Miracles do happen
- The story of recent Irish economic growth

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Key concerns and conclusions

Thank you for this invitation to present on the background to recent economic development in Ireland. In this presentation, I would like to describe some of the recent evidence in relation to the measured contribution of formal education to growth in economic productivity in Ireland. In so doing, I would like to draw attention to the following:

− The evidence points to a significant role for formal education in contributing both directly, as well as indirectly, to fast economic growth in Ireland.

− It is likely that the role of education was to work mainly as a “facilitating factor” in contributing to growth through its impact on the quality of domestic investment, social partnership arrangements, inducement of foreign direct investment and other factors.

− The role of knowledge, learning and competence acquired outside formal educational settings is difficult to assess. However, it is likely that a wide range of skills both at the individual as well as organisational levels made a significant contribution to performance and these may not be reflected in standard measures of human capital and its contribution to growth.

− As the debate about the role of education in Irish economic growth has evolved greater attention is being paid in Irish public discourse to the contribution of human capital to human well-being as well as the role of learning and community development to productivity growth.

− Consequently, considerable care is needed in assessing the policy implications of education’s role. Greater spending, more years of schooling and expansion of formal education “downwards” and “upwards” to younger and older age-groups will not necessarily increase economic productivity (or human well-being). Greater attention to the quality of learning, the development of “social skills” and the application of knowledge in more socially and economically productive ways remains paramount.

Who did it?

The recent Irish “economic miracle” has been the subject of much analysis, debate, and at times, controversy. Depending on prejudice, impression or taste a number of “Who did it” explanations have been offered including some of the following:

- Human resources and quality of education (or human capital)
- Favourable regulatory, tax, trade and investment climates favouring, among other things, direct foreign investment and new business start-ups
- Use of industry clustering, technology transfer and supply chains
Stability of political and legal institutions

Consensus and relative industrial calm through social partnership

Subventions from the European Union

Use of the English language and proximity to the UK and continental European markets

Notwithstanding a large number of empirical studies, it has proven impossible to put a precise estimate on any of the above factors not least because many have tended to work in tandem and laboratory-type counter-factual evidence is not available. However, we can be more sure that in the absence of certain factors growth would have been much lower. Studies by Barry, Fitzgerald, Ferreira De Almeida illustrate the quantitative importance of many factors.

Trade, investment and convergence

Data cited by Ferreira De Almeida (2002) shows that between 1990 and 1999 exports as a share of GDP increased from 56 to 87 percent leading to a widening trade surplus. A continuation of trade openness dating back to the 1960s has been an important engine of productivity growth and has been associated with fast growth in particular sectors such as software and especially computer equipment linked in part to continuing high direct foreign investment in key sectors. Two largely indigenously owned sectors which also contributed to significant growth in GDP were natural resources (especially gas) and Construction. The bulk of the increase in physical investment was accounted for by the latter sector, alone.

The scale of foreign direct investment has been cited as a prime factor in explaining high growth in GDP in the 1990s. Clearly, foreign direct investment has contributed to much of the growth in employment and investment. It also was facilitated by the availability of skilled English-speaking labour on the “door of Europe” with the added benefits of relative flexibility in product and labour markets, lower levels of regulation and bureaucracy in starting and expanding businesses and perceived higher quality of life for individuals and companies locating in Ireland. A regime of targeted low corporate tax rates since the 1960s has contributed to foreign inward investment. There is evidence from Barry (1999) and elsewhere that foreign investment in Ireland was relatively concentrated in high-tech and high-skill sectors as well as firms where increasing returns to scale were at work more than in other countries.

Many economists (e.g. Barro, 2000) have suggested that historically low initial levels of human capital, such as was the case in Ireland in the early 1960s when most recent cross-country growth analysis starts from, provides a strong stimulus for the importation of knowledge-intensive services, technology and products with likely spillover effects on local productivity and business start-ups. “Learning-by-observing” and mobility of high-skilled workers and technology have facilitated some of these spillover impacts. Catch-up and convergence in some developing countries are widely recognised phenomena in
the economic growth literature. Economic under-development can, in certain circumstances provide, a fortunate opportunity for investment in the best and latest technology and skill-intensive production.

Within the industrial sector, the fastest growth in higher education graduate employees has been in the those sectors which have recorded the largest productivity gains (e.g. communication equipment, electrical and optical equipment, chemicals and natural resources). Although, levels of in-company and work-based training remain low by international comparisons, it is likely that flexibility, adaptability and patterns of informal learning have more than compensated.

Taken together with a relatively low initial level of GDP per capita in the 1960s (in comparison with other OECD countries), foreign direct investment may have assisted a process of convergence towards average international levels. However, direct foreign investment cannot be the only explanation. Compared to other countries with relatively high levels of inward investment (e.g. Belgium and Sweden), productivity growth has been much faster in Ireland.

**The role of the European Union**

Much attention has been drawn to the impact of various forms of European Union financial support for regional, economic and social development in Ireland. In addition to subsidies for the agricultural industry, various infrastructural programmes continue to be funded by the European Union. During the early 1990s as much as 80% of total funding for “polytechnic” colleges in Ireland (now referred to as Institutes of Technology and formerly known as Regional Technical Colleges or the Dublin Institute of Technology) came from the European Social Fund. Fitzgerald (1999 and 2000) and Barry (1999) have acknowledge the role of EU funds in Irish economic growth. However, they accord much greater importance to other factors. More generally, EU membership has facilitated development on many fronts including a greater openness to the external world in trade, ideas, mobility of workers and the strengthening of national capacity in terms of longer-term planning.

**Demographic factors**

On the demand side, the large growth in the construction industry was partly linked to demographic factors including return or new immigration as well as changing patterns of household and family formation. More generally, it is likely that a very youthful population and a delayed downturn in births (occurring from the early 1980s - a full 15 years later than in most English-speaking countries) facilitated increased demand in consumption as well as sectors such as construction. From constituting a strain on the labour market, fast growth in labour market supply in the 1980s and 1990s has turned into a positive factor both in terms of stimulating demand as well as in providing a pool of young and better educated people.
Labour market participation and productivity

The turnaround in the labour market from the late-1980s along with factors such as rising educational attainment facilitated a very significant expansion of labour force participation, especially female. Many of the new jobs were created in the service sector. The rates of part-time and temporary employment have increased significantly in the last decade in response to more flexible labour market conditions as well increased female labour supply. Increases in labour force supply contributed to increased GDP at the same time as part of economic activity was transferred from unpaid household activities to the paid labour market.

Using growth accounting techniques, Ferreira De Almeida (2002) reports that growth in labour market participation was by far less significant than growth in labour productivity or total employment as factors in GNP per capita growth. In searching for explanations for recent economic performance, the focus is still on the causes of growth in labour productivity to which I now turn.

The unexplained residual

Changes in GDP per capita can be attributed to various factors including physical capital, human capital and the total numbers employed in the labour force. Over and above increases in the stock of physical or human capital, increases in the “efficiency” of use of capital are represented in Total or Multi-factor productivity (TFP). These are derived by Bassanini and Scarpetta (2001) as well as Ferreira De Almeida (2002) from growth-accounting estimates in which the contributions of various components including numbers at work, output per worker and quality of human capital are accounted for. These estimates for Ireland indicate significant increases in TPF for Ireland compared to either growth in employment or physical capital. Bassanini and Scarpetta (2001) show a decomposition of growth over a 20 year period for most OECD countries (refer to the Table in the Annex). In common with Greece and Spain, Ireland shows a high level of growth attributable to changes in human capital (approximated by the average number of years of formal education in the working age population). Where Ireland stands out most is the extent of the “unexplained residual” – once human capital, physical investment, population growth, variability in inflation, government consumption and trade exposure are accounted for. The extent of the unexplained change in growth of GDP per capita could be described as spectacular (2.71 compared to a spread of –1.02 to 1.23 for other OECD countries not all of which are shown in the Annex table, below).

Any explanation of growth in terms of the role of human capital ideally needs to focus on at least three aspects:

1. The rate of growth in human capital as approximated by “average years of schooling”
2. The distribution of human capital by age-group, industry sector and gender and its link to economic performance “at the margin”.
3. Trends in the “quality” and use of human capital over time.
Due to lack of data, most analyses of Irish economic growth have focussed on broad aggregates such as “average years of schooling” in the initial period under analysis or on changes in human capital stock. Some approaches (reviewed in OECD, 1998) have tried to extrapolate from micro-wage based data on “private rates of return” to investment in education to draw conclusions about the societal or macro-economic rate of return to additional years of schooling (or additional levels of formal education). Most findings from studies of the relationship between labour market earnings and initial education conclude that an additional year of schooling is likely to yield an annual “rate of return” for individuals of 8-10 percent (see OECD, 2001a). Similarly positive results emerge from macro-economic growth studies on the impact of additional schooling on long-term growth in GDP. However, these results tell us little about the likely future impacts of current-day investments in formal education and still less on how investments are best undertaken and how learning experiences inside as well as outside formal education are enhanced through better quality teaching or learning strategies. Moreover, the “economic” rate of return on investment in education is only one measure of education’s success. An important contribution of learning and education to sustainable development is likely to be via more healthy, more cohesive and more enriched societies.

It is likely that the process by which individual skills are combined and translated into better economic performance is highly complex, organisational and specific in nature. Analyses at the firm or regional level may point to important dynamics and institutional factors which are lost in both macro-level analysis using aggregate and single-index human capital measures as well as micro-level analysis based on analysis of individual earnings and labour force participation only.

**Accounting for the impact of education and knowledge**

Uncertainty about the timing of impacts as well as the interaction between various facilitating factors does not make the life of analysts any simpler. The fast expansion in education in the 1960s and 1970s based on the extension of free secondary education to all as well as reform and growth in the third level sector laid important foundations for sustained growth in the 1990s. How much of this growth can be attributed to education and knowledge more broadly is difficult to say. The recent OECD estimates have attributed 0.54 points of the change of 1.21 in the growth of GDP per capita in Ireland between the period 1981-89 and 1989 and 1997 to “human capital”. However, this measure of human capital is crude, to say the least. A broader definition encompassing the effects of learning, training and development of knowledge in organisations is difficult to measure in practice. A definition used by OECD in its recent report is “The knowledge, skills, competencies and attributes embodied in individuals that facilitate the creation of personal, social and economic well-being” (OECD, 2001a: p18). It is likely that some of the effect of formal education, as well as human capital more broadly, is being picked up by other factors including more efficient investment in physical capital. In other words, other factors may be taking the credit for human and knowledge capital.
Expansion of second level education

As a way of measuring the increase in human capital, it is possible to estimate the total numbers of “years of schooling” in the population by taking the typical completed duration in years of formal education at each level (primary, lower secondary, upper secondary and tertiary) and weighting by the total population in each category of educational attainment by level. Although the percentage increase in “average years of schooling” is highest at tertiary level in Ireland, the bulk of the total increase across the entire population aged 25-64 is accounted for by increases in second level education – where significant expansion took place from the late 1960s onwards. The decision, in 1967 to publicly subsidise second level education (covering age 12 to 18) with the removal of school fees for the vast majority of second level schools provided a huge boost to a pattern of increasing participation up to the end of second level with the completion of the Leaving Certificate. Allied to this changes in the legal minimum age for completion of compulsory education (up from 14 to 15 in 1972 and more recently to 16) as well as the development of new and more applied programmes at upper secondary level has encouraged young people to stay on longer in formal education. Difficult labour market conditions in the 1980s and early 1990s for young people further increased the trend towards higher “retention” (as measured by the proportion completing upper secondary which is now approaching 80% compared to 20% in 1965).

The role of higher level education

Together with the United States and United Kingdom, Ireland tends to have a relatively high ratio of spending per student at tertiary level (universities and technical colleges at post-secondary level) to spending per student at primary level (approximately 3:1 compared to an average of just over 2:1 across OECD countries according to the latest OECD publication on education indicators: OECD, 2001b: p68). A question arises as to whether the relative priority given to higher education in Ireland in recent decades was an important factor in stimulating investment and economic growth in recent years. There is much anecdotal and circumstantial evidence around the expansions in higher education beginning with the growth in Regional Technical Colleges in the late 1960s and early 1970s as well as the continuing upward trend in full-time undergraduate intake through the last 3 decades of the last century to growth in the expansion of high-skilled jobs – especially in sectors such as electronics, software, computer hardware and professional services.

It is difficult to prove, in the absence of counter-factual evidence, that productivity trends and employment growth would not have occurred to the same extent without this surge in the number of young graduates at technician and university degree levels. However, it is reasonable to conclude that the availability of highly skilled graduates, together with other factors, played an important facilitating role at a crucial juncture in the late 1980s and early 1990s when, fortuitously other factors started coming together including favourable world market conditions, EU support and favourable domestic wage and public spending policies. The Celtic cubs had already been born and the Tiger was about to emerge when the conditions were right!
A question arises in relation to the “quality of higher education”. There are few ways of assessing “quality” of higher education in Ireland vis-à-vis other countries. If international adult literacy test scores are anything to go by, Ireland would appear to be close to the average in respect of tertiary graduates in the adult population (for example, see OECD and Statistics Canada, 2001: p 138-139). In common with most countries, higher education grew very rapidly in Ireland throughout the 1980s and 1990s providing increasingly well-educated youth cohorts entering the labour market. A particularly rapid expansion in “non-university” education stemmed from considerable EU funding under the European Social Fund as well as the establishment and growth of the Regional Technical Colleges and other Technological institutions at higher level. A combination of factors including availability of graduates in computing, science and engineering disciplines, among others, is likely to have played an important role in both attracting foreign inward investment as well as spawning business start-ups and innovation at regional level. International comparisons of rates of graduation (relative to the total size of the young labour force) in natural science, mathematics, computing and engineering show Ireland to be near the top of OECD countries. Added to this, a rising stream of returned immigrants who had topped up their initial tertiary level education with experience abroad is likely to have assisted productivity growth in the 1990s.

**Accounting for some aspects of quality**

Of course, increases in “average years of schooling” take no account of the quality and diversity of learning experience in formal education and still less of the extent of learning not accounted for in statistics of formal educational attainment. Human capital is highly heterogeneous and its distribution, allocation and growth is likely to be highly occupation and life-specific implying that, at best, “years of schooling” and other human capital proxy measures are crude. Recent international survey results from the OECD *Programme for International Student Assessment* (Shiel et al., 2001) show that Irish students at age 15 have higher reading, mathematics and science skills than most OECD countries (based on a common school survey undertaken in 32 countries in 2000). Ireland has the second highest score for 14 EU reporting countries in the combined reading literacy measure (Finland is first). On scientific literacy, Ireland comes 4th out of 14 EU countries, while in mathematics it is in an average position among both EU and OECD countries. These results suggest that the quality of human capital is likely to be higher in respect of recent graduates of upper secondary education – at least in respect of those aspects of skill and competence measured in international test surveys.

To my knowledge, no attempt has yet been made to incorporate recent adult literacy or student achievement data in explaining Irish economic growth performance. While it is not known how Ireland compares with other OECD countries over time in respect of measured adult literacy or student achievement, it is likely that no major changes have occurred in levels of student achievement in reading according to national level test data (Kellaghan, 2001). Results are available for previous international surveys on student achievement (but not adult literacy). These were conducted by the *International Association for the Evaluation of Educational Achievement* (or IEA for short) and are not directly comparable to PISA in terms of content and approach. They were also undertaken in different sets of countries over time.
Quality of human capital beyond schools and universities

The positive achievement results reported at age 15 are contrasted with significantly below-average levels of prose, document and quantitative literacy as measured in the Statistics Canada/OECD survey of adult literacy (the International Adult Literacy Survey). Results from the IALS comparisons in the mid to late 1990s showed Ireland falling significantly behind most EU countries in terms of measured literacy. These results were based on a standardised “paper-and-pencil” test relating to comprehension of printed textual, graphical, numerical or other information. These difference can largely be explained by the relatively low level of educational attainment in the adult population. Currently, most adults over the age of 40 have not completed upper secondary education (the “retention rate” only exceeded 50% for the first time around 1980). The results from IALS show that when level of education is controlled for, differences in measured literacy between Ireland and other EU countries are not as large. It is noticeable that results in prose and document literacy in Ireland are close to average for both OECD and EU countries when only adults with upper secondary and higher are included (OECD and Statistics Canada, 2001: p 138-139). However, for adults with below upper secondary completion appear to have significantly lower literacy levels than similar adults elsewhere. For these adults, out of nine EU countries for which data are reported, only Portugal had lower levels of measured literacy on all three scales (prose, document and quantitative). This points to the existence of a large section of the adult population, including the labour force, for whom formal education and subsequent experience has not translated into high levels of measured literacy. Over three-quarters of all persons in Ireland (aged 16-65) who have not completed upper secondary education scored at levels 1 or 2 in the IALS test (there being five levels in all). This compares with corresponding figures of 63 and 49 percent in the UK and Germany, respectively (OECD and Statistics Canada, 2001: p 138-139). Many of the lowest skilled and most poorly educated adults are concentrated in traditional manufacturing or service industries or are outside the labour force.

In the absence of internationally comparable time series data on the quality of education and post-school learning experience, it is difficult to assess the extent to which relatively low levels of measured literacy together with low levels of educational attainment in the adult population impeded economic growth in Ireland in the past. It would appear that high GDP growth in the 1990s was underpinned by an inflow of more highly educated youth cohorts and that the existence of a large number of low skilled adults did not stand in the way of productivity gains and employment expansion in key sectors. Considerable care is needed in interpreting international adult literacy results since they do not account for a wide variety of life skills including writing, oral communication, teamwork, practical cognition and problem-solving etc. To what extent measured and measurable skills such as those covered in IALS and other surveys are necessary and core competencies, without which, other skills are likely to be deficient is an open question (Rychen and Salganik, 2001). A more serious issue is the extent to which measured skills are necessary for economic performance let alone personal well-being. It is likely that skills required in a particular occupation, industry sector, cultural context or point in the lifecycle vary. Hence, no firm conclusions can be drawn in relation to the relative
impact of measured literacy in Ireland’s adult population on recent economic growth patterns.

**Social partnership**

When the “chips were down”, the Irish stood together. At least, this is received wisdom from the fiscal crisis of the mid to late 1980s when Ireland’s economy looked as if it were heading for insolvency. It is easy to forget the reality of the Irish economy at the time. Some of the highest levels of outward migration among young people anywhere in Europe were recorded, unemployment rates touching 20% of the labour force, debt-to-GDP ratios of 1.6 and stagnant productivity and employment growth. Wage moderation, prudent curtailment of public spending and the institution of national wage agreements began to address aspects of the “social wage” and involved not only unions and employers around the table but the voluntary and community sectors too. These trends created a climate of relative consensus, a relative lack of industrial strife and an acceptance of the need for change. Moreover, there was broad cross-party support on the need for wage and spending moderation – partly reflecting the pragmatic and relatively non-ideological nature of the Irish political landscape. Historically, and unlike most other European countries, the Irish kept ideology out of politics except when it came to the national question and even on that issue there has been a longstanding bipartisan consensus. Arguably, all of this made it easier to “get things done” at the right time when crises loomed – as they did on the fiscal, trade and industrial fronts in the 1980s. Not that the processes of partnership, moderation and adjustment were without pain. Difficult decisions had to be made in relation to public sector recruitment, infrastructure and spending in areas such as health and education. A remarkable feature of the recent growth experience for a newcomer to Dublin – or indeed someone returning to Dublin after a long interlude – is the contrast between apparently new found wealth and income on the one side and an inherited infrastructure including public social infrastructure which is struggling to catch up. Users of public transport in Dublin will understand! Along with public transport, topics such as traffic congestion, hospital waiting lists, early childhood care and housing prices feature prominently in conversations.

**Social arrangements working in tandem with education as a possible clue**

Explaining the Irish growth miracle remains a challenge. World Bank, vice-president, Jo Ritzen asked at a recent OECD conference:

“Consider the case of Ireland, for example, which emerged from a relatively poor OECD country to recently overtake the UK in GDP per capita. The explanations for this rise are quite solid: the Irish combined sound fiscal policy and a strong human development policy, with a commitment to the rule of law and peaceful labor relations in an open country environment (Barry, 1999). But we would like to look behind these explanations, since they tell us nothing about how the Irish were able to organize these good policies. Conversely, consider Argentina, which fell from being one of the richest countries in GDP per capita in 1920 to developing countries status now, doing so largely because of its poor choice of economic policies. We know in general that good policies matter for
development, but we are still looking for clues as to why good policies come about in one country but not in another. Social cohesion may provide one of those clues” (Ritzen, 2001).

Social capital as a newly used term in economic analysis

One novel factor which has emerged in international debate and analysis is the role of social capital – the networks and associated norms in civil society that can build trust, renew communities and facilitate innovation, transfer of information and inclusion of various groups. The term social capital has increasingly been used to understand and measure the impact of less tangible resources inherent in the social relations that bind individuals and communities together and that can spill over – for better or worse - into the culture of organisations and firms. The definition used by the OECD in its recent publication The Well-Being of Nations: the role of human and social capital, is “networks together with shared norms, values and understandings that facilitate cooperation within or among groups” (OECD, 2001a: p41). This definition is sufficiently narrow to exclude confusing social capital with anything and everything from institutions to outcomes such as social cohesion. At the same time, it is sufficiently broad to encompass the specific, complex cultural and relational features of various types of groups and organisations. At the level of firms and organisations, networks, shared values and norms matter and constitute types of organisational capital which are important for sustained market success.

While much of the international evidence is still very tentative, there is enough to suggest that some of the recent Irish “economic miracle” may be attributable to historical accumulations of values, norms and networks which facilitated entrepreneurship, lowered transactions costs and generally facilitated the impact of education, trade and investment on the domestic economy. Early evidence on cross-country differences in cross-country GDP growth over a 20 year period suggest a link between levels of trust and growth as well as between levels of trust and investment in physical capital (Knack and Keefer, 1997 and Knack, 2001). They estimate the level of general inter-personal trust by using data from the World Values Survey\(^2\) in which individuals are asked: “Generally speaking, would you say that most people can be trusted, or that you can’t be too careful in dealing with people?” They estimated that, on average, a level of trust that is ten percentage points higher in a country is associated with an annual growth rate that is 0.8 percentage points higher.

Unfortunately, we do not have adequate time series data on trends for social capital in Ireland their possible impact on economic development. Depending on which data source is used, it appears that both levels of trust and voluntary engagement are average to above average compared to other OECD countries. However, a reasonable hypothesis worthy of further exploration is that civic norms and networks embedded in local communities, organisations and institutions have played a significant role in “greasing” the machinery for the “mainstream” factors to have their joint impact over time (education, physical capital investment, social partnership etc.). The black boxes which

\(^2\) Refer to http://wvs.isr.umich.edu/index.html
transform knowledge, skills and physical capital into exceptional productivity performance have been the firms and organisations where human, physical and social capital combined.

**Conclusions**

The summary by Ferreira De Almeida just to follow this presentation makes a convincing overall case as follows:

“Consequently, the evidence presented so far seems to point towards the conclusion that the sector composition of foreign direct investment – and with it the induced demand pressures for skills and education, the linkages to local companies, and the thereby associated crowding in of domestic investment in key sectors – may have been of more importance for total factor productivity and long run growth than the actual size of the inflows, or spending patterns on education by themselves.”

It is difficult not to disagree with the above. However, the reasons for the extraordinary combination of fortuitous circumstances and mutually supporting and facilitating factors in the late 1980s and early 1990s point towards the importance of the specific social, cultural, institutional and political circumstances in Ireland which facilitated the transition to a high-growth economy. This raises a number of questions which continue to challenge policy makers and others:

- Will growth in Irish GDP per capita be sustained throughout the current decade notwithstanding the recent international slowdown and vulnerability of the Irish high-tech sectors?

- What are the implications for sustained and balanced growth in the face of various social and environmental challenges including the impending changes in age-structure into the next decades?

- What are the implications of continuing growth and adjustments in patterns of work, education and living for the perceived quality of life in Ireland? GDP is not the only yardstick of progress.

- Can the Celtic Tiger boom benefit groups which have been excluded from learning, employment and social opportunities in the past? Poverty, social exclusion, poor health and low levels of educational attainment are still a reality – not just for the older population but an alarmingly high number of children who enter into the official statistics of absolute and relative poverty.

- How can learning partnerships and networks be developed to help the attainment of better learning experiences and outcomes as well as more opportunity for the utilisation of social and human potential? We cannot rest on the laurels of our recent economic success and more spending and more years of schooling, alone, are not the answer.
References


### ANNEX TABLE  Changes in annual average growth rates in Output per working-age person (1981-89 to 1989-97) broken down into various components

<table>
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<tr>
<th>Country</th>
<th>Change in growth rate of GDP per capita (1980s-1990s)</th>
<th>Investment share</th>
<th>Human capital</th>
<th>Population growth</th>
<th>Variability of inflation</th>
<th>Government consumption</th>
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