

The Mystery of Economic Growth

by

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The facts...



Burundi, 2006



Sweden, 2006

According to Maddison, in the year 1000 levels of real GDP per capita in Africa ... were higher than in Western Europe but the differences were not very large; ...in contrast in 1998 GDP per capita in Western Europe 13 times higher than in Africa...; (footnote 2 ch.1)

...

- There are great differences across GDP per capita across countries.
- Growth rates of GDP per capita vary widely
- It is not always the case that poorer countries grow more
- Small but prolonged differences in growth rates produce dramatic differences in living standards
- The book starts by giving us a thorough picture of differences in living standards and growth rates highlighting that post-world War II has been an era of remarkable growth and increasing divergence between poor and rich countries. (Chapter 1)

... and the mysteries

The questions remain:

- What makes some countries rich and others poor?
- What are the forces that drive “convergence”; the catching-up of the poor countries with the rich?
- What the are the forces that drive “divergence”, richer countries becoming even richer?
- What has driven the accelerated rate of growth in the post-World War II era?

The tale

- The author gives a personal overview of research into economic growth
- He discusses the evolution of economic explanations of growth in an historical perspective
- The journey on which the author takes us from the Solow model through the developments of the first and second waves of endogenous growth theory; to trade and the interdependence of countries; to finally reach the latest developments in the studies of political economy and of institutions. In the journey we are also taken on the side to think about the related issue of inequality; its relation with economic growth and more generally with the determinants of inequality
- On each “stop” the author presents the theory in an informal way and gives us the opportunity of deciding whether the empirical evidence confirms or refutes the theory to finally give us his own (tentative) conclusion

The first “attempts”: accumulation

- The book presents the 1957 Solow model to introduce the role of physical and human capital as determinants of growth. Helpman highlights the inadequacy of this model in explaining the actual growth pattern and explains why in the following chapter (Chapter 2)
- The main predictions of the Solow model of “conditional convergence” and that countries with relatively low initial K/L ratio should grow relatively fast do not find confirmation in the data
- The main limitation of the Solow model is that technological progress is assumed exogenous and common across countries
- The author presents evidence that confirms TFP as the main driver of economic growth.
- In fact the role of TFP is underestimated in growth accounting exercises - which do not unveil causality - since TFP growth will determine also capital accumulation and therefore output growth indirectly (Chapter 3)

The “new” growth theories

- Given the inadequacy of human and physical capital accumulation as drivers of economic growth economists have turned to other possible explanations. This spurred the so called “new or Endogenous growth theory”. “Endogenous” is the key word as technological change is finally explained. The author presents the two waves of endogenous growth theory
 - The first led by Romer 1986 and Lucas 1988 emphasise the importance of externalities in the accumulation of knowledge and of human capital respectively in offsetting the decreasing returns to scale in factor accumulation.
 - The second wave led by Romer 1990; Grossman and Helpman 1991 and Aghion and Howitt 1992. In all three endogenous technological change is driven by R&D investments of firms. The first sees innovation as expanding the varieties of products; the latter see innovation as improving innovations along quality ladders.
- The author presents empirical evidence in favour of the quality ladder model and of the existence of scale effects, while evidence on education externalities are mixed and still await a definite answer

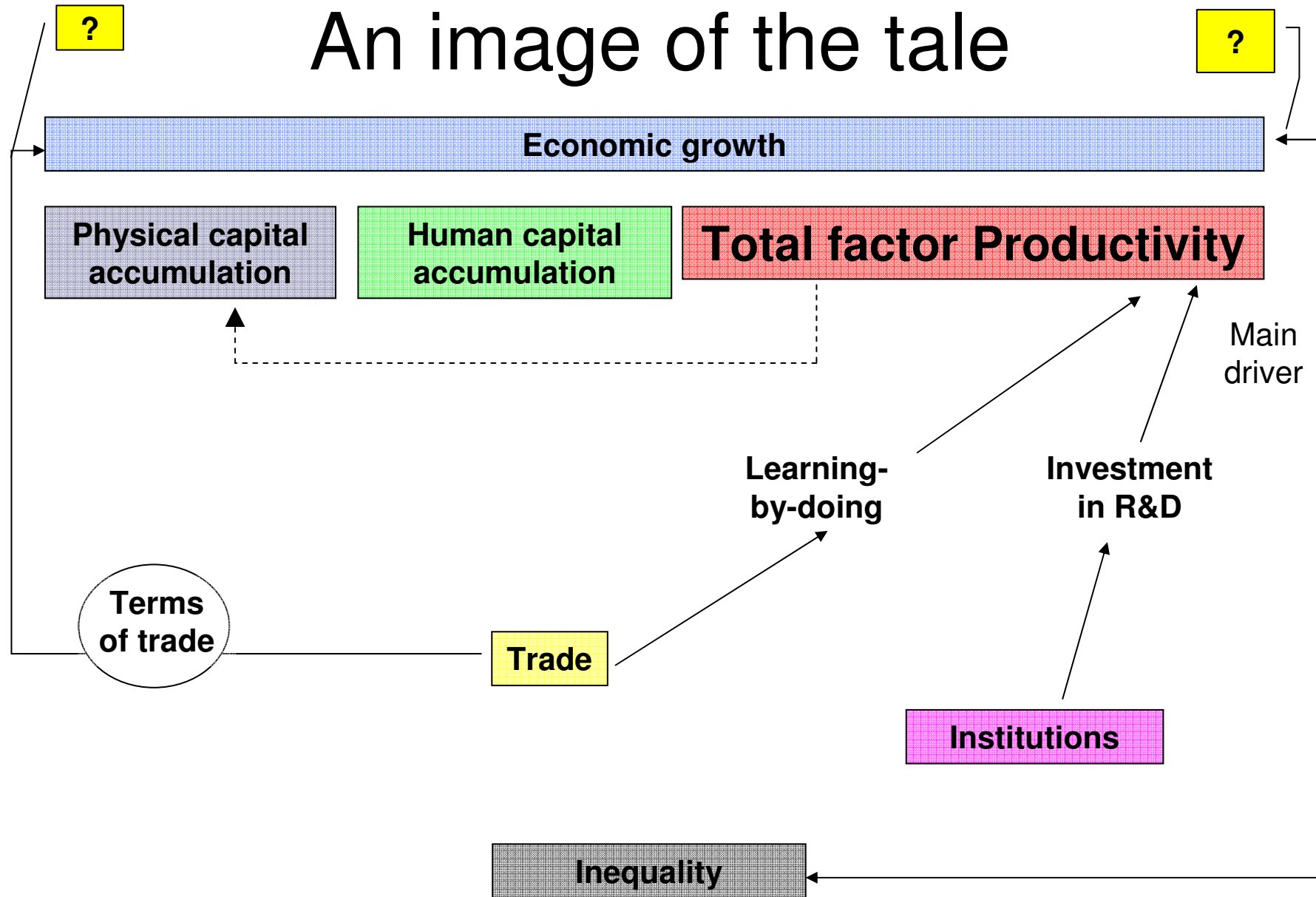
...The role of trade

- Why does trade matter for growth? Trade links countries through their terms of trade; knowledge diffusion and the interaction between the two.
- The main message of this chapter is that from the theory we cannot tell whether trade leads to convergence or divergence of incomes or growth rates.
- The empirical evidence also gives countervailing answers and needs to be read with caution as it will only present “average” effects of trade.
- Similar caution is needed when looking at the role of trade policies
- However, Helpman’s tentative conclusions are
 - the positive effects of trade on growth appear to prevail and as for the role of trade policies the relation might be contingent to each country’s characteristics.
 - Spillovers of R&D in rich countries to poor countries benefit the latter but less than it benefits the former, thus increasing divergence between the two groups

The role of institutions

- The last chapter of the book gives institutions the key role in determining growth as they are the main determinants of innovation and accumulation in human and physical capital.
- Differences in institutions are the answer to the question as to why some countries have been successful innovators and quick to adapt to change, while others have not.
- Institutions need to evolve hand in hand with technological progress.
- To understand the mechanics of economic growth, research needs to investigate the evolution of institutions; their relation to growth and the way in which various institutions interact.

An image of the tale



The style

- The book is written in a style which ensures that each chapter is self-contained and can be read in isolation, but also each chapter links together with the others to form a flowing continuity to tell the “tale of growth economics”
- The chapters start with an informal description of the theory, to then provide empirical evidence that confirms or refutes the theory finally the author provides (tentative) conclusions from his reading of the theory and the evidence providing “key messages”
- Some important concepts and different definitions of these concepts are provided in the main text (e.g. “productivity”; “institutions”)
- The glossary at the end of the book contains concise explanations of economic terms.

To conclude

- The author defines the book “short”...but... good things come in small packages: this is an illuminating comprehensive and honest book written in a concise and clear style for non-economists and scholars alike.
- The book provides an excellent picture of the evidence in an historical perspective and elucidates the milestones of growth economics to *“arrive at a summary conclusions about what we know; what we do not know; and what it is that we need to learn in order to improve our understanding of a subject that affects, in major ways, the well being of billions of people across the globe.”* (preface p.ix)
- **The ‘take-home’ message is:**
 - Most of the differences in levels and growth of income per capita is driven by differences in TFP. TFP differences in turn are driven by accumulation of knowledge which is shaped by economic incentives; these are strongly affected by institutions.

Sweden's Performance in an international perspective

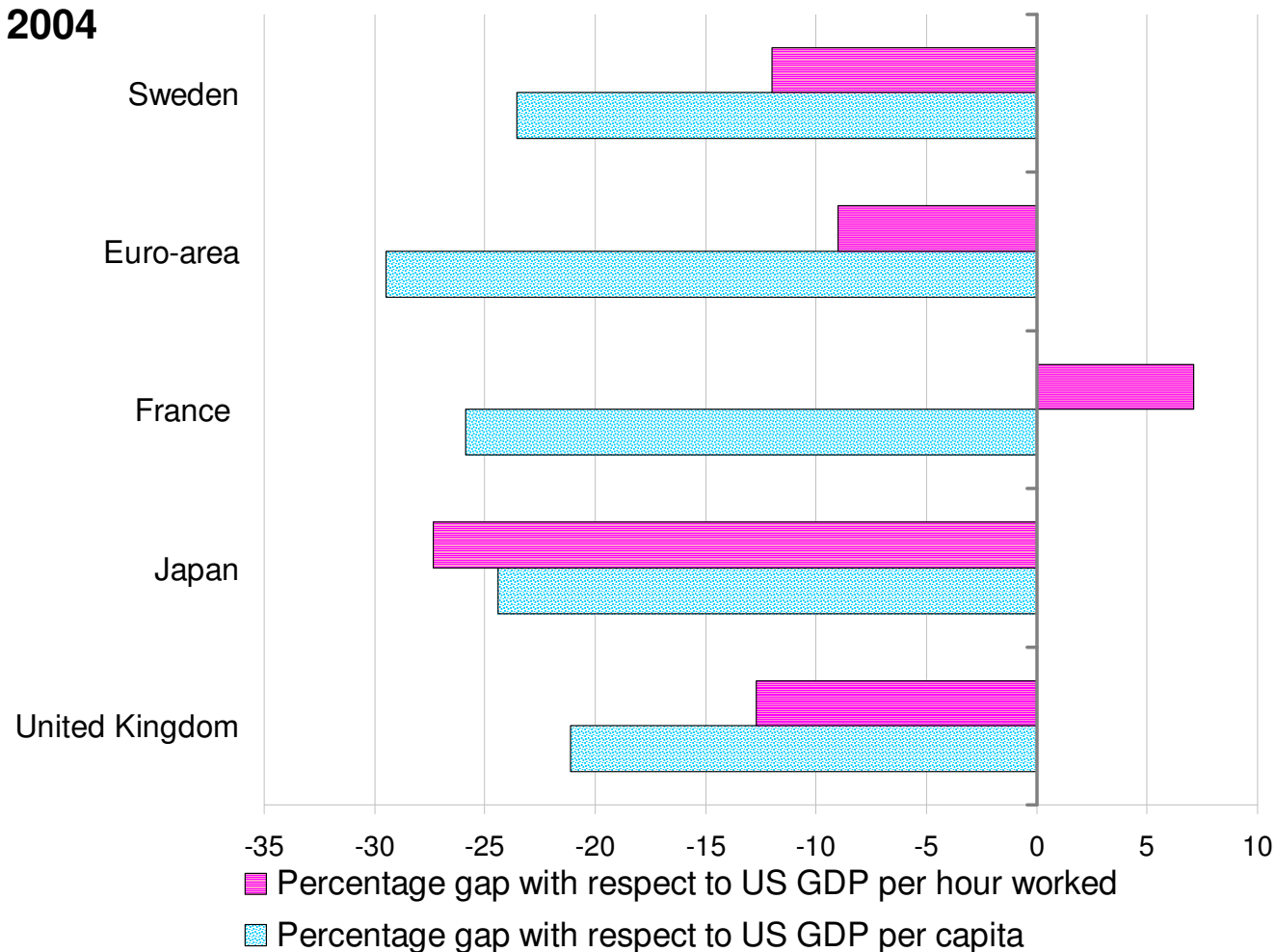
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The productivity performance

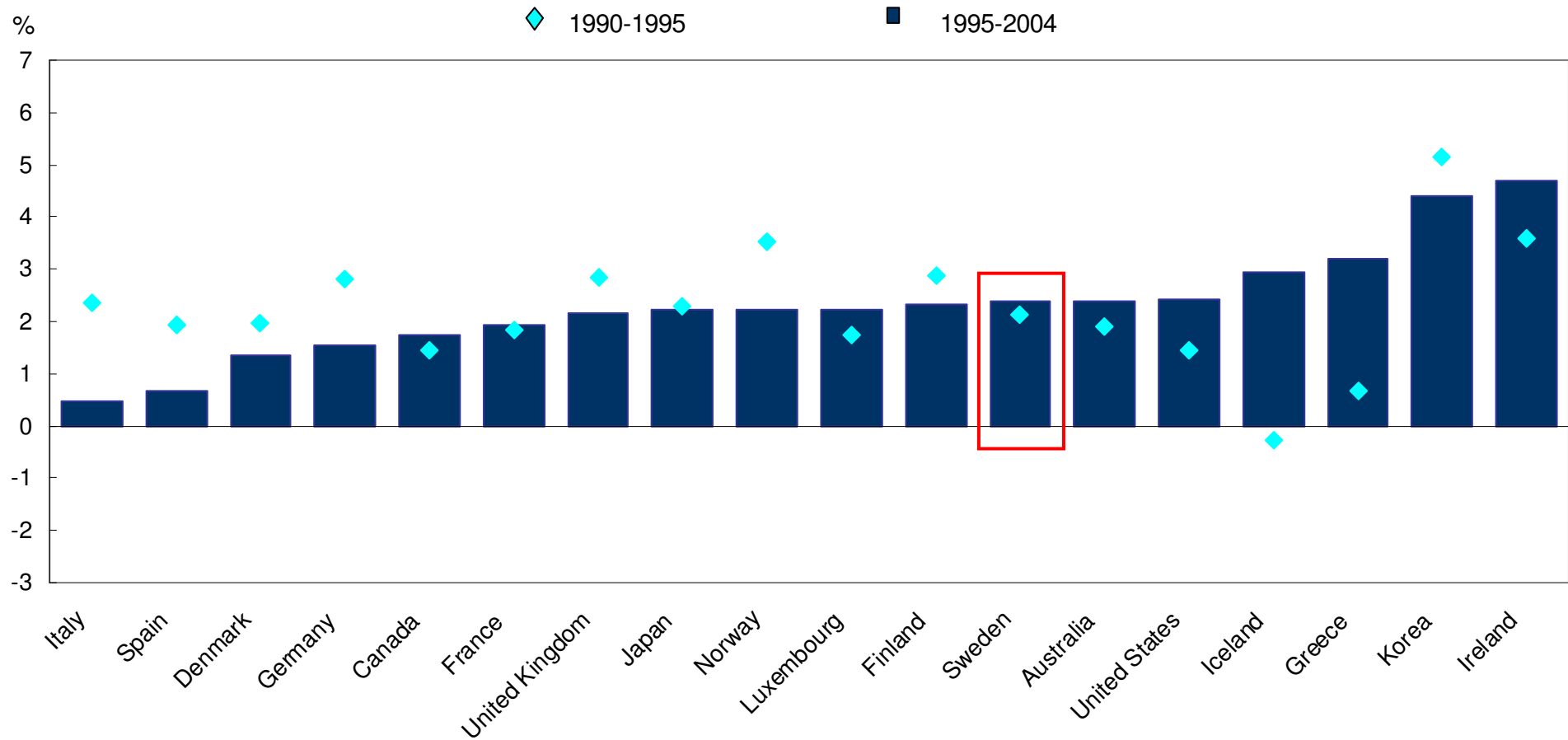
2004



Sweden has a productivity gap with US but performs better than Euro area countries

The gap halves after controlling for hours worked

Labour productivity growth

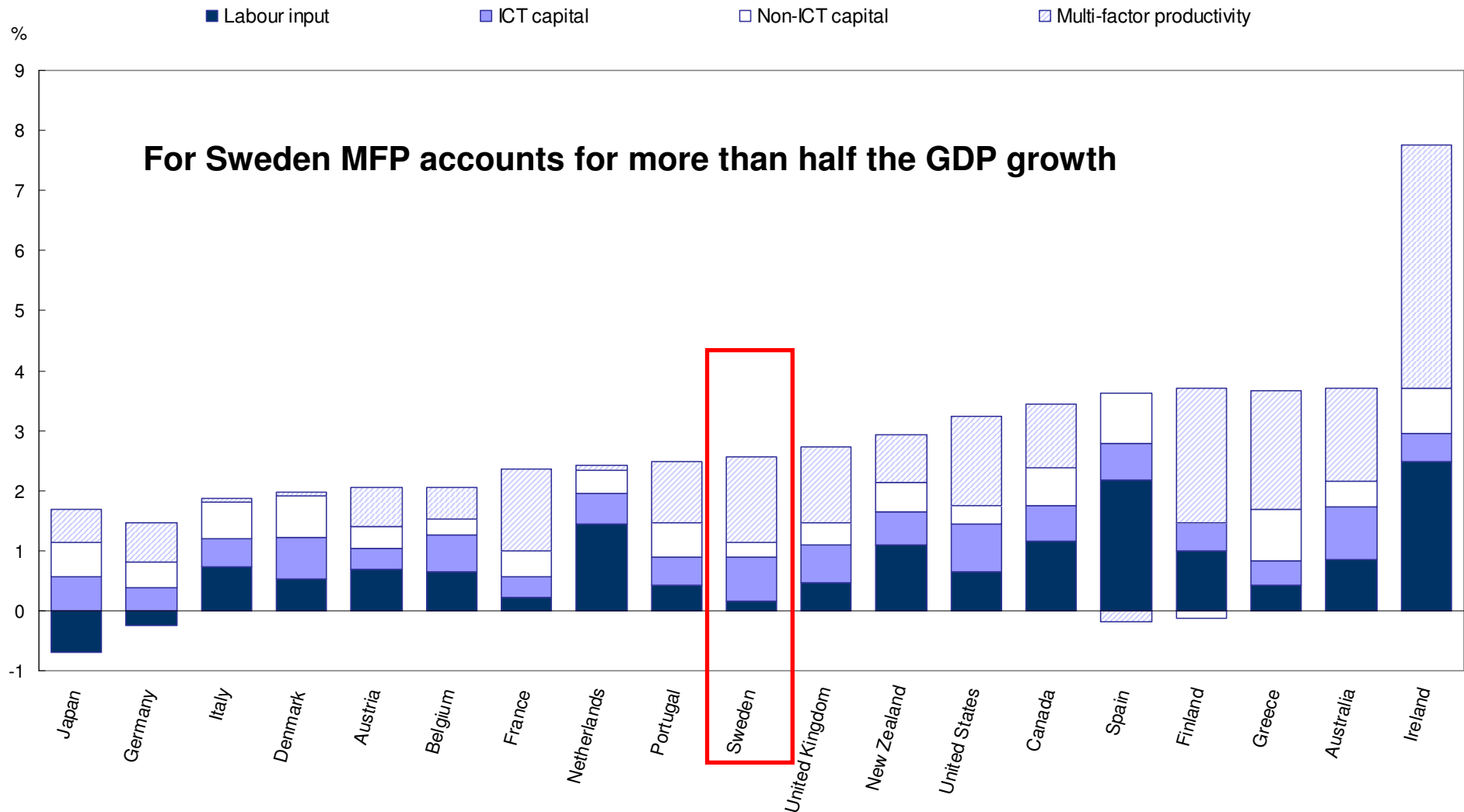


Growth in GDP per hour worked, 1990-1995 compared with 1995-2004
Total economy, percentage change at annual rate (Source, OECD STI Scoreboard 2005).

Determinants of growth

- From a “growth accounting” perspective
- Output per hour depends on:
 - Inputs per hour (physical and human capital, etc.)
 - “Total Factor Productivity” (technology, organisation, etc.) Also known as the “Solow residual” a “measure of our ignorance”

Sources of labour productivity growth 1995-2003 : a growth accounting exercise

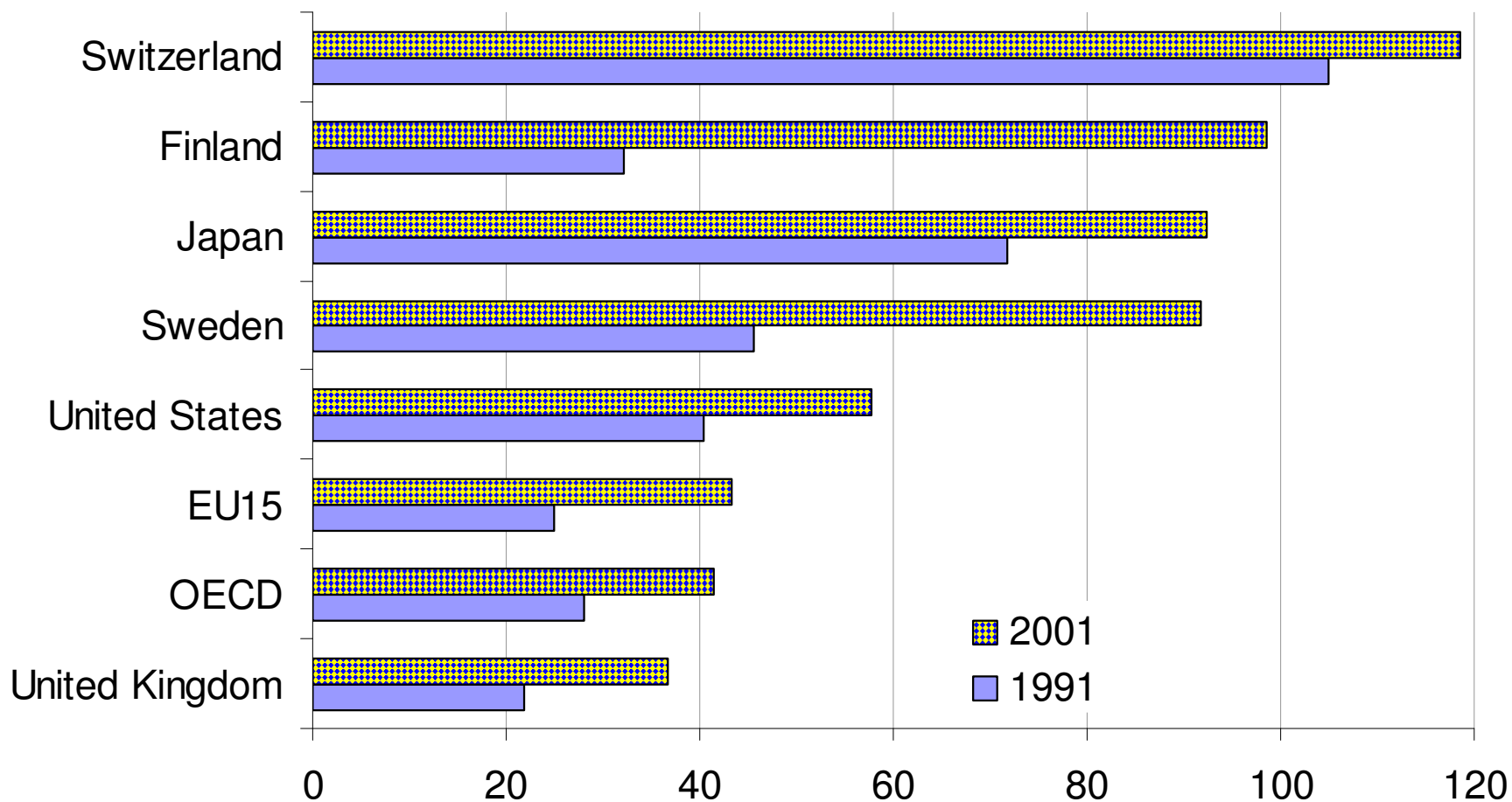


Technological knowledge is the main driver of productivity growth

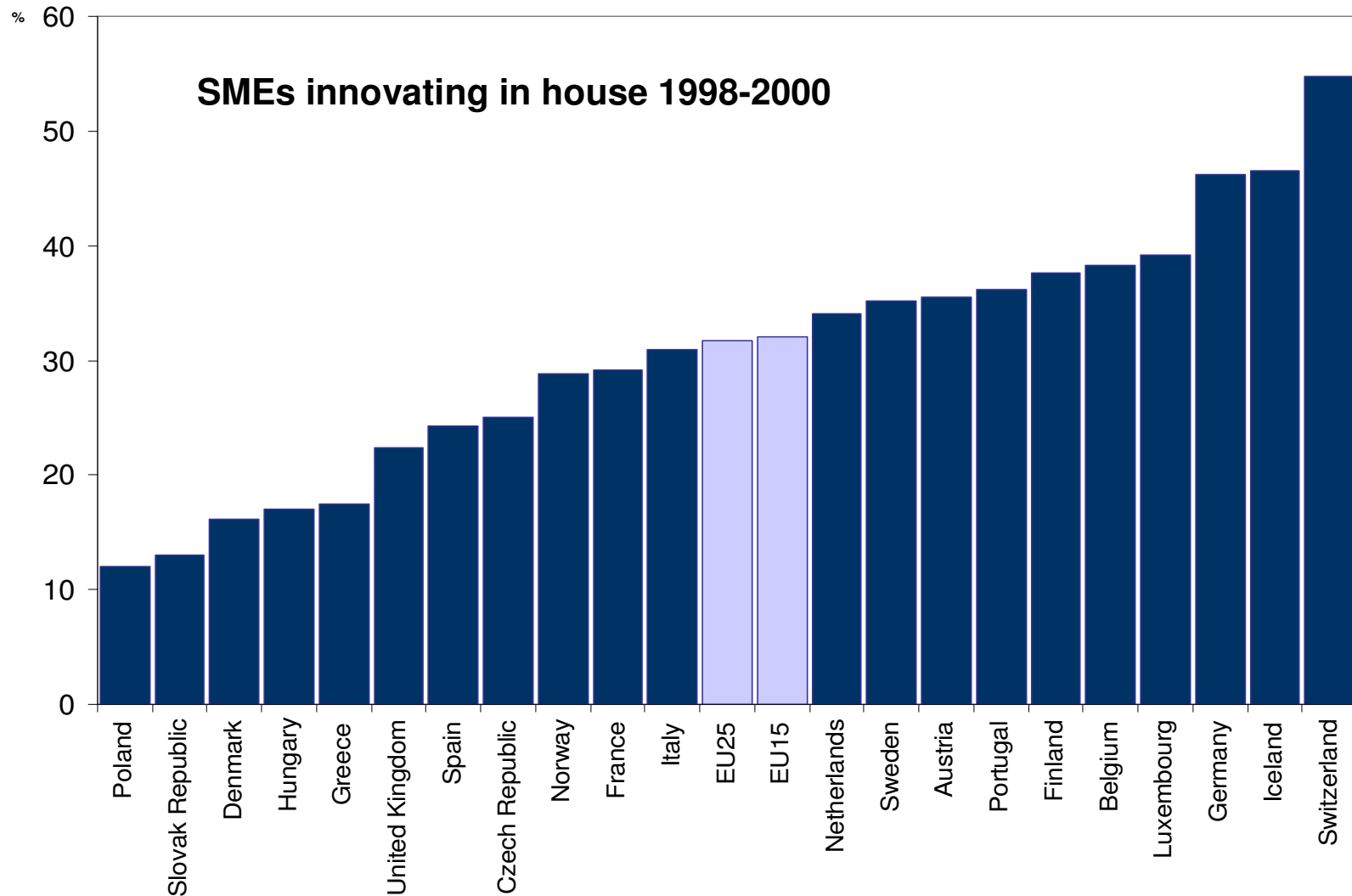
- The question we ask is:
- How does Sweden perform when we look at technological progress?
 - “knowledge” outputs (patents but not only)
 - Investment in “knowledge” (not only R&D)
- How does Sweden perform in terms institutions that are conducive to innovation?

INNOVATION OUTPUT: Patents

Triadic patent families per million population, 2001



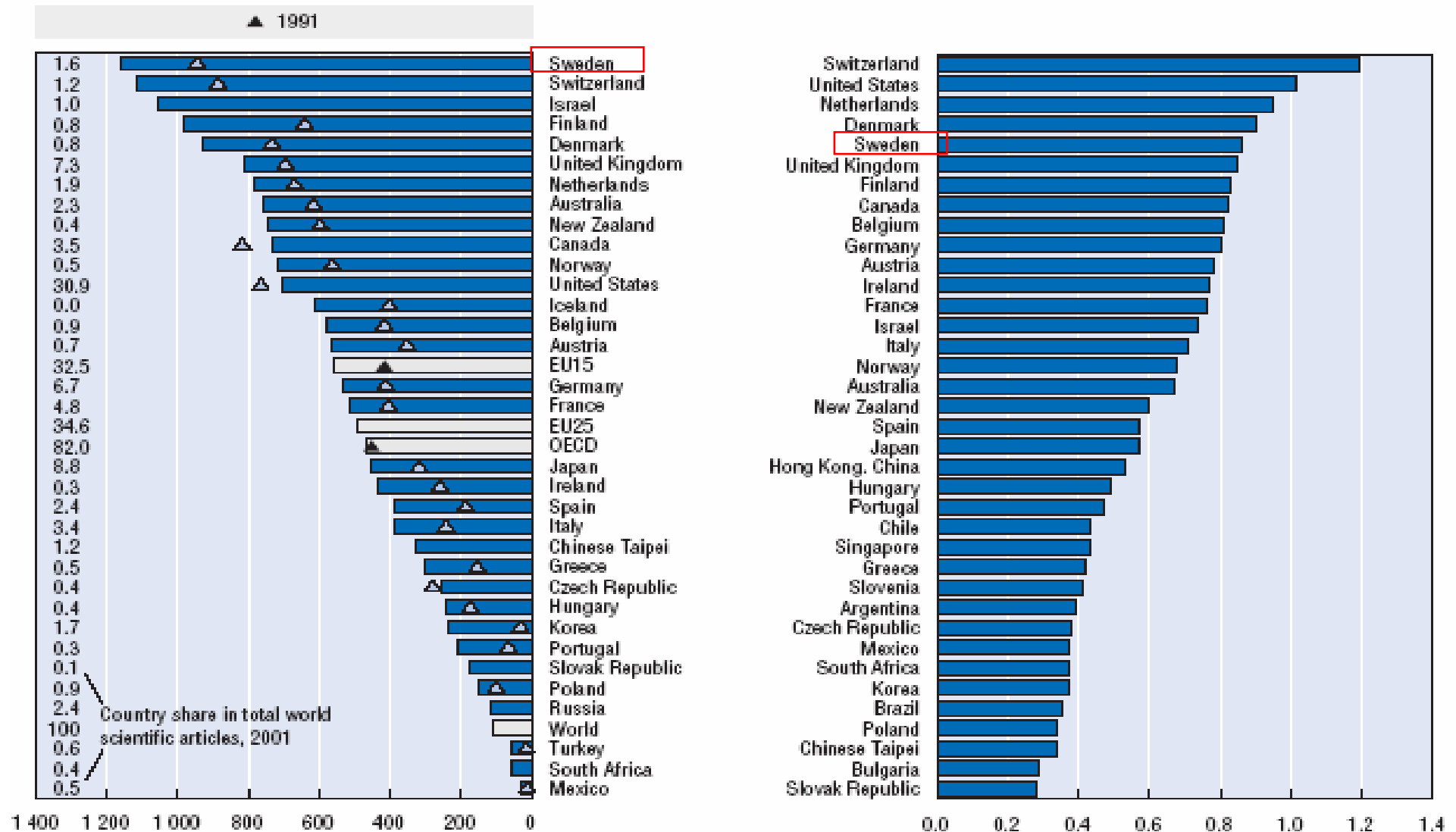
Innovation output: SME performance in innovation



Scientific articles output

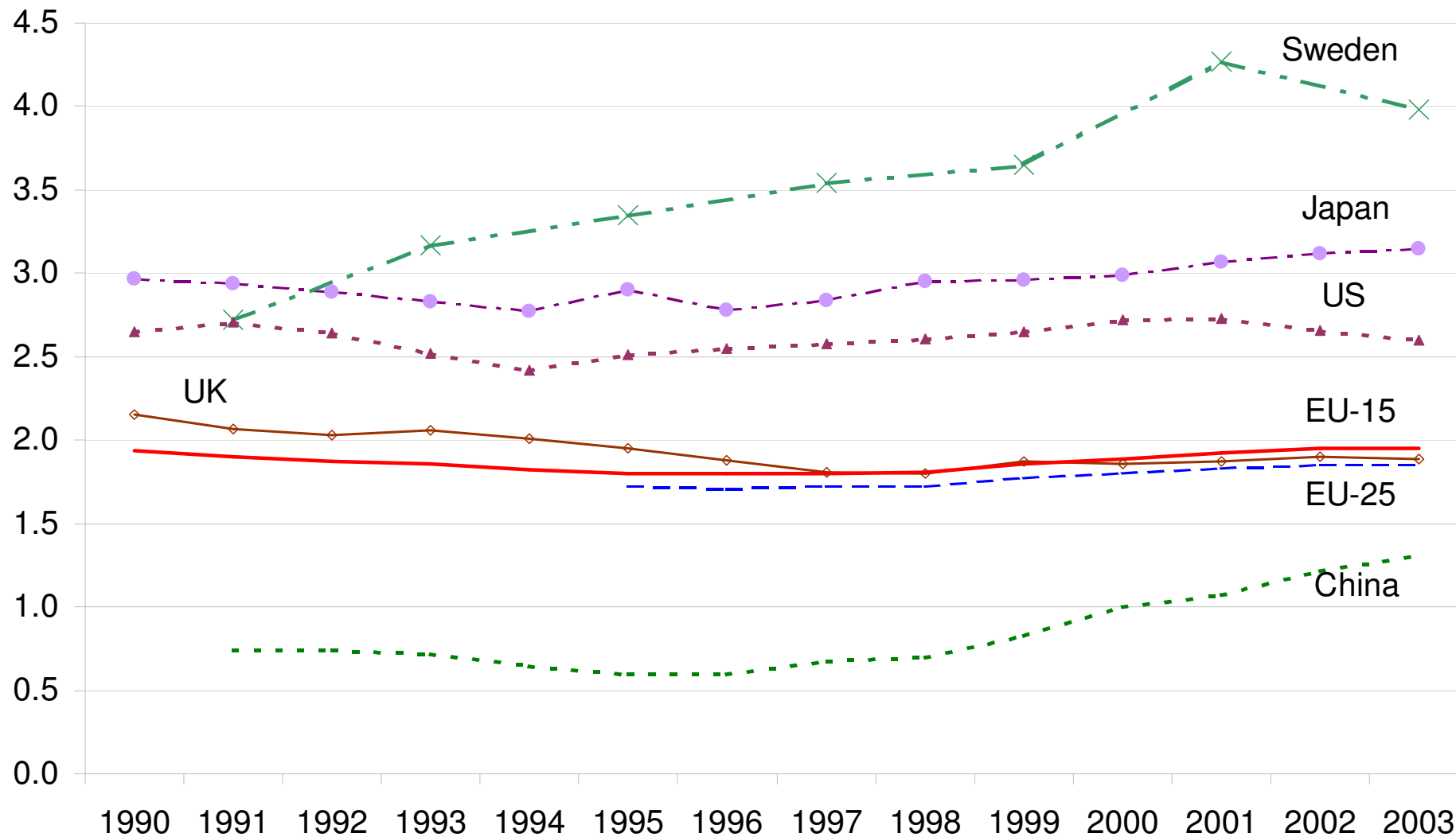
Scientific articles per million population, 2001

Relative prominence of cited scientific literature, 2001



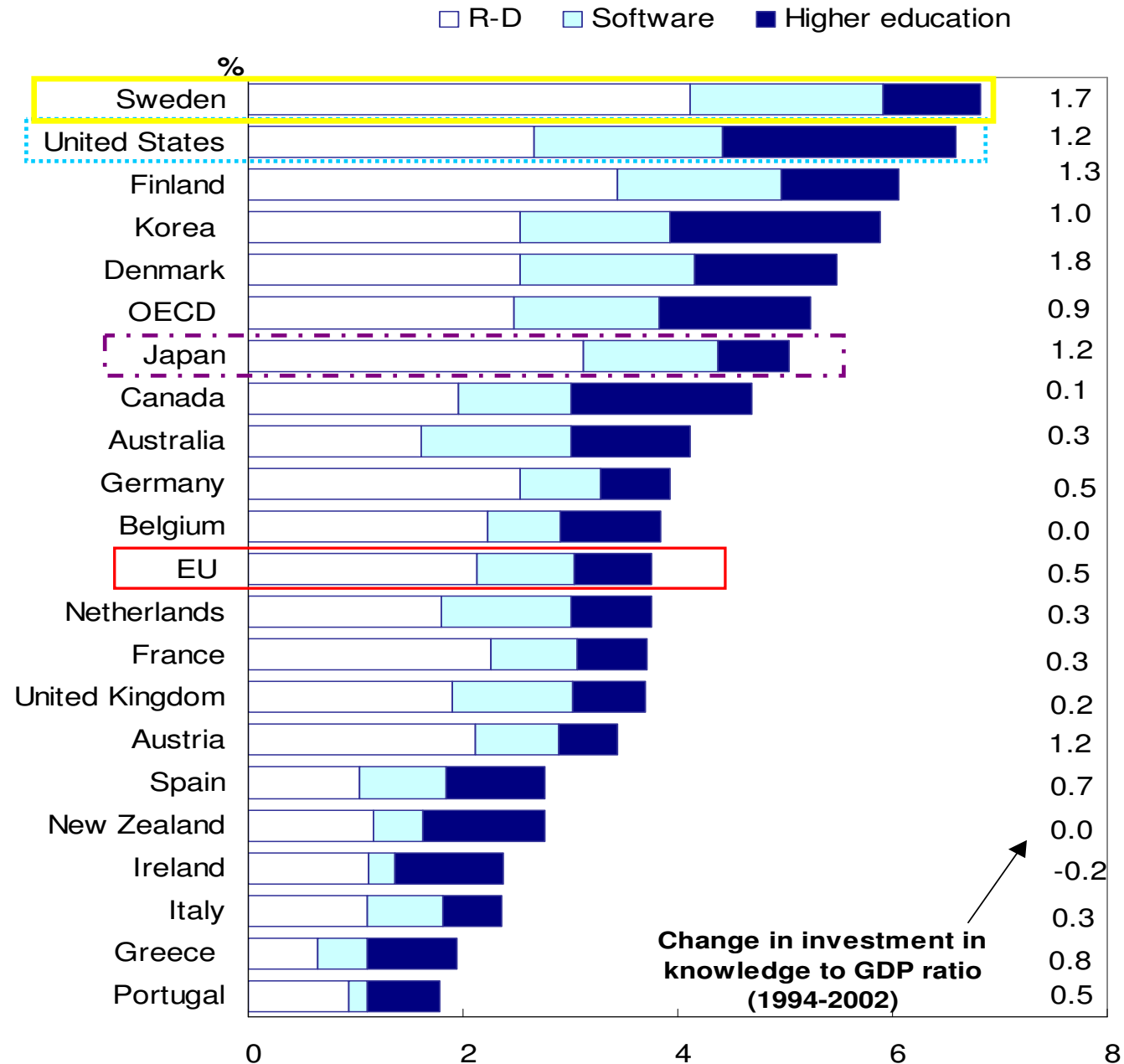
R&D investment

R&D (GERD) to GDP 1991-2003



Source: OECD, STI

Broader measures of investment in knowledge (as % of GDP 2002)



Change in investment in knowledge to GDP ratio (1994-2002)

Source: OECD

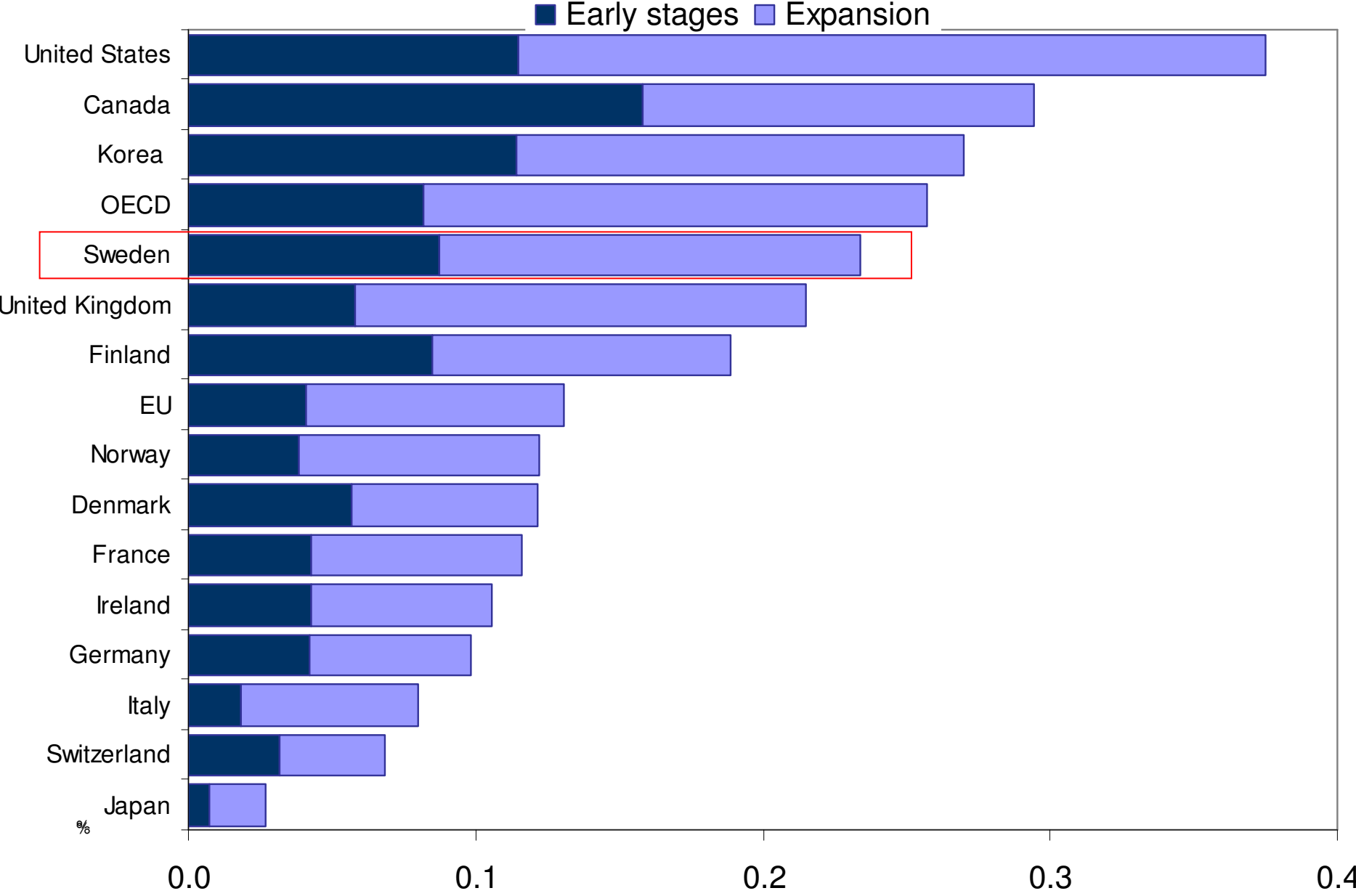
Other innovation inputs: Knowledge Spillovers

- Hard to find cross-country evidence on knowledge spillovers
- Possible proxies:
 - FDI/Presence of foreign affiliates
 - Trade openness of the country
 - cooperation

Innovation Policies

- Correct for market failures (e.g. in financing R&D)
 - Venture Capital
- Make the country more conducive to innovation:
 - Entry of new firm and growth of better firms
 - Competition

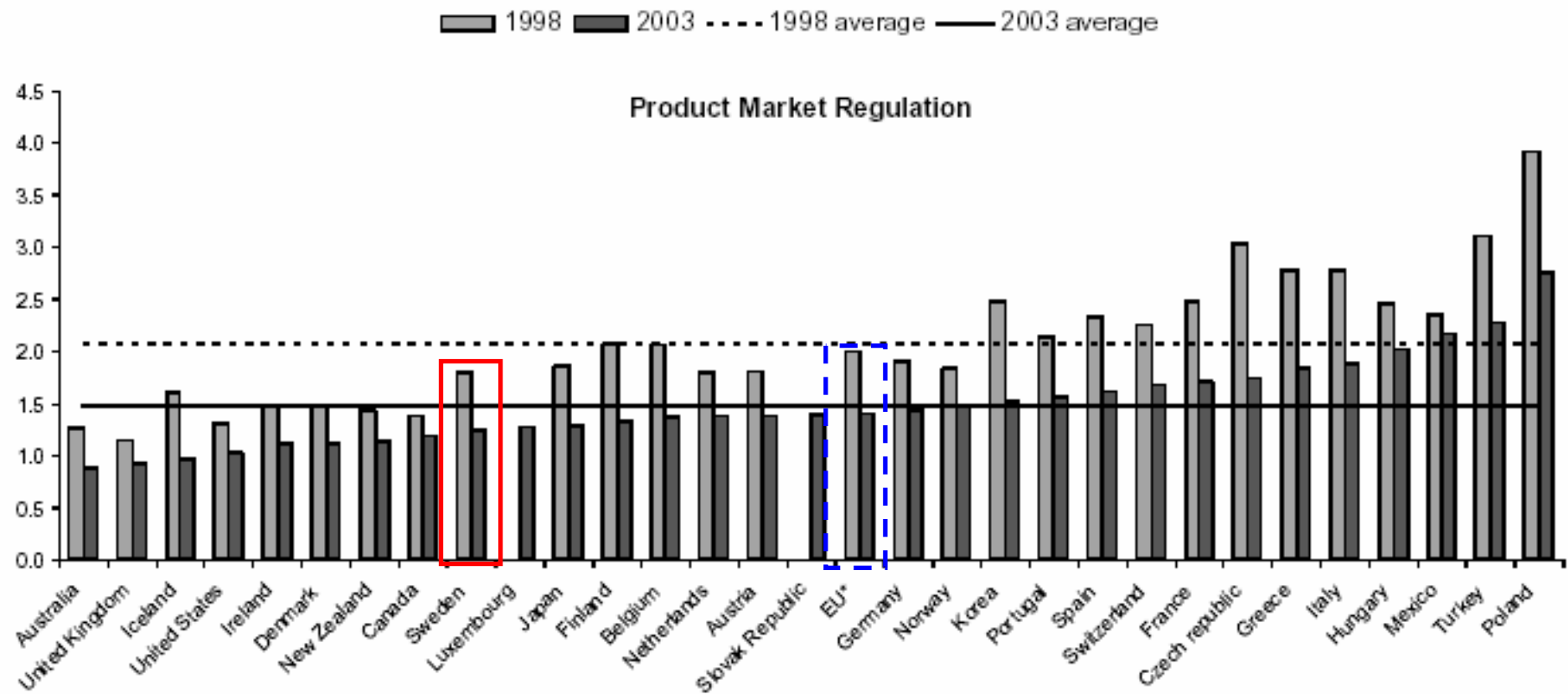
Investment in Venture Capital as a percentage of GDP 2000-2003



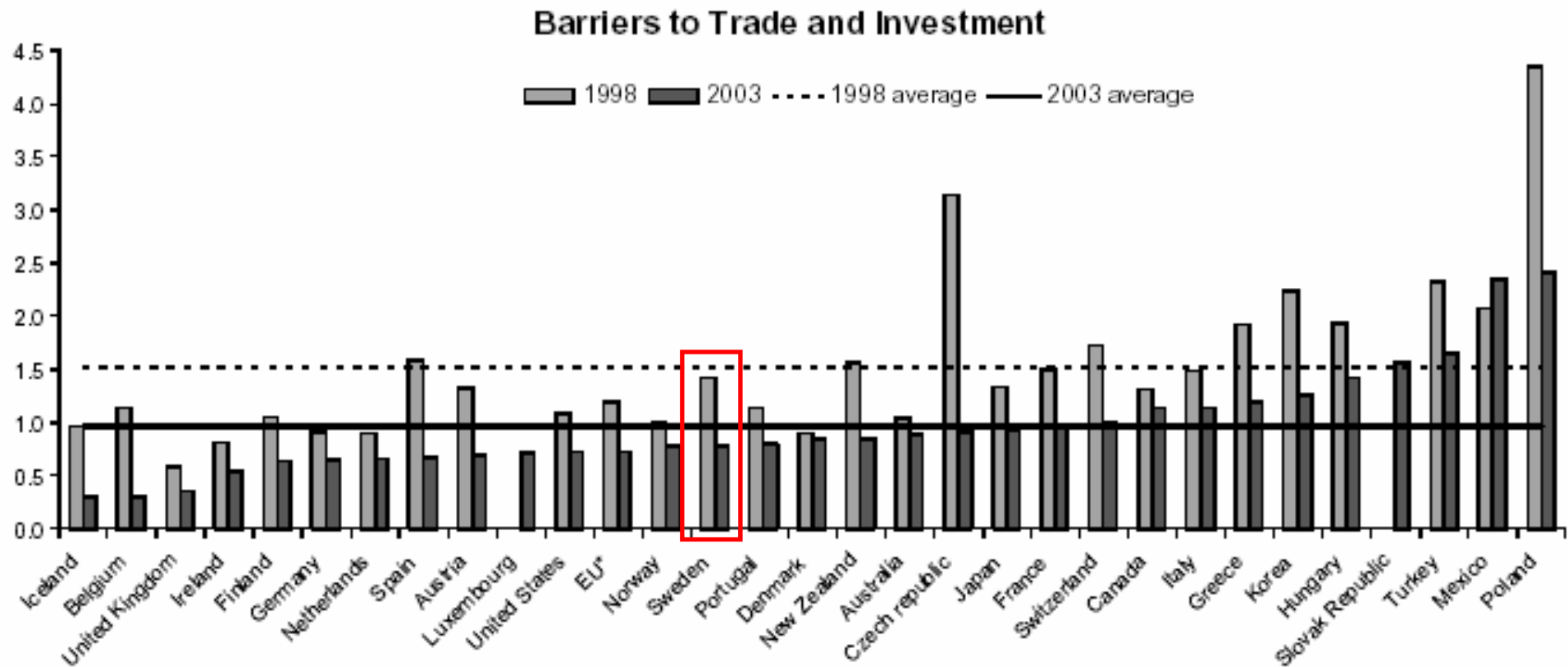
Role of competition, regulation and firm turnover

- Competition important driver of innovation and productivity:
 - Swedish position seems strong on OECD Indicators on product market regulation
 - Swedish position seems strong on Indicators on barriers to trade and investment
- Schumpeterian theory of creative destruction stresses the positive role of firms' turnover and in particular of firm entry
 - Swedish position seems strong on Indicators on barriers to entrepreneurship

Product Market Regulation



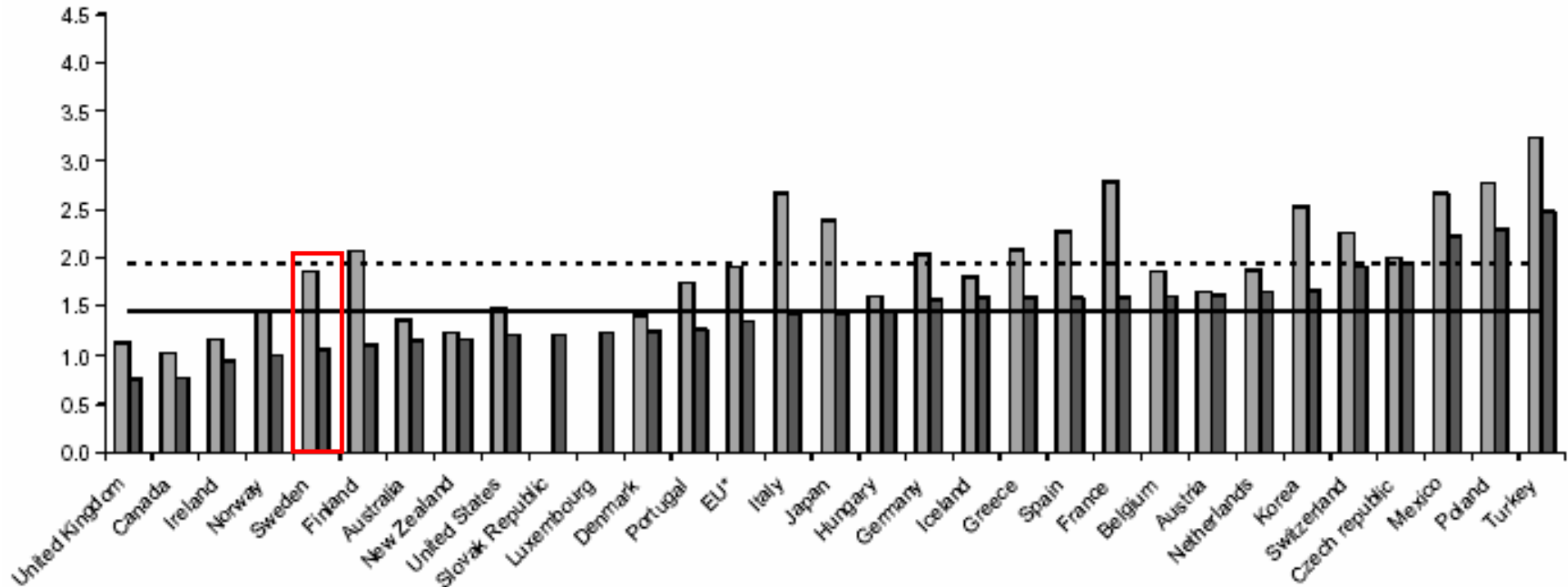
Barriers to Trade and Investment



Barriers to Entrepreneurship

■ 1998 ■ 2003 - - - 1998 average — 2003 average

Barriers to Entrepreneurship



Conclusions

- Sweden's economic performance has been defined by the OECD as "impressive in many respects"
- Labour productivity growth has experienced a "remarkable" surge in the late 1990s.
- More than half of this growth can be accounted for by MFP growth
- When we look at measures of technological progress, the performance of Sweden is outstanding in terms of innovation outputs; inputs and policies conducive to innovation.
- Nobody is perfect...not even Sweden...but I will leave the discussion of the pitfalls of the Swedish economies to this afternoon's presenters!

Thank you

For references and further reading

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Creating an efficient intellectual property system

- Because of the public nature of knowledge, innovators need some degree of intellectual property protection to reap the benefits of commercialising their inventions.
- According to a recent study (European Patent Office, 2005), the cost of registering patents across the EU (€37,500-€57,000) is as much as five times the cost of patenting in the United States.
- The proposed institution of a single 'Community patent' - less costly and less bureaucratic - according to figures attributed to EU officials - would reduce the cost by around 60% (to €22-23,000), mainly by reducing the registration and translation costs of patenting.

What is labour productivity?

Basic “welfare” measure

Choice?

$$\frac{GDP}{Population} = \frac{GDP}{hours} \times \frac{hours}{workers} \times \frac{workers}{population}$$

Labour
productivity

Voluntary and involuntary.
Unemployment and inactivity

1998
 2003
 1998 average
 2003 average

State Control

