Plan for Oxford Research Fellowship in Economics

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An inevitable consequence of climate change, and the non-renewability of the 86% of our primary energy consumption which is fossil fuels (U.S. Energy Information Administration, 2010), will be a substantial ongoing rise in the costs of transport and agriculture during the coming two decades (International Energy Agency, 2010) and a corresponding decline in economic output (Brown, 2006). If the elasticities between fossil fuel prices and the prices of transport and agriculture remain the same as during the fossil fuel price spike of 2007/2008, simple microeconomic analysis would show real household income in Britain decreasing by 48% for the poorest quintile and by 58% for the richest quintile[1]. Given that half the world's population lives on less than US$2.50 (PPP) a day (World Bank, 2008), halving real household income would likely cause the populations of most poorer countries to degenerate into anarchy due to insufficient food. Even in Britain, substantial social unrest would surely occur if real household incomes were halved, especially if those in starving countries attempted to migrate here.

If the above were to occur it would imply the need for a considerably more authoritarian form of government, as it did for the Emperor Diocletian when in 284 AD he ended the "Crisis of the Third Century" in the Roman Empire through establishing a comprehensive autocratic bureaucracy (Rostovtzev, 1963). In the hope of avoiding Orwell's *Nineteen Eighty-Four* or worse, I would like to begin researching how best to design a repressive system of economic control which (i) delivers a sufficient but not excessive level of authoritarianism and (ii) engenders the foundations in the population for long-term sustainable economic growth. **Most importantly**, (i) above is deliberately designed to fail within one generation, thus restoring essential liberties, after it has fulfilled its purpose of creating long-term sustainable economic growth.

My preliminary research so far would suggest the development of unconventional financial instruments which are fiat valuations of productive capital: (i) "Educares" which monetise human capital (ii) "Ecostors" which monetise natural capital and (iii) "Infrabonds" which finance physical capital. Each currency system has its own accounting standards, runs under a separate monetary policy with its own rates of interest and inflation and a floating exchange rate operates between them.

If awarded a Junior Research Fellowship at Oxford, I would undertake the following specific items of research:

1. Write and submit several papers for peer reviewed publication which develop the concepts of "Educares", "Ecostors" and "Infrabonds". I would estimate that this will consume twenty-four months (67%) of effort.
    a. "Educares" would be developed with reference to recent papers reporting the relation of human capital to economic growth, particularly with respect to early investment (Olds, Henderson Jr, Phelps, Kitzman, & Hanks, 1993; Reynolds, Temple, Robertson, & Mann, 2002; Harmon, Oosterbeek, & Walker, 2003; Sianesi & Reenen, 2003; Schweinhart, Barnes, & Weikart, 2005; Barnett & Masse, 2007). The model of education in mind is similar to that proposed by Cardinal Newman (Newman, 1858).
    b. "Ecostors" would be developed with reference to recent papers in Environmental Economics, extending my St. Andrews Masters Economics thesis which received a first class honours grade (Douglas, 2008).

[1] Calculated from the US agricultural production data during the fossil fuel price spike of 2002-2007 (Mitchell, 2008); the historical oil, gas and diesel price movements during 2002-2007 (U.S. Energy Information Administration, 2010); and the breakdown of UK household expenditure by quintile of income (UK Office for National Statistics, 2010).

c. "Infrabonds" would seek to rewrite the base equations of microeconomics such that prices are represented as vector rather than scalar quantities, and that long-term sustainability is generated by treating physical capital as a loan taken out against natural and human capital.

2. The development of computer software models which represent the proposed economic system. I would estimate that this will consume eight months (23%) of effort.
3. The writing of a book of approximately two hundred and fifty pages (100,000 words) in length presenting edited versions of the aforementioned papers as a single cohesive argument. I would estimate that this will consume four months (10%) of effort[2].

My Suitability for this Research

I obtained a first class honours mark for my thesis in Economics while reading at the University of St. Andrews in 2008. I also obtained a first class honours mark and national recognition with a prize at the Student Enterprise Awards for my group project in Business Information Systems while reading at the National University of Ireland, Cork, in 2009. By October 2011 I shall have completed the majority of an ESRC recognised Educational and Social research methods postgraduate qualification with the Institute of Education at the University of London.

I have a long history of excellence in research and development from an early age. I received fourth place in the world in the 1989 International Logo Programming Competition; second place in the 1993 Motorola Software in Schools Competition; and second place in the 1994 Aer Lingus Young Scientist's Competition. Between 2000 and 2002 I was the lead architect of the control software for the fuel and hydraulic test benches of the EuroFighter defence aircraft. Between 2002 and 2006, during the development of a computer software infrastructure of my own design intended to improve user productivity tenfold, I contributed over two man-years of computer programming to open source with multiple contributions to major open source projects such as the GNU compiler collection, the peer reviewed Boost C++ libraries and the stream computing language Brook which enables trillions of calculations per second on commodity hardware.

On the strength of my reputation in open source software, in early 2010 I petitioned the multinational corporation Applied Research Associates Inc. for the funding of research developing a new kind of computer memory allocator. I was awarded the funding and successfully completed the research at the end of the summer of 2010, and I hope to present a paper on the topic in the summer of 2011.

My Suitability for life in Oxford

I have always taken a keen interest in contributing to academic life. At the University of Hull I was elected as student representative to the Lawns Residents Association; as staff/student representative for the Computer Science Department; as a member of the Student Union Parliament; and as the undergraduate Science Faculty Representative on University Senate. At the University of St. Andrews, I was elected as Secretary of the Senior Residents Committee of Andrew Melville Hall as well as founding a student society called *The Future Society*[3] which held a lecture series called *Creating the Future* which brought to speak at St. Andrews distinguished guest lecturers such as the diplomat and environmentalist Sir Crispin Tickell GCMG KCVO, the founder of the Schumacher College and editor of *Resurgence* Satish Kumar, the heterodox Economist Paul Ormerod, the Historiographer Professor Michael Bentley and the Accounting expert Professor Robert Gray.

I am sure that, if selected, I would make similar contributions to academic life at Oxford.

[2] Note that I have written a 200,000 word book before, so I understand what work and how much work is involved.

[3] The St. Andrews Future Society's website is still available at http://www.futuresociety.org.uk/.

Bibliography

Barnett, W. S., & Masse, L. N. (2007). Comparative benefit-cost analysis of the Abecedarian program and its policy implications. *Economics of Education Review , 26*, 113--125.

Brown, L. R. (2006). *Plan B 2.0: Rescuing a planet under stress and a civilization in trouble.* WW Norton & Co.

Cleveland, C. J., Costanza, R., & Kaufmann, C. A. (1999 orig. 1984). Energy and the US Economy: A Biophysical Perspective. *Global aspects of the environment* , 345.

Douglas, N. E. (2008). Modelling the Costs of Climate Change and its Costs of Mitigation: A Scientific Approach. *MPRA Paper* .

Harmon, C., Oosterbeek, H., & Walker, I. (2003). The Returns to Education: Microeconomics. *Journal of Economic Surveys , 17*, 115-156.

International Energy Agency. (2010). World energy outlook. *International Energy Agency, Paris, France* .

Mitchell, D. (2008). A note on rising food prices. *Policy Research Working Paper Series of the World Bank* .

Newman, J. H. (1858). *The idea of a university.* Pickering.

Olds, D. L., Henderson Jr, C. R., Phelps, C., Kitzman, H., & Hanks, C. (1993). Effect of prenatal and infancy nurse home visitation on government spending. *Medical Care , 31*, 155.

Olejarnik, P. (2010). World energy outlook. *International Energy Agency, Paris, France* .

Orwell, G. (1948). Nineteen Eighty-Four.

Reynolds, A. J., Temple, J. A., Robertson, D. L., & Mann, E. A. (2002). Age 21 cost-benefit analysis of the title I Chicago Child-Parent Centers. *Educational Evaluation and Policy Analysis , 24*, 267.

Rostovtzev, M. I. (1963). *The social and economic history of the Roman Empire.* Clarendon press.

Schweinhart, L. J., Barnes, H. V., & Weikart, D. P. (2005). Significant benefits: The High/Scope Perry preschool study through age 27. *Child Welfare: Issues in child welfare* , 9.

Sianesi, B., & Reenen, J. V. (2003). The returns to education: macroeconomics. *Journal of Economic Surveys , 17*, 157--200.

U.S. Energy Information Administration. (2010, Nov 12th). *International Energy Statistics*. Retrieved from http://www.eia.doe.gov/emeu/international/contents.html

UK Office for National Statistics. (2010). *Social Trends No. 40*. Retrieved from http://www.statistics.gov.uk/downloads/theme_social/Social-Trends40/ST40_2010_FINAL.pdf

World Bank, I. (2008). *World development indicators.* World Bank Washington, DC.

Abstract

As the costs to our civilisation of climate change and energy rise, we could reach a tipping point where in Britain authoritarianism becomes seen as necessary to maintain order in a world where substantial rises in the prices of food and transport have brought famine to much of the world's population. In anticipation of this, I would like to begin researching how best to design a repressive system of economic control which (i) delivers a sufficient but not excessive level of authoritarianism and (ii) engenders the foundations in the population for long-term sustainable economic growth. **Most importantly**, (i) above is deliberately designed to fail, thus restoring essential liberties, after it has fulfilled its purpose of creating long-term sustainable economic growth. The economic heart of my proposed solution is the monetisation of Education, Natural Capital and the securitisation of Physical Capital.