfields, which became a large coal producer for the continent, but not until the nineteenth century and primarily for the Prussians. It is questionable that the Ruhr coalfields could have been accessed at the low cost of the British peripheries, and the political disputes there would have been heightened with a thriving coal industry. Even if they had been accessed at these low costs, there were further problems for the Dutch, a problem of domestic population and a problem of colonial export markets. The population of the Republic was between 0.9-2.0 million between 1561- 1732, whereas Britain had 5.7 million in 1688, giving them a far larger domestic market (Milanovic, Lindert and Williamson, 2011, p.261). And more important than the domestic market, the Republic did not have the colonial export markets. In Britain, these facilitated an increase in industrial output that increased demand for coal. In 1700 it was already the case that '15 percent of English exports' were bound for the New World, and it should be noted that these figures do not include re-exports of "colonial … products to Europe" (Pincus, 2009, p.83) The importance of colonial export markets was only increased when Colbert, the French minister of finance, constructed 'barriers to English and Dutch imports,' thereby shutting off the large French market to the Dutch. The Republic did have a few small colonial possessions, these however "were comparatively self-sufficient economically" and thus vacant of demand for Dutch manufactures (Pincus, 2009, p.87).

A Counterfactual Narrative: The Glorious Revolution of 1688 Fails

The British coal deposits lay relatively unused until the early modern period; it has been found that the accelerant that elevated coal use from domestic to industrial 'was Britain's success in the world economy' (Allen, 2009, p.4). It seems wise to ask what the factors or events were that lead to this international success. Some of the more traditional factors have already been discussed in the first two sections. The transition of economic primacy from the Republic to the British is worth addressing, if not just due to their being neighbours, then also for the lengthy and complex relationship between them. A most notable event in this transfer must be the Revolution of 1688, when the Dutch Stadtholder also became the King of England, William III.

The British textile industry sector in the seventeenth-century, or the "draperies", were "of great importance for England's success" (Allen, 2009, p.127). The draperies that developed in Britain were by no means "autochthonous"; in fact, a "gradual evolution" of "English manufacturing" is a fiction. It has instead been found that immigrants, and for the larger part "immigrants from the Netherlands" were instrumental in "developing the new lighter clothing" (Pincus, 2009:55). Building on the evidence from the draperies, "England's sugar revolution" was also "not a native growth but relied on Dutch expertise" (Pincus, 2009, p.58). These were all Dutch influences that occurred before the Glorious Revolution, trends that seemed to be reversing with the regime of James II.

Now we turn to the consequences of the Glorious Revolution, the impacts and effects of a Dutch king coming to the throne. First let us inspect the immediate impacts. The financial policy effects of 1688 were immediate and significant. The "financial [and banking] revolution" (Murphy, 2009, p.5) occurred in the remainder of William III's reign, a key pillar of which was the "introduction of excise taxes to fund a public debt (de Vries and van der Woude, 1997, p.141). These same 'excises' were in fact 'Dutch fiscal inventions,' along with their fellow "stamp taxes" (de Vries and van der Woude, 1997, p.111). The excises were referred to as "gemene middelen" with their introduction in the Republic being in 1583. This highly effective tax was introduced in Britain only a year after the Dutch King gained power (de Vries and van der Woude, 1997, p.102). Another immediate impact was the capital inflows to British public debt and stock companies, with Dutch investors perceiving William III to be providing an increased creditworthiness over James II.

There was a longer-term financial and economic relationship between the Dutch and the British following the Glorious Revolution. Though the British clearly emerged as the more powerful partner of the two, the importance of the Republic as "entrepôt remained crucial to the functioning" of the British trade mechanism, the larger part of which was "the re-export of colonial goods" (de Vries and van der Woude, 1997, p.485). The strength of the relationship can also be seen in the "British trade surpluses" after 1688,

culminating from "re-exports of Virginia tobacco" and "New World drugs, dyestuffs" and "beverages", with these re-exports reaching £200,000-400,000 in 1693-1695 (de Vries and van der Woude, 1997, p.485). The bullion flows in the longer term after 1688 were also very significant. The Republic ran a deficit, but this was paid in large part by its services and investment income. To give a scale of the bullion flows from Britain to the Republic in this period, and thus their interdependency, from 1706-80 'a total of £59 million' flowed in, with this number being equivalent to 'the total output of Dutch mints in this period' (de Vries and van der Woude, 1997, p.486).

So ultimately a significant amount of positive economic effects may be extrapolated from the events of 1688. To take this assessment further, an interesting question is what would Britain's trajectory have been under James II. Of course, we cannot know for sure, but estimates can be made based on his ideology, foreign policy and international allegiances. First, James II was 'deeply influenced' by his cousin the absolutist monarch, Louis XIV of France (Pincus, 2009, p.6). The revolutionaries, seeking to replace James, "looked to the Dutch Republic rather than to the French monarchy", whom James sought to follow (Pincus, 2009, p.7). This placed James and the revolutionaries in opposing schools of thought, it should be noted that a key opponent to the King's guiding principles was the exiled liberal thinker and Whig, John Locke.

The first of James II's major policy errors was where his economic foreign policy was focused. It was obvious to the Whigs, and John Locke, that there was a comparative advantage to trading with the New World rather than the East Indies with their 'very limited demand for English and European products' (Pincus, 2009, p.87). James, with his advice and ideology stemming from Josiah Child[1] rather than John Locke, believed that land had a finite production value, and therefore the higher value raw products from the East should be the focus rather than the New World and trade with the colonies there. John Locke, and the revolutionaries that replaced the James II regime, believed in the infinite potential of human endeavour, through the means of manufacture, which led to their foreign policy focus being the colonial export markets (Pincus, 2009, p.372).

The second of James II's major policy errors was his views on immigration; he did everything within his political power to "discourage" the Huguenot and protestant "French refugees" from relocating to England after the persecution they faced from Louis XIV (Pincus, 2009, p.178). Had these sorts of policy been allowed to continue it would have led to direct negative economic impacts, the loss of the new Huguenot immigrants and their advanced manufacturing techniques, as well as the long run effects, all of the

1. This is the same Josiah Child who was forced to resign his position as president of the East India Company after attempting to dump pepper on the market at below cost price, to increase market share on the Dutch VOC. The VOC had greater financial resources and won the attack whilst the stock of the East India Company fell from 600 to 250 (de Vries and van der Woude, 1997:433). This illustrates James selecting an adviser with a zero-sum view of the world economy.

protestant immigrants residing in the UK would have reassessed their position and considered emigrating, many of these families managed textile businesses in Britain, the backbone of the economy. Ultimately, if these key policy decisions had been allowed to continue they would have undermined the advantage Britain had in two key areas; their advanced manufacturing techniques would be lost through emigration, and detrimental East India spice market policies would have been selected at the expense of the colonial export market to the New World.

Conclusion

We found in the first and second sections that the Industrial Revolution could only be British and not Dutch. The coal deposits of the British Isles gave them primacy, and the counterproductive peat deposits and limited markets for Dutch goods, both at home and abroad, restricted them. What was then discovered was controversial, however. The British textile and sugar refining industries, key drivers of the High wage economy and of demand for coal, were found to be a consequence of Dutch ingenuity. The influence only increases with the Glorious Revolution of 1688 and transfer of the monarchy to a Dutch king, unlocking the financial revolution and establishing an Anglo-Dutch economic partnership that aided in stabilizing pre-industrial growth. The impacts are not limited to that which did occur. It was found that the foreign policy view and stance on immigration of James II were so poor, that their continuance would have led to a loss of many of Britain's skilled manufacturing labourers, and a trade policy that would have turned its back on its most important sector, colonial exports. Therefore, the conclusion is made here that the Industrial Revolution is thanks to the ecological accident of coal deposits, and the Dutch.

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Chinese Economic Reform from 1979 to 1989: From The Death of Mao to Tiananmen

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It is impossible to properly understand the Chinese economy today without first understanding its history. Tomás Campbell provides an excellent account of Chinese economic reforms after the death of Chairman Mao, giving a context for China's economic performance today.

Introduction

In May 1977 death hung over Tiananmen Square. The Mausoleum of Mao Zedong had just been completed and inside the man himself, founding father of the People's Republic of China and its leader for a quarter-century, lay in a coffin of crystal. His death and the subsequent arrest of the Gang of Four, including his wife, ushered in a new era for the Chinese economy, with reformers seizing control of the Communist Party of China (CPC) and changing its ideology from the one of class struggle, which had been apparent during the Cultural Revolution, to one of economic development (Xu, 2011). This ideological shift was consolidated in the Third Plenum of the 11th CPC Central Committee in December 1978 with the adoption of the policy gaige kaifang – literally 'reform and opening up' (Zhu, 2012). In practice, these reforms amounted to the 'four modernisations', namely: the decentralisation of economic administration; the adoption of market mechanisms; the wider use of indirect, economic tools rather than administrative commands; and, the partial liberalisation of private business activity (Imai, 1985). There is no historical precedent for what followed. In 1978 Chinese GDP was 13.6 per cent that of the USA, by 1990 that figure had doubled to 27.9 per cent; by 2004 it stood at 64 per cent and by 2016 the Chinese economy is forecast to be the largest in the world (Brandt and Rawski, 2008). This paper seeks to explain the role that monetary policy played in this remarkable transformation during the early years of reform, from 1979 to 1989, predominately through discussion of the banking sector's development, while also giving consideration to the impact of the opening of the economy to foreign capital and the reform of the price system.

Reform of the Banking System

From 1950 until 1978 China's financial system consisted of a solitary bank, the People's Bank of China (PBOC), which was central government-owned and controlled under the Ministry of Finance (Allen et al., 2008). It simultaneously acted as a commercial bank, a savings bank, and the central bank, virtually single-handedly administering the entire banking system (Imai, 1985). Its primary function was to support the physical production plans drawn up by the government, and to this end, it formulated cash and credit plans to control cash flows in consumer markets and transfer flows between its local branches (Allen et al., 2008), ensuring there was adequate credit and currency in the economy to fulfil production schedules while holding prices stable (Imai, 1985). Credit was virtually non-existent outside of the enterprise sector (De Wulf and Goldsbrough, 1986) for fear that any growth in the currency in circulation would increase demand and bring about inflation (Imai, 1985). Before reform, monetary policy served no allocative function in China (Feltenstein and Farhadian, 1987).

With the aim of turning the PBOC into a separate central bank, a major process of banking system decentralisation commenced in February 1979 with the reestablishment of the Agricultural Bank of China (ABC) (Imai, 1985), a specialised bank operating, unsurprisingly, in the agricultural sector of the economy. In April of the same year the State Administration of Exchange Control assumed responsibility for administering foreign exchange functions, and by October the China International Trust and Investment Corporation had been set up to channel foreign funds into domestic projects. The China Investment Bank, established in 1981, would serve a similar purpose (ibid.).

By the end of 1979 the PBOC had departed the Ministry of Finance and become an independent entity (Allen, 2008), and in 1980 local branches were given greater autonomy. Their key target became the difference between the level of deposits and the level of credit outstanding, which allowed branches that attracted more deposits to extend more credit rather than remitting their surpluses to a higher level of the bank. Furthermore, because a large portion of credit expansion would return to the same bank in the form of further increased deposits, multiple expansions of credit could come from an initial increase in deposit holdings (De Wulf and Goldsbrough, 1986).

The final step in the PBOC's establishment as an independent central bank came in January 1984 with the formation of the Industrial and Commercial Bank of China, which took charge of the PBOC's remaining commercial operations (Imai, 1985). At the same time, specialised banks operating in specific sectors, such as the ABC, were allowed to transfer funds between their branches in different regions in response to credit demand (De Wulf and Goldsbrough, 1986). Furthermore, in 1986 two universal banks were allowed to compete with the specialised banks in all areas of activity, and a number of new banks were formed at local and provincial level; the competition bringing with it further efficiency improvements (Bléjer et al., 1991).

Alongside its decentralisation, the banking system became the major source of enterprise funding during this period, credit supplanting budgetary grants. By 1984 60 per cent of investment was being financed through credit, that is to say, outside the state budget, up from 35 per cent in 1979 (De Wulf and Goldsbrough, 1986). Specialised banks took advantage of their new authority as financial intermediaries by selecting loan items which promised large economic returns (Imai, 1985), though it is worth noting that due to the distortionary effects of the price system, profitability was not always a reliable indicator of a project's costs and benefits to society (De Wulf and Goldsbrough, 1986). Nevertheless, the efficiency of the use of funds was somewhat improved. Another factor to bear in mind is that during the early days of banking reform the boundary between the political and economic spheres was rather permeable, and provincial government officials often applied pressure on local bank branches to provide loans that suited their political agenda in one way or another (Bléjer et al., 1991). Finally, and again because the price system prevented the efficient working of interest rates, preferential borrowing rates were given to high-priority sectors starting in 1981 (Feltenstein and Farhadian, 1987; Imai, 1985).

As credit began to proliferate through the economy, the PBOC began to control credit expansion by more indirect instruments such as reserve requirements and interest rates (ibid.). As discussed above, interest rates were not as effective a tool as they might be due to the price system, while reserve requirements were set at extremely high levels – up to 40 per cent in the case of savings deposits (Imai, 1985). Administrative commands had not gone away, however, and credit ceilings remained in place, though they were not always rigidly enforced and at times were significantly overshot. They would, however, be reemphasised during periods of monetary tightening. During such times credit would go to priority areas first, a euphemism for state enterprises, so it was predominately non-state entities, which had started to emerge with the reforms, that bore the brunt of credit contraction (Bléjer et al., 1991).

Given the rapid expansion of credit and China's inexperience operating the tools to moderate it, it is perhaps no surprise that inflation started to become a serious issue in a nation that had lived for decades under a fixed-price regime. From 1978 to 1984 the broad money supply increased by 268 per cent, while inflation across the same period was a mere 20 per cent, if official figures are to be believed. Inevitably, this led to enormous pressure on demand – people had much more money to spend while prices had increased only marginally – which found some relief in a rapidly deteriorating trade balance, the current account deficit increasing from 2 billion yuan in 1978 to 24 billion yuan in 1985, but not enough to stave off inflation (Feltenstein and Farhadian, 1987).

To understand exactly how Chinese monetary officials attempted to combat the emerging problem of inflation, it is useful to look at their response to a specific inflationary episode. In 1979 and 1980 inflation started from large and unexpected budgetary deficits, 17.1 billion yuan in the first year and 12.8 billion yuan in the second. These deficits were

primarily the consequence of reform measures aimed at improving living standards, such as wage increases, the state paying higher prices for agricultural goods and reductions in taxes. Both deficits were primarily financed by borrowing from the PBOC in the form of overdrafts, 9 billion yuan in 1979 and 8 billion yuan in 1980. Adding further inflationary potential, the rest of the 1979 deficit was paid for by spending 8 billion yuan in accumulated past surpluses (Imai, 1985).

In order to combat inflation, credit ceilings were more stringently enforced and the savings rate was increased three times, in the Aprils of 1979, 1980 and 1982, in the hope of curbing sharp rises in demand for consumer goods (ibid.). More significantly, 1981 saw the introduction of treasury bonds. For the first issue, state-owned firms and collectives were forced to buy up a certain quota of the bonds based on their profits from the previous year, so it was essentially a form of enforced saving (De Wulf and Goldsbrough, 1986). The following year, however, eligibility to purchase treasury bonds expanded to include private individuals, and from 1982 to 1984 about half of the annual bond issue of 4 billion yuan was bought up by households, who were strongly motivated, no doubt, by the generosity of their return – 9% in 1985. Also by 1985, the value of the issue had risen to 6 billion yuan and treasury bonds had begun to serve an increasingly important role not only as a means to fight inflation but also as a source of government funding (ibid.). Reflecting this, in 1987 the government began to issue bonds whose proceeds were earmarked for capital spending in priority areas (Bléjer et al., 1991).

As a side note, nongovernment financial assets were virtually non-existent at this time. Starting in 1985, enterprises were allowed to issue bonds to fund investment but their high yields made them an attractive alternative to traditional saving and caused a savings outflow, which proved their undoing. In order to curb this deposits flight, enterprises were subsequently required to obtain PBOC permission before a bond issuance could be held (ibid.).

Throughout the early period of reform, monetary policy was never under tight control. This can perhaps be seen most clearly by the rapid growth in money supply in early 1985, which came in response to increased demand from enterprises after they had been awarded greater autonomy over their affairs, directing their own investment and awarding bonuses for the first time. By the middle of the year this surge in the money supply was beginning to fuel inflation so the PBOC tightened policy, predominately through stricter credit ceilings. However, concerns arose that tight policy was causing economic slowdown and easy policy soon made its return, growth in broad money supply standing at about 30 per cent for most of 1987 and 1988 (ibid.). On one level, these rapid vacillations in policy could be viewed simply as the result of bank managers gradually becoming familiar with their new monetary tools (De Wulf and Goldsbrough, 1986), but, on a deeper level, they also reflected a fundamental debate within the CPC hierarchy about whether price stability should be prioritised at the cost of slower growth, or if

growth should be pursued as rapidly as possible no matter how high inflation might become (Bléjer et al., 1991). It was a debate that would take until the end of the decade to be settled.

The Role of Foreign Capital

It was not just economic power that was decentralised during the reforms; political power was increasingly delegated to the regions to direct their own affairs. Indeed, the Chinese use the term fangquan rangli when referring to the early reform period, which roughly translates as 'decentralisation of authority and retention of profits', highlighting the importance with which the devolution process is regarded (Naughton, 2008). Competition between the regions was encouraged, with local governments keen to develop faster than their neighbours due to the fact that rankings of regional performance were a key element in the promotion prospects of a subnational government official. Career aspirations aside, the increased autonomy of local government was a source of incentive in itself (Xu, 2011).

As a consequence of regional competition, and in a clear break from its insular past, starting in 1978 China began to pursue foreign capital by opening its economy up for foreign investment and borrowing (Bléjer et al., 1991). Today China holds the largest reserves of foreign exchange in the world, by a considerable margin, and is one of the biggest recipients of foreign direct investment; in 1978 it had negligible reserves and virtually no foreign investment (Xu, 2011). The pace and scale of the transformation is staggering.

The transformation finds its origins in regional economic competition, specifically the establishment of Special Economic Zones (SEZs) for foreign investment in 1980. Foreign direct investment was initially restricted to these SEZs, with their preferential tax rates and tariff regimes, which only permitted certain types of activity within them, typically as joint ventures with the Chinese government. They were a controversial innovation at first, many within the CPC opposed to them on ideological grounds, but proved to be hugely successful, and in 1984 the scheme was rolled out more widely in response to fervent demand from local officials for SEZs to be developed within their regions (Bléjer et al., 1991). Interestingly, much of the early success of the SEZs can be ascribed to the marriage of low-cost Chinese venues and labour with the market knowledge and entrepreneurial experience of ethnic Chinese investors from Hong Kong and Taiwan (Brandt and Rawski, 2008).

The Overhaul of Fixed Pricing

One final shift in monetary policy in the early reform period worth discussion is the evolution of the pricing regime. Prior to reform almost all prices were controlled by the state and infrequently adjusted, so they reflected neither relative scarcities nor prices on international markets (Bléjer et al., 1991). Prices could often be years outdated and by

1983, due to rising input costs, subsidies had come to represent 20 per cent of all government expenditure (Feltenstein and Farhadian, 1987). The system of dual-pricing, introduced under the reforms to increase economic efficiency, brought market forces into the lives of Chinese households and businesses for the first time in a generation, while managing to avoid the political problems associated with privatisation (which threatens livelihoods) and full price liberalisation (which would require an end to subsidies) (Brandt and Rawski, 2008).

Perhaps unsurprisingly given the recurring food shortages of the pre-reform period, and also reflecting the cautious and incremental nature of reform, dual-pricing was originally an experiment limited to agriculture. Essentially, farming households were given grain quotas which they had to sell to the government at official prices. If they produced in excess of their quota, however, they were free to sell the remainder at market prices (Zhu, 2012). With this fresh incentive to be productive, agricultural output increased by 47 per cent from 1978 to 1984, while the share of the labour force involved in agriculture actually declined drastically during the same period from 69 per cent to 50 per cent, a massive reallocation of 49 million workers into other sectors of the economy (ibid.). Bearing in mind that average labour productivity was about six times higher in non-agricultural sectors than in agriculture at this time, it is little wonder that many identify the reform of agricultural goods pricing as the single most important driver of Chinese growth from 1979 to 1989 (ibid.).

Encouraged by the scheme's success in rural areas, officials extended dual-pricing to cover a wider range of products in 1984. Furthermore, for the first time prices of some products were allowed to be freely determined, while yet more could vary within official boundaries, so-called 'guided' prices (Bléjer et al., 1991).

In addition to enterprises now being able to sell their above-quota output at market prices, a new system of taxation was introduced in 1983 which saw them pay 80 per cent of their earnings, with whatever after-tax profit that remained retained for investment and workers bonuses (Imai, 1985). Replacing the previous system of full remittance of profits to the government, this system better aligned the interests of workers and owners, i.e., the Chinese state (Li, 1997). Prior to this, there had been effectively no link between individual productivity and remuneration (Bléjer et al., 1991).

Overall, from 1978 to 1988, the share of goods subject to mandatory pricing fell from two-thirds to one-third, and the remaining controls were reflected by production bottlenecks in areas such as energy and transport (ibid.). Following the inflation surge of 1987 to 1989 there was some retrenchment of price reforms as authorities tried to bring it down by tightening administrative controls (ibid.), but the overall picture in the first decade of reform was one of diminishing central price setting and gradual introduction of market-based signals.

Concluding Remarks

On the evening of 4 June 1989 death once again hung over Tiananmen Square, this time in the guise of hundreds of dead students gunned down by the military. None of them would be buried in crystal coffins. From 1979 to 1989, the programme of economic reform brought scarcely credible growth to the Chinese economy, but it also brought with it high levels of public corruption and several periods of rampant and sustained inflation. These were two of the things the students had taken to Tiananmen Square to protest about. The CPC had found what Friedrich Hayek had predicted, that central planning and individual liberty cannot go hand in hand (Hayek, 2005), and soon after the protests General Secretary Zhao Ziyang, his top advisors and the economic leadership were purged and replaced, though the general direction of policy remained stable (Naughton, 2008). One question had been settled, though: henceforth, the PBOC would prioritise price stability over economic growth (Blejer et al., 1991).

Reform of monetary policy played a huge role in China's growth in the 1980s, most significantly with the overhaul of the banking system, but also with inflows of foreign investment and reserves, and the reformation of the price system. Market-orientated reforms in the 1980s were slow and cautious experiments, tried on small scales before being expanded or abandoned, painstaking, incremental steps that would occasionally be reversed, and this is still how market-based reform progresses in China today, some 25 years later. When the process of reform was just beginning, reformist leader Chen Yun compared the Chinese economy to a caged bird, the cage serving as a metaphor for the central plan. By expanding the size of the cage you improve the bird's capacity for flight (Brandt and Rawski, 2008). It is an image that neatly captures the essence of Chinese economic reform, its gradual introduction of market-based mechanisms. Today, nearly four decades on from when reform began, the Chinese cage stands on the cusp of being the biggest of all.

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The Whitaker Turn: Overrated?

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Senior Freshman

Few figures in the history of Irish economic policy are as universally revered as T.K Whitaker. In this essay,William Foley boldly challenges the conventional wisdom that Whitaker's policies greatly improved Ireland's economic fortunes. His in-depth analysis of the period 1960-1980 shows that whileWhitaker's impact was vastly overstated, his policies were undoubtedly an improvement on the bleak era of protectionism that went before.

Introduction

A radical change occurred in Irish economic policy in the 1950s. Protectionism had been the economic orthodoxy of the previous twenty years, but this policy had ended in stagnancy and relative decline. The solution, many felt, was to open up the Irish economy and claim some of the ever-expanding exports market of the post-war global economy. T.K. Whitaker, a senior civil servant, is the most prominent figure associated with this position – and so I shall refer to this change of policy paradigms as the Whitaker Turn. In this essay I shall evaluate the accomplishments of the Whitaker Turn and conclude that its achievements are rather less glorious, and rather more tawdry than they are usually presented. I will concentrate mainly on the industrial sector, as this is the most important sector when considering Irish economic development in this period. And I shall also focus primarily on the period from the mid-1950s up to the end of the 1980s, as this is the period when most of the developments and trends associated with the new policy unfolded and reached maturity.

Protectionism

By the mid-1950s, protectionism had trundled to a halt. Fianna Fáil's protectionist doctrine had proved more successful than Cumann na nGaedhal's free trade oriented policies – though the latter had introduced some selective tariffs (Meenan, 1970, p.139-41). During the period of the Cumann na nGaedhal government, slightly over eight thousand new jobs were created in industry, an increase of 7.9 per cent between 1926 and 1931(O'-Malley, 1989: p56). On coming to power, the Fianna Fáil government rapidly introduced new tariffs, raising the average nominal tariff from 9 per cent in 1931 to 45 per cent in 1936 (O'Malley, 1989, p.59). Contrary to popular wisdom, protection had a beneficial effect on Irish industry.

Between 1931 and 1938, industrial employment increased by 50.5 per cent from 110,600 to 166,500 (O'Malley, 1989, p.59).

Nevertheless, this kind of "import-substitution" industrialisation (where domestically produced goods replace artificially expensive, tariffed imports) was inevitably limited by the size of the home market (which was particularly small in Ireland, and diminishing due to emigration) and the cost of importing inputs (Crotty, 1986, p.75). Thus, by the mid-1950s, Ireland experienced "a fairly typical conclusion to a process of import-substituting industrialisation" (O'Malley, 1989, p.70). Industrial production faltered, employment fell across the economy, emigration rose to levels not seen for seventy years, and a chronic balance of payments crisis emerged (Crotty, 1986, p.87; O'Malley, 1989, p.64-5; Department of Finance, 1958, p.7). This depressing economic situation led to what Garret FitzGerald described as a "crisis of national self-confidence" (FitzGerald, 1969, p.118).

The Whitaker Turn

Nevertheless, the morose atmosphere proved conducive to a rethinking of how economic policy should be conducted in Ireland. The man who was at the forefront of this process was T.K. Whitaker, "sometime Secretary of the Department of Finance and sometime Governor of the Central Bank" (Crotty, 1986, p.78). Whitaker penned the seminal Economic Development document, published in 1958, in which he provided the first rigorous formulation of the new doctrine. Whitaker was clear about the need to develop a new policy direction: "if we do not expand production on a competitive basis, we shall fail to provide the basis necessary for the economic independence and material progress of the community" (Whitaker, 1969a, p.102).

The new direction would be fundamentally different from the old. The home market had been shown to be insufficient so the Irish economy had to become more export-oriented (Whitaker, 1969a: p103; Whitaker, 1969b, p.59; Crotty, 1985, p.87). Boosting exports meant achieving greater integration with the world market by opening up the Irish economy. This entailed ending the protectionist policies that had been in place since 1932. Whitaker put it simply: "it seems clear that, sooner or later, protection will have to go and the challenge of free trade be accepted" (Whitaker, 1969a, p.101).

Whitaker's recommendations were codified and formally adopted in the government's 1958 Programme for Economic Expansion. The document established the priority of developing export-oriented industries to facilitate industrial expansion (Department of Finance, 1958, p.36). The primary aim of government policy in the industrial sector would be to "stimulate a vast increase in private industrial investment" while ensuring that "manufacturing activities will cover all processes from the basic raw material stage" (Department of Finance, 1958, p.35). This would involve severely lowering tariffs, providing large quantities of capital through the state's Industrial Credit Corpora-

tion, lowering taxation on profits and various expenditures, extending technical assistance, establishing a permanent agency for the promotion of exports (An Córas Tráchtála Teo.), providing grants through An Foras Tionscail, and attracting foreign investment through the Irish Development Authority (Department of Finance, 1958, pp. 37-40).

The exact details of the plan changed but there was a marked continuity in policy approach from the 1960s onwards (Telesis, 1982, p.24; O'Malley, 1981, p.14). The broad shape of industrial policy involved "encouraging industrial investment by Irish and foreign companies through general promotional activities and financial incentives, and opening the Irish economy to free trade" (Telesis, 1982, p.24). The government lowered tariffs progressively from the 1960s onwards, beginning with unilateral, across the board cuts in 1963 and 1964 (O'Malley, 1989, p.77). The Anglo-Irish Free Trade Agreement of 1965, and the accession to the EEC in 1973, led to a phasing out of tariffs on British and European goods respectively (O'Malley, 1989, p.77). The government also introduced a package of grants, subsidies and tax holidays offered to industries producing for export (Crotty, 1986, p.88). An Foras Tionscail tended to provide grants only to export-oriented companies. These grants were very generous, amounting to up to 50 per cent of plant and machinery costs and 100 per cent of building and land costs in designated areas, and up to 33 per cent of plant and machinery costs and 66 per cent of building and land costs everywhere else (O'Malley, 1989, p.73). In the latter half of the 1950s, successive governments introduced significant tax relief programmes for exporting industries such as the Export Profits Tax Relief (O'Malley, 1989, p.73).

Results and Responses

The economic growth that Ireland experienced in the two decades following the implementation of these policies was, by any account, impressive. Between 1962 and 1982, gross national product per capita tripled (Telesis, 1982, p.3). The productivity of industrial workers increased by more than half between 1956 and 1967, and earnings increased apace (Meenan, 1970, p.132). Irish and British wages began to converge so that by 1978 average earnings in manufacturing were 93 per cent of the British level (O'Malley, 1989, p.94). Economic growth was particularly strong in the industrial sector. Between 1976 and 1979, the Irish manufacturing sector expanded faster than in any other country in the EEC (O'Malley, 1989, p.90).

The progress of Irish industry in particular, and the economy in general, was regarded as highly successful by many people who commanded considerable respect. Garret FitzGerald, who as an economist in the 1950s and 1960s acted as a sort of cheerleader for T.K. Whitaker, regularly referred to "Ireland's economic miracle" (Crotty, 1986, p.87; p.90). Charles Haughey, as minister for finance, declared in 1969 that Ireland had solved its economic problems and now only had to deal with the issue of distributing wealth (Crotty, 1986, p.90). His rival, Des O'Malley, speaking in 1980 as Fianna Fáil minister

for industry, commerce, and tourism, lauded Sean Lemass who "began the highly successful programme of planned growth, based on rapid export development, a high level of investment and selective attraction of foreign enterprise to strengthen the industrial base" (O'Malley, 1989, p.89).

Something is rotten…

However, the events of the 1980s illustrated that the Whitaker Turn had not as profoundly improved the Irish economy as had been hitherto believed. Unemployment rose to 10 per cent in 1981 and then 18 per cent in 1987. Manufacturing employment fell by 20 per cent between 1979 and 1987, an unprecedented decline. Yet the average annual growth rate in industry was over 6 per cent between 1982 and 1987, and Ireland often had the fastest rate of growth of industrial output in the OECD in that period (O'Malley, 1989, pp.89-90). Even when employment began to recover, the gains were modest. Between 1985 and1990 there was net growth in manufacturing employment of 3 per cent but real increases in output of 27 per cent and in exports of 33 per cent (Brulhart and McAleese, 1994, p.21). The explanation of this seeming paradox is explained by fundamental structural weaknesses, which were only exacerbated by the Whitaker Turn.

The outward-looking policies established since the 1950s were very successful in attracting overseas investment. The Economic Commission for Europe's judgement in the early 1970s was that Irish measures "go further than any other country in Europe in encouraging export industries and attracting private capital for this purpose" (O'Malley, 1989, p.76). Indeed, the Telesis Consultancy Group concluded that the Irish incentives package was considerably more generous than necessary and that some of its constituent funds should be reallocated towards indigenous industry (Telesis, 1992, p.28). The ultimate effect of this generosity is that new foreign firms took the lion's share of the export markets whereas, domestically, indigenous industry was reduced by competitive newcomers to low-valued added and / or non-traded activities. In fact, the overall improvement in industrial performance was almost entirely due to the establishment of new foreign firms (O'Malley, 1985, p.1). Industrial output grew in the 1960s and 1970s at three times the rate of the 1950s. Irish exports' share of foreign markets increased continuously; there was considerable diversification in production (O'Malley, 1985, p.11). But indigenous industry generally declined or remained stagnant during this period. After free trade was introduced in the mid-60s, employment in indigenous industry declined from 188,000 in 1966 to 182,000 in 1980 (O'Malley, 1985, p.15).

Indigenous Industry

In reality, most of the gains made during the 1960s and 1970s were made by new foreign firms. By 1979, new foreign firms and subsidiaries accounted for 70 per cent of manufactured exports (O'Malley, 1989, p.107). The only indigenous firms which showed any

sort of improvement were in low value-added, primary processing industries such as food, or were in non-traded industries which serviced the newcomers (O'Malley, 1989, p.115-20). In 1981/2, food, drink and tobacco, clay, glass and cement, and paper and printing accounted for 18 of the 20 top indigenous firms (O'Malley 1985, p.31). Outside of the low value-added, naturally protected food sector, most of the indigenous growth took place in non-traded industries centred on servicing the new foreign firms: employment in traded industries such as textiles, clothing, and footwear fell from their 1973 peak, whereas employment in non-traded industries such as packaging, cement and metal fabrication increased between 1973 and 1980 (Telesis, 1982, p.12). In other words: everywhere where indigenous industry could be beaten, it was beaten.

This poor performance was unsurprising. The Committee for Industrial Organisation concluded in a 1965 report that there were systemic problems in indigenous industry: poor management, shortage of skilled labour, old buildings and equipment, small scale and short production runs due to the small market (O'Malley, 1989, p.78). Over fifteen years later, the Telesis consultancy concluded that indigenous Irish companies have "had difficulty in developing marketing, technical selling and distribution advantage in export markets" (Telesis, 1982, p.15).

The Newcomers

The virtual wiping out of traded indigenous industry, except in naturally protected and non-traded industries, was problematic in itself. But the new foreign firms also added to the structural problems of the Irish economy in other ways. Crotty points out that the newcomers, in general, shared three undesirable features: they were ethically and morally "dirty", they generally practised transfer pricing, and they were capital intensive and labour extensive (Crotty, 1986, p.90). Crotty offers little enough evidence that most, or even a large number of the new foreign firms were ethically or environmentally dirty. But his other two points are more readily empirically supportable. To the list of negative features of these foreign newcomers, we might also add the small quantity of linkage effects generated by them (O'Malley, 1988, p.177; Foley and McAleese, 1991, p.26; Drudy, 1991, p.167).

Crotty takes the Aughinish Aluminia Company (AAC) as a typical example of the new foreign firm. (Note: his description dates from the 1980s). It practiced transfer pricing by charging inputs and outputs so that the maximum amount of profit is registered in Ireland where the parent firm, Alcan, could avail of the various tax breaks and holidays for exporting industries (Crotty, 1986, pp.91-2). The AAC was also very capital intensive and labour extensive. It employed a lot of capital, of which Ireland has a shortage – as Whitaker was painfully aware (see Whitaker, 1969b) – and employed little labour, of which Ireland has a surplus. Indeed, the firm only employed one person per £1 million pounds invested (Crotty, 1986, p.92). Finally, AAC created few upstream and downstream

linkages with Irish industry. The firm imported virtually all its imports, except for circa 1,000 tonnes of flour, and circa 11,000 tonnes of limestone, along with some discounted electricity (Crotty, 1986, p.92).

These features chime with evidence of the general character of the new foreign industries in Ireland. Firms readily availed themselves of the generous tax reliefs. For many firms the "fundamental attraction" of Irish investment was the 10 per cent corporation tax rate (Telesis, 1982, p.25). This did not augur well, financially, for the Irish state which, as pointed out above, ploughed vast quantities of capital into attracting foreign industry. The capital intensiveness of the new foreign firms was also problematic as it created insufficient demand for labour to end Ireland's long term unemployment problem. Even in the 1960s and 1970s, unemployment remained relatively high at 6-8 per cent (O'Malley, 1989, p.91). As pointed out above, the huge difference between growth in employment and growth in industrial output became very pronounced in the 1980s. Irish industry employed proportionally fewer workers than any other comparable economy. By 1987, in the opinion of Pádraig O hUiginn of NESC, it should have been employing circa 100,000 more workers (McCabe, 2013, p.108). This gap is attributable, ultimately, to the capital intensiveness of foreign firms (O'Malley, 1989, p.90).

The newcomers also created few linkage effects with indigenous Irish firms, purchasing few domestic inputs and dampening any potential stimulus effect (McCabe, 2013, p.99;). Instead, newcomers imported most of their inputs. In 1974, the import content of raw materials used by new industries in the chemicals, metal and engineering, and other manufacturing sectors (dominated by new foreign firms) was "in the region of 90 per cent or more" (McAleese, 1977, p.46). Indeed, overall, the import content of overseas firms was significantly greater than Irish firms – one of the reasons being the relatively technologically more sophisticated nature of the foreign firms (McAleese, 1977, p.46). In 1983, foreign industrial firms spent only 11.43 per cent of their revenue on Irish materials, compared with 45.84 per cent for indigenous firms (O'Malley, 1989, p.1979). Telesis pointed out that in Belgium, a small country with a proportionally similar foreign industrial sector, indigenous firms were three times as successful in supplying foreign businesses (Telesis, 1982, p.16).

Thus, foreign investment did not significantly develop the industrial base. As reported above, besides the food, drink, and tobacco sectors, the only significant industrial growth occurred in packaging, cement, glass, clay and metal fabrication. In other words, the output growth was in (effectively or absolutely) non-traded firms which, safe from international competition, supplied packaging for the new foreign export firms to ship their exports out of Ireland, and which supplied the materials for the construction of new plants and buildings.

The indigenous commercial activities which ultimately developed under the new, export-oriented policies were not involved in high-tech industrial production, but in "the acquisition of greenfield sites, the construction of factory and office space, road haulage, banking, and insurance" (McCabe, 2013, p.98).

Telesis is damning in its conclusion about the state of Irish industry: "High skilled, high-tech enterprises are rare; Irish indigenous exports are small and limited in scope; Small firms exist primarily in low-skilled non-traded businesses; Little cooperation exists between primary producers and processors in raw materials-based businesses; Foreign-owned industry is often unsophisticated and the evolution of existing companies shows inadequate promise for substantial improvement" (Telesis, 1982, p.25).

Conclusion

The Whitaker Turn was did not make the profound structural change that its cheerleaders claim for it. As the Telesis report pointed out: "Long term industrial growth can only be provided by the development of businesses exporting outside Ireland" (Telesis, 1982, p.12). The only indigenous business of any significance exporting out of Ireland by the end of the 1980s was the naturally protected food industry – which is at any rate a low value-added industry (McAleese, 1977, p.42) – and a small number of long-established exporters in the drink and tobacco sector such as Guinness, Irish Distillers and Carroll's, all of which were founded before 1824 (O'Malley, 1989, p.116).

The vast majority of industrial growth was achieved by new foreign firms. As Foley and McAleese put it, this is the "second best" form of industrialisation - overseas industry "repatriates profits; it has limited linkages with the domestic economy; it imports most of its components and materials; and it rarely includes higher-order or head office type functions in its projects" (Foley and McAleese, 1991, p.26). The main growth in employment over the 1960s and 1970s was thus in those sectors which serviced the new foreign firms – construction and provision of construction materials, packaging, property development, and finance. The type of economy developed under the Whitaker Turn remained fundamentally structurally weak. The indigenous Irish capitalist class consists not of captains of industry, reinvesting their profits and expanding the economy, but of hangers-on, feeding off foreign direct investment.

But, in a sense, the policy-makers of 1950s Ireland could not really have done any better. The only alternative, after all, was the stagnancy of protectionism. Arguably, despite the limitations of foreign direct investment, it is doubtful that alternative uses of state resources would have procured a better economic return than was generated by overseas industry (Foley and McAleese, 1991, p.26). Indeed, going into the nineties, policy makers retained the same orientation towards overseas investment (Fitzpatrick and Storey, 1991, p.59). Thus, the same cycle of the 1960s-1980s was repeated: an initial burst of foreign investment spurred on indigenous growth in construction, finance, and property

development, leading to a catastrophic collapse. Arguably, the 1990s-2000s cycle only repeated that of the 1960s-1970s in a more extreme manner. Indeed, today, the exporting industrial sector is even more dominated by foreign firms, is even more labour extensive, and still maintains relatively low linkages (McCabe, 2013, p.98).

The conclusion for Ireland as a "small open economy" is thus pessimistic. With the only alternatives being the introverted stagnancy of protectionism or the precarious parasitism of openness, it seems that Ireland is fated to be one of the perennial bottom feeders of the developed world.

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Quo Vadis, EU? An Inquiry into the Dysfunctional Nature of the EU's Labour Market

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In this essay, Sabrina Schoenfeld questions whether the alarming fissures in the EU labour market are a result of deep structural flaws in the economic orthodoxy. Three pertinent labour issues are raised, and taken together they provide strong evidence challenging the belief that private demand can fuel economic growth perpetually. She concludes by warning that these inherent flaws must be acknowledged in order to develop an optimal strategy for the future.

> *"The errors of a theory are rarely found in what it asserts explicitly; they hide in what it ignores or tacitly assumes."(Kahneman, 2012, pp. 274-275)*

Introduction

The labour market of the EU is a unique construct. Assisted by the four freedoms (free movement of people, goods, services and capital), the single market offers a vast range of opportunities for millions of workers. However, the financial and economic crises have put the EU's labour market under severe stress. The Commission's long-run strategy of using labour market flexibility and mobility as the safeguards against the threat of diminishing competitiveness in a globalised world economy requires reassessment, given the devastating consequences of the Great Recession. This essay seeks to provide why these strategies have been unable to cope with the crisis. It is structured as follows. The first part will provide an overview of the mechanics and theoretical assumptions for the functioning of the Union's labour markets. The second part will reveal systemic conflicts, highlighting the need to rethink the economic and social strategy of the EU.

The EU's Labour Market

The general design of the EU's labour market aims to introduce mechanisms that ensure competitiveness. Flexibility is a key requirement, as this can, ideally, compensate demand shocks and balance the natural fluctuations of labour demand. Competitiveness, on the other hand, can be considered not only as an end, but as a means as well. Competition is

at the core of current economic thought, working as an incentive for governments to have well designed policies in order to remain competitive and to increase the overall efficiency of the EU's labour market by economic convergence. In this respect, non-wage costs (used to finance social policy) are a key variable determined by each individual state.

Most countries have benefitted considerably from the creation of the single market. Satisfactory overall growth rates in the 1990s and early 2000s ensured a mostly positive impact on the labour statistics of the member states. Although only mediocre convergence in growth and unemployment rates - especially after the Eastern enlargement - highlighted the complexity of the challenges, hopes remained high that a well functioning, competitive single European labour market was achievable in the long run (Cappelen et al., 2003, European Commission, 2006). However, the global financial crisis, starting in 2007, amplified the impact of practical and systemic problems that the project has been struggling with from the beginning.

Although the European labour market was able to withstand the disastrous effects of the financial crisis initially, unemployment skyrocketed to unprecedented heights from 2011 onwards. Despite efforts to stabilise the European economies through bailout programs and structural and labour market reforms[1], the overall performance of the EU's labour market remains a matter of concern. The EU's institutions attribute this to the great variance of the labour markets' structures and inflexible labour markets (European Commission, 2013a, European Commission, 2013b). By 2013, the European labour markets appear to have stabilised, but substantially high long term and youth unemployment rates remain at worrying levels. Reports from the European Commission highlight the dangers of structural problems, as job finding rates in many member states linger at all-time low levels; youth unemployment has hit the 50per cent mark in Spain and Greece, and floats above 25 per cent in most member states (2013b). Fear that these problems may become one of a persistent nature dominates the debate about how to improve the functioning of the individual member states' labour markets (European Commission, 2013a).

Labour force mobility is another cornerstone of the EU's strategy to deal with labour demand fluctuations. In theory, a flexible and mobile workforce can, in part, adjust the disequilibrium of supply and demand. However, in practice, only about 3 per cent of EU citizens are moving to look for jobs within the EU (Dhéret et al., 2013), highlighting the significant disparity between theoretical assumptions and reality. Moreover, language

1. These reforms are at the heart of the Commission's strategy to resolve the unemployment crisis. For example, in late 2013, the Commission reported that, "European countries have shown an increased commitment to tackle the structural weaknesses built-up over the last decade. Substantial reforms, aiming at improving the resilience of the labour market, introducing more internal and external flexibility and facilitating the transition between jobs, have been introduced in several member states, and more are planned in years to come." (2013b, p. 60)

barriers and bureaucratic struggles contribute notably to the mobility inertia. The harmonisation of skills and qualifications throughout the EU remains the mammoth task for the institutions and member states.

While these barriers to mobility certainly are significant, they do not explain the severity of the current malaise. To answer the question at hand, a closer look on the underlying dynamics at play is required. The remainder of the paper will examine three sources responsible for the distortions of the labour market and will propose that these are simply corollaries of systemic flaws at work. It is worth noting, though, that the discussion of sources in this paper is not extensive by any means, but merely puts the focus on the most disruptive forces.

Are Systemic Flaws at the Heart of the Problem?

The Widening Gap between Labour Productivity and Real Wages

A good starting point for this analysis is the oft-discussed decline of trade unions and the resulting loss of labour's bargaining power. Scholars attribute the diminished influence of trade unions to the rise of neoliberalism, the ideology that has shaped the policies of the EU's member states considerably (Harvey, 2005; Flassbeck and Lapavitsas, 2013). Even in countries with relatively strong unions, such as Germany, bargaining power has been on the decline. For example, Germany's trade unions were put under considerable pressure to accept wage moderation in the early 2000s, contributing greatly to the economy's export based boost in the years to follow (Mazier and Petit, 2013). This wage moderation resulted in a desynchronised movement of labour productivity and average income per worker, with a widening gap over time (Flassbeck and Lapavitsas, 2013). However, Germany is not an exception in this regard, as Figure 1 illustrates. Scholars have noted the diminishing collective bargaining power in most western countries - expressed through increased labour productivity and wage growth discrepancies - and its positive relationship with inequality (Machin, 1997, Acemoglu et al., 2001). Others have argued that the weakening or circumventing of labour unions is an imperative necessity for the application of neoliberal theory (Harvey, 2005, Flassbeck and Lapavitsas, 2013).

The conflict between capitalism and labour demands in a democratic regime has been well discussed, and may be conducive to the understanding of the underlying problems of the EU's labour market. Many scholars have identified the mid-1970s as the tipping point when growth, spurred by the post-war period, slowed down and the conflict between capitalism and democracy re-emerged (Reich, 1991, 2010; Streeck, 2011). There is general agreement that inflation can be considered as a manifestation of the inherent conflict between the demands of capitalism and the demands of labour (Galbraith, 1999; Streeck, 2011). During the Bretton Woods regime, fiscal and monetary policy could be used to consolidate democratic and capitalist politics to satisfy both sides' demands to keep distributional inequality in check. The decreasing growth rates in the 1970s - while

trade unions still held great power - led to high levels of inflation in the 1970s, as policy-makers faced the trade-off between unemployment and inflation, and opted for the latter. Following this, Volker's tenure as Chairman of the Federal Reserve resulted in a change of policy which brought about deflation, which in turn led to high public debt in the 1980s (Streeck, 2011). Lastly, the credit boom in the 1990s and early 2000s, fuelled by consumers' attempts to compensate for declining incomes, resulted in high private debt, and, eventually, culminated in the outbreak of the financial crisis in 2008 (Reich, 2010, Streeck, 2011).

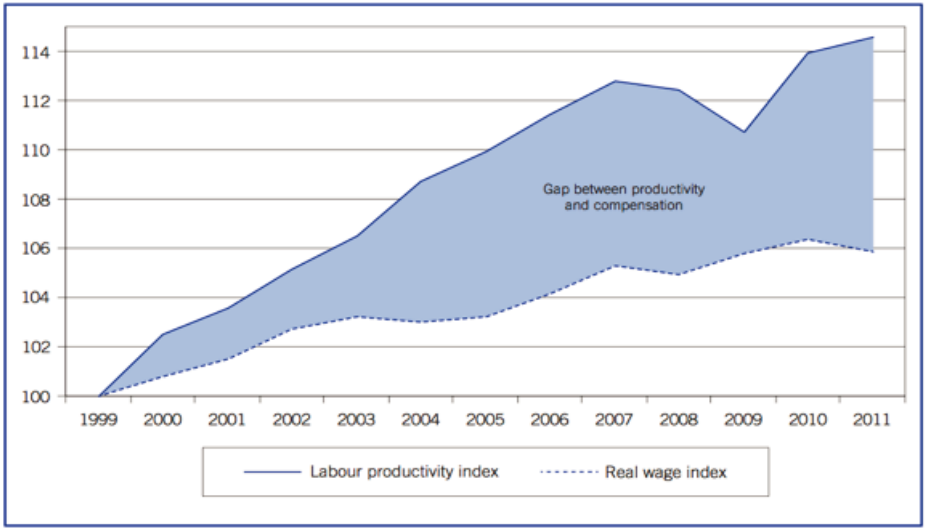

Figure 1: Trends in growth in average wages and labour productivity in developed economies (index: 1999 = 100). Source: International Labour Office, 2013, p. 48

Developed economies, many of who had followed the path described above, took different measures to stabilise economic output and avoid big drops in employment and consumer demand. Since the production of goods and services, above all, ensures economic security for the worker, high economic output remains a crucial necessity. However, an extreme drop in production could not be avoided in the aftermath of the financial crisis. Moreover, countries in the euro area, stripped of the ability to devalue their currency, could only react by devaluing the living standards of their citizens, rather than their currencies, to remain competitive in the global economy. To illustrate this point, in their discussion on the success of 'competitive internal devaluation', Mazier and Petit (2013) noted that, "countries applying such policies [...] run the risk of opening a cumulative process of deterioration.

Austerity policies are all the more ineffective that they are implemented in a group of interdependent countries." (p. 514)

Declining Consumer Spending and Domestic Demand

A second cause of the Great Recession has been attributed to the different growth strategies that the economies had adopted in the run-up to the crash, that are directly linked to the decline in disposable income (International Labour Office, 2013). Export-driven growth had been achieved in some countries through the prior reduction in labour unit costs, resulting in low levels of aggregated demand. Other economies adopted either demand-driven or debt-driven growth strategies. The former, for example France, achieved this by keeping labour productivity and wages in line. The latter, such as the United Kingdom or, outside the EU, the USA, worked following the logic of the mechanisms described in the previous section i.e. by the compensation of declining wages through debt (International Labour Office, 2013).

The current dilemma of the EU is caused by declining or stagnating domestic demand levels in the majority of the member states (Flassbeck and Lapavitsas, 2013; European Commission, 2013a). Domestic demand, consisting not only of household consumption, but government investment, too, has been additionally stifled through austerity measures imposed to balance national budgets. To be sure, a lack of domestic demand is problematic for labour markets for obvious reasons, as low demand for goods and services translates into low demand for labour. Consequently, low domestic demand in too many EU member states and major international trading partners leads to a vicious cycle of low labour demand, low income levels, implying low consumption, resulting in even lower labour demand.

With public finances already subject to the burden of debt as a result of bailout programmes, rising social protection payments, and a steep decline in revenue, the scope for expansionary fiscal policy is limited. From a monetary policy perspective, quantitative easing, conducted by the European Central Bank, has helped to stabilise the financial system, but this mechanism has proven to be inefficacious to stimulate aggregate demand (European Commission, 2013a). The only feasible option for governments in a downturn spiral as described above is further downward pressure on labour costs to minimise unemployment, with simultaneous efforts to create jobs in the export sector, in the hope of gaining ground in the competition for foreign demand and investments.[2] This can, in the short run, lead to an improvement, as the German case has shown. Similarly, low domestic demand can lead to higher exports, as producers allocate more resources to satisfy foreign

2. This is reflected in the current developments within the EU: "[…] the adjustment of internal and external imbalances is continuing. There is evidence that a shift in production factors from non-tradables to tradables sectors is contributing to the reduction of current-account deficits in vulnerable economies." (European Commission, 2013a, p. 3)

demand (Esteves and Rua, 2013). However, warnings have been issued by various organisations that the current strategy of fiscal austerity in combination with the disparity between productivity and real wages in many countries may have disastrous consequences, leading to rising income inequality and a significant impact on labour dynamics, as can already be observed in many EU member states (International Labour Office, 2013). Further research implies that aggregate demand in the eurozone and most EU countries is mainly wage-led, supporting these recommendations (Onaran and Galanis, 2012). Therefore, this strategy cannot be regarded as sustainable in the long run.

The Changing nature of Labour

A third cause of the crisis of the labour market has been identified to be the changing nature of labour itself. The first section of this paper outlined how labour flexibility and mobility are required to tackle the effects of globalisation on the labour markets. These have been established with varying success in the EU, but intra-EU mobility remains low. This is exacerbated by the finding that a growing number of people move outside of the EU to find work (Dhéret et al., 2013). This trend is worrying, as it clearly implies a mismatch between the labour demanded in the EU and the labour supplied. The conceptualisation of different labour divisions is a key requirement to understand the dynamics through which this mismatch is created.

As early as the 1990s, Robert B. Reich (1991) observed that the old service/production categorisation no longer holds. Instead, he identified three new job categories. First, routine production services, which have been declining in all industrialised countries, and are subject to international competition. Secondly, in-person services, such as personal trainers, which cannot be sold worldwide and have increased with globalisation. Lastly, people working in the expanding field of symbolic-analytic services, comprising of problem solving, problem-identifying, and strategic-brokering activities, who are competing on an international level, but with the advantage that their services cannot be standardised, leaving them the freedom to move following their preferences. Examples of this group are bankers, lawyers, accountants, and business people.

Without doubt, it is the latter group that benefits most from globalisation. Not only can members of this group expect high remuneration for their services, they have also gained considerably in bargaining power that the trade unions have lost. Moreover, they constitute the most mobile and flexible group, benefitting from the advantage of attracting the interest of multinational companies and organisations competing for their services. Furthermore, no other group is as well connected through global networks as the members of this group. These features have considerable consequences on income and power distributions, as well as on economic and social policies.

The implications are a reflection of the state of the global labour markets today: routine production workers compete with both technological innovations as well as with

other routine production workers on an international scale, leading to a race to the bottom in terms of labour unit costs. In countries where this is politically, economically, and socially unfeasible, public policy encourages labour participation in the other two labour categories. With in-person service workers increasingly depending on the demand created by symbolic-analytic workers, given the declining spending power of routine production workers, governments increasingly provide incentives in the form of favourable policies. Furthermore, members of the latter group have little incentive to vote for redistributive policies. It is beyond the scope of this paper to discuss the tax related developments of the past three decades. However, it may certainly be argued that changes in the tax system have similarly contributed to the distortions of the labour markets. In conclusion, public, economic, and social policy have not been in tandem with the demands that the changing nature of labour created.

Bringing it Together

These three observations - the widening gap between wages and productivity, the drop in domestic demand, and the changing nature of labour – help to understand the dynamics at play. However, since each of them have only partial explanatory power, the introduction of a final element is necessary to fully understand the implications. The resolution, this paper argues, lies in the misinterpretation of the role of demand for private goods and service in the age of a globalised world. For decades, scholars and commentators have noted that the production of goods and services has achieved its original goal - the satisfaction of urgent needs such as food, clothing and shelter – a long time ago (Galbraith, 1999; Jackson, 2011). Moreover, well before the 1990s, John Kenneth Galbraith observed that,

> *"the process of by which wants are now synthesized is a potential source of economic insta bility. Production and therewith employment and social security are dependent on an in herently unstable process of consumer debt creation. This may one day falter. And decay in emulative compulsions or in the ability to synthesize demand could bring a fall in con sumption, an increase in unemployment and a difficult problem of readjustment" (Galbraith, 1999, p. 207).*

This observation is of paramount importance in understanding the systemic flaws in the labour market strategy of the EU's labour market. The economic security of individuals, which is based on the demands for private goods and services (required to increase perpetually), works only as long as this can be sustained and financed. Sustainability seems highly uncertain in the context of finite resources, negative environmental consequences and rising levels of inequality. The question of the financial feasibility of these demands has been answered unequivocally by the financial crisis and the run-up to it. Therefore, it

may be argued that any strategy of the EU to reduce unemployment needs to re-examine the role of demand for private goods. Ultimately, strategies that fail to go beyond the creation of more demand for private goods and services are prone to be unsuccessful in the long run, as they fail to resolve the conflicts described in this paper. Possible directions are a move towards an increased production of public goods or the provision of income for non-market related activities. Concepts of a universal basic income, the negative income tax, or living wages are just a few examples of what future strategies may incorporate. However, this requires hard political choices. By acknowledging the aforementioned systemic flaws, the first step towards a real economic recovery may be accomplished.

Conclusion

In conclusion, the four freedoms have contributed significantly to the theoretical improvement of the functioning of the EU's labour market. In practice, though, the Great Recession has shown that the strategies employed by the European Commission have proven to be unsuccessful to handle the current crisis. This paper has examined the underlying dynamics responsible for the malfunctioning of the EU's labour market. Furthermore, it has been argued that only a critical reassessment of the fundamental role of the demand for private goods and services can provide the basis on which to build future strategies to tackle the distortions of the labour market.

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THE PROTECTIVE SOCIETY: A DEFENSE OF PATERNALISTIC PUBLIC POLICY

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In an insightful and challenging paper, Conor McGlynn firstly questions whether society is morally obliged to use paternalistic policies to ensure equality. He then turns a discerning eye to the philosophical foundations of paternalism in an attempt to figure out whether a group can ever be justified in imposing its values on others. Throughout, he displays an astute understanding of the multitude of difficulties inherent in defining and upholding a moral code.

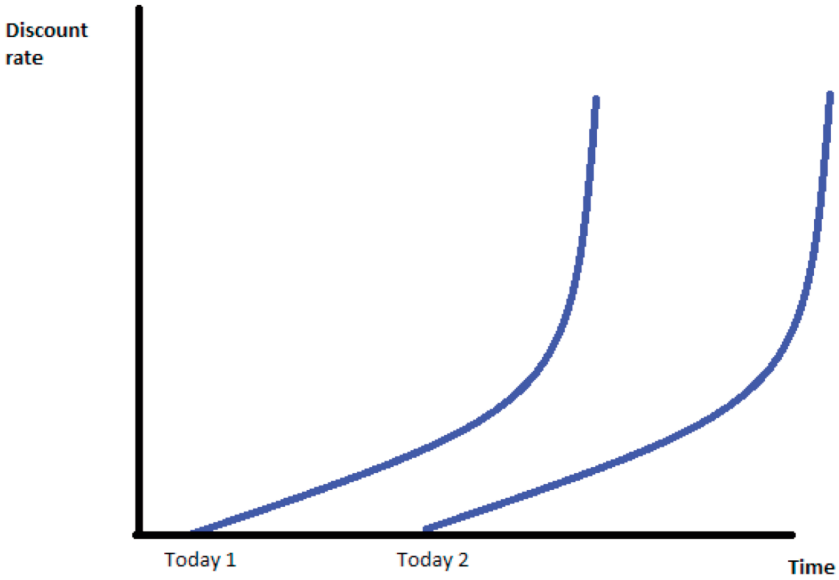
Introduction

Paternalistic public policies aim to prevent people from harming themselves, or to ensure that they benefit themselves. Many people object to such policies on the grounds that they violate individuals' liberty. Others disagree, and say that the benefits to society of such policies outweigh the loss in personal freedom. In this paper, I will make the case for paternalistic public policies on two different grounds. First, I will argue that paternalism is necessary to ensure equality in society. Second, I will argue that we should implement paternalistic policies which reflect our own liberal values, and that we should promote such policies in other communities.

Hyperbolic Discounting and Obesity

One argument used in favour of paternalistic public policies is from hyperbolic discounting. When deciding between a reward today and a reward in the future, people show a preference for the reward that comes today. When offered the choice between receiving €100 today or €110 a month from now, people will often go for the immediate payment even though it is of lesser value. They discount the value of the future reward by a certain factor; if the discounted value of the future reward is lower than the value of the reward today then they will choose the reward today. Neoclassical economic theories originally assumed this rate to be constant. However, observation reveals that in reality people often do not use a constant discount rate; instead they are hyperbolic discounters, and their discount rates change over time (Kirby, 1997).

Starting from the time period of 'Today 1' the discount rate increases gradually in the near future, but increases more steeply in the distant future (Graph 1).



Graph 1: Hyperbolic discounting

When the time period moves the graph also shifts, from 'Today 1' to 'Today 2'. The value of future rewards is hence much lower under hyperbolic discounting. This leads to dynamic inconsistency, where an individual's preferences at one point in time are inconsistent with their preferences at another time. If an individual is offered the choice between €100 a year from now or €110 in 13 months, they will choose the €110. However, if in a year they are told they can change their choice, and can instead take the €100, then they may do so instead of waiting a month for the €110. This means that the individual is 'present-biased'; they have very short time horizons and heavily discount any time period that is not today (Hillman, 2009).

Hyperbolic discounting is associated with cases of personal excess (O'Donoghue and Rabin, 1999). People who have short time horizons will decide to act today in such a way that they know they will regret in the future. Overeating is an example of this; a person's choices in an otherwise beneficial market lead to a lower standard of living. Paternalistic policies may be implemented to stop people eating unhealthily. The least controversial way of doing this is through public awareness campaigns, which inform the public about the dangers of obesity and the benefits of healthy eating. Other methods in-

clude setting limits on the amount of fat that products may have, offering tax incentives to people who lose weight, and even banning certain foods outright. However, such paternalistic laws are often unpopular. One such law, attempting to introduce a size limit for soft drinks in New York City in 2013, was met with huge public anger, and was ultimately defeated in a court challenge. It is argued that people should be free to choose how much they want to eat. Why should the food lover be prevented from eating now, just because his 'future self' may regret the decision? A nanny state which enforced such laws would have too much control over our personal lives. There are other cases of personal excess, such as watching too much television or having unprotected sex, that, although they have consequences we might regret, we feel that it is a violation of people's liberty for the state to limit or ban these activities.

An argument from equity can be made in reply to these objections. It has been observed that there is a significantly higher incidence of obesity amongst low income and low education groups. One study (Singh, et al., 2010) shows rising inequality between socioeconomic groups in childhood obesity levels (Table 1). There are a number of possible reasons for this. It has been speculated (Hillman 2009, p.372) that obesity reduces income, particularly for women, due to discrimination in employment and in spouse-selection against the obese. However, this does not account for the inequality in childhood obesity. Another possible explanation is that low education groups aren't sufficiently informed about the dangers of an unhealthy lifestyle, and about healthy foods (McKinnon, 2010). If this is the case then it is a strong argument for more comprehensive public awareness programmes.

	Obesity Prevalence 2007	**Obesity Prevalence 2003**
Total Population	16.37	14.83
Family Income: Poverty Threshold		
< 1:1	27.37	22.18
1:1 - 2:1	21.15	18.68
2:1 - 4:1	14.51	13.78
> 4:1	9.96	9.33
Household Employment Status		
Employed	15.11	14.1
Unemployed	26.05	20.7
Highest Household Education Level		
< 12	30.43	22.95
12	20.52	19.9
13 - 15	17.93	16.36
16+	9.74	10.48

Table 1: Obesity prevalence amongst US children aged 12 - 17, 2003 and 2007, according to socioeconomic group

Another, more controversial reason why such inequalities exist is suggested by evidence from a recent study (Can and Erdem, 2013) carried out in Turkey. The researchers surveyed the level of hyperbolic discounting in different income groups. What they found were significantly higher present bias levels in lower income groups. While for high income individuals the present bias prevalence was 6.4 per cent, this increased to 29.4 per cent for low income individuals. A higher level of present bias could account for some of the disparity in obesity between high and low income groups. Low income groups discount the future at a higher rate than high income groups, making them more susceptible to personal excesses such as overeating. This provides a justification for stronger paternalistic policies dealing with obesity. A child born into a low income family is more likely to develop obesity than a child in a high income family, and therefore to have a lower standard of life. If the causes of this inequality go beyond a lack of information about healthy eating then a public awareness campaign won't be enough to correct the inequality. In order to ensure ex ante equality, or equality of opportunity, there must be paternalistic laws, such as limits on fat content and bans on unhealthy ingredients. Paternalism is therefore essential for an equal society.

Community Values and Illegal Markets

Another reason why paternalistic public policies are implemented is that they are a way of expressing the values of a community (Sandel, 2009). Many paternalistic laws which seek to protect people from personal excess and self-inflicted injury, such as laws criminalising the use of dangerous drugs, are partly motivated by the values of the community. States prohibit the use of drugs not just because of the damage they cause, but also because the community values sobriety. Prostitution is illegal in many countries not just to protect women, but because the community thinks that sex should not be a marketable commodity. Some people object to such laws as they force people to comply with the value system of others, even if they themselves do not share those values. If a value system is incorporated into law and enforced by the state then there is no way for people who disagree to opt out of it. The difficulty of reconciling competing value systems is a problem faced by many modern societies. Increased immigration leads to a greater variety of values in a country, but the majority may still want their own value system to be expressed in the law.

One solution to this problem was proposed by Robert Nozick in Anarchy, State, and Utopia (1974). According to him, there is no justification for one community to impose its values on another, as long as people have a choice about what community they are or are not part. This means that the state cannot implement paternalistic laws. He maintained that while states should not enforce any sort of paternalistic legislation, communities within the state could voluntarily agree to such laws limiting their own freedom, the proviso being that people were always free to leave a community, and consequently a

set of values, if they wish. Society would therefore be made up of a minimal state and a number of different sub-communities within the state, each maintaining its own value system and not interfering with the values of any other community. Since people voluntarily consent to the paternalistic policies adopted by the community, there is no coercion, and no violation of liberty.

A problem with Nozick's solution is interdependent utilities, where the actions of other people affect your utility level. Censorship is an example of this. The state is not permitted, according to Nozick, to ban books or films. Instead, if some people want a book or film banned then they should form a community and agree not to read the book or watch the film. They cannot, however, forcibly prevent anyone else from viewing the book or film. This poses a difficulty, as the point of censorship is to stop a particular piece of culture from being consumed by anyone. That object is defeated if people may opt in or out of the censorship law. The utility of the people who want the book banned is dependent on the ban applying to everyone. Nozick would reply that it's too bad for them, that they have no right to impose their own values about what should and should not be read or watched on others.

While censorship laws are generally unpopular, there are other cases when the values of another community clash with our own, and these pose a greater moral challenge to us. In the West, there are currently paternalistic laws forbidding a market in human organs (Wilkinson, 2003). While people are free to donate their organs to others it is illegal to sell them for profit. Suppose that another community allows trade in human organs, and that in this community there are a large number of people living in poverty[1]. If there was a practice here of the wealthy buying organs from the poor, what would our reaction be? Such a practice strikes us at once as barbaric. However, according to Nozick we cannot insist on our own paternalistic legislation being enforced in another community. If the selling of human organs is not against the value system of this other community then there should be nothing objectionable about it. The same is true of any number of cultural practices, including communities which deny rights to women, or permit child labour. If we believe that cultural value systems are independent of each other, and that all should be respected equally, then we have no grounds on which to prevent the cultural practices of other communities.

How then are we to justify the paternalistic laws we enforce? This issue of conflicting community values, and the proper bounds of paternalistic policies, poses a huge challenge to liberals. There is a tension between on the one hand trying to end practices such as the subjugation of women, and on the other trying to promote multiculturalism, where no system of values is placed above any other. Esteeming the value system of our civilisation more than the value system of others is a practice that seems like cultural imperialism, and yet we do attempt to stop practices in other cultures that seem unjust and

1. Such a situation may not be so remote; see Shimazono, 2007.

immoral according to our value system. One answer to this puzzle is given by the neo-pragmatist philosopher Richard Rorty who puts forward a theory of 'liberal ironism'. He thinks we should pursue Western liberal goals and promote the rights which we in the West hold as fundamental in a free society. However, he also admits that there is nothing that makes these rights and goals universal, or better than those of other countries. We can only justify our cultural practices in relation to our own culture; we can only judge other cultural practices relative to our own cultural standards. We pursue liberal goals, but are ironists about the justification of such goals. Thus "a circular justification of our practices, a justification which makes one feature of our culture look good by citing still another, or comparing our culture invidiously with others by reference to our own standards, is the only sort of justification we are going to get" (1989: 57). This ironic justification will seem unsatisfactory to someone who is looking for an 'absolute' grounding for their set of values. Ultimately, however, if we wish to implement paternalistic policies that reflect our community values then such an ironic defence is perhaps the only defence we can make.

Conclusion

In this essay, I have put forward what I believe to be the two strongest reasons why paternalistic public policies should be enacted in society. Many of the things that paternalistic policies try to protect us from disproportionately affect the poor. Further, paternalistic policies are an essential way for us to express the values of our community. While society could probably function without such policies, I contend that we would not want to live in such a society that allowed such grave inequalities to persist, and which did not enforce the moral code by which its citizens live.

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Paternalistic Public Policy and the Organ Trade

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Junior Sophister

Since the publication of Thaler's "Nudge" in 2008, the idea of liberal paternalism has spread like wildfire across the spheres of policymaking and academia alike. In this essay, Eoin Campbell applies this concept to the highly contentious issue of trade in organs. In a finely balanced piece, he shows a keen awareness of both the advantages and pitfalls of the legalisation of the organ trade.

Introduction

The first human organ transplant was carried out in Boston in 1954. The market took off in the 1970s, due to technological advances, and since then demand has grown exponentially faster than supply. The USA is a striking example: currently there are around 96,000 people on the waiting list for kidneys alone, while only 16,812 (11,043 from deceased donors, 5,769 live donations) transplants took place last year (National Kidney Foundation, 2013). The problem is the same worldwide. Financial incentives remain illegal in all countries (bar Iran).

Does paternalism have a role to play? The concept of paternalism derives from family interactions, where the head of the family makes decisions, forcibly if needs be, on behalf of other family members in their best interests. Often a difficult term to define without making normative statements, paternalism can be viewed in varying degrees. 'Hard' paternalism where coercion by a supposed enlightened elite entirely diminishes an individual's freedom of choice (Prowse, 2008) is differentiated from "soft" or "libertarian paternalism" where policy "tries to influence choices in a way that will make choosers better off, as judged by themselves" (Thaler and Sunstein, 2009, p.5). Paternalism would appear to contradict the implicit assumption of economics that people are the best judges of their own welfare:

> *"He is the person most interested in his own well-being… with respect to his own feelings and circumstances, the most ordinary man or woman has means of knowledge immeasurably surpassing those that can be possessed by any one else"(Mill, 2005).*

Can paternalism be justified when it is aimed at protecting welfare and freedom? Illegal markets are perceived to mentally and physically damage the health of the populace. This essay enquires if paternalism, or lack of, can ease the shortage of organs supplied.

Libertarian Paternalism

At present the buying and selling of organs is illegal, yet the voluntary donation of organs is not only legal but viewed at altruistic. Within the current system, how can we encourage such altruistic behaviour? Thaler and Sunstein (2009) show how the use of "choice architecture" can achieve this. Libertarian paternalism or a "nudge" is "any aspect of choice architecture that alters people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives" (Thaler and Sunstein, 2009, p.6). The nudge in this case is the setting of default consent. Explicit consent, where proactive steps are needed to become a donor, is the most common default setting, but with this system willingness often doesn't result in necessary action. A Gallup report in 2005 stated 95.4 per cent of Americans "strongly support" or "support" organ donation, yet 53.2 per cent joined a registry, carry a donor card or granted consent on their drivers' licenses (Kahan, 2012). Human inertia plays a role here deterring progressive action.

Under a system of presumed consent people would be assumed to be consenting donors, but have the opportunity to remove their consent easily, thus preserving the freedom of choice. An experimental online survey devised by and Goldstein (2004) illustrates the power of the default rule. When, under explicit consent, participants had to opt-in to becoming an organ donor, only 42 per cent of participants agreed. On the other hand when they had to opt-out 82 per cent gave consent. Singapore, Spain, Austria and some other continental European nations use the opt-out setting with notably higher rates of consent than opt-in countries. Only 12 per cent of German citizens give consent under the opt-in system while 99 per cent of Austrians do (Thaler and Sunstein, 2009).

At this point, a change in the default rule may seem to be a logical policy solution, yet it is important to stress the default rule is not the only important aspect. On average donation rates are higher in presumed consent nations, but not by a significant amount (Abadie and Gay, 2004). The infrastructure of the system is often incomplete with presumed consent often trumped by next of kin decisions after the donor is deceased. Live relative to cadaveric donations are becoming increasingly important with rising demand. Default rules have little impact on living donors (ibid).

A different type of "nudge" or "non-financial incentive" is what is put forward by non-profit organ donor network "Lifesharers"; when voluntarily agreeing to donate when you die, you will receive a better chance of receiving an organ, through the network, should you need one in order to live (Levitt and Dubner, 2007). Live donors have been targeted by transplant experts, with discussion of incentives of guaranteed health insurance, tax breaks, retirement account bonuses and educational scholarships/grants (Satel,

2006). These incentives are obviously more heavy-handed paternalistic policies. Interestingly while all of these incentives are in some form "financial", they are not straight up cash payments that are, in sharp contrast, viewed as immoral and unacceptable by many communities.

Community Values

The prohibition of organ markets are an expression of cultural and community values. Society favours philanthropic or altruistic actions. Selling an organ diminishes any altruism or utility potentially gained from a donative transaction. However Becker and Elias (2007) point out that altruism has so far not come close to solving the supply shortage problem. There is limited, if any, empirical evidence on the importance of altruism because it cannot be measured accurately (ibid). Altruism is arguably stronger in the context of intra-family donations. NBA basketball player Gregg Ostertag donated a kidney to his sister at the height of his career. Although this is no doubt altruistic, his intentions may have been somewhat necessary (as it was a close family member) rather than voluntary. It is "arguably something of a misnomer to call the current organ procurement system 'voluntary'; it might be more accurate simply to call it 'uncompensated'" (Hansmann, 1989, p.). Becker and Elias (2007) enquire why is it better for Ostertag to give his kidney to his sister (and risk his career) rather than paying for a donation from someone else? Buying a kidney certainly appears pareto-optimal, yet society states the former option is morally better than the other.

Critics of legalisation believe the commodification of the body is immoral. Yet hair, skin, eggs and sperm can all be bought and sold in markets. Many nations let people buy from surrogate mothers where the risk of mortality from renting out your womb is 6 times greater than being a live kidney donor (The Economist, 2006). One could go so far as to suggest that when registering for a voluntary army, one is effectively commodifying the whole body exposing oneself to injury/death (Becker and Elias, 2007).

There exist markets where altruism and commerciality can co-exist to a certain extent. Most modern day medical systems are built around this premise. Dan Pallotta (2013) explains the perverse stigma attached to high wages of charity CEOs, asking why their wages are so low compared to CEOs in the financial sector, when their motivations are obviously more humanitarian. Pallotta is essentially remarking that the way communities perceive charity is wrong; the same could be said about the ethics of the organ trade. Policymakers may wrongfully adhere to cultural values to appease voters, ignoring the true objective of paternalism:

> *"In political life, perhaps the most basic incentive comes from the need to be re-elected" (Besley, 2004 p.196).*

Legalisation of the Market

Hard paternalism is imposed on undesirable markets to prevent people from harming themselves. Whether this is justified in organ trade is questionable. If we take away what an individual regards as their best option, they are worse off, as judged from their own perspective. This best option may be to sell ones organ, thus it is worth investigating whether the legalisation and liberalisation of the market can solve the organ supply shortage, while justifying freedom.

In the illegal organ market, prices are higher and supply is limited due to penalties on suppliers and stigma. With no rule of law, interactions within an informal market are that of a Nietzschean anarchy - strong dominating the weak with exploitation rife (Hillman, 2009). Hillman emphasises that "criminalization of supply introduces criminals into supply" (2009, p.379). Those willing to sell on the black market are often misled and manipulated.

Would it not be better to legalise and regulate the market, clearing waiting lists? Becker and Elias (2007) provide a price-determining framework (based on risk of death, quality of life, ability to perform market activities after operation) for the organ market, that would result in increasing numbers of organs supplied and the shift from inelastic to highly elastic supply of organs. An organ market would improve efficiency of transplants. A larger pool of donors to draw from means improved tissue matching is likely. The element of timing is also eliminated, as cadaveric donors are no longer heavily relied upon (Hansmann, 1989). When harvesting cadavers, kidneys are only viable for transplant for 48 to 72 hours (Becker and Elias, 2007). Live sellers and buyers can agree on suitable operation times. Iran legalised the organ trade in 1988 and within 11 years it was the only country in the world that cleared its waiting lists (The Economist, 2011). Of course many organ donors in Iran suffer subsequent health problems, yet this is a by-product of the quality of the health industry, a problem potentially overcome in many wealthier nations. With legalisation comes problems of self-control or, as will now be discussed, "hyperbolic discounting".

Hyperbolic Discounting

Hillman (2009) explains that different people use different discount rates to compare personal costs/benefits over time. When faced with a decision a hyperbolic discounter values present costs/benefits at a zero discount rate with increasing discount rates as movement is made away from this present date/time. As the individual moves to a future time/date (second hyperbola) past benefits are worth little in retrospect. Applying this to selling one's organ, an individual undervalues future health costs at the time of surgery. At a future date, financial incentives received in the past are worth little in retrospect. Put simply; "hyperbolic discounters choose immediate gratification, and in the future regret past decisions" (Hillman, 2009). A striking example of this comes from a 17 year-old Chi-

nese teenager called Zheng who sold his kidney illegally for RMB 22,000 (only around £2,000) in order to buy a newly released IPad2. He subsequently suffered health complications (Foster, 2011). Paternalistic policies seem justified here in altering decisions of hyperbolic or irrational discounters for their own benefit. Yet state policy is subject to asymmetric information problems: whether the individuals are indeed acting irrationally and the discount rate that acts as basis for choice is unknown.

With legalisation of the market, poor people appear vulnerable to irrational or impulsive decisions, selling organs out of desperation. Assuming low income is correlated with low health, markets would be flooded with poor quality and diseased organs. However this problem already exists on the black market, with over 2000 organs sold each year in Pakistan alone (Cohen, 2013). In a legal market all administration would be above board with a potential screening process for drug use, Aids, Hepatitis and other diseases, with refusal an option. A more realistic outcome, taking this into account, would be a donor pool made up of a middle class and a healthy poor class. Hansmann (1989) suggests the exclusion of low-income earners/persons in debt from the supply side of the market. He acknowledges a large number of poor people suffer from organ failure and, with a new more affordable price for organs, a net benefit for such demographics could arise. This aspect, although somewhat contradictory to liberalisation, could be incorporated into the screening process.

Becker and Elias (2007) even suggest a "cooling-off period" (allocated time between registration to sell and any final decision) to deter the possibility of hyperbolic discounting and recklessness. Another soft paternalistic necessity in state policy would be bridging the information gap and providing accurate estimates of risk elements. There is an estimated 0.06 per cent chance of mortality when undergoing a live organ transplant (National Kidney Foundation, 2013). A study of more than 80,000 live kidney donors in the USA found no difference in their long-term mortality rates suggesting kidney donation is very safe in the USA (Cohen, 2013).

Conclusion

As with most policy decisions the answer to improving the current situation isn't black and white. It is not simply a question of hard paternalism vs. libertarianism but more how paternalism should be applied, what kind and to what extent. This essay makes the case that hard coercive paternalism isn't justified in the organ market and a legalised regulated market could potentially clear organ waiting lists. Complete liberalisation is not an objective and not even plausible; "Every market has some rules and boundaries that restrict freedom of choice" (Chang, 2010). The regulation within the market is paramount in incentivising individuals to make rational and beneficial choices.

John Stuart Mill (2005) believed we become the best judges of our own welfare, with time and practise. As selling/donating one's kidney is a once off event, paternalism on some level has a role to play. Someday the development of artificial organs may render this debate beside the point, but until science takes over economics will remain at the forefront of debate.

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The Wage Effects of Personal Smoking

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Senior Sophister

It is well established that smoking is bad for both your lungs and your wallet, but could it also affect your payslip? Michelle Riordan conducts a rigorous econometric analysis to determine the effect of smoking on one's wage. The results show that the price of a pack of cigarettes is not the true cost of smoking, but instead one must also account for a considerable wage penalty.

Introduction

Tobacco smoking is a topic that has generated a lot of discussion in recent decades. Since the release of the 1964 Surgeon General report asserting that smoking has adverse effects on health, causing cancers, respiratory disease etc., it has now been widely established that smoking leads to a huge amount of pain and suffering being inflicted on smokers themselves, those exposed to cigarette smoke, and society at large (Levine et al., 1997). While numerous price increases, anti-smoking campaigns, and policies, such as the smoking ban, have in the past reduced the number of smokers considerably, the effectiveness of these has weakened in recent years (Murphy, 2007). This study will attempt to show the wage penalty borne by smokers, which thereby acts as a disincentive to smoke. Using a Two-Stage Least Squares estimation method, I find that current smokers are subject to an approximate 1.95% wage penalty compared to their non-smoker counterparts.

Literature Review

A vast amount of econometric literature exists on investigating the determinants of wages, concluding that factors such as education, experience, health, innate ability, gender, age, and marital status all have a significant effect on an individual's wage, most noteworthy; Angrist & Kruegar (1991), Blackburn & Neumark (1992), and Mroz (1987). However, in comparison, the effect of smoking on income has received relatively little attention in the literature. The general consensus from those who have undertaken such studies is that smoking has a statistically significant negative effect on wages. However, the magnitude of this negative effect is subject to much discussion in the literature, with estimates of the wage penalty borne by smokers ranging from 0.5%-24%. These studies test several hypotheses regarding this wage penalty.

Firstly, there is evidence that smokers are less productive than their non-smoker counterparts, which may translate into lower wages. Basic microeconomic theory suggests that the wage of an individual is related to his/her marginal productivity, with a low wage implying a lower marginal product of labour (Arrow, 1973). Authors such as Levine, Gustafson & Velenchik (1997), Van Ours (2007) and Grek (2007) examine this link between productivity and smoking. They report that a smoker's productivity may be lower than a non-smoker for two reasons:

1. "Smoking may reduce net workers' productivity by interfering with workers' ability to carry out manual tasks"
2. "Smokers' productivity would be lower if the act of smoking itself draws time away from work"

Therefore, all reach the conclusion that that there is a statistically significant wage differential between smokers and non-smokers, where the act of smoking is believed to reduce an individual's wage by way of lower productivity levels.

Secondly, some studies also explore the notion that smokers tend to earn less as smoking is adversely related to health. Grossman (1972) found that wages and health are positively related. Using this fact and since smoking has clearly negative effects on an individual's health, some authors have concluded that it may be the case that the use of tobacco has negative effects on an individuals wage (e.g. Grek, 2007 & Braakman, 2008). One argument is that current smokers have significantly greater absenteeism than those who had never smoked, with former smokers having intermediate values. They suggest that this is because smokers on average miss 6.16 days per annum due to sickness (including smoking-related acute and chronic conditions), compared to non-smokers who miss 3.86 days of work per annum (Halpern et al, 2004).

Third, Grafova & Stafford (2009) explore whether former smokers are also subject to this wage penalty. They found statistically significant wage gaps between smokers who would continue to smoke and three other groups: those who would later quit smoking, those who had already quit smoking and those who had never smoked. They found that the wage penalty was the highest for those who would continue to smoke and was almost negligible for those who had already quit smoking.

Finally, there may be unobserved factors related to both the decision to smoke and lower wages. Becker et al. (1988 & 1994) and Munasinghe & Sicherman (1999) argue that smoking may reflect a higher time preference rate, as smoking may provide utility today, with the adverse effects generally occurring later in life. A higher discount rate is a key determinant of an individual's investment in human capital and occupational choice, where individuals who have higher discount rates tend to be less future-oriented. They come to the conclusion that smokers are less future-oriented and are less likely to invest

in human capital and, therefore, are more likely to select careers with lower and flatter earnings profiles compared to non-smokers. Other possible unobservables may include preferences for work/leisure time, innate ability, intrinsic motivation, desire to succeed, etc. Therefore it is not smoking per se that is causing the lower wages but the effect of the unobservables.

The vast majority of the studies listed above have used U.S. or Eastern-European data to test their various hypotheses. My major innovation in this study is to investigate whether the hypothesis that smoking can reduce an individual's wage is true for Irish/British data. Since there can be vast differences between the social and cultural backgrounds of individuals from the US, Eastern-Europe and Western-Europe, it will be interesting to find whether this hypothesis also holds for Irish/British data.

Econometric Model

In order to quantify the hypothesized relationship above, the following regression was estimated:

$$Yi=\beta 0+\beta 1X1+\beta 2X2+\beta 3X3+\beta 4X4+\beta 5X5+\beta 6X6+\beta 7X7+\beta 8X8+\beta 9X9+ui$$

Where:
Yi=Ln(wage): The log of real monthly labour income
X1=Educ: The number of years of schooling the individual has
X2=Total Exper: The total number of years of work experience an individual has
X3=Current Exper: The number of years of experience an indv. has in their current job
X4=Female: A dummy variable equal to 1 if the person is female
X5=Marr: A dummy variable equal to 1 if the person is married
X6=Age: Age of the person in years
X7=Smoke: A dummy variable equal to 1 if the person smokes
X8=Hhsize: No. of individuals currently living in the same residence as the individual
X9=Hours: Usual number of hours worked per week
ui=An error term of statistical residuals

A positive effect is expected between Ln(wage) and Educ, TotalExper, CurrentExper, Marr, Age, and Hours. Conversely, a negative effect is expected between Ln (wage), Female, Hhsize, and Smoke. The inclusion of the log of wage will enable a semi-elasticity interpretation of the coefficients, i.e. the percentage change in wage given one unit increase in the independent variable is approximately given by:

$$\%\Delta\widehat{wage} \approx 100(\Delta\hat{\beta}_j) \quad (1)$$

Using simple algebraic properties of the exponential and logarithmic functions, we can find the exact percentage change in the predicted wage (Wooldridge, 2009). This is given by:

$$\%\Delta\widehat{wage} = 100[\exp(\widehat{\beta_j}\ \Delta x_j) - 1] \quad (2)$$

Potential Problems

It is highly likely that factors such as ability present in the error term will not be constant across observations. Due to this likely presence of heteroscedasticity in the model, robust standard errors will be used when estimating the model. This is because although heteroscedasticity does not cause bias or inconsistency in the OLS estimators of the coefficients, homoscedasticity is required to perform the standard t and F tests. In addition, the possible issue of endogeneity in wage equations has been highlighted in the literature and will therefore also be an issue in this case. It is commonly thought that education is correlated with the error term through unobserved ability, i.e. Cov(xi,ui)≠0. Failure to correct for this would result in a violation of the Gauss-Markov zero-conditional mean assumption leading to biased estimates, as OLS would incorrectly estimate the effect of education on an individual's wage. If the education variable is not exogenous, Griliches (1977) proposes the use of the instrumental variable (IV) method to tackle the problems of ability bias and endogeneity, i.e. finding a variable to instrument for education in the regression model can rectify this problem. It can be difficult to find instruments though. The use of an IV to estimate the return to education requires that the instrument satisfies the instrument relevance and instrument exogeneity conditions, i.e. an IV for education must be uncorrelated with ability (and any other unobservable factors affecting wage) and highly correlated with education (Chaung & Lai, 2010). Empirical studies have shown that more siblings are associated with lower average levels of education. Moreover, given a family's budget constraint, the greater the number of siblings there are, the smaller the educational resources that are available to each child, leading to those in larger families having lower average levels of education. I will therefore use the number of siblings as an IV for the number of years of schooling an individual has, as it will be correlated with an individual's educational achievement but have no correlation with an individual's ability.

Data

It was originally intended to use Irish data to conduct this analysis. However, after dropping cases with missing values, it was felt that the sample size was too small for this purpose. To overcome this problem, this paper will use data from the year 2009 from the British Household Panel Survey (BHPS), an annual survey carried out by the ESRC UK Longitudinal Studies Centre within the Institute for Social and Economic Research at the University of Essex (See: http://www.iser.essex.ac.uk/uisc/bhps/). For the purpose of this paper, we will focus of those of working age, i.e. those between the ages of 16-65. After

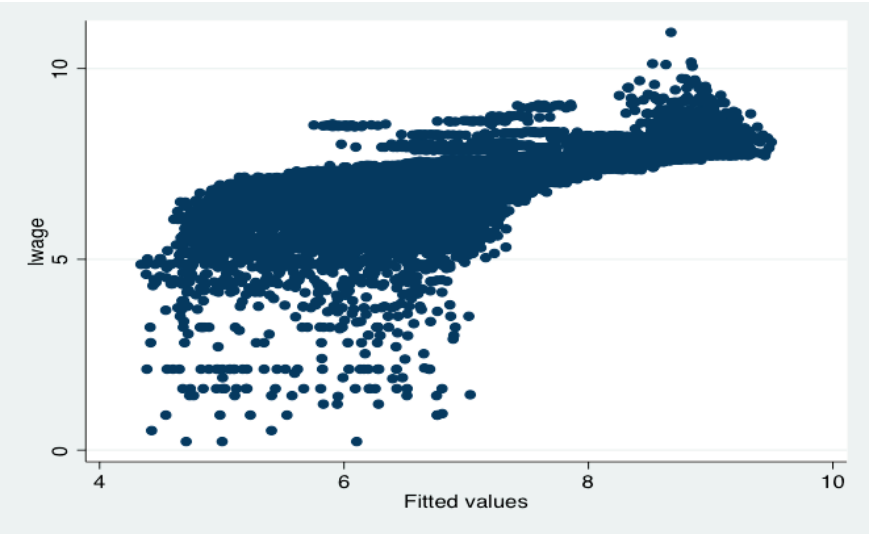
dropping the cases with missing values and the cases where the individual was over 65, we arrive at a sample size of 10,344.

Variable	Observations	Mean	Std. Dev.	Min	Max
Wage	10344	1652.111	1561.319	1.25	56916.67
Ln(wage)	10344	7.014514	1.064298	0.2231435	10.94934
Educ	10344	10.49903	5.198561	0	20
TotalExper	10344	14.72322	8.552597	0	47
CurrentExper	10344	6.082367	7.197345	0	47
Female	10344	0.5446636	0.4979729	0	1
Marr	10344	0.5554911	0.4969352	0	1
Age	10344	40.90874	13.69378	16	65
Smoke	10344	0.2585073	0.4378354	0	1
Hhsize	10344	3.099961	1.39302	1	16
Hours	10344	22.6162	17.91157	0	98
Sibs	10344	3.29679	2.397121	0	9

Table 1: Summary statistics

Results

For comparison purposes, we first estimate the econometric model specified above by using the conventional OLS method with robust standard errors, noting that these estimates will be biased as the zero-conditional mean assumption will be violated. The results of this regression are shown in Table 2. We can see that all of the coefficients have the expected effect, with all coefficients being statistically significant except for current work experience. This is not a surprising result as we would expect an individual's total work experience to have a much greater effect on their wage compared to the number of years they have been in their current job. In addition, the R2 is 0.5789, implying that the model explains 57.89% of the variation in the dependent variable. From Graph 1, we can see that the model seems to explain average levels of income quite well. However, we can also see that at lower income levels, there are several significant differences between the fitted values and the actual wage of an individual. This in turn suggests that the model fails to explain 42.11% of the variation in wages, which indicates that a significant proportion of an individual's wage is determined by 'unobservables'. As already mentioned, taking the log of the dependent variable enables a semi-elasticity interpretation of the coefficients. Most noteworthy, from Table 2 we can see that if an individual smokes, on average their wage will be approximately 11.26% lower than non-smokers. Moreover, we can also see that the most common variables used in econometric wage equations, such as education, total work experience, gender, marital status, and age, all have signs consistent with previous empirical works.



Graph 1: Fitted Values of OLS Regression

Secondly, to overcome the endogeneity problem, a Two Stage Least Squares (2SLS) regression was conducted using the number of siblings as an instrument for education. For the 2SLS estimation, the variable "current work experience" was omitted, as it was statistically insignificant at any conventional statistical significance level in the first OLS estimation. Not surprisingly, the R2 fell to 0.2597, implying that 25.97% of the variation in the dependent variable is explained in the model. However, the fundamental goal of IV estimation is to correct for any endogeneity problem so that the estimates are unbiased and consistent and not solely to maximize the 'goodness of fit' (Wooldridge, 2009). From Table 2, we can see that the IV estimates are of the same direction as the OLS coefficients but several of the coefficients differ greatly in both magnitude and statistical significance. Most relevant for this paper, the coefficient on smoke is still highly statistically significant but of a much lower magnitude, with smoking reducing an individuals wage by approximately 1.95%. Furthermore there are several interesting differences between the OLS and IV estimates which include:

- The coefficient on female is now only statistically significant at the 10% level, which is quite a surprising result.
- The coefficient on current household size has become statistically insignificant.
- The IV coefficient of the return of work experience has almost tripled compared to the OLS coefficient.

Variable	OLS Coefficient (with robust std. errors	IV Coefficient (educ = sibs)
Educ	0.0745851*** (0.0016072)	0.2216247*** (0.017022)
TotalExper	0.0249403*** (0.0009600)	0.068212*** (0.0170711)
CurrentExper	0.0002228 (0.0011475)	–
Female	-0.0622505*** (0.0146029)	-0.0454236* (0.0241888)
Marr	0.0393872*** (0.016700)	0.0880125*** (0.0260882)
Age	0.0109432*** (0.0007805)	0.0070866*** (0.0009921)
Smoke	-0.1125643*** (0.0178894)	-0.0195109*** (0.00247509)
Hhsize	-0.0156371*** (0.0054907)	-0.0009336 (0.00719760
Hours	0.0201504*** (0.0005099)	0.0060065*** (0.0017096)
Constant	5.049086*** (0.0476841)	4.341796*** (0.1013211)
R^2	0.5789	0.2597

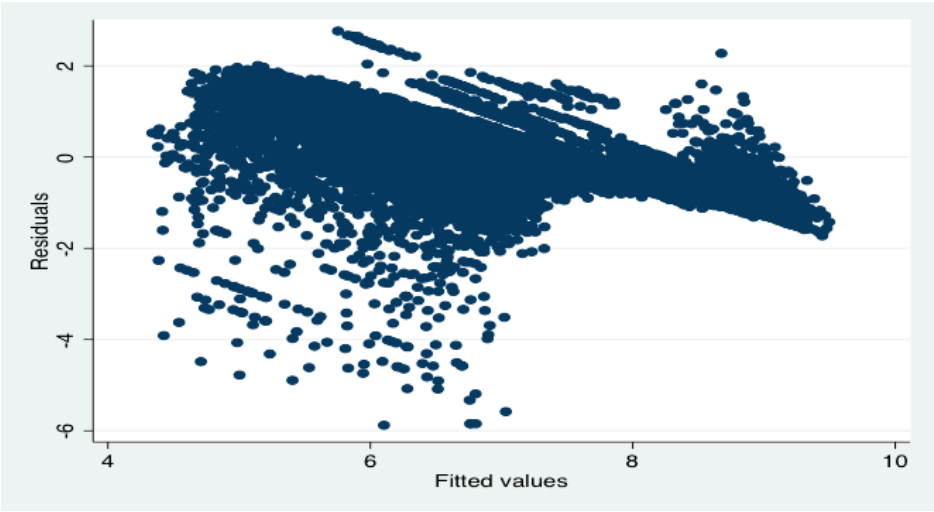
Table 2: Regression Results

Diagnostic Checks and Testing

Heteroscedasticity

If a model is well fitted, there should be no evident pattern to the residuals plotted against their respective fitted values (Wooldridge, 2009). Graph 3 plots the fitted values against the residuals from the OLS regression without robust standard errors. From this graph, we can see that the middle section and final section of the graph is not particularly scattered and, as expected, we can conclude that heteroscedasticity will be an issue in this model.

Furthermore, to confirm the presence of heteroscedasticity in the model, a Breusch-Pagan/Cook-Weisberg test for heteroscedasticity was conducted. The p-value (Prob>chi2=0.0000) confirms that heteroscedasticity will be an issue in this model. Similar tests for heteroscedasticity were conducted on the OLS model and IV model, both with robust standard errors. Both tests returned no evidence of heteroscedasticity, implying that the models and results presented in Table 2 will be valid for statistical testing.



Graph 3: Residuals vs. Fitted Values from OLS Regression without Robust SE

Omitted Non-Linear Variables

To investigate whether there are any non-linear combinations of the variable not presently in the model, which have predictive power, a heteroscedasticity-robust Ramsey RESET test was conducted. A statistically significant p-value suggests that there are relevant explanatory variables omitted from the model. This test was conducted on the OLS (with robust standard errors) and IV models. The Ramsey RESET test returned a p-value=0.000, implying that there are no non-linear combinations of the variable, not presently in the model, which have predictive power.

Endogeneity

Due to the likely presence of endogeneity in the model, a Durbin-Wu-Hausman test for endogeneity was conducted on the OLS model. As expected, the test confirmed the presence of endogeneity. Furthermore, the residuals were backed out from the OLS regression and the correlation between education and the squared residuals was calculated. The computed correlation between the two variables was -18.6. This suggests that the education variable is in fact endogenous and thus, the return to education estimated by OLS presented in Table 2 will be biased and inconsistent.

Possible Extensions

Firstly, this study focuses on individuals who currently smoke. It may be of interest to explore whether those who are currently trying to quit smoking and ex-smokers are also subject to this wage penalty. It was shown by Grafova & Stafford (2009) that the wage

penalty for those who intended to quit smoking was much smaller than those who had no intention to quit and was almost negligible for ex-smokers. Due to a lack of available data, such a study was not possible in this analysis. Secondly, it also may be instructive to add cultural variables to the model. Adding such factors will enable a better understanding of the social and cultural background of individuals and may also act as a proxy for some of the 'unobservables' currently present in the error term.

Conclusion

The central goal of this analysis was to show that a wage penalty is borne by current smokers. To achieve this, I used cross-sectional data from the BHPS. As the model suffered from heteroscedasticity and endogeneity, a Two-Stage Least Squares method was used. As already mentioned, the possible issue of endogeneity in wage equations has been highlighted in the literature, with education being correlated with the error term through unobserved ability. This required the use of an IV to estimate the return to education. The number of siblings an individual has was used as an IV as the instrument satisfies the instrument relevance and instrument exogeneity conditions. After correcting for heteroscedasticity and endogeneity, I found that smokers suffer a wage penalty of approximately 1.95%. Although this is at the lower end of the estimates of the wage penalty borne by smokers, this study should act as a disincentive to smoke.

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A STATISTICAL ENQUIRY INTO THE FACTORS AFFECTING IRISH SECONDARY SCHOOL PERFORMANCE.

ALEXANDER REDMOND
Senior Sophister

Through the use of a comprehensive dataset provided by The Irish Times, Alexander Redmond analyses the impact of attending a fee paying school on the prospects of third level education. A further econometric analysis on the relationship between fee size and third level attendance is then conducted, with surprising results. This project is particularly timely given the current debate surrounding the government funding of fee-paying schools.

Introduction

The Leaving Certificate is Ireland's national final exam for the secondary school system. Students' leaving certificate results determine their matriculation into third level education in Ireland. Many believe that the type of school a student attends will affect whether or not they continue into third level education. In this paper I will attempt to examine the characteristics of Irish schools which determine the number of students continuing on to third level education. I have considered many variables that could affect matriculation, and have chosen a select few based on the availability of data and their economic implications. My research is motivated by my own experience with the Leaving Certificate as a pupil in a private school. There is much public speculation about whether or not attending a private school improves students' academic performance. I wish to examine potential statistical correlations that may be present regarding school performance. Finally I think that this topic is of great relevance in Ireland today. There is currently a debate about whether or not public finances should be given to private schools. During times of tightening government budgets, questions of equity arise, questions which are certainly relevant in the context of education. I will attempt to identify correlations, with an emphasis on fee-paying schools in particular.

Theoretical Model

I have decided to use a multiple regression model to describe the correlated effects of secondary school characteristics on school performance. I have taken "performance" to

mean academic performance of the schools' pupils. The continuation of pupils on to third level education is hence my dependent variable. For my independent variables I had originally chosen a variety of characteristics that I considered important, but due to difficulty in acquiring data, some are omitted. This will be discussed in section 3. Due to the presence of fee-paying schools in Ireland I have decided to create two separate models. Both contain similar dependent variables as mentioned above. I will outline the differences in my models below:

A. Complete Model:

$$thirdlevel = \beta 0 + \beta 1\ fee + \beta 2\ class + \beta 3\ class2 + \beta 4\ urban + ut$$

Thirdlevel: This variable equals the percentage of the senior class to follow on to third level education after completing their Leaving Certificate.

$\beta 0$: This is the intercept value of the regression.

fee: A dummy variable to classify a school as fee-paying. Its associated parameter is $\beta 1$.

class: This is the number of students in the 6th (final) year class at the school. Its associated parameter is $\beta 2$.

class2: This is the number of students in the 6th year class squared. I suspect there may be a non-linear relationship and so I want to investigate this. Its associated parameter is $\beta 3$.

urban: This is a dummy variable identifying whether or not the school is located within a major city. Its associated parameter is $\beta 4$.

u: This is the error term/disturbance as is typical standard with in regression models.

B. Fee-Paying Model:

$$thirdlevel = \beta\_0 + \beta\_1\ fee + \beta\_2\ class + \beta\_3\ class2 + \beta\_4\ urban + u$$

thirdlevel: See above.
fee: This is the annual fee charged by the school. Its associated paramter is $\beta 1$.
class: See above.
class2: See above.
urban: See above.
u: See above.

Dataset

In order to conduct my analysis I used already existing data, along with my own research, to order create the dataset used. A sample of 678 fee-paying and public schools in the country has been included for Model A's regression. A sample of 44 fee-paying schools has been used for Model B's regression. These were reduced from an original data set of 685 secondary schools, representing the entire country. This complete data set included 630 public schools, 54 fee-paying schools, and a single grind school. The reduction in the sample size is due to difficulties in obtaining information from a handfull of fee-paying, private schools that refused to disclose their annual cost for my research. I decided to remove these schools from both Model A and Model B in order to make comparisons more accurate.

The dataset is cross-sectional, with data relevant to the 2011 academic year. After explaining my research to Liam Stebbings at The Irish Times, he graciously agreed to provide me their annual Secondary School League Table data. The author thanks Sean Flynn, Peter McGuire, and Mick Crowley for compiling an invaluable dataset. This data included a list of all secondary schools in the country, along with the number of students in the secondary school class, and the percentage of the senior class that went onto third level. These preliminary numbers allowed me to build my own dataset on top of this.

I conducted my research into both fee-paying schools and public schools. The majority of the fee-paying schools had a website, with approximately 60 per cent of them providing the public with their fee policy, including annual cost. I contacted the other 40 per cent of schools directly, explained my research, and requested their fee policy. This led to a reduction in my sample size, as explained above. In order to get the data for the urban variable I used the addresses of schools located in Dublin, Cork, and Limerick. Within this subset I had to differentiate between the county and the city. If the school was located in the city limits it was considered Urban and was given a binary value of 1. In Model A, I simply assigned the fee-paying schools a value of 1. I also scaled the thirdlevel variable for ease of interpretation of coefficients.

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
thirdlevel2	678	7.530206	2.171703	.63	10
fee	678	.0663717	.2491145	0	1
class	678	71.72566	40.84663	5	257
class2	678	6810.558	7509.744	25	66049
urban	678	.2507375	.4337576	0	1

Table presents the output of Model A

Variable	Obs	Mean	Std. Dev.	Min	Max
thirdlevel2	44	9.284318	1.149357	4.56	10
fee	44	4743.159	1703.358	2550	12456
class	44	80.65909	41.59939	6	196
class2	44	8197.068	7889.397	36	38416
urban	44	.5681818	.501056	0	1

Table presents the output of Model B

Empirical Model

In my multiple regressions of both models, I started with a simple OLS estimation as a baseline. I then decided to conduct a Tobit regression, due to the nature of my dependent variable. I transformed my dependent variable from a percentage into a decimalized interger between 0 and 10. This allowed me to run a Tobit regression with a lower limit of value 0 and an upper limit of value 10.

Model A

Variable	Obs	Mean	Std. Dev.	Min	Max
thirdlevel2	44	9.284318	1.149357	4.56	10
fee	44	4743.159	1703.358	2550	12456
class	44	80.65909	41.59939	6	196
class2	44	8197.068	7889.397	36	38416
urban	44	.5681818	.501056	0	1

Table presents the output of Model A (augmented)

fee: Our dummy variable fee is positively related to our dependent variable thirdlevel. This agrees with economic intuition. Fee paying schools are generally expected to perform better than their public counterparts. A strongly significant t-score of 7.44 is welcomed.

class: Our class independent variable is also positively correlated with thirdlevel. Again this can be argued to agree with conventional wisdom. Very small senior classes are generally located in remote areas that may be lacking in resources and labour supply of teachers. Of course this is all speculative. It should be noted that there exist some studies which find the opposite relationship between class size and performance (Leithwood, 2009). It is also statistically significant, with a t-score of 4.52.

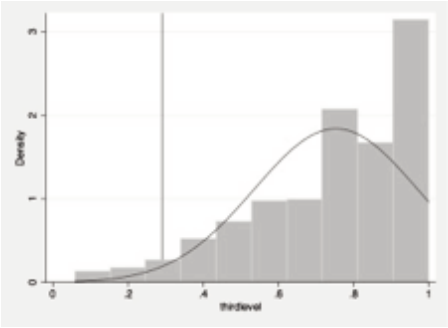
class2: This is a worrying result. The estimation suggests that a non-linear relationship between class size and performance is negative.

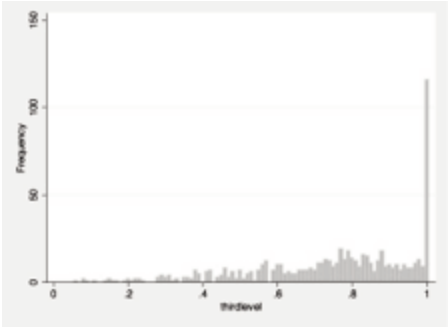
urban: Our dummy variable urban is also statistically significant, with a t-score of -9.85. It has a negative relationship with thirdlevel, suggesting an urban environment may not be conducive to strong academic results.

R2: Our R-squared value of 0.2051 tells us that 20% of the variation in thirdlevel is explained by our model.

The estimation and results above are a simple OLS regression and, as discussed earlier, are not suitable for the data used, but good for an initial test of the data. I will now give with my empirical reasoning for choosing a Tobit regression and the results for Model A.

As we can see there is a large proportion of data points skewed to the right in this normalized histogram of thirdlevel. One can see that the natural censoring of data above the value 1.





If we view the histogram with all values represented we get a similar result. Again we see a large number of thirdlevel values being 1. Both the normally distributed and discrete histograms highlight the need to use a Tobit regression. We can see the results of the regression below.

Tobit regression — Number of obs = 678; LR chi2(4) = 141.03; Prob > chi2 = 0.0000; Log likelihood = −1368.2123; Pseudo R2 = 0.0490

thirdlevel2	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
fee	3.014685	.3867372	7.80	0.000	2.255331	3.77404
class	.0222193	.0067819	3.28	0.001	.008903	.0355355
class2	−.0000764	.0000368	−2.08	0.038	−.0001487	−4.14e−06
urban	−1.9011	.2057895	−9.24	0.000	−2.305165	−1.497034
_cons	6.955577	.2835246	24.53	0.000	6.39888	7.512275
/sigma	2.24089	.0695396			2.10435	2.37743

Obs. summary: 0 left-censored observations
562 uncensored observations
116 right-censored observations at thirdlevel2>=10

As the table above shows us, the Tobit regression censored 116 observations at 100% third-level attendance.

fee: This states that if a school is fee-paying then it will have three times as many students going on to third level as a public school. This result is also strongly statistically significant at the 1 per cent level.

class: This value states that a one unit increase in the final year class size will lead to a 2 per cent increase in the predicted value of thirdlevel attendace. Again this is statistcially significant.

class2: Just like the OLS, this variable is throwing out strange results. It is negatively correlated, and is not as statistically significant as the other variables.

urban: This variable is negatively correlated with thirdlevel, and is highly statistcially significant. It states that if a school is located in an urban area, it is going to have 1.9 times fewer students attending third level. This is a worrying result for economic policy in an increasingly urbanized world.

Model B

The results for Model B will be displayed and examined below. The dramatically lower sample size and inclusion of specific costs within fee-paying schools are to be noted. Our OLS gives us back some strange and conflicting results compared to our full-sample regression including public schools.

Source	SS	df	MS	Number of obs =	44
				F(4, 39) =	6.51
Model	22.7490801	4	5.68727004	Prob > F =	0.0004
Residual	34.0548013	39	.873200033	R-squared =	0.4005
				Adj R-squared =	0.3390
Total	56.8038814	43	1.3210205	Root MSE =	.93445

thirdlevel2	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
fee	-.0004112	.0000847	-4.85	0.000	-.0005826	-.0002399
class	-.0036048	.0112112	-0.32	0.750	-.0262816	.0190719
class2	.0000578	.0000594	0.97	0.336	-.0000622	.0001779
urban	.014689	.288496	0.05	0.960	-.5688492	.5982271
_cons	11.0431	.622616	17.74	0.000	9.783736	12.30246

fee: Interestingly, there is a statistically significant negative correlation between the annual cost and the thirdlevel attendance. It has a t-score of -4.85.

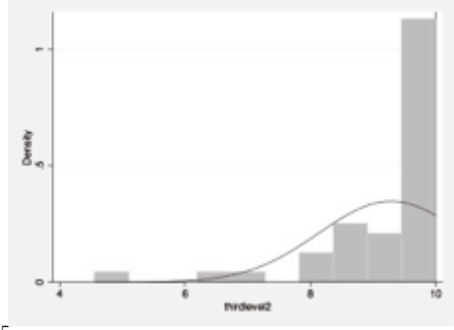
class: This is result is not statistically significant, and we can conclude that the coefficient is not statistically different from zero.

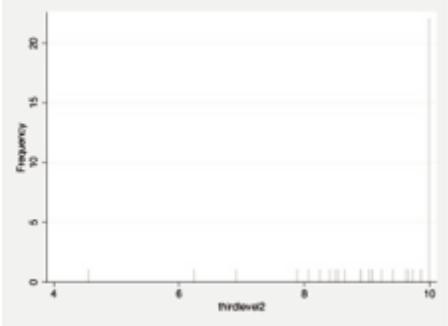
class2: This result is the same as that for class, although not as strongly statistcially insignificant.

urban: Again this is highly statistically insignificant.

R2: Our R-squared value is 0.40, which tells us 40 per cent of the variation in our dependent variable is explained by our independent variables.

As with Model A, I will now conduct a Tobit regression with upper and lower limits for my dependent variables, and present the histograms illustrating the censoring.





This too shows a highly skewed dataset, with a majority of my dependent variable results being at 10. We can see this using a discrete frequency as with Model A. The small sample of fee paying schools may be throwing off the results in this case. There are clearly many more values of thirdlevel equalling 10 than anywhere else. Coupling this fact with the sample size of 44 may help to explain our strange estimates. The Tobit results are outlined below.

```
Tobit regression                                  Number of obs     =         44
                                                  LR chi2(4)        =      14.82
                                                  Prob > chi2       =     0.0051
Log likelihood = -53.147534                       Pseudo R2         =     0.1224
```

thirdlevel2	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
fee	-.0005213	.0001407	-3.70	0.001	-.0008057	-.0002369
class	-.0239604	.0230203	-1.04	0.304	-.0704862	.0225654
class2	.0001922	.000132	1.46	0.153	-.0000746	.000459
urban	.0539591	.5029278	0.11	0.915	-.9624959	1.070414
_cons	12.73769	1.185536	10.74	0.000	10.34163	15.13375
/sigma	1.454409	.2411399			.9670472	1.941771

```
  Obs. summary:          0  left-censored observations
                        22     uncensored observations
                        22 right-censored observations at thirdlevel2>=10
```

Our results show us that 22 observations were censored at thirdlevel value of 10 – which corresponds with 100 per cent third level throughput.

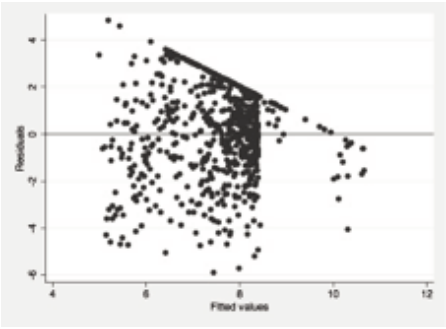
fee: We see that fee, as with the OLS estimate, is negatively correlated and statistically significant with our dependent variable.

class: class is again not statistically significant in this model. There is a 30 per cent chance that our coefficient is equal to zero and thus fails to reject our null hypothesis.

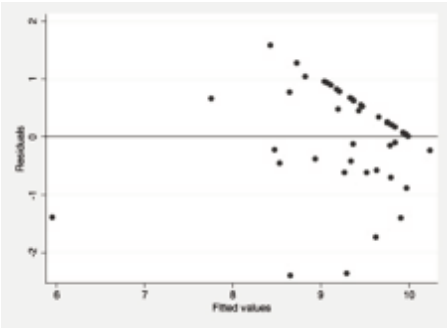
class2: class2 is the same as class however is less insignificant.
urban: This variable is highly insignificant in our model, with an extremely low t-score.

Diagnosis check

A major assumption of OLS is that of homoscedasticity of variance in the residuals. I feel a test for this is necessary in identifying possible problems in applying these statistical models onto data that may or may not fit the assumptions. In order to test for constant variance between the residuals we can plot them against the fitted values. We see this for both models below.



Model A



Model B

These results are very worrying for our assumption of homoscedasticity, in our OLS estimates at least. It is clear that the residuals in both Model A and Model B are not scattered randomly and evenly; there is a clear pattern. This means that the residuals are not homoscedastic and highlights a possible heteroscedastic problem for our regression. This is especially worrying in my Tobit regressions, as the results attained are achieved by using a false estimate of the distribution of residuals – which determine whether or not to censor a value. Our coefficients, therefore, may be biased. This highlights the caution needed in running OLS and Tobit regressions, and a caveat must be stated about interpretting possibly incorrect results.

Results

The statistical insignificance in Model B compared to Model A is disappointing. However, there are still significant results from both OLS and Tobit regressions for both models. The strong correlation between fee and thirdlevel throughput in Model A is not surprising, but it is a welcome result. This reinforces the notion of fee-paying schools achieving generally better academic results then their public counterparts. Supporting evidence of this relationship has also been found in the Australian secondary school market (Vella, 1999). This may be due to selection-bias of students rather than the school themselves, as fee-paying schools sometimes require an entrance examination to attend. This is called 'creaming', and empirical research exists on the subject (West, 2006). One also cannot deny the additional resources available to fee-paying school students due to the larger budgets expected. The ability to afford a fee-paying secondary school will also be correlated with other supports like grinds and weekend classes. The opposing results for class and class2 are worrying. On the one hand we see a positive relationship for class; however on the other hand class2 is negative. I believe that this attempt to analysis a non-linear relationship has failed, and a more appropriate examination would use a variable of student/teacher ratio. This data was, unfortunately unavailable. An exciting result is the negative correlation

between thirdlevel and urban. Its strong statistical correlation is welcome. Empirical results for underperforming schools in urban areas have been found by other researchers (Lankford, 2002). This is a worrying result for schools located in cities, and may lead to questions of equitable budgeting between urban and non-urban schools.

As stated earlier, the results for Model B were disappointing. The negative correlation between fee and thirdlevel was surprising, particularly the statistical significance. There are a number of possible explanations for this. One is the religious nature of fee-paying schools. Many fee-paying schools give as their motivation for their fees the religious ethos of the school, rather than its academic performance. The schools are not justifying their high costs with better academic performance, and so a positive relationship is perhaps not expected.

Other studies have been carried out in order to identify how school characteristics affect performance, and these should be acknowledged for their results. In particular, there have been conflicting results with regards to private school performance, as well as supporting results with regards to class size (Shulruf, 2008).

Extensions

There is much scope available for future research on this topic. An increase in sample size for the fee-paying schools model is a possible improvement, although obtaining the missing data may be difficult. A panel data approach combining previous years' results would be of most use; however this would require further cooperation by the generous Irish Times staff.

A major disappointment for my own study was the lack of a gender variable due to time constraints of collecting gender information from 650+ schools. The results with such a variable included would have been quite interesting. It is anecdotally said that females perform better than males during secondary school; I would like to see the statistical relationship, if any, and would welcome further research in this area. An analysis of pupil/teacher ratio is another possible avenue of study with education policy implications.

Conclusion

The goal of this study was to identify statistical relationships between the characteristics of secondary schools and their student continuation rates into third level education. I also wanted to examine the differences in performance between fee-paying and public schools, as well as the differences in performance between fee-paying schools themselves, treating them as a subset of the larger sample size. Statistically significant results were found for both models, which tend to agree with economic and intuitive thinking. The results shed light on the apropriateness of sending public-sector money to fee-paying, private schools when they already out-perform their public counterparts. The issue of school location is

also raised. Urban schools underperform compared to non-urban schools. More governmnet spending on public schools in urban areas seems appropriate from an equity viewpoint. This study may help to guide policymakers during this time of debate around school funding.

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EXPLAINING BILATERAL TRADE FLOWS IN IRELAND USING A GRAVITY MODEL: EMPIRICAL EVIDENCE FROM 2001-2011

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The concept of equilibrium was borrowed by the first economic philosophers from the field of physics, and this tradition was continued in the formation of the gravity model of trade. In this paper, Yannick Lang analyses Ireland's bilateral trade from 2001-2011 and succeeds in showing that trade flows are explained well using a gravity model approach.

Introduction

When Tinbergen and Pyhonen first stated a model similar to the model of gravity developed by Newton not much theoretical evidence existed. There was no deeper theoretical reason for why the income of two countries should have a positive effect and the distance a negative effect on bilateral trade flows. Nor was there any theoretical reason why this relationship should be multiplicative rather than additive. Tinbergen and Pyhonen only gave economists an intuitive explanation not theoretically based on existent models which explain trade flows, such as those of Ricardo or Heckscher Ohlin. Much has changed since the pioneers revealed this quite simple relationship. Gravity models have become the most important models to explain bilateral trade flows. Data seems to fit gravity formulations well independent of the research topic. A lot of papers supported its validity in terms of statistical significance.

This paper will follow the empirical wave of papers confirming Gravity Models importance in modeling bilateral trade flows by applying it to Irish trade data. Is a gravity model going to explain Irish bilateral trade flows well? Confirming its validity for the 1xN country case with Ireland would emphasize the importance of gravity models applied to single country analysis. Apart from this it would also give economists a benchmark for their research related to Irish bilateral trade flows. If not, this report would state an exception in the usage of Gravity models. Not fitting a gravity formulation, Irish trade data would stand from much research that supports the success of Gravity models for other countries.

Literature Review

This chapter gives an overview of the research that has already been undertaken since the first formulation of the gravity model in 1962 and 1963. The first part of this chapter presents the theoretical models, while the second provides some empirical studies related to this topic.

Theoretical Background

It has already been described that in the first years of the gravity model a reasonable theoretical foundation did not exist. Nevertheless in the years after the first wave of empirical papers some economists provided the gravity formulation with a theoretical foundation. Not long after the pioneers of the gravity model, Linnemann added more variables to the original standard version in 1966, and used a Walrasian General Equilibrium model, being the first researcher to start a limited but still theoretical discussion (Linnemann, 1966). Deardoff criticized this approach later by stating that there are too many explanatory variables in the Walrasian model for it to be reduced to the very simple form of the gravity model (Deardorff, 1998). It seemed like in the early years of the model the theoretical foundation was not as important, as it was simply fitting the data too well. Leamer, for example, only used the Heckscher Ohlin model to motivate his explanatory variable in his regression analysis but did not quite explain if the Heckscher Ohlin approach was consistent with the used Gravity Model (Leamer, 1974).

Following this first stream of papers with weak theoretical foundations, more researchers tried to find a reasonable model that could explain the good performance of econometric work based on the gravity model. Several attempts based their reasoning on product differentiation. The first of these was Anderson. He assumed simple Cobb Douglas preferences and the so called "Armington assumption", which became more and more important in the theoretical foundation of the gravity model. The Armington assumption simply states that products are differentiated by the country of origin (Anderson, 1979). A similar approach was taken by Jeffrey Bergstrand in his series of papers about explaining bilateral trade flows theoretically. While the differentiation of goods was still to be assumed in accordance with the Armington assumption, Bergstrand used CES (constant elasticity of substitution) preferences rather than simple Cobb Douglas preferences to derive his results (Bergstrand, 1985). In his following paper he went one step further by using a different approach for product differentiation. He assumed monopolistic competition and therefore included product differentiation on the level of the firm rather than the countries' level (Bergstrand, 1989). Bergstrand acted like a mediator between the early developed models basing product differentiation on the Armington assumption and the models presented by Krugman and Helpman that strongly argued in favor of monopolistic competition being the key driver of product differentiation (Helpman and Krug-

man, 1985).

A lot of research has been done by now to explain the theoretical foundation of the gravity model. They all seem to be consistent with the behavior of Gravity Equation. Why is that so? Deardoff, who also showed that the Gravity Equation is consistent with the classical Heckscher Ohlin model, stated in 1998 that the Gravity model is consistent with any other plausible model. The reason for this is simple. The Gravity Equation is, just like Newton's Apple falling on his head, "a fact of life" that cannot be neglected (Deardorff, 1998).

Empirical Background

A lot of researchers, especially econometricians, favour the Gravity model. Being able to generate stable and highly significant coefficients on income and distance and high R squares led to a flood of empirical papers, of which only a limited range will be presented in this section.

Evaluating Trade-Policy Issues was probably the most important issue analyzed by Gravity Models. Wall assesses the effect of trade barriers against the US in 1996, and finds that without any of those barriers US exports would have been 26.2 per cent higher than they were in the very same year with the barriers being present. The effect of imports was with 15.4 per cent, slightly smaller but still quite high (Wall, 1999). Another important question in this context was whether or not borders have negative effects on trade. McCallum proved that borders indeed seem to decrease trade flows (McCallum, 1995). Furthermore one could even use the Gravity model to test what effect a single currency market would have on bilateral trade flows of the member state, a question that was important after the establishment of the Euro in 2002. It has been answered by Rose, who shows that a single currency area will have a positive and strong effect on bilateral trade flows (Rose, 2000).

But the strength of the gravity model doesn't seem to be limited to the analysis of policy issues. Non policy issues became more and more important over the last years. Migration flows (Helliwell, 1997), capital flows (Portes and Rey, 1998) and the flows of FDI [Foreign Direct Investment] (Brenton et al., 1999) all seem to fit a gravity approach, making it a very strong tool in empirical research.

Model and Data

Having some idea about the theoretical and empirical history of gravity models, we can now start applying this model to an explicit market. The data used in the following empirical section of the paper has been extracted from various sources. Most of the data, including geographical and historical variables like distance, common official language and colony, have been extracted from the CEPII database which is commonly used for

gravity equations (The GeoDist databaseCEPII, 2013). Macroeconomic variables like GDP (gross domestic product) or Population were taken from the World Bank database (The World Bank DataBank, 2013). Bilateral trade flow data for Ireland can be accessed from the IMF (International Monetary Fund, Direction of Trade Statistics - IMF, 2013). The gravity model that is going to be used in this report takes the following form:

$$\ln Tijt = \alpha + \beta 1 \ln Yit + \beta 2 \ln Yjt + \beta 3 \ln Pit + \beta 4 \ln Pjt + \beta 3 \ln Dij + \mu k + Zkij + \varepsilon it$$

Tijt = bilateral trade volume between country i and country j in year t (Note: country i in this report will only be Ireland)

Yit = Ireland's GDP in million US $ in year t for t = 2001, , 2011

Yjt = Ireland's trading partners' GDP in million US $ in year t

Pit = Ireland's population in millions in year t

Pjt = Ireland's trading partners' population in million in year t

Dij = Distance between Ireland and its trading partners

Zkij = Vector of Dummy variables with Zkij representing common official language and colony

While most empirical work done so far tested the gravity models for an NxN country sample this report will focus on Ireland and its bilateral trade flows to potential partner countries, resulting in a 1xN sample. This approach and the model stated above follow the analysis of Chang-Hyun Sohn, who examined Korean's trade patterns (Sohn und Yoon 2001). The index i in the general formulation of gravity equations will be fixed to Ireland while the index j still varies and takes the value of each individual trading partner over the time horizon t for the years from 2001 to 2011.

Most empirical papers use exports measuring the trade flows between countries. It has been pointed out that imports are usually more influenced on a political basis than exports, and could therefore lead to distortion issues (Gruber und Vernon 1970). Nevertheless, the following analysis will use all possible bilateral trade flow measures: Exports, Imports and Total = Exports + Imports (in current US dollars). This is mainly done to see how robust the estimated results are.

Furthermore, it is noteworthy that the underlying dataset is panel data, with partner countries of Ireland being the panel variable. Advanced econometric techniques

are used to tackle the problems arising from this specific kind of data. There are three possible approaches for the analysis of panel data: Pooled OLS; Fixed Effects Models and Random Effects Models. While a Pooled OLS does not account for heterogeneity of countries and therefore only estimates one intercept for all partner countries of Ireland, Fixed and Random Effects actually model this systematic difference. Nevertheless Random Effects models make more sense in a gravity formulation as they can also estimate time invariant variables. Therefore the results presented in the following sections were all estimated with robust random effects models to tackle the possible problem of heteroscedasticity.

Empirical Results

Can Irish trade patterns actually be explained by a model as simple as the gravity model? The answer to this question is given in this section of the report using the data presented and described in the previous section.

Using exports (1), imports (2) and total bilateral trade flows (3) as dependent variables, Table 1 shows the derived results. Exports are presented first and in further detail due to the possible distortion issues described in the previous section of the other measures leaving exports as the most valuable instrument to measure trade flow data. For this reason coefficients and significance will be extracted in the following analysis from the first model.

VARIABLES	(1) RANDOM Exports	(2) RANDOM Imports	(3) RANDOM Total
Log(GDP) of Partner in million	1.444***	1.941***	1.535***
	(0.106)	(0.0403)	(0.0168)
Log(GDP) of Reporter in million	1.489***	1.592**	1.563***
	(0.351)	(0.808)	(0.539)
Log(Population) of Partner in million	-0.356***	-0.476***	-0.381***
	(0.104)	(0.0547)	(0.0184)
Log(Population) of Reporter in million	-5.874***	-9.961***	-6.589***
	(1.209)	(2.160)	(1.376)
Log(Weighted Distance)	-1.211***	-0.988***	-1.064***
	(0.160)	(0.0484)	(0.0413)
comlang_off	1.135***	0.884***	1.027***
	(0.220)	(0.0849)	(0.0345)
Colony	-1.142***	0.236	-0.602***
	(0.442)	(0.167)	(0.133)
Constant	-11.69***	-16.04**	-13.29***
	(3.321)	(6.694)	(4.745)
Observations	1,684	1,571	1,688
R-squared	0.81	0.63	0.81
Number of year	173	10	10

*Table 1: Gravity Model for Ireland: Exports, Imports and Total Trade flows (Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1)*

All variables are included in log form in accordance with the gravity model, meaning that they can be interpreted as elasticities. An increase in an Irish trading partner's GDP in millions of US dollars by 1 per cent will increase Irish exports to the partner country by 1.44 Per cent. Significance can be reported at a 1 per cent level. This means that the null hypothesis that Irish trading partners GDP in millions of US dollars does not have any effect on Irish exports can be rejected at a 1 per cent level. Irish GDP increases of 1 per cent will increase Irish exports by 1.489 per cent (Significant on a 1 per cent level). Population also reports the expected effect. Countries with larger populations tend to be less open than smaller countries. This could be derived from simple international trade theory analyzing the effect of a tariff for a relatively small and a relatively large country. While small countries always lose economic welfare, the effect for large countries tends to be positive. In the model presented in the table we see that a 1 per cent increase in population of the partner country decreases exports by 0.356 per cent (Significant at the 1 per cent level). Another important parameter in gravity models is the distance parameter, representing any kind of transport costs or trade barriers that could inhibit trade flows. This parameter seems to be a little bit higher than reported in recent gravity models, stating it would be between 0.7 and 1. Nevertheless, it is still highly significant at the 1 per cent level and can be interpreted as an increase in weighted distance by 1 per cent will decrease exports by 1.211 per cent.

The dummy variables accounting for historical and cultural differences or similarities of countries are also highly significant at the 1 per cent level. Having English as an official language (as in Ireland) leads to export flows to this partner country that are 1.14 per cent higher than to countries with another official language. Ireland being a former colony of the trading partner seems to reduce exports significantly by 1.14 per cent.

Generally speaking, one can say that the gravity model seems to fit bilateral trade flow data quite well. Imports and Total bilateral trade flow data show almost the same results as the non distorted exports measure which shows that the model used is robust across different model specifications.

Conclusion

The starting question of this report was whether Irish bilateral trade flows can be explained by a gravity approach. After an empirical analysis and a detailed discussion in the previous chapter it seems that Irish trade flows indeed seem to be quite well estimated with a gravity approach. Coefficients and statistical significance are consistent with what other economists found for other countries.

It is noteworthy that this paper only focused on the basic version of the gravity model. It has been shown that the gravity model can be seen as a benchmark to explain Irish bilateral trade flows. More variables can be added using the estimated variables above as control variables to evaluate, for example, trade policy issues for Irish market.

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THE GOLD STANDARD AND ITS EFFECT ON MONETARY THOUGHT AND POLICY DURING THE GREAT DEPRESSION

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Senior Sophister

It is easy in hindsight to marvel at the inept monetary policies of the Great Depression, but much harder to explain why these policies were considered optimal at the time. Paul Kelly takes on this formidable task by giving a meticulous account of why the role of the Gold Standard was never questioned. This cautionary tale of the perils of excessive caution should be required reading for today's policy makers.

Introduction

The Great Depression began in 1929 as a normal economic recession, similar to those that preceded it in 1924 and 1927 (Friedmann and Schwartz, 1963). Its origins were not monetary in nature, but rather stemmed from the Wall Street Crash (Romer and Romer, 2013). Despite this fact, monetary policy, especially the refusal to abandon the gold standard, is commonly blamed as one of the main causes of the Great Depression. This is because, although monetary factors did not instigate the contraction, they were responsible for its depth and persistence. As Eichengreen and Temin (2000, p.195) note, what began as an "unexceptional downturn… was converted into the Great Depression by the actions of central banks and governments."

Such a result was not predestined. The gold standard alone did not force central banks to pursue such policies, rather it formed the core of the ideology which promoted them. So hegemonic was this ideology, that even as economies spiralled towards disaster, all options were framed with the implicit assumption that the standard would be maintained. As Morrison (2013: p.2) notes, "most policymakers did not know that they even 'could' leave gold- let alone that they 'should'." This essay shall examine why the gold standard worsened the Great Depression, the effect of monetary policies which tried to support it, and the monetary thought which produced such policies. In doing so, this essay shall seek to produce a fuller understanding of the effect of the gold standard on monetary thought and policy during the Great Depression.

Why did the Gold Standard Worsen the Great Depression?

The gold standard was a fixed exchange rate system that relied on Hume's Price-Specie mechanism to ensure that prices, the money supply and the current account remained consistent . If prices rose, a trade deficit ensured that gold flowed out of the country. As a result, the supply of money declined and prices eventually returned to normal, although the process was often painful.

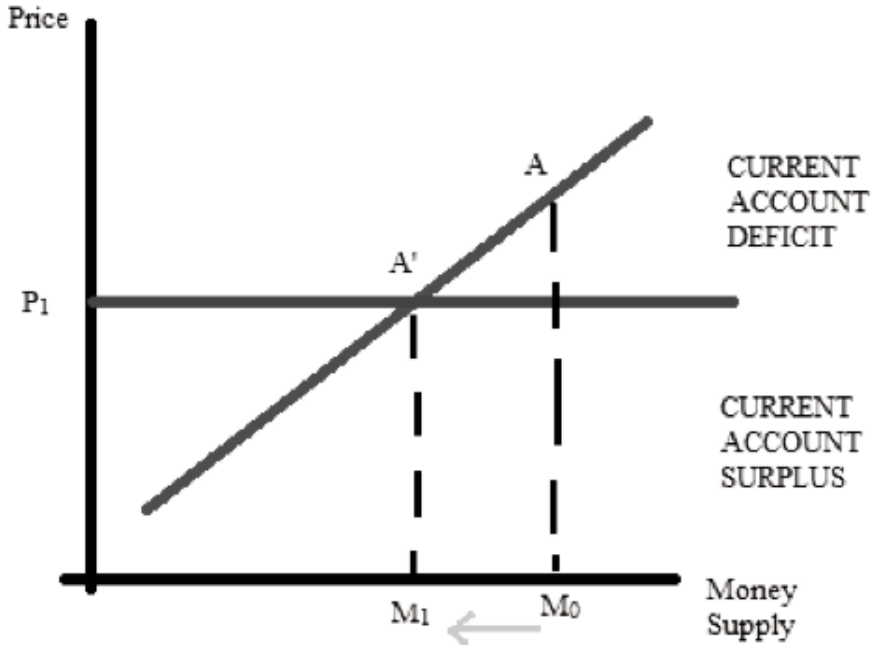

Figure 1: Hume's Price-Specie Mechanism - at A, Home is in a current ac count deficit and prices rise. As a result, money flows out until the money supply decreases to M1 and prices fall to A'. Here, trade is balanced.

This standard was distinctly rigid and was not conducive to monetary experimentation. Deviations from the fixed exchange rate were rare and only occurred in emergencies. Afterwards, parity was always restored (Morrison, 2013). World War 1 abruptly changed this system. In 1914, the gold standard was suspended in all major economies as countries printed money to finance the war. After it, countries attempted to, as before, return to their pre-war parities. By now, however, every currency was vastly overvalued, to a degree never seen before. The solution prescribed for this was deflation, as this would allow prices

to fall and would ensure that enough gold remained to keep the fixed exchange rate. This was believed to be essential for the maintenance of international stability. Without it, policymakers believed that "violent fluctuations in the exchanges" would force trade to cease (Strong, 1925, quoted in Eichengreen and Temmin, 2000, p.188).

But such deflationary policies were no longer appropriate for these economies, as wages had become sticky, preventing lower prices. The increasing power of trade unions meant that increased unemployment no longer produced lower wages, cheaper exports and a return to equilibrium. As Eichengreen and Temin (2000, p.184) have noted "the gold standard adjustment mechanism no longer operated as before". This problem was accentuated by the fact that gold no longer provided a suitable nominal anchor for the world's money supply. As mining became increasingly unpredictable and gold in ever shorter supply, it provided a direct barrier to economic growth. In addition to this, with France and the USA now controlling a combined 72 per cent of the world's gold reserves, gold had become a "managed currency" (Bernanke and James, 1991; Keynes, 1923, p.167). Its rarity no longer dictated its price, but rather the actions of central banks did, leaving it open to speculative attacks. With this emphasis on deflation and its inability to provide a suitable nominal anchor, the gold standard ceased to be an appropriate monetary system.

Indeed, it was only when countries began to abandon gold that growth began to recover. Between 1932 and 1935, economic growth was 7 per cent higher for countries that had left the gold standard than for those who remained (Bernanke and James, 1991). Such a result, however, was not necessarily inevitable. Although the gold standard worsened the economies of many countries, it could have survived, and the worst of the depression been avoided, had the correct monetary policies been in place. However, the failure to use such monetary policies was intimately connected with the ideology the gold standard was embedded into. In the words of Friedman and Schwartz (1963, p407) "the monetary system collapsed, but it clearly need not have done so."

Monetary Policy: Mismanagement of the Gold Standard

Like all fixed exchange rate systems, the gold standard required a degree of cooperation in order for it to succeed. To assist the price-specie flow mechanism, surplus countries needed to increase domestic money supply, while deficit countries needed to decrease it. In the interwar period, however, such cooperation was rare. Although previously, the system had been led by the Bank of England, during the Great Depression there was no such leader (Giovannini, 1988). The USA and France, the two main surplus countries, instead of increasing their money supply, drastically contracted it and instead of allowing gold to flow freely, sterilised it. This insured that deflation was exported worldwide, forcing deficit countries to increase interest rates still further in order to avoid losing all their reserves (Bernanke and James, 1991). In the words of a contemporary business magazine, this gave

rise to "worldwide reckless deflation" (Business Week, quoted in Romer and Romer, 2013: p.6).

This competitive gold hoarding had drastic domestic implications. As central banks continued to increase their interest rates, commercial "banks failed by the thousands" (Calomirs and Wheelick, 1998, p.25). Although commercial nominal interest rates remained low throughout this period, thus encouraging central banks in their deflationary policies, given expected deflation, real interest rates were actually high. This increased the burden of existing debt, forcing many banks to collapse, inspiring panic and bank runs, which forced still more to fail. This financial collapse produced decreased investment, output, and employment. As a result, further deflation followed. Between 1929 and 1931, prices fell by 31.4 per cent in the USA alone (Romer and Romer, 2013).

Similar monetary failures were abundant throughout the Great Depression. Widespread banking panics, for example, could have been averted had the proper monetary policies been in place. This can be seen in Bordo et al's (1999) empirical analysis of USA monetary policy. They found that if $1 billion of expansionary open market operations had been conducted between October 1930 and February 1931 and between September 1931 and January 1932, such panics could have been averted without endangering the gold standard.

A failure to follow such policies was due to the Federal Reserve's inability to calculate when they were necessary. The Federal Reserve believed, in the words of one contemporary economist, that "member banks are in general reluctant to borrow from the Reserve Banks, (and) when they do borrow they are in most cases motivated by necessity rather than profit" (Riefler, 1930, quoted in Wheelock, 1990, p411). Due to this belief, the Federal Reserve calculated when monetary expansion was necessary based on whether banks were borrowing. When banks borrowed heavily, monetary expansion was utilised. Such a policy was inherently flawed however, given that banks were less likely to borrow during the Great Depression due to uncertainty and the fact that the recession had decreased the amount of loans and investments they made. As a result, "The Fed actually contributed to economic instability by exacerbating pro-cyclical swings in the money supply" (Wheelock, 1990, p.412). Although, Friedman and Schwartz (1963, p 411) have argued that such policies were due to the death of New York Bank Governor Benjamin Strong and the resultant "shift of power within the system and the lack of understanding and experience of the individuals to whom the power shifted", this misunderstands how the Federal Reserve operated. As Wheelock (1990) has shown, these pro-cyclical policies were in place even during Strong's lifetime. The reason they did not provoke depression earlier was that the 1924 and 1927 recessions had not hurt bank borrowing and, as such, had led to an expansionary monetary policy.

In contrast, the Great Depression abruptly halted bank borrowing leading policymakers to believe "that the decline in borrowed reserves following the stock market crash implied that money and credit were plentiful" (Wheelock, 1990, p.423).

Similar policy failures were endemic elsewhere. In Germany, as in much of central Europe, deflation was pursued as policymakers recovered from the shock of hyperinflation. In Great Britain, in what has been described as a "landmark policy mistake", deflation was also used to return to the pre-war parity (Baldwin and Wyplosz, 2012, p.382). In the UK, this pursuit was largely due to a mistaken belief that the gap between pre and post-war prices was only 2-3 per cent when, in reality, the gap was five times greater. Whilst policymakers had measured prices using wholesale index numbers, which were mainly affected by international prices, they should have instead used internal prices and measurements of the cost of living (Keynes, 1925). Similarly, policymakers severally underestimated the difficulty of deflation. As Keynes (1925, p.11) eloquently described it, policymakers "dwelt in the imaginary academic world… where the necessary adjustments follow 'automatically' from a 'sound' policy by the bank of England". The net result was that policymakers across Europe and the USA deliberately tried to create unemployment, in the hope of decreasing wages and lowering prices back to their pre-war parities (Keynes, 1923). Here, it is most clear how the ideology of the gold standard became so inextricably intertwined with that of a deflationary mind-set and a mismanagement of the very standard they sought to protect. In the words of Eichengreen and Temin (2010, p.13) "policies were perverse because they were formulated to preserve the gold standard, not to stabilise output and employment".

Monetary Thought: a Fixation on Gold

Monetary thought throughout the Great Depression supported such perverse policies, as it was believed that they would preserve the gold standard. As a contemporary economist, Basil Blackett makes clear: "The gold standard has become a religion for some of the boards of central banks in Continental Europe, believed in with an emotional fervour which makes them incapable of an unprejudiced and objective examination of possible alternatives" (Eichengreen and Temin, 2000, p.207). Such a fixation on gold was not without foundation. For decades, gold had provided the international system with stability and encouraged both saving and investment by removing the risk of government interference in the value of money. So great were the benefits of this that by 1914, one third of UK savings were invested abroad (Edelstein, 1982). The alternative to such stability, it was believed, was Germany's hyperinflation. Indeed, the fear of such hyperinflation cannot be underestimated in the minds of policymakers. Even as deflation gripped the USA, officials continued to preach that expansionary monetary policy would produce uncontrollable inflation. The same beliefs held true elsewhere. In Britain, few believed "that it was possible to let the pound float without suffering political and economic collapse" (Mor-

rison, 2013, p.9). In Continental Europe, central banks were legally banned from making open market purchases (Bemanke and James, 1991).

Some writers, such as Keynes, have attributed this fixation to the fact that elites who held contracts valued at the pre-war parity benefited most from deflation. But with the cost of credit spiralling upwards, such elites, who typically invested heavily abroad, hardly benefited from the end results. Indeed, as Morrison (2013, p.35) makes clear, the attachment to gold was not an elite phenomenon: "Virtually all of Britain- from the Prime Minister who sacrificed his political future, to the labourers and the unemployed who swallowed the 10-15 per cent cuts in income with minimal resistance – wanted desperately to save the gold standard". This was due to the hegemony of the gold standard as an idea. The idea that gold was intrinsically valuable was clung to by policymakers and publics alike who searched in vain for stability in a world economy that was crumbling. With this at the fore, few other options were considered. Policy debate centred on the choice between deflation and devaluation (Keynes, 1923). Whether the gold standard should be abandoned or not did not even reach the agenda. And given that deflation strengthened the gold standard, whilst devaluation, would weaken it, deflation and its consequences, were what was prescribed. The hegemony of the gold standard can be clearly seen in the fact that even when countries abandoned it, such actions were viewed as failure. Britain's withdrawal in 1931 was described as "a catastrophe of the first order of magnitude" by a contemporary economist (Robbins, 1934, p.117). Likewise, the USA's withdrawal was seen as due to "inflationist sentiment" (Robbins, 1934, p.122). The American Institute of Banking even argued that abandoning gold had not been necessary, given that "at the time… its international economic position was so strong and its own gold holdings so large" (Robbins, 1934: p.122). The idea that the gold standard could be doing internal economic damage was not even considered.

Similarly, anything but the gold standard was blamed for the Great Depression. The public and the media blamed central banks for failing to expand, resulting in "the creeping paralysis of deflation" (Business Week, quoted in Romer and Romer, 2013: p.6). Central Banks, in turn, blamed commercial banks, arguing that money was neutral and that bank failures were due to the mismanagement of individual banks (Friedman and Schwartz, 1963). Professional economists blamed politicians, World War 1 and protectionism (Robbins, 1934). Politicians blamed trade unions for failing to allow wages to fall. Although all of these factors clearly impacted the Great Depression, none were as influential as the gold standard, which was rarely mentioned. This, above all, was hailed as the only bastion of stability in the world, while German hyperinflation was consistently used as a lesson for its necessity.

Conclusion

In conclusion, it is clear that the gold standard drastically impacted monetary thought and policy during the Great Depression. As we have seen, it was hugely harmful to the world economy as it was no longer suitable as a nominal anchor and encouraged deflation. Despite this, through the sterilisation of gold inflows and the hiking of interest rates, contractionary monetary policies were formulated to preserve it. This led to a further undermining of not just the world economy, but the conditions under which the gold standard could function as an appropriate monetary system. However, even as this occurred, monetary thought, despite some notable exceptions, consistently called for its protection due to the hegemony the ideology had over other alternatives. Such alternatives existed, as can be seen in Keynes' A Tract on Monetary Reform (1923), but they were never allowed reach the policy agenda. This led to a vicious circle, where monetary thought produced monetary policies which harmed the global economy, further endangering the gold standard, resulting in policymakers advocating ever more drastic measures to save it. Indeed, in the USA and in much of continental Europe, it was only when such policymakers were removed from office that the gold standard was abandoned (Eichengreen and Temin, 2000). In the UK, gold was only abandoned after a financial crisis forced what was intended to be a brief floatation of sterling. It was only when this failed to result in hyperinflation that policymakers at last began to consider a floating rate as a permanent solution (Morrison, 2013). Clearly, although the gold standard harmed the global economy, its effect on monetary thought and policy was unparalleled.

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Virtual Currency: Fad or Future?

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Are cryptocurrencies such as Bitcoin the beginnings of a monetary revolution or merely an inflated asset price bubble? Gearóid Gibbs examines the characteristics of this phenomenon, and looks at its long term stability as a form of currency.

Introduction

Digital innovations increasingly challenge the conceptual and practical limits of the traditional financial system. The vast majority of global money transactions now take place in cyberspace. As a result, nearly all currency is digital. While the electronic versions of traditional "fiat" currencies account for the majority of this, there are also newer independent virtual currencies that push the boundaries of what we consider as money. Such e-currencies have experienced exponential growth in recent years and have far reaching practical and policy implications.

An array of virtual currencies has emerged in recent decades. This essay, however, will particularly focus on Bitcoin; a currency, that since its inception in 2009, has seen phenomenal growth and widespread diffusion. The development of such virtual currencies is catalysed by a number of contributing factors. In the first instance, technological progress has produced the systems required to track virtual currencies and financial transfers over the internet (Boyle, 2000). Increasing mistrust towards financial organisations arising from the recent global economic crisis has accelerated the uptake of new monetary alternatives. Similarly, a decline in deference for government and formal institutions has encouraged more to people to put their money out of reach of the authorities. When Bitcoin first appeared it was quickly recognised by the 'anarcho-utopian crowd of techno-libertarians' who are prominent advancers of online innovation (Salmon, 2013).

Development

Developments in digital technologies have challenged the role of central banking in democratic states (Sassower, 2013). Hayek's (1976) prediction of the "de-nationalisation of money" appears to be realised - albeit not by a traditional government backed fiat currency.

An inherent mistrust of institutions sets Bitcoin apart from traditional currencies. The prevailing fiat currencies get their value by way of regulation or law, being underwritten by the state and issued by a monetary authority, which is, in general, a central bank. In contrast, Bitcoin does not have any intrinsic value nor does any formal institution

control it. Bitcoin's fame is due mainly to its status as the "world's first completely decentralised digital currency" (Brito & Castillo, 2013). A pseudonymous programmer under the name "Satoshi Nakamoto" devised the currency. In an online bulletin post Nakamoto (2009) criticised traditional fiat currencies and proclaimed that the new currency was "completely decentralised, with no trusted parties".

> *"The root problem with conventional currency is all the trust that's required to make it work. The central bank must be trusted not to debase the currency, but the history of fiat currencies is full of breaches of that trust. Banks must be trusted to hold our money and transfer it electronically, but they lend it out in waves of credit bubbles with barely a fraction in reserve. We have to trust them with our privacy, trust them not to let identity thieves drain our accounts" (Nakamoto, 2009).*

As such, Bitcoin is based on mistrust. The peer-to-peer network uses sophisticated cryptography to validate and secure online transactions (Cohen, 2013). There is no requirement for a central monetary authority to monitor or verify payments. Nakamoto (2009) contends that "with e-currency based on cryptographic proof, without the need to trust a third party middleman, money can be secure and transactions effortless."

Analogous to scare resources, such as gold, the global supply of Bitcoin has been exogenously predetermined and will never exceed 21 million coins. Like gold, Bitcoins are "mined". The process of mining Bitcoins requires huge amounts of computer power to solve complex mathematical problems. The ultimately fixed supply means the global rate at which new coins can be mined is decreasing. By 2021, assuming Bitcoins remain in circulation, the rate of growth in the supply of the currency will be so low that the money stock could be considered constant (Salmon, 2013).

Implications for the Monetary System

Nakamoto's beliefs are compatible to an extent with those of Milton Friedman. Friedman (1962) questioned the necessity of central banks, in particular the Federal Reserve. He argued that such institutions ought to be replaced by an automated system which would "increase the money supply at a steady, predetermined rate" k, irrespective of business cycles (The Economist, 2011).

> *"Any system which gives so much power and so much discretion to a few men, [so] that mis takes - excusable or not - can have such far reaching effects, is a bad system. It is a bad system to believers in freedom just because it gives a few men such power without any ef fective check by the body politic - this is the key political argument against an independent central bank … To paraphrase Clemenceau: money is much too serious a matter to be left to the Central Bankers" (Friedman, 1962: p.50).*

Bitcoin approximates Friedman's idea, albeit the supply is ultimately fixed at 21 million coins. Why this seemingly arbitrary number was chosen remains unclear. However, the inflexible supply does have certain benefits. No central bank can print millions of new coins, which would have the effect of diluting the value of existing ones (Salmon, 2013). As such, the system should in theory repress inflation. Conversely, given the fixed supply, the cost of mining new Bitcoins rises over time, so that the value of the currency increases relative to the stock of goods and services available in the economy (Stross, 2013). A problem of deflation emerges. Deflation postpones consumption, as prices would be decreasing when considered in Bitcoin terms. Paul Krugman (2011) highlights the "massive deflation" that the Bitcoin economy has experienced. As a result, the currency has been hoarded as opposed to spent. "In effect, real gross Bitcoin product has fallen sharply" (Krugman, 2011).

This development raises major concerns about the long-term sustainability of Bitcoin. Monetary expansion is required alongside economic growth. In a fiat currency system, the central bank can increase supply when required by printing new money. Such an expansion is not possible in the Bitcoin economy. This predicament partially undermines the success of Bitcoin in the long run (Salmon, 2013).

Questions have been raised about the validity of virtual currencies as a form of money. Money is generally credited with acting as a means of payment, while also fulfilling the functions of acting as a unit of account and as a store of value (Pierce & Tysome, 1985). In terms of acting as a medium of exchange, Bitcoin appears similar to fiat currencies. Arguably, anything portable fulfils this function as long as enough agents consent to its use. When one considers the other two functions of money, Bitcoin's limitations become evident. It is considerably less suited to acting as a unit of account and as a stable source of value given its extreme volatility. The crypto currency has been susceptible to major price fluctuations in its short history.

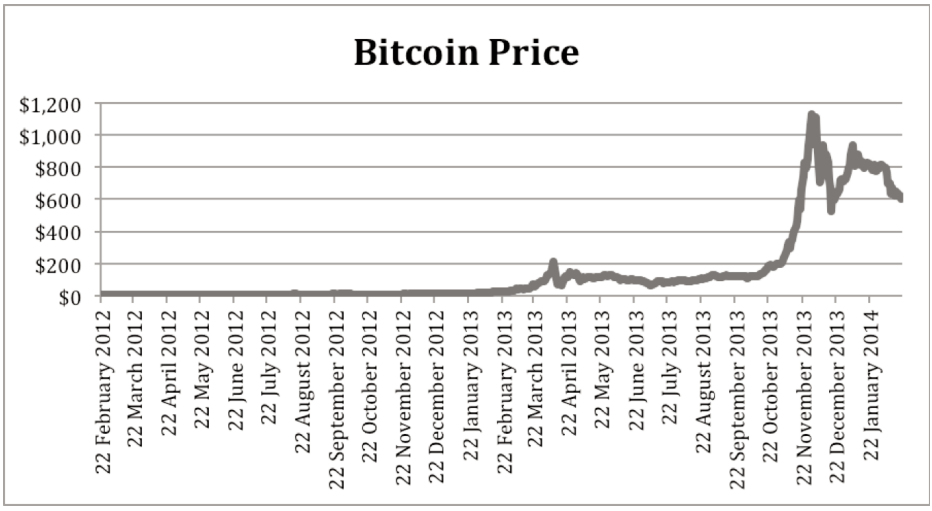
Currency Versus Commodity

A Bitcoin bubble may exist. As with most speculative bubbles, it is likely to be temporary and will inevitably burst. Price fluctuations have been driven by a number of factors over time. Firstly, many people are holding Bitcoin based purely on the hope that their value will increase. A correlation exists between the value of Bitcoin and the level of media coverage it receives (Salmon, 2013). Specific articles have in some cases increased the price tenfold. This sensation is a vicious circle. As the price of Bitcoin rises, press coverage increases, creating a media frenzy that attracts more people in, sending the price even higher.

In mid-2013, following the Cypriot bank collapse and deposit "bail-in" programme, a currency beyond the reach of governments became instantly more appealing to many depositors (Salmon, 2013). Chinese investors storing money offshore drove fur-

ther price surges. China quickly became the world's largest Bitcoin market. Towards the end of 2013, a peak price of $1132.01 was reached (Bitcoin Charts, 2014). In December 2013, following a Chinese government ruling that Bitcoin could not be used as legal currency in China; the value plummeted (Bischof, 2014). The price has recovered to roughly half of its peak value but remains highly volatile.

"Hoarding means that Bitcoin is currently more of a speculative asset than a currency" (The Economist, 2013). Salmon (2013) described Bitcoin as "an uncomfortable combination of commodity and currency." Such a relationship is paradoxical. "The commodity value of Bitcoins is rooted in their currency value, but the more of a commodity they become, the less useful they are as a currency" (Salmon, 2013). Due to the inherent instability of Bitcoin prices, it is difficult to consider it a legitimate medium of exchange. Currencies require some degree of stability. As such, Bitcoin does not really behave like a currency at all. Considering its market value and fluctuating nature, it is more akin to a highly volatile commodity. However, this feature is by design. Bitcoin was ultimately created to be the "most fungible commodity in existence" (Salmon, 2013), in effect, blurring the line between currency and commodity.



Data source: Bitcoin Charts, 2014.

Policy, Regulatory, and Social Concerns

Virtual currencies will have much broader effects on society than other electronic payment systems that use traditional fiat currencies (Boyle, 2000). The continued proliferation of virtual currencies raises a number of salient issues that must be addressed. The attractive characteristics of Bitcoin as a payment mechanism, also allow users to "evade taxes, launder

money, and trade illicit goods" (Brito & Castillo, 2013: p.1). Bitcoin has been linked to illegal drug markets, human trafficking, even assassinations. However, this argument is exaggerated. In reality, Bitcoin makes up a small share of illegal transactions, especially when compared to the US dollar (Urquhart, 2014). Concerns regarding money laundering are legitimate and policy makers and regulators around the world are increasingly turning their attention to virtual currencies.

Further major regulatory concerns exist regarding fraud, virtual currencies as types of ponzi-schemes, and contagion from collapse of other e-currencies. While individual regulatory approaches will likely differ, the results should share some common ground. Boyle (2000: p.53) considered a "loose regulatory framework that protects consumers, protects the banking system and still allows the development of profitable new innovations" as an ideal solution. Regardless, when considering possible regulation options, pragmatism and efficiency should be promoted rather than dogma. One system is unlikely to suit the whole range of virtual currencies that are likely to exist in an economy.

Ambiguity over the exact secureness of the Bitcoin system prevails. The issue does not lie with the integrity of the coins, but rather in keeping the coins in a safe place. It is not clear if there is any simple way for owners to store their coins securely. Using one's personal computer can be dangerous, requires a certain degree of technical competence, and is susceptible to hacking (Grinberg, 2012). The alternative is to use the services of an external party to protect the coins, but this requires trust, something Bitcoins were designed to avoid in the first place (Salmon, 2013). A range of exchanges and virtual wallets exist where people can hold their Bitcoins and initiate transactions. Alarmingly, many of these websites have been hacked, and their respective Bitcoins lost to cyber-thieves.

In this age of ubiquitous technological surveillance and data collection, Bitcoin has been promoted as an anonymous payment mechanism. However, given the peer-to-peer network utilised, the currency's records are open and accessible. All transactions made are available for inspection, albeit the accounts are anonymous and no database of identities exists. As a result, it is theoretically impossible to associate account holders to their account labels. However, as Grinberg (2012) correctly identified, people often unintentionally leave "clues about their identities when negotiating transactions, posting messages and transferring Bitcoins in e-wallets". As such, Bitcoin should not be considered anymore impervious to surveillance than traditional cash payments (Lee, 2011).

Social concerns also exist in that virtual currencies may increase social exclusion, being open only to those individuals who can afford them (Boyle, 2000). In one study of Bitcoin wealth distribution, the Gini coefficient was calculated at 0.87709 (Bitcoinica, 2011). Such data supports the claims that ubiquitous virtual currencies could further deepen global inequality.

On the other hand, it is argued that, given Bitcoin's open-system and negligible transaction costs, the currency could have the potential to improve access to basic financial services for the world's poorest (Brito & Castillo, 2013).

Conclusion

Given the associated problems with Bitcoin, it is unlikely it could replace outright any established fiat currency. For Bitcoin to increase its credibility and gain widespread adoption, the backing of a large, reputable institution or government would appear to be required. However, such a development would go against the very design philosophy that underpins Nakamoto's creation. While Bitcoin in itself may not be the future of monetary systems, it should be used as a foundation to aid successive developments. The basic premise of Bitcoin as being a fast, efficient, peer-to-peer payments system which circumvents trusted third parties, while maintaining low to negligible transaction costs holds much potential. Whether Bitcoin and other e-currencies are an evolution of the financial sphere or a revolutionary new monetary system remains to be seen. Regardless, such monetary experimentation has vast potential and should be encouraged.

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ISLAMIC BANKING: NECESSITY IS THE MOTHER OF INVENTION

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In this essay, Sam Logan takes a novel view of banking practices by examining the world of Islamic banking. He analyses how and why this alternative form of banking evolved, and the benefits it may have to improve societal welfare. He concludes by stating that the Western banking industry could learn important lessons in risk management by paying attention to this alternative system.

Introduction

> *". . . let us begin and create in idea a State; and yet a true creator is necessity, which is the mother of our invention."*
>
> *Plato, The Republic, Book II*

This quote from Plato is often cited as the origin of the idea that necessity is the mother of invention. This necessity often comes courtesy of artificial constraints that force one to significantly alter one's approach to the problem being addressed. Canned food was created as a means of feeding seafarers on long ocean voyages. Examples from space exploration range from foil heat blankets to the technology of freeze drying food for supporting human life without gravity or oxygen. Like these and similar inventions, Islamic banking was created to overcome a specific constraint but is relevant far beyond the restriction that inspired it.

Islamic banking is a system of financial intermediation that complies with Shari'a law and forms an alternative to the traditional, Western system of banking. The necessity for such an alternative was born out of the prohibition in Islam of several practices that are integral to Western banking. The most important of these practices for this discussion are riba, charging an interest rate on loans, and gharar, speculative or excessive risk. While the centrality of interest rates to European-style banking makes an alternative system seem close to impossible, Islamic banking attempts to provide such an alternative. Indeed, the presence of these and other moral prohibitions has forced Islamic bankers to devise alternative ways of providing the credit necessary for the healthy functioning of an economy.

It is important to acknowledge that Western banking makes use of many of the ideas also prevalent in Islamic banking. The argument I put forth in this essay is not that these ideas are exclusive to Islamic banking, but that their benefits are more obvious when viewed through this lens. Islamic banking approaches creating credit from a perspective fundamentally different to the approach of Western banking. The incentive effects of concepts which are shared by both Islamic and Western banking are made clearer through the Islamic system's explicit preference for profit and loss sharing models.

In this discussion I challenge the degree of difference between Islamic and Western banking systems, separating what is genuinely divergent in Islamic banking from what is, in practice, identical to the Western system. I investigate the implications that the application of Islamic banking principles could have for issues of informational asymmetry and show that risk-sharing models of finance bring the incentives of banks and borrowers closer together. I present the beneficial effects the principles of Islamic banking could have on avoiding the inefficiencies arising from the present-biased preferences of investors. Lastly, I put forward an argument for the application of Islamic financial principles to capital structures. These equity-based capital structures would minimise costs from default and give the economy greater resilience to shocks. Overall, the aim of this essay is to show the wide ranging effects a radically different approach to banking can have on an economy.

How Different Are Islamic Banks?

Shari'a law is an interpretation of Islamic holy writ that gives guidance to Muslims about how to act in accordance with their faith in everyday situations. Islamic banks operate with the same objective of making a profit as Western banks; however they have the additional aim of upholding Shari'a law and providing Shari'a-compliant services for their customers. Although there are different interpretations of Shari'a law, there is a broad consensus in Islamic jurisprudence that engaging in transactions based on an interest rate, excessive unilateral risk and gambling on uncertain events are all unacceptable. Instead of European-style banking where debt is issued and repaid with interest, Islamic jurisprudence prefers an arrangement where profit and loss are shared by the source of funds and the receiver. This system usually operates through either a copartnery arrangement or by the investor taking an equity stake in a project.

However, the way these profit and loss sharing arrangements actually operate may not always make Shari'a-compliant alternatives materially different from their Western counterparts, as observed by Willem Buiter (2009):

> *"I am not talking here about the sham shari'a-compliant instruments that flooded the mar ket in the decade before the crisis; these were window-dressing pseudo-Islamic financial in struments that were mathematically equivalent to conventional debt and mortgage contracts, but met the letter if not the spirit of shari'a law"*

This quote most likely refers to sukuk, the Islamic alternative to securities and bonds, but we can also observe connections between some of the foundational products of Islamic banking and Western banking. Mahmoud El Gamal describes the Murabaha, one of the alternative loan contracts integral to Islamic banking, as a purchase and resale agreement where the bank charges the customer a "transaction fee" (El Gamal, 2006). As Tarek Coury notes, this "transaction fee" tracks the market interest rate (Coury, 2013). The Musharaka, or diminishing partnership, is a common alternative to a mortgage where the customer's monthly payments are comprised of elements of principle and rent. Again, the rental portion of the payments tracks the market interest rate. In this way many Islamic banking products can be technically Shari'a-compliant without differing substantially from products that explicitly charge an interest rate. However, while the alternative nature of Islamic banking may be undermined by its current underlying use of market interest rates as a reference, the conceptual value of Shari'a-inspired arrangements for the sharing of profit, loss and risk and avoiding an interest rate is unaltered. This provides a based for a truly distinct alternative that has wide ranging and profound implications.

Shari'a Principles for Incentive Alignment

The finance sector, which provides the credit vital for the continued functioning of the economy, is plagued by issues of moral hazard, adverse selection and myriad other problems of informational asymmetry and misaligned incentives. These problems all lead to inefficiencies which cumulatively erode the highest potential level of societal welfare. Is it possible to change or improve this inefficiency by changing the mechanism by which credit enters the economy? While Islamic banking is not perfect in this respect, I believe it provides support for the idea that the answer to this question is positive.

Moral hazard refers to any situation that involves a decision where the choice of the level of risk to take and the cost of this risk do not fall to the same agent. In these situations the risk taker is incentivised to take more risk than they would, were they to face the cost themselves. In banking this concept finds its most frequent application in the context of a bank providing a loan for a private investment project. In the Western paradigm, credit is provided as a loan that must be repaid regardless of the result of the project. The entrepreneur shoulders all of the risk of failure but retains the entire reward in the event of success. This leads to a situation where potentially profitable investment projects are not pursued because the entrepreneur is unwilling to take sole responsibility for all the risk involved. In the profit and loss sharing model, on which Islamic banking is based, credit is provided as an equity stake in the project. In this case the bank and the entrepreneur share both the potential reward of success and the cost of failure and the disincentive to pursuing potentially beneficial investment opportunities is reduced.

From this simple theoretical example it becomes clear that using a profit and loss sharing arrangement to provide credit brings the incentives of the entrepreneur, the

bank and society in general into closer alignment. This paradigm has the effect, lauded by proponents of Islamic banking, of ensuring that credit is rationed according to multiple factors, rather than a one dimensional conception of "creditworthiness". This has the effect of enforcing greater due diligence on the part of the lender (Coury, 2013).

Despite the observable reductions in moral hazard, the Shari'a-compliant structures do not completely eliminate inefficiencies arising from all instances of informational asymmetries (Dar, 2007). For example, in a type of loan alternative called a Murabaha contract, the usual Western deterrent to default in the form of accumulating interest is not present. While this can be remedied by the application of a penalty clause, it essentially advantages the borrower to the detriment of the lender. Due to this disadvantage Murabaha and similar contracts have high prices that make cheaper Western products preferable to potential customers of Islamic banking. As Humayon Dar observes, these types of incentive incompatibilities between lenders and borrowers are widespread among the Islamic banking products currently in use (Dar, 2007).

Pro-social Effects of Partnerships

Some of the most profound effects of profit and loss sharing arrangements arise when a partnership functions as a way of enforcing a commitment to a decision that will bring about the best possible outcome. The point has been raised that the prohibition of the riba in Islam is not exclusively due to the exploitative aspect of an interest rate but is also motivated by the pro-social effects of the alternatives (El Gamal, 2001).

Hyperbolic discounting is the term used to describe the way that people consistently display preferences that are present-biased. That is, present consumption is preferred to equivalent consumption in the future (Prelec, 2004). Hyperbolic discounting is unquestionably relevant to financial intermediation given how people make decisions without considering their "future selves". It is particularly apparent in the area of savings and investment (Phelps and Pollack, 1968). El Gamal (2001) presents a plausible situation where an entrepreneur with present-biased preferences revises their initial investment decision in favour of present consumption. This situation, whereby the final investment is less than the ex-ante optimum (Laibson, 1997), may arise in the context of an investment financed by debt. In the Sharia-influenced alternative, a profit and loss sharing arrangement allows investment decisions to be vetoed by a risk sharing partner. This alleviates the detrimental effects of hyperbolic discounting and results in an outcome that has greater potential for Pareto optimality.

The crux of El Gamal's argument is that the wisdom of Islam anticipated some of the insights of behavioural economics. From the Islamic philosophical perspective, humans are seen as flawed and vulnerable to making mistakes and so mechanisms for checking individual decisions against a benchmark external to the individual would lead to a better collective outcome (El Gamal, 2001). However, there is a conflict between this

philosophical background and how Islamic banking is actually applied. The influence of an Islamic bank on the decisions of an entrepreneur in a partnership-style contract may be overestimated in the theoretical model due to real world costs of monitoring those decisions. Nonetheless, the idea that partnerships in profit and loss sharing models of finance can have a beneficial effect on outcomes is significant. It would be worthwhile to investigate these effects further and develop financial products that replicate their theoretical benefits in a practical setting.

Capital Structures and Islamic Banking Principles

The Modigliani-Miller "irrelevance" theorem is a mainstay of orthodox economic theory that has come to set the agenda in discussions of the capital structures of firms. The crucial result of this theorem is that the composition of a firm's capital structure has no bearing on the firm's market value. When the extensive assumptions of this theorem hold, the choice of either debt or equity financing (or indeed any mixture of the two options) does not affect how the agents concerned act or the economic results. The justification of this counter-intuitive result is that the fundamental factors underlying a firm are what determine the firm's market value. As Villamil explains, the failure of the theorem to explain different behaviours in contexts of varying debt-to-equity ratios is as a result of it assuming that the meaningful frictions of the real world do not apply (Villamil, 2009). However, relaxing these assumptions does not give a single definitive result for an ideal capital structure (Coury, 2013). Instead, the results are context dependent and so provide richer ground for analysis of the application of Islamic banking principles to capital structures.

The behaviour of banks in the era preceding the recent financial crisis is particularly germane to a discussion of Islamic financial ethics and their effects. The change in the model of banking in the United States, and much of the world of Western banking, during this period was from one of making loans and profiting from their repayment to one where loans were made, assembled, tranched and resold (Brunnermeier, 2008). The novel practice of financing mortgages through money market funds accessed via the sale of collateralised debt obligations emerged. This capital structure left banks exceedingly vulnerable to a fall in asset prices, a vulnerability to which many ultimately succumbed. Banks applying this system of financing were violating the Islamic prohibition of riba, by reselling interest-based debt, and gharar, by speculating on the sustained rise of property prices.

Instituting a risk-sharing system where mortgage debt would be converted to equity could reduce the costs of debt default and improve the incentive compatibility of banks and mortgage holders. In 2009, Willem Buiter advocated for the application of Islamic financial principles as a partial solution to the legacy of excessive debt from the financial crisis. His argument is as follows: mortgages in default should be converted

into a Musharaka rent-to-ownership contract, after which the bank could sell the contract, transferring ownership and the right to collect rents from the occupier, and thus the social and financial costs of repossession could be minimised. He puts forward parallel arguments for converting corporate and government debt into equity.

In sum, the sort of risk sharing advocated by Islamic financial ethics could improve the stability of the economy by disciplining lenders through exposure to greater risk and increasing the capacity of the economy to resist shocks.

Conclusion

Given the advantages of seniority and incumbency, any comparison of traditional European-style banking with Islamic banking is bound to favour the former. Islamic banking has existed in its current form for a little over forty years, and was not born into a vacuum. Compliance with a supra-legal moral imperative is Islamic banking's raison d'étre. However, it has struggled to fulfil this ideal, faced as it is with competition from the well-established, innovative and lucrative Western system. In short, the Islamic approach has, as of yet, failed to revolutionise banking. Islamic banks have dealt pragmatically with this competition; instead of enjoying the freedom to create "ideal" Sharia products they have created a range of "least bad" alternatives that can compete through mirroring Western alternatives.

As I have shown, the ideological motivation to innovate around the proscriptions of Islam has made a highly valuable contribution with wide-ranging implications. The behavioural implications from profit, loss and risk-sharing models of credit could have enormous benefits for the efficiency of the economy. Similarly, converting debts into equity holdings, in line with Islamic principles, could reduce social costs from defaults and even has significant implications for the effectiveness of government economic policy. Islamic banking was created because of the need to avoid certain practices prohibited by religious doctrine. In this case necessity was the mother of invention, and the fruits of this invention are too important and interesting to ignore.

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