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ABSTRACT

This paper reviews the extent and policy implications of linkages between demographic changes and international factor mobility. Evidence is found of significant demographic effects on both migration and the current account, but for different reasons neither increased migration nor international transfers of savings is expected to offer much assistance in digesting the variety of demographic transitions expected over the next fifty years. The paper also examines more briefly the effects of demography on the factor content of international trade, as exemplified by offshore provision of back-office and other services previously provided closer to home.

When considering the consequences of using international capital movements and especially migration to mediate international differences in demographic patterns, I broaden the focus from the usual economic variables, such as the size and distribution of incomes and employment, to consider explicit measures of well-being, which have been shown to depend on far more than economic variables. This has implications for a whole range of policies, both domestic and international, that might help deal with national and global demographic transitions.

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Introduction

The task of this paper is to review the extent and policy implications of linkages between demographic changes and international factor mobility. I report evidence of significant demographic effects on both migration and the current account, but for different reasons neither increased migration nor international transfers of savings is expected to offer much assistance in digesting the variety of demographic transitions expected over the next fifty years. I also examine more briefly the effects of demography on the factor content of international trade, as exemplified by offshore provision of back-office and other services previously provided closer to home. Such changes in the structure of trade in goods and services may provide a mutually beneficial way to mediate demographic differences without requiring the large scale relocation of established communities.

When considering the consequences of using international capital movements and especially migration to mediate international differences in demographic patterns, I propose broadening the focus from the usual economic variables, such as the size and distribution of incomes and employment, to consider explicit measures of well-being, which have been shown to depend on far more than economic variables. This has implications for a whole range of policies, both domestic and international, that might help deal with national and global demographic transitions.

Setting the Context

Before proceeding to the separate consideration of migration, capital mobility, and factor-embodied trade in goods and services, it is perhaps worthwhile to illuminate the stage. One overarching question is whether the causes and consequences of demographic changes are fundamentally local, national or global. There is much talk about the irrelevance of the nation state in an increasingly interdependent global economy. Having spent more than a decade trying to find and interpret evidence on this question, I have found that the best way of measuring the strength of international linkages, and hence the extent of globalization, is in relation to those existing within nation states.

To the extent that international linkages, either on average or at the margin, are as strong as those within nations, then one could indeed argue that national boundaries were irrelevant for at least that linkage. Well, even then not quite irrelevant, since the nation state remains the main locus for establishing policies that create or discourage international factor mobility. In this sense, if densities were as tight internationally as within nation states, it would be because national governments either wish that to be the case or have decided to live with that reality. But that is getting ahead of the game in two ways: we have not yet established the extent of globalization, and policy issues will receive their own attention in due course. Here we want only to establish whatever broad considerations seem to apply across all types of international linkages.

What might they be? Three are worth headlines: the continuing relevance of national boundaries, the U-shaped pattern for changes in international intensities over the past century, and the influence of demography on international factor movements. The first of these findings gained widespread attention among economists only when data became available permitting the strength of intra-national and inter-national linkages to be directly compared. At roughly the same time, it was found that intra-provincial trade intensities in Canada were more than an order of magnitude larger than the corresponding intensities between Canadian provinces and U.S. states (McCallum 1995), and that consumer price change linkages were much tighter between Canadian cities than between Canadian and U.S. cities (Engel and Rogers 1996).

Similar results were also found for factor mobility, in particular for international movements of capital and labour. Almost twenty-five years ago, Feldstein and Horioka (1980) first established that national savings and domestic investment rates tend to be highly correlated across OECD countries, a finding that led them to conclude that international capital mobility was far from perfect. This has since become one of the most tested and generally confirmed findings in modern economics¹. The amount of attention it has received is due to the challenge it poses for standard models of open-economy macroeconomics, which usually assume perfect international capital mobility. In defense of the assumption of the standard model, it was pointed out that some patterns of shocks can cause increases in domestic output, savings and investment without requiring abandonment of the assumption of perfect international mobility of capital².

¹ For a review of almost twenty years of subsequent tests, see Coakley et al (1998).

² It has also been argued that the operation of inter-temporal budget constraints could also be responsible for limiting access to foreign borrowing. For a recent survey, see Taylor (2002).

To my mind, the most convincing evidence in favour of the Feldstein and Horioka interpretation of their finding comes from combining intra-national and international data, just as was done for trade flows and prices. For example, when a data sample was used combining national data for the OECD countries and provincial data for Canada, it was found that the cross-country correlation of savings and investment rates was robustly high, just as was found by Feldstein and Horioka, while among the Canadian provinces there was no correlation at all³. Thus it appears very likely, just as originally suggested by Feldstein and Horioka, that international mobility of capital, like that of goods and services, is far less than that between regions within a single country. This interpretation is also supported by findings that portfolios are much less internationally diversified than would be expected if capital markets were perfectly integrated (French and Poterba 1991, Baxter and Jermann 1997).

As emphasized by many researchers (e.g. Obstfeld and Rogoff 2000) these findings require a fresh approach to international economics, since they together show that even at the end of the 20th century international economic linkages are far less dense than those within countries. Similar gravity-based modeling of migration has shown in a parallel way that those born in one country are far more likely to move elsewhere in the same country than to move to another country, even after adjusting for the effects of economic size and distance (Helliwell 1998, 85-6). The large size of these ‘border effects’, as they have generally come to be called, for migration is less surprising to economists and others than were the parallel results for goods, services and capital. I suspect this is because economists are more used to assuming that goods and capital are mobile, while populations are assumed to be rooted in place. In addition, in contemporary times world migration flows are more policy-determined than are those of goods, services and capital.

The second headline relates to the U-shaped pattern evident for many measures of the intensity of international linkages. The left hand peak of the U is situated at the end of the 19th century, the trough in the middle of the 20th century, and the right hand peak either approaching or passing the left-hand peak in the late 20th or early 21st centuries. The details will be discussed separately for migration and capital movements, but the pattern is applicable broadly enough to belong in the stage setting. International intensities in the mid 20th century were half or less, sometimes

³ See Helliwell and McKittrick (1999). Since Canada has a complete set of provincial savings and investment accounts, prepared on the same basis as the national accounts, it provides the most appropriate place to make such a test. Regional data for other countries, even if often not fully comparable with the national accounts data, tell a similar story for Japan (Dekle 1996), the United States (Sinn 1992) and the United Kingdom (Bayoumi and Rose 1993).

much less, than either at the beginning or the end of the century (Bordo, Taylor and Williamson 2003).

Are these two headlines from consistent stories? If the U-shaped finding is general, and if the Feldstein-Horioka interpretation of their coefficient is the correct one, then we might expect to find some weakening of the correlation between national savings and domestic investment as international linkages deepen in the markets for goods, services and capital. Figures 1 and 2 provide an eye-ball confirmation of this proposition, Figure 1 shows the plots of savings and investment rates for five-year intervals covering the final quarter of the 20th century for 16 OECD countries originally studied by Feldstein and Horioka, using national accounts data provided by the OECD. Figure 2 shows similar graphs for global samples of more than 100 countries, using data from the World Bank's World Development Indicators (WDI). Table 1 reports regressions on domestic investment rates on national savings rates for the OECD countries, for the rest of the global set of countries, and for the entire set of countries, separately for each five-year period, using the WDI data in all cases.

Three main features of the data are revealed by the charts and regressions. First, for the OECD countries the tight 1970s correlation between savings and investment becomes slightly looser as time passes, and is very much weaker in the last panel, covering 1996-2000. Second, the relation is always weaker for the global samples than for the OECD countries, and also becomes much weaker in the final period. Third, the weakening cross country relation between saving and investment is coming from increasing variance in national savings rates rather than domestic investment rates. This is especially so in the final five years of the past century. Since this is a period marked by a number of national and regional balance of payments crises it is quite possible that the greater variance of current account balances reflects the coming and going of these crises more than the operation of more globally fluid investment markets, although the two possibilities are perhaps not so easy to distinguish.

The third headline provides a counter-point to the first, by suggesting that even though international factor movements are small relative to those within countries, there is past and current evidence that demographic pressures have in some circumstances led to significant international factor movements. We shall consider below if the weaker relations between savings

and investment rates are matched by growing demographic effects on current accounts. It is time now to consider this evidence and its implications.

Demography and Migration: Past, Present and Future

People have always tended to stay close to where they are born. It takes a strong push or pull to make them move, especially to far-away and unknown destinations. The migration-reducing effects of distance and of the unknown are offset and sometimes obliterated by the existence of migration pathways, blazed by others from the same own family, town or region, providing welcoming arms and ready-made networks of family and friends at the far end. Migrants generally move from poorer and unstable to richer and more stable locations. Once migration is either chosen or forced, migrants tend to choose among alternative destinations based on the prospect of a better life, constrained by distance and risks.

The major mass migrations a century ago were from Western Europe to the major immigrant-receiving countries in the Americas and Oceania. Hatton and Williamson (1998, 39) have modeled emigration (by decade) from Western Europe 1860-1910 to depend principally on the wage differential between source and destination countries, the existing stock of migrants in place in the destination countries, and the source-country birth rate lagged thirty years. The birth rate effect was large, suggesting that eventually almost half of excess births spilled over into emigration. This was at a time when migrations, at least from Western Europe, were unconstrained, and immigration was being generally encouraged by destination countries.

By the dawn of the 20th century, things were starting to turn sour in the destination countries, and the floods of increasingly lower-skilled immigrants were seen to threaten the employment prospects for those already in place. The rising resistance to mass migration was not new, however, as there had also been a backlash in the United States in the 1850s in the wake of the 1820-1850 migration surge, when annual immigration rates reached 15 per 1,000 and the skill levels of migrants were steadily falling (Hatton and Williamson 2004, Table 4). The backlash was repeated at the dawn of the 20th century, when politics and economics combined more conclusively to restrict immigrant inflows to the United States. Over the next thirty years, driven principally by the great depression, most of the other immigrant-receiving New World countries also acted to restrict immigration. The same employment and income pressures were also responsible for the more widespread tariffs and macroeconomic policies that were pushing all

forms of international linkage down toward their mid-century troughs. After a tumultuous half-century of wars and depression, there was at last some renewed interest in rebuilding a more open and peaceful world order, based principally on the United Nations, the Bretton Woods twins and the GATT.

Hatton and Williamson (2004) distinguish five seismic movements over the following half century of global migration. I have taken the liberty of suggesting a sixth:

1. Western Europe's decline as a source of migrants. Western Europe was the source of almost 50% of immigrants to the United States in the 1950s, compared to less than 6% in the 1990s. (Hatton and Williamson 2003, Table 2). To some extent this transatlantic decline was offset by increased migration within Western Europe.
2. Latin America's change from destination to source of migration. This is mainly a US story without parallels in the other main immigrant-receiving countries. In the 1960 US census, the foreign-born population included about 900 thousand who were born in Latin America (less than the 1 million who had been born in Canada). In the 2000 US census, there were 14.5 million born in Latin America, more than twenty times as numerous as the 700 thousand Canadian-born, and more than three times as many as the European-born.
3. Sharply increasing emigration from Asia and Africa. Five factors are most important here. First is demography, second is the change in immigration policies of the receiving countries, third is the declining costs of migration, fourth the increases in the education and incomes of the migrants, and fifth the gradual establishment of immigrant pathways from Asia and Africa into the main receiving regions: the New World, Western Europe, and the oil-producing Middle East.
4. Re-establishment of large scale emigration from Eastern Europe in the last twenty years of the 20th century. This traditional channel was closed by emigration restriction from Eastern Europe between the 1950s and the 1980s.
5. Immigration to the Persian Gulf, chiefly from Asia and North Africa. In 2002, the foreign-born share of the world population was just under 3%, comprising 8.7% for the more developed regions and less than 2% for the less and least developed countries. But for several of the oil-rich countries of the Middle East, it was far higher (United Nations Population Division 2002): 26% in Saudi Arabia, 58% in Kuwait, 27% in Oman, and

over 70% in Qatar and the United Arab Emirates. In total, this amounts to more than 9 million migrants, more than 5% of the global migrant stock.

6. Immigration is now overwhelmingly to urban areas. The foreign-born percentage of the entire US population rose from 7.9% in 1990 to 11.1% in 2000. But in the major cities the foreign-born percentage in 2000 was much higher than the national average: 36% in New York, 41% in Los Angeles, 37% in San Francisco, 22% in Chicago, and almost 60% in Miami. One exception to this general rule lies in the role of the Mexican-born in US agriculture. There are about nine million workers employed in agriculture in the three NAFTA countries, and eight million of these are Mexican-born. Of these eight million Mexican-born farm workers, two million are working in the United States (Martin 2004).

Given the variety of circumstances and policies that underlie these seismic shifts, it is perhaps too much to expect a single equation to explain even their broad features. One way of simplifying is to concentrate on particular source or destination countries. Using pooled samples of annual immigration rates 1971-98 from more than 80 countries to the United States, Clark et al (2002) and Hatton and Williamson (2003) repeat their finding for the late 1800s that immigration rates are higher from poorer than from richer countries. This relationship is complicated by the fact that immigration rates are lower from countries where poverty is more widespread, echoing a common finding that migration has often been constrained by poverty (or lack of knowledge of and contacts in the receiving countries). Their equations also repeat the finding that existing stocks of migrants tend to encourage or enable others to follow in their footsteps⁴. On the demographic side, Clark et al (2002) find that source countries with higher shares of population aged 15-29 had in the late 20th century higher rates of migration to the United States, echoing the result found in data from the late 19th century.

Table 2 contains cross-sectional regressions testing for similar demographic effects in explaining international differences in net migration rates over the last quarter of the 20th century. The data provide some weak echo of the results of a century earlier, but nothing as clear as what Clark et al find looking at immigration to the United States from a large number of source countries. Furthermore, as also shown in Table 2, when per capita real incomes of each country, measured at purchasing power parity, are added to the equation the demographic push variable largely drops out, except for the most recent time periods. Subsidiary tests show that the rising influence

of per capita incomes in the 1990s is due to the addition to the sample of many countries that were previously part of the Soviet bloc, and from which emigration became much less restricted after 1989. At least in these simple global cross-sections, the demographic push has an impact mainly insofar as it contributes to international disparities in per capita incomes. It is not surprising that recent and current international differences in net migration rates are determined by patterns of events and policies complex enough to stop demographic influences from appearing clearly in simple tests. Contemporary migration flows, at least in those situations where the number of potential migrants is very large, are likely to be determined more by the immigration policies of the receiving countries than by demographic imbalances in the sending countries.

Returning to the Clark et al results for US immigration from many source countries, there is evidence of an education effect, with migration flows to the United States being larger from countries with higher average rates of schooling. This probably reflects some combination of increased emigration capacity in countries with more schooling and of immigration policies intended to attract and admit skilled and educated migrants. Immigration is now much more constrained by policy limits than it was in the late 19th century. The restrictions are now less by country and more by individual characteristics than they were in the first part of the 20th century, when country and racially-based exclusions were common. The move towards skills-based immigration policies has gone furthest in Australia, with the Canadian points-based system close behind. These skills-based criteria have been adopted in recognition of the fact that immigration is seen to have strong labour market consequences. This has given policy-makers an incentive to tailor their national immigration criteria to select immigrants with skills and occupations in short supply.

The move towards more selective immigration rules has been accelerated by accumulating evidence that labour-market success rates of migrants have been dropping over recent decades. This has reflected some combination of factors: the abandonment of area preferences, the rise of refugee and illegal migration from countries with low levels of skills, education and social capital, the decline of migration supply from traditional Western European sources (now enjoying relatively high incomes and globally top levels of life satisfaction), and the increasing

⁴ In their latest results this effect is quadratic, with a negative coefficient on the squared term, thus making the process self-limiting.

numbers of potential migrants with sufficient resources and contacts to facilitate migration, whether legal or clandestine.

Analysis of Canadian census data shows that recent immigrants have faced lower incomes at entry, and have converged less fast to the income levels of the native-born, than was true of earlier cohorts. For example, male immigrants to Canada in the first half of the 1970s saw their earnings converge fully to those of Canadian-born males within a period of less than 15 years following arrival. By contrast, male immigrants in the latter half of the 1980s had earnings after fifteen years that were on average 12 percentage points below those of Canadian-born males of the same age and education, mostly because of a lower relative entry wage (Frenette and Morissette, 2003, 8). These calculations hold constant the ages, education levels and work experience of the immigrants and native-born workers, but do not differentiate immigrants by source⁵. Thus the lower success rate for recent Canadian immigrants is not due to lower levels of education, since education levels have been held constant in the calculations. In any event formal education levels of immigrants are on average high and increasing, reflecting the operation of the points system used to select Canadian immigrants. For example, in the 2000 census, 13% of Canadian-born men and 15% of Canadian-born women had bachelor's degrees, while 23% of recent immigrants, both men and women, had bachelor's degrees (Frenette and Morissette, 2003, 4).

Australian studies of post-immigration workplace experience have found large differences between those coming from an English-speaking background (ESB) and those from a non-English-speaking background (NESB). In 1990, ESB immigrants had employment outcomes that were better than those of the native-born, and much better than those of the NESB immigrants (Foster et al 1991). Policy changes in the mid-1990s were aimed at increasing the labour market success of new migrants, principally by raising the English language proficiency requirements, pre-testing professional competencies, giving points for education in Australia, for job offers and other measures of labour market demand (Hawthorne 2003). In the skill-related categories of migrants, the consequences for outcomes were substantial: the median personal income doubled in the subsequent cohort, the average duration of unemployment was halved, and there were increases in average job satisfaction and the extent to which earlier qualifications were being put

⁵ The relative decline of Canadian immigrant earnings is even larger if the comparison group is taken to be longer-established Canadian-born workers, since over the past 20 years there has been a parallel but smaller decline in the earning of all new entrants to the labour market (Green and Worswick 2004).

to use (Richardson, Robertson and Ilsley 2001, as presented by Hawthorne 2003, 27). Pre-selecting migrants for success in Australian labour markets thus had the intended effect, although presumably with the consequence of increasing the average ‘brain drain’ effect of the migration when seen from the perspective of the source countries.

The United States has had an even larger decline in labour market success for recent migrants. Hatton and Williamson (2004) argue that the difference can be mostly explained by the much greater importance of Mexican migration in the US case. Geographic proximity and existing migration pathways have led to massive movements of Mexicans with much lower skill levels than those of other immigrants to the United States, and education levels only slightly higher than of non-migrating Mexicans. NAFTA was intended to offset these migration pressures by easing the flows of goods, services and capital. In the event, although there has been substantial growth of Mexican exports to Northern America, the flows of migrants have also increased, showing the effects of cumulative causation of a familiar sort (Massey 1990). The number of unauthorized Mexicans in the United States rose from an estimated 2.5 million in 1995 to 4.5 million in 2000 (Martin 2004).

Looking ahead, the seismic changes in migration patterns will combine with evolving demographic patterns to make immigration policies more selective in the receiving countries, while eventually reducing the demographic push from Asia (as aging takes place in China, and as fertility drops in India and elsewhere in converging Asia) and increasing that from Africa. Figure 3 provides a world map showing the projected youth share in 2020, with Africa and parts of Latin America being the major remaining sources of demographically driven emigration. Income-based incentives for individuals to migrate to higher income countries will remain very large, and there will continue to be large increases in the number of potential migrants with sufficient education, cash and connections to make migration feasible. Hence the scale of migration will become if anything more limited by the policies of immigrant-receiving countries. Within Europe, the situation will be further complicated by EU enlargement and its uneven consequences for internal migration.

Most of the evidence reviewed thus far relates to the determinants of migration. There have also been theoretical and empirically-based simulation models designed to show the consequences of alternative migration policies for aging industrial countries. Fehr, Jokisch and Kotlikoff (2003,

2004) develop a three-region (US, EU and Japan) dynamic over-lapping generations model of the major developed countries with detailed treatment of the costs and financing of health care and pension costs. One of the alternatives they consider is to double immigration from the developing world to each of these aging richer regions. With immigration doubled, the US labour supply by 2030 is 13% higher than in the baseline, and 31% higher by the end of the century. The proportionate effects are much smaller in the EU (6% increase in 2030) and Japan (2%), reflecting their correspondingly smaller net immigration rates (Fehr, Jokisch and Kotlikoff 2004).

Despite the substantial increases in labour supply, the resulting macroeconomic outcomes in 2030 are not much changed. For example, the US social insurance payroll tax rate in 2030 is modeled to be 23.1% with baseline immigration and 21.5% with immigration doubled. How is this consistent with the substantial increase in the number of employees? “The answer is that the model provides new immigrants with public goods and social insurance benefits on the same basis as existing natives. And doubling the number of immigrants on an across-the-board basis ends up costing the US government almost as much in additional expenditures as the US government earns in additional revenues” (Fehr, Jokisch and Kotlikoff 2004, 21). They also experiment with doubling only the number of high-skilled immigrants, who are assumed to be four times as productive as low-skilled workers. This produces an increase in the effective labour supply greater than the increase in social security costs, given the nature of the social security financing system, so that the new immigrants, who get high incomes to match their high skill levels, pay for more than their share of social security. The reverse occurs if immigration is concentrated among those with low skills, in which case the payroll tax rate is unchanged from baseline, and the tax rate on wages is increased (Fehr, Jokisch and Kotlikoff 2004, Table 3). The policy implications will be considered later.

Demography and Capital Movements: Past, Present and Future

As has been seen, the effects of demography on migration flow primarily from the demographic push from the young and often under-employed cohorts in the source countries. For savings and investment, and hence possibly for the current account, the story is different and more complicated. First, there is the idea that younger populations, and especially those with many dependent children, will have low savings rate and high investment requirements (for schools and other infrastructure, among other things). Taylor and Williamson (1994) have argued that as

much as three-quarters of the net capital inflows of Canada, Australia and Argentina before 1914 could have been attributed to their high youth dependency ratios.

Those results were from a period of relatively high international mobility of capital, certainly compared to what happened over the next half-century. In terms of balance sheet ratios, foreign assets fell as a share of total assets until well after the middle of the 20th century, before starting a rise that has by some measures just reached the values of a century ago.

What do more recent discussions and data show about the likely effects of demographic change on the current account? Recent discussions have added a concern about the effects of population aging on savings, investment and capital markets. Most discussions suggest the likelihood that rates of return, and hence net capital inflows, are likely to be higher, others things equal, for countries that have relatively high shares of either young or elder dependents. Two recent studies have found statistically significant linkages of this sort using panel data for many countries over the past thirty years. Higgins (1998) uses the results from his global sample to suggest the demographic shifts were responsible for increases of the Japanese and Canadian current accounts (between the first half of the 1960s and the latter half on the 1980s) of 7% and 3% respectively. Recognizing the implications of the Feldstein-Horioka proposition, Higgins argues that one should therefore expect to find that the demographic effects on the savings rate, and especially on the current account balance, would be expected to be larger for more open economies. He does indeed find that the estimated demographic effects are twice as large for open as for closed economies, employing the Sachs and Warner (1995) definition of openness.

Luhrman (2003) refines the analysis further by considering also the effects of anticipated demographic changes, and by defining all of the dependency ratios in relative terms (as suggested by Williamson 2001), to ensure that the estimated demographic effects on current account balances sum to zero across the global sample of countries. She combines her estimates with UN projections of dependency ratios to forecast partial demographic effects on current account balances over the first twenty years of the current century. Japan, the United States and Canada are all expected to have negative balance swings equal to about 5% of GDP from 2000 to 2020. Japan's swing from 2000 to 2020 is the second half of a much larger swing starting in the 1970s. The other mature industrial countries show demographic swings of the same sign, and of only slightly smaller scale. After a swing to surplus in the 1990s, China is forecast to have a

negative current account shift of about 3% between 2000 and 2020. The shifts to demographic surpluses, so far as they are shown in her results, are found in Argentina, India, Indonesia and Turkey. This would imply substantial induced transfers of resources from poor to rich countries, in the face of what by some accounts should be rates of return that are higher in the poorer countries.

How do these results square with the main implication of the Feldstein and Horioka finding, that changes in domestic investment tend to be financed by changes in national saving, and vice versa? Figure 4 shows national savings rates for more than 100 countries plotted against the youth dependency population ratio for several recent five-year periods, using the same global sample of countries as was used in Figure 2. Figure 5 plots the savings rate against the elderly dependency ratio. If the demographic effects are as indicated by the Higgins and Luhrman results, then we might expect to find downward sloping relations from left to right, with a more positive current account balance being matched to a higher non-dependent shares of the population. This relation is much more apparent for the youth-dependency ratio than for the elderly dependency ratio. Since the two dependency ratios are negatively related across countries, these simple correlations are likely to be misleading. There are two way of dealing with this. One is to combine the two dependency ratios together, and to plot the non-dependent population share against national savings. Figure 6 shows the plots of the national savings rate against the active population ratio. Figures 7 through 9 repeat Figures 4 through 6, but this time plotting domestic investment rates against the demographic shares. Tables 3 and 4 show the regression results for the effects of the dependency ratios, separately and in combination, on national savings and domestic investment, respectively. Finally, to bring the savings and investment results together, Figures 10-12 and Table 5 show the corresponding net effects of the demographic variables on the current account balance. By construction, the effects on the current account balance are simply the national savings rate effects minus the domestic investment rate effects.

The behaviour of the current account, and the relation between savings and investment, differs a lot between the OECD and non-OECD countries. For example, the variability of the current account across countries and time periods is much greater for the non-OECD countries as for the OECD countries. In addition, the correlation between savings and investment is much higher across the OECD than the non-OECD countries, as shown as already shown by Figures 1 and 2.

The Table 5 regressions explaining current account balances separately for the OECD and non-OECD countries show that both dependency ratios have net negative current balance effects for both groups of countries, although the time pattern differs for the two groups of countries. For the OECD countries the current balance effects are significant only in the earlier time periods, while the reverse is true for the other countries. The same results come through when we combine the two dependency ratios and consider the positive effect of their complement, the active population ratio, on the current balance.

Of course, the negative effects of the dependency variables on the current balance are simply the net of their negative effects on national savings and domestic investment. The negative effects of the dependency ratios on national savings are significant and generally similar in size for the two groups of countries. They are also roughly similar for the two dependency ratios, so that combining the two ratios, as reflected by the active population share, reveals a very similar story. Those countries with higher shares of active population have higher national savings rates, just as life cycle theories would predict. They also have higher investment rates, to an extent roughly half as great. Thus on average about half of the demographic effects on national savings are matched by corresponding changes in domestic investment, with the rest showing up in the current balance. The part that shows up in the current balance has tended to be decreasing for the OECD countries, while increasing among the non-OECD countries. There is no strong evidence that increasing international interdependence has increased the extent to which demographic imbalances induced net capital movements.

The finding that savings and investment are more closely tied for the OECD countries than for non-OECD countries would seem to suggest, following the Feldstein and Horioka logic, that capital is more mobile among the non-OECD than among the OECD countries. The same result has shown up in earlier studies that compared the savings-investment correlations for industrial and for developing countries (Dooley et al 1987). It is part and parcel of the fact that current account imbalances are on average much larger and more prevalent among developing countries. This is more likely to reflect structural features of these economies, and not greater international mobility of capital. These special features would include the small scale⁶ and specialized nature of many of the developing countries, combined with the greater prevalence of exchange rate crises that are often preceded and followed by large swings in current account balances, often

financed by short-term capital flows (Edwards 2003). Another way of putting the matter, which would also be consistent with the presumption that capital is if anything more mobile among the industrial countries, is that the industrial countries have in general been more successful in following macroeconomic policies that have avoided balance of payments crises. Whether this has also included some explicit or implicit targeting of the current account⁷ is more speculative. If so, then that could explain the fact that demographic swings have had negligible impacts on the current accounts of the OECD countries.

As already noted in the previous section, calibrated general equilibrium models based on overlapping generations have also been used to study the linkages between demographic changes and factor mobility. Bryant (2004a, 2004b) uses a calibrated two-region model operating under flexible exchange rates to reveal a more complicated picture, but which supports the empirical finding that the country with lower dependency ratios exports capital to the country with the more active population. Fehr, Jokisch and Kotlikoff (2003) assume perfect capital mobility among their three developed regions in the ‘open economy’ version, but no mobility between these countries and the rest of the world. In the three-region closed economy version, interest rates rise more in the EU than in Japan or the US, so that in the open economy version capital moves from the US to Europe over the course of the century. This leads to a smaller US economy, with a higher social insurance tax rates and a lower wage tax rate than in the closed economy case. The reverse happens in the EU, and Japan is largely unaffected (Fehr, Jokisch and Kotlikoff 2003, Tables 3-12). Overall, the effects of even full capital mobility among the three regions are slight, reflecting the general similarity of their demographic transitions.

If similar modeling were extended to the global economy, the earlier results of Higgins (1998) and Luhrman (2003) would suggest that the main current account balance changes would not be among the developed regions but between developed and developing countries. This is because the demographic transitions of the developed countries are more synchronized than are those between developed and developing countries. As already noted, their results suggest, other things equal, demography-induced capital movements from a variety of developing countries toward the developed countries⁸. This is in a global context where, if the relevant institutional quality

⁶ Ho (2003) has presented evidence showing that the savings-investment correlation is smaller for smaller economies, even among the OECD countries.

⁷ As argued by Bayoumi (1990).

⁸ If Bryant’s modeling (Bryant 2004a, 2004b) of a two-region world were applicable globally, it would be likely to reveal a different pattern. More testing of alternative models is needed.

exists or can be put in place, rates of return on investment will be generally higher in the developing world, and global investment flows will be in their direction. Thus the aging of the developed world will act if anything to limit the extent to which capital flows to developing countries.

Factor Movements via Trade Flows: Offshore Outsourcing and International Supply Chains

There is a long-established literature in international trade arguing that trade in goods and services can be a substitute for movements of factors of production. The essential idea is that each country's exports will be specialized in those factors in abundance in that country. In a demographic context, this would imply that countries with a demographic bulge, or more generally with a bulge in a particular age, education, or skill category, would have an export mix rich in those categories. Tests of this proposition have produced much more supportive results for intra-national than for international trade (Davis et al, 1997). The fact that relative factor abundance is less successful in explaining international than inter-regional trade flows within countries is consistent with the border effects literature discussed earlier. Nonetheless, we would expect to see some important cases where factor abundance shows up in international trade patterns.

There have been two much-noticed recent trade trends that might have increased the extent to which demographic changes might be altering the factor content of international trade. These include slicing of the supply chain in ways that permit different stages to take place where costs are low, and the related phenomenon of offshore outsourcing, wherein large segments of a firm's requirements for specific services are provided from remote locations linked by high-speed data connections. Recent examples have included call centres and a variety of information technology, accounting and billing services. These examples have received additional attention in part because they add a new dimension to the longer-standing shift of lower wage manufacturing and assembly activities to offshore locations. Perhaps more importantly, they often involve new and different streams of a firm's activities, including tasks previously kept close to head office, and often requiring high degrees of trust, reliability and education.

These new forms of outsourcing are relevant to this conference, and especially to this paper, because they illustrate some key parallels with migration, and may offer an alternative and possibly lower cost way for global demographic and development imbalances to be mediated.

Migration and offshore outsourcing (especially of services) are linked in complicated ways. At least anecdotally, the seeds for IT outsourcing to India came from the employment in Silicon Valley of Indian-born and Indian-trained IT professionals. These individuals often had dense networks of trust, knowledge and professional contacts in both societies. Such networks enabled established migrants, using a process that Kapur (2001) has called ‘reputational intermediation’, to provide immediate access to new resources at the drop of an e-mail. What was left in a Silicon Valley ‘to do’ or ‘too hard’ basket at the end of the day could be dealt with as if by magic by a trusted friend in Bangalore while Silicon Valley slept. Once such doors are open, they expose more widespread opportunities. These emerging opportunities are likely to be best exploited by slow experimental steps, so as not to threaten the crucial networks of trust necessary to enable urgent and confidential work to be done reliably by strangers in far-flung locations.

Thus we should expect to see in out-sourcing the same pathway phenomenon, the ‘friends and relatives effect’, that makes the existing stock of migrants such a strong predictor of future migration flows. We might also expect to find migration and offshore outsourcing to be seen increasingly as substitutes. IT professionals were among the first to adopt and adapt to telecommuting, and what is off-shore outsourcing of these services but a slight expansion of the telecommuting network? But what is now at stake is not just the time and expense of the daily commute, but the acquisition of a whole new set of potential employees set in their own established communities, fully trained and ready to work for a fraction of head office costs.

The fact that services can be provided offshore at a fraction of rich-country costs is sometimes considered to be evidence of exploitation of poor foreign workers. Exploitation may on occasion be part of the story, but the fundamental reason for the lower offshore costs is that the market-separating effects of space and borders are so great that there are large and pervasive differences in real exchange rates. Thus in low income countries it is possible to do almost anything much more cheaply than in countries with much higher levels of per capita incomes⁹. An IT professional in Bangalore can work for a fraction of the Silicon Valley wage (measured in dollars at the market exchange rate) and nonetheless have an equal or greater material standard of living (measured at purchasing power parity), while also maintaining his or her own life-

⁹ Bergin, Glick and Taylor (2004) provide data showing that this currently strong positive correlation between real per capita incomes and real exchange rates is a feature of the last fifty years, and was not much in evidence over the preceding century.

enhancing local networks of family, friends and neighbours. There is increasing evidence that the latter is even more important than the material standard of living.

People in poorer countries often report measures of life satisfaction as high as those in richer countries. Some economists have argued that this is paradoxical, and provides grounds for rejecting subjective measures of life satisfaction as indicators of well-being. I am convinced, on the contrary, that there is ample cross-sectional evidence within and across countries showing that the most important sources of life satisfaction relate to the way life is lived, and much less to levels of GDP per capita (Helliwell 2002, 2003, 2004). These non-material sources of life satisfaction are often higher, but not generally or necessarily so, in lower-income communities and countries.

Thus it matters to individuals, families, and communities, whether and how global interdependence, and the consequences of demographic changes, affect trade, capital mobility, institutional reforms, and migration. Theoretical work has shown, as might be guessed, that if each of the linkages has various types of externalities, it is possible that there are several different equilibrium outcomes, some much less desirable for all concerned. For example, Baldwin and Venables (1994) paint two contrasting models of development in the transition economies. In their vicious circle path, skilled professionals move west because they do not expect to see technology and capital move fast enough in the reverse direction, while those in the west able to provide technology and investment to the transition economies do not do so because of the expectation that the best and the brightest have already emigrated, or are likely to do so.

The virtuous circle path, by contrast, involves little emigration, lots of foreign investment and technology transfer, and rapidly rising incomes in the transition economies. I would be inclined to emphasize even more than they do the importance of high quality of governance in increasing the likelihood that the virtuous path is feasible. In any event, their analysis of the transition economies has great relevance for the alternative ways in which global demographic and development imbalances are likely to be worked out over the current century.

Policy Challenges

The policy challenges posed by demographic change differ for youth bulges and elderly bulges, and according to each nation's level of development and place in the global economy. Taking the

narrow national perspective of the government of a rich industrial country with an aging population, international capital mobility is seen as a way to smooth looming imbalances of national savings and investment, while migration is seen as a possible source of new tax-paying workers to cover the costs of pensions and health care for aging baby boomers. However, the broad nature of the evidence on factor mobility is that while both capital and population move internationally to some extent in response to demographic pressures, the basic issues will remain whatever changes may be made to national policies affecting factor mobility. The issues are quite different for capital movements and migration, and will thus be considered separately.

In global samples, there is some evidence that countries with high dependency ratios have tended to import capital, i.e. to run current account deficits. However, these effects appear to be smaller for the OECD countries, and insignificantly different from zero in the case of share of the population aged 65 and up. Thus the national data appear to show some echo of the microeconomic evidence that those over 65 have not been consuming as much, relative to their incomes and assets, and compared to those in younger age groups, as life-cycle models would predict¹⁰. In addition, simulation models assuming life-cycle spending do not show marked capital movements among the different groups of developed economies, in part because they are all going through somewhat similar aging cycles. One might therefore think that capital would flow from the developing world to the industrial countries, given that the former are at generally much earlier stages of their demographic transitions.

However, there are several reasons for expecting that these are not likely to be large net movements. First, China, with an economy by far the largest in the developing world, and in purchasing power parity terms already much larger than any other national economy but that of the United States, is going through a demographic transition much like that of the industrial countries, and only a relatively few years behind. Second, the global evidence seems to suggest that youth dependency is as likely as elder dependency to lead to net capital inflows, and important parts of the developing world, especially in Africa and to a lesser extent Latin America, are thereby still capital users on demographic account. Figures 13 to 15 show the projected elderly, youth, and active population shares by continent, and for the world as a whole, over the first half of the 21st century. Figure 13 shows the population share of the elderly to start high and rise slightly higher in Europe, and to remain low in Africa, while rising fairly rapidly in

¹⁰ See Deaton and Paxson (1997) and the survey of Bosworth, Bryant and Burtless (2004).

most other parts of the world, and in the world as a whole. As was already foreshadowed by Figure 3, the youth dependency share in Figure 14 is projected to remain very high in Africa and very low in Europe, with steady reductions in other continents and the world as a whole. The net effect of these offsetting changes in dependency ratios, as shown by the share of the population aged 15-64 in Figure 15, shows a hypothetical working population share that is at first rising and then declining as the century progresses. In continental terms, the peak active share is projected to be reached in 2010 in Europe, North America and Oceania, in 2015 in Asia and 2020 in South America, but not until after mid-century in Africa. In broad continental terms, it is only in the case of Africa that the demographic transitions are different enough from those in other continents to be a major spur for international factor movements.

The third factor is even more fundamental, and is likely to be of even greater empirical importance. If and when the institutional and economic structures of developing countries are solid enough to support raising their standards of health, education, nourishment and personal security towards the levels that are taken for granted in the older industrial societies, rates of return on investment there are likely to rise enough to increase substantially the share of world savings invested those countries. It will still be the case, as the Feldstein-Horioka evidence shows so graphically, that most countries will finance the largest part of their investment from savings generated at home. Yet to the extent that the growth process takes off in developing countries, as exemplified most recently in China and India, market pressures are more likely to change to favour inflows than outflows of international investment. Thus although any successful generalization of the development process is likely to generate greater world savings, it is likely at the same time, and for the same reasons, to lead to an even greater share of world investment in the developing world¹¹.

The combination of these factors is likely to mean that the industrial countries are not likely to run significant current account deficits during their aging processes, especially with relation to the developing world as a whole. That said, it is probably worth saying, as has been emphasized

¹¹ This point is made more insightfully by Alan Taylor in his comment. He argues that even if the poorest countries have a demographic structure that might lead to capital exports on demographic account, such countries would be unlikely to have the institutions and economic structures to generate, collect, and transfer the savings in question. But if they did have those institutions in place, then this would raise the expected return on investments in these countries (given their low levels of capital and per capita incomes) to induce large-scale capital inflows. This suggests an important policy conclusion. World capital markets are most likely to protect asset values in aging rich societies not by importing savings from poor countries, but by international efforts to raise world rates of return on

by several researchers, that current account effects of demographic transition could be large enough to enter whatever calculations are made about the longer-term dynamics of current accounts. One more reason, you might say, for not using a zero balance of the current account as an implicit or explicit policy target. And just as well. In a world where a large and growing number of industrial countries (or groups of countries, in the case of the euro zone) are operating monetary systems based on flexible exchange rates and inflation targeting, it simplifies matters to be able to ignore the current account as a direct or even intermediate policy target.

In the case of migration, there is even less reason for expecting changes in migration policy to provide the most appropriate response to the fiscal pressures of population aging in the industrial societies. For starters, there are the simulation studies showing that large-scale movements of population are not likely to lower tax rates in the aging societies. Some recommendations for large scale migration to countries with low birth rates have been based on the presumption that there are economic or social returns from larger scale. However, there is no correlation between population size and levels of GDP per capita, suggesting the absence of any substantial national returns to scale. As revealed by Ralph Bryant's (2004a, 2004b) global modeling of asymmetric birth-rate reductions, a smaller population can improve a country's terms of trade and real per capita incomes¹². If we all hanker after Swiss chocolate, and there are fewer Swiss to produce it, then we have to pay more for the privilege. When attention moves to consider measures of the quality of government assembled by Kaufman et al (2003), or a variety of measures of life satisfaction, the correlation with country size turns negative for global and industrial country samples alike.

In cases where countries heavily screen their migrants to let in only those most able to pay their own way, and also contribute to the support of the resident old-timers (Fehr et al 2003), this would be likely to worsen matters for the countries of emigration more than it would improve the lot of those in the richer countries. In terms of global welfare, for the rich countries to cherry-pick skilled international migrants in order to make it easier for them to finance their own

investment by helping the poorest countries to build institutional structures of sufficient strength to support their economic and social development.

¹² In his paper for this symposium (Bryant 2004b), Bryant cautions, I think correctly, that his assumptions about consumer preferences, while commonly made, are likely to overstate the extent to which real per capita incomes will for this reason rise in countries with relatively slow-growing populations. I continue to think that there is far more alignment between local tastes and local production than is implied by the preference assumptions he is using and he and I are questioning.

retirement at income levels many times the world average seems almost unbelievably and short-sightedly self-serving.

This conclusion would seem fairly obvious even in the national interests of the industrial countries. But when the canvas is extended to include broader measures of well-being, and to take into account the interests of the developing world, then the argument seems to me even clearer. Five points are of particular importance. First, there is simply no way in which moving large fractions of the world's population can solve the major problems in either the sending or the receiving regions. The fraction of the world's population already well-enough situated to be able to help the rest is simply too small for their help to take the form of large-scale intercontinental migration.

Second, the critical shortages and gaps that can make life miserable relate to the structure of society, and the institutions by which it operates. These cannot be parachuted in from abroad, but there are nonetheless many ways in which international efforts from all segments of more favoured societies can help plant and nurture the seeds. Third, broader measures of well-being depend far more on the quality of families, communities and institutions than on conventional measures of the economic standard of life (Helliwell 2002, 2003).

Fourth, building life satisfaction requires individuals to feel engaged and efficacious, collaborating with others to produce a better life. These feelings of mutual engagement turn out to be of far more importance than the material consequences of their efforts. This may sound heretical to some economists, but it is so striking in the evidence that it needs, in my view, to be given a more central role in the design of national and international policy agendas. Finally, studies of both life satisfaction and suicide (Helliwell 2004) show that migration is costly in more than economic terms, and poses adjustment costs on both the sending and receiving communities. As the experience of the main immigrant-receiving countries has shown, immigration has been broadening and enriching, producing globe-spanning networks of value to individuals and to society as a whole. But expanded migration to a level that would materially alter demographic balances would be to strain the capacity of the receiving countries while draining much-needed human resources from the source countries.

These five points together suggest that the most appropriate ways of dealing with global demographic transitions do not lie in large-scale international movements of either capital or labour, but in the sharing of ideas, of institutional know-how, of scientific advances, and of opportunities. If modern technology permits international collaboration of a far more sophisticated and mutually enriching sort than was possible even a decade or two ago, then this should be welcomed as part of the mix. Seen in this light, outsourcing is more a solution than a problem. By permitting virtual commuting between Bangalore and New York, it may well provide a highly effective means of exploiting demographic imbalances to mutual advantage. But successful societies will continue as always to pull themselves up by their own bootstraps, aided by as much international collaboration as populations are ready and willing to provide and receive.

If large-scale factor movements are not likely to do much to mediate global demographic transitions in the coming decades, what might? To attempt an answer this question takes me beyond my assigned task. But if I am to end on an upbeat note, something needs to be offered in response to the policy challenges posed by increasing dependency ratios in the industrial countries. In keeping with the well-being focus that I have advocated here, the primary point to be made is that the well-being of both older and younger members of society depends much more on their active engagement than on their incomes. This suggests that the search should be on for policy options that support families, communities, and workplaces, increasing the extent to which each can contribute directly to the well-being of its members while also providing the services whose currently forecast costs are the focus of policy-making concern in OECD countries.

In some cases, such as medical care, focusing more attention to the building and maintenance of families and communities can reduce the cost and scale of demand, since much evidence, reaching back some decades (e.g. Berkman and Syme 1979) shows that those who are actively integrated with family, friends, workmates, and communities, whether religious or secular, have lower rates of mortality and morbidity from many causes. More recent research shows that they also have higher levels of subjective well-being. Longer attachment to both commercial and non-commercial workplaces offer the prospects of life-enhancing experiences while coincidentally reducing the pressures on established pension and health care systems. Recent Canadian research suggests that to work where management can be trusted, where skills are required, where the

work has variety, sufficient time for completion, and is free of conflicting demands raises life satisfaction by amounts whose monetary equivalent is several times larger than average incomes. This has important implications for the management of all workplaces, but it is especially promising for the development of new ways of providing services both by and for those who are currently being viewed as part of dependent populations. Even the terminology of dependence reflects what I now think to be the wrong way of addressing the very real issues that are faced by aging populations.

What might it require to convert policies and perceptions about dependent populations, so as to increase their participation and reduce their perceived and actual dependence? The adoption of community-based and generation-spanning delivery of services would seem an obvious starting point. Why should not the elderly and the very young be able to enrich each others' lives in times and places that depend much less than currently on full-time professional care-givers? Cash-strapped public and private service providers who may be attracted by these possibilities will already realize how many elements need to come together if current trends are to be slowed and reversed. They need to be warned that many pre-conceptions need to be questioned, and many cultural and professional divides need to be crossed.

Some co-incidental changes are taking place elsewhere in OECD societies of a sort that may facilitate the re-conception of service provision by and for the younger and older segments of the population. These include the declining use of age-based employment contracts, the removal of compulsory retirement provisions, and the increasing use of defined contribution rather than defined benefit pension plans. These trends, which are themselves due in part to the same demographic pressures, will help to make it easier for individuals, associations, and employers to invent more flexible ways of making the best use of extended lifetimes. To go deeper into the evidence, possibilities and issues involved would take me too far from my assigned task. But I could not bring myself to conclude without at least hinting at some promising new approaches to the social and fiscal issues of demographic change.

Conclusion

I have surveyed a range of research and added some new results on the links between demographic changes and international movements of capital and population. What are the main conclusions?

It remains true that the bulk of economic and social life takes place close to home, and that distance and national boundaries continue to provide an important part of the organizing framework for commercial, individual, family, and community activities. Thus both people and capital stay close to home, even after centuries of impressively strong, and historically variable, international connections. The oft-noted U-shape curve of declining and then increasing international intensities over the past century applies clearly to movements of goods and capital, while less so to migration, which is now determined much more by migration policies than by the number of willing migrants.

If this is broadly the state of affairs, what are the implications for policy? The extent of international capital mobility is affected partly by policy decisions, but mainly by preferences and institutions unaffected by demographic changes. Migration is a relatively rare event, but for many countries is determined by explicit policies. The evidence I have considered suggests that large increases in migration are more likely to worsen rather than ease the problems posed by demographic transitions of all the projected types. This means that the policies needed to adapt to demographic changes will have a domestic focus. However, I did note that offshore out-sourcing might provide an example where new trade patterns were developing in a way that reflects and develops to mutual advantage the emerging patterns of skills, technologies and costs. It may thus provide some implicit demographic smoothing more efficiently, in both economic and human terms, than would be possible through large scale international population movements.

Throughout, I have suggested analyzing the consequences of demographic transitions in terms of well-being, as measured by individuals' own assessments of life satisfaction, rather than just in terms of GDP per capita. This has two important implications for the structure of my argument. First, it changes the analysis of the costs and benefits, since the subjective well-being benefits of engaged families, communities and workplaces are far larger than those from higher incomes, especially when incomes have reached the levels of those in the OECD countries. Second, it demands that policies be assessed in terms of their effects on how people live, work and participate in their communities. To illustrate, I suggested a few ways in which demographic

transitions could be eased, and even turned from problems into opportunities, by abandoning the notion of dependent population groups and instead seeking ways of giving individuals more scope, in both years and space, to engage with each other in mutual support. This could well lead both to greater engagement and lower costs. Recent research in well-being suggests that increased engagement is the more important of the two benefits, but so much the better to find policies that could do more with less.

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Table 1: Cross-sectional equations explaining domestic investment rates by national savings rates

	OECD24			Rest			Global	
	Coeff.	t-stat		Coeff.	t-stat		Coeff.	t-stat
y1976~1980	0.8	[6.65]		0.7	[12.15]		0.68	[13.65]
y1981~1985	0.53	[4.04]		0.57	[9.20]		0.55	[10.10]
y1986~1990	0.6	[6.94]		0.51	[9.58]		0.52	[11.27]
y1991~1995	0.42	[5.30]		0.59	[11.29]		0.56	[11.81]
y1996~2000	0.17	[1.63]		-0.06	[0.83]		-0.06	[0.94]

Table 2a. Explaining net international migration rate by population shares 15-29

	OECD24			Rest			Global	
	s1529_d			s1529_d			s1529_d	
y1976~1980	-0.09	[0.32]		-0.28	[1.18]		-0.4	[2.52]
y1981~1985	0.12	[0.54]		-0.34	[1.50]		-0.35	[2.22]
y1986~1990	-0.31	[0.69]		-0.56	[1.78]		-0.61	[2.93]
y1991~1995	-0.58	[2.37]		0.19	[0.57]		-0.29	[1.21]
y1996~2000	0.06	[0.28]		-0.11	[0.35]		-0.26	[1.40]

Table 2b. Explaining net international migration rate by population shares 15-29, and PPP GDP per capita

	OECD24					Rest					Global			
	s1529_d		pppgdp			s1529_d		pppgdp			s1529_d		pppgdp	
y1976~1980	-0.11	[0.36]	-0.17	[0.66]		-0.29	[1.17]	0.05	[0.16]		-0.32	[1.85]	0.15	[1.20]
y1981~1985	0.2	[0.96]	0.26	[2.01]		-0.36	[1.54]	0.16	[0.66]		-0.25	[1.37]	0.14	[1.33]
y1986~1990	0.3	[0.68]	0.53	[2.75]		-0.56	[1.76]	0.06	[0.22]		-0.45	[1.73]	0.12	[1.00]
y1991~1995	-0.21	[0.71]	0.22	[2.00]		0.6	[1.73]	0.87	[3.21]		0.53	[1.73]	0.54	[4.05]
y1996~2000	0.36	[1.78]	0.21	[2.91]		0.34	[0.99]	0.55	[2.90]		0.37	[1.34]	0.34	[3.01]

Table 3a: Explaining national savings rates by population shares 0-14 and 65&up

	OECD24					Rest					Global			
	s0014_d	t-stat	s65up_d	t-stat		s0014_d	t-stat	s65up_d	t-stat		s0014_d	t-stat	s65up_d	t-stat
y1976~1980	-0.74	[2.76]	-0.76	[1.68]		-0.25	[0.70]	0.44	[0.40]		-0.36	[1.35]	-0.17	[0.27]
y1981~1985	-0.81	[2.36]	-0.84	[1.38]		-0.74	[2.49]	-0.68	[0.73]		-0.74	[3.09]	-0.96	[1.64]
y1986~1990	-0.89	[2.09]	-1.06	[1.50]		-1.02	[4.58]	-1.48	[2.09]		-1	[5.33]	-1.61	[3.58]
y1991~1995	-1.31	[2.07]	-1.73	[1.78]		-0.98	[4.04]	-1.48	[2.32]		-0.98	[4.70]	-1.49	[3.13]
y1996~2000	-0.61	[0.78]	-0.54	[0.53]		-0.8	[3.49]	-1.45	[2.54]		-0.7	[3.50]	-0.96	[2.25]

Table 3b: Explaining national savings rates by population shares aged 15-64

	OECD24			Rest			Global	
	s1564_d			s1564_d			s1564_d	
y1976~1980	0.73	[3.05]		0.43	[1.60]		0.47	[3.10]
y1981~1985	0.79	[2.74]		0.76	[3.41]		0.63	[4.66]
y1986~1990	0.81	[2.21]		0.89	[5.37]		0.67	[5.99]
y1991~1995	1.03	[1.90]		0.76	[4.93]		0.68	[5.55]
y1996~2000	0.65	[0.96]		0.53	[3.21]		0.56	[4.01]

Table 4a: Explaining domestic investment rates (gross capital formation) by population shares 0-14 and 65&up

	OECD24					Rest					Global			
	s0014_d		s65up_d			s0014_d		s65up_d			s0014_d		s65up_d	
y1976~1980	-0.32	[1.05]	-0.33	[0.64]		-0.29	[0.98]	0.1	[0.11]		-0.31	[1.37]	-0.43	[0.80]
y1981~1985	-0.36	[1.16]	-0.58	[1.05]		-0.63	[2.64]	-0.88	[1.18]		-0.6	[3.07]	-1.16	[2.42]
y1986~1990	-0.56	[1.74]	-0.72	[1.38]		-0.64	[3.89]	-0.97	[1.85]		-0.63	[4.54]	-1.05	[3.17]
y1991~1995	-0.95	[2.86]	-1.4	[2.76]		-0.63	[3.14]	-1.15	[2.16]		-0.66	[3.84]	-1.34	[3.40]
y1996~2000	-0.82	[2.29]	-1.2	[2.53]		0.01	[0.04]	0.13	[0.27]		-0.05	[0.32]	-0.15	[0.44]

Table 4b: Explaining domestic investment rates (gross capital formation) by population shares 15-64

	OECD24 s1564_d			Rest s1564_d			Global s1564_d	
y1976~1980	0.32	[1.16]		0.4	[1.74]		0.25	[1.91]
y1981~1985	0.25	[0.96]		0.56	[3.13]		0.3	[2.73]
y1986~1990	0.46	[1.70]		0.55	[4.47]		0.4	[4.86]
y1991~1995	0.65	[2.15]		0.41	[3.16]		0.27	[2.59]
y1996~2000	0.52	[1.50]		0.04	[0.31]		0.001	[0.02]

Table 5a: Explaining current account balances (as shares of GDP) by population shares 0-14 and 65&up

	OECD24 s0014_d		s65up_d			Rest s0014_d		s65up_d			Global s0014_d		s65up_d	
y1976~1980	-0.42	[2.63]	-0.43	[1.60]		0.05	[0.22]	0.34	[0.54]		-0.05	[0.29]	0.26	[0.72]
y1981~1985	-0.45	[1.69]	-0.26	[0.55]		-0.11	[0.51]	0.2	[0.29]		-0.14	[0.81]	0.19	[0.45]
y1986~1990	-0.34	[1.33]	-0.33	[0.79]		-0.38	[2.22]	-0.51	[0.93]		-0.37	[2.61]	-0.56	[1.64]
y1991~1995	-0.36	[0.76]	-0.32	[0.45]		-0.34	[1.99]	-0.33	[0.71]		-0.32	[2.14]	-0.16	[0.46]
y1996~2000	0.21	[0.29]	0.66	[0.67]		-0.8	[2.62]	-1.58	[2.05]		-0.65	[2.42]	-0.81	[1.42]

Table 5b: Explaining current account balances (as shares of GDP) by population shares 15-64

	OECD24 s1564_d			Rest s1564_d			Global s1564_d	
y1976~1980	0.41	[2.90]		0.03	[0.22]		0.22	[2.48]
y1981~1985	0.54	[2.36]		0.2	[1.21]		0.32	[3.24]
y1986~1990	0.34	[1.58]		0.35	[2.70]		0.27	[3.23]
y1991~1995	0.38	[0.96]		0.35	[3.20]		0.41	[4.73]
y1996~2000	0.14	[0.20]		0.49	[2.21]		0.56	[3.03]

Data Source: National Account Information: World Development Indicators, on line database

Demographic Information: United Nations Common Database-on line

Sample Size: Except for table 1 where observations from period 1961-1975 were used, all other tables are based on the 574 observations from the following periods

of nations

y1976~1980	95
y1981~1985	103
y1986~1990	110
y1991~1995	130
y1996~2000	136

Figure 1: Investment-Saving Relation for the 16 OECD Nations of Feldstein-Horioka (1980)

Y: Gross Capital Formation (% of GDP)

X: Gross National Saving (% of GDP)

Source: WDI

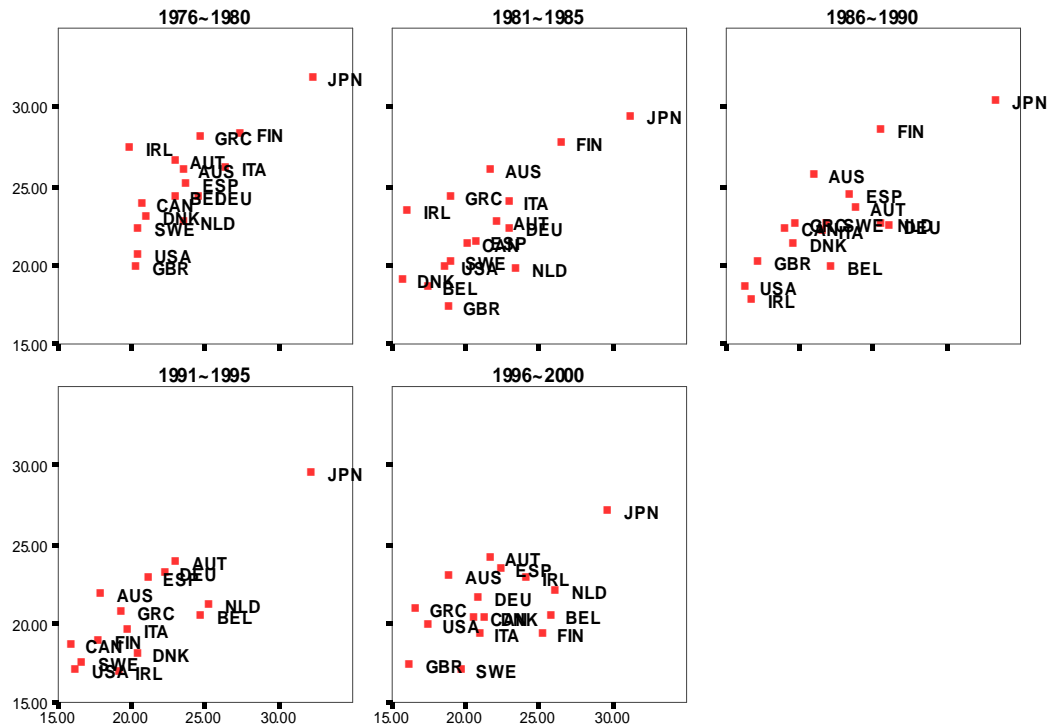


Figure 2: Investment-Saving Relation for Global Sample

Y: Gross Capital Formation (% of GDP)

X: Gross National Saving (% of GDP)

Source: WDI

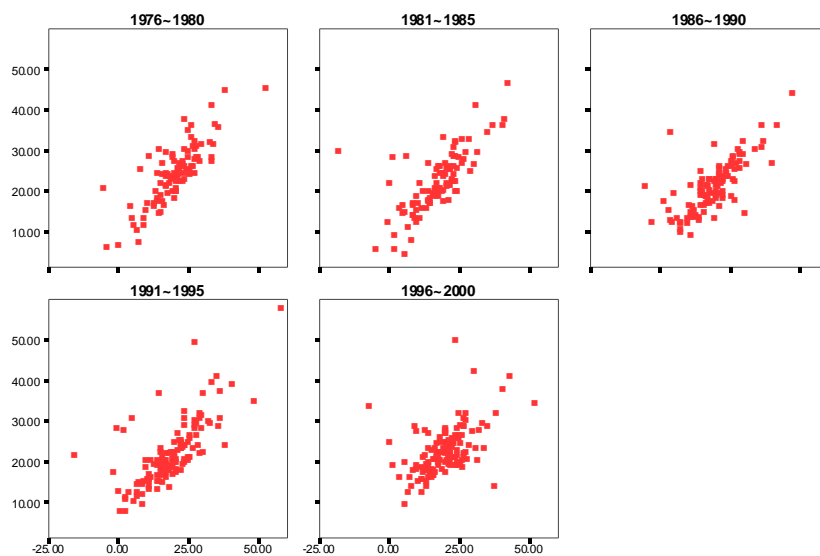


Figure 3

**Projected Share of Population Aged Below 20,
Year 2020**

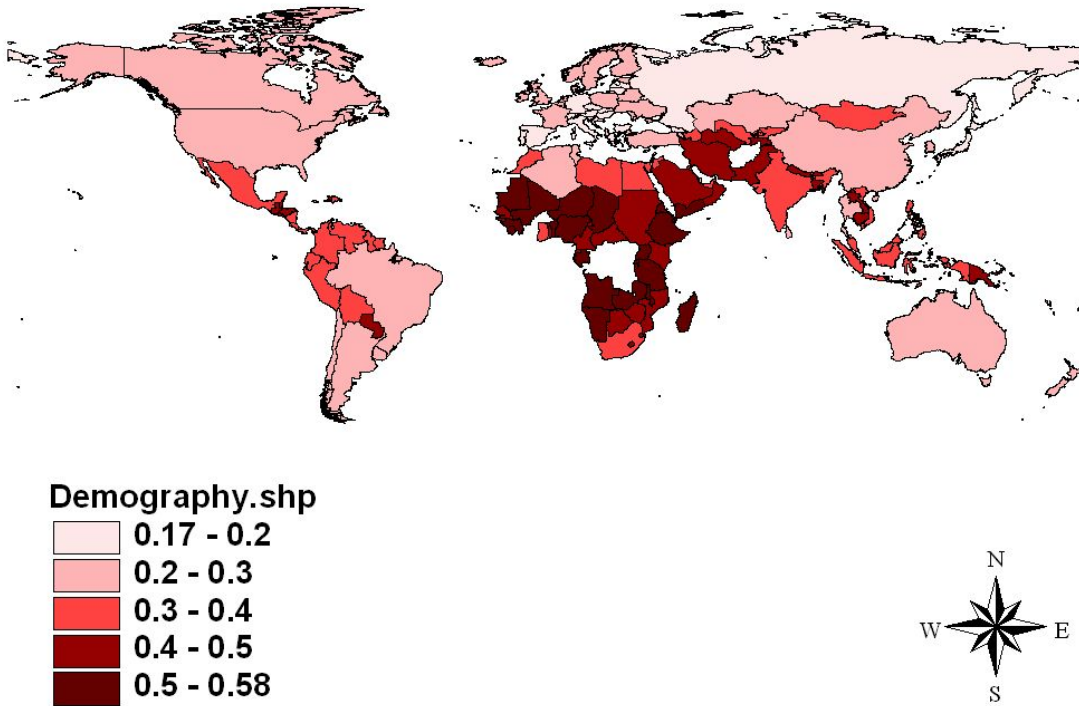


Figure 4: Savings and Youth

Y: Gross National Saving (% of GDP)

X: Difference to World Average, Share of population aged below 15

Source: WDI

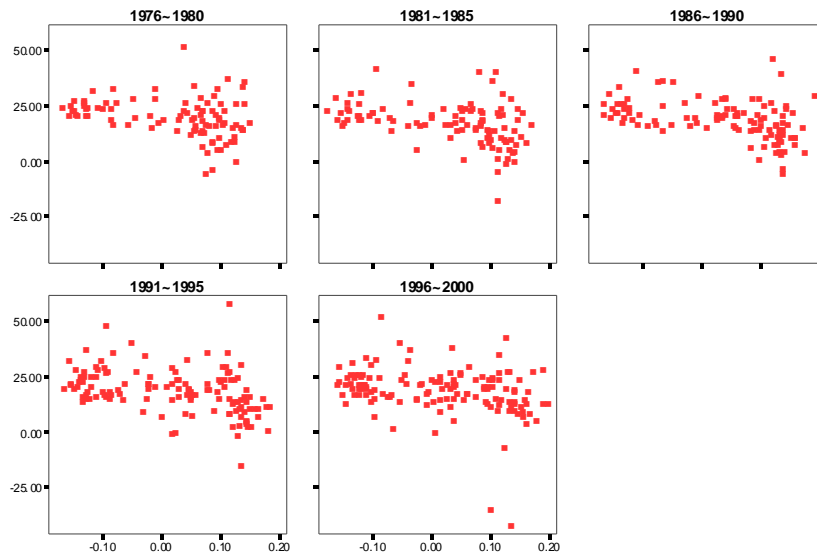


Figure 5: Savings and population 65 and up

Y: Gross National Saving (% of GDP)

X: Difference to World Average, Share of population aged 65 and over

Source: WDI

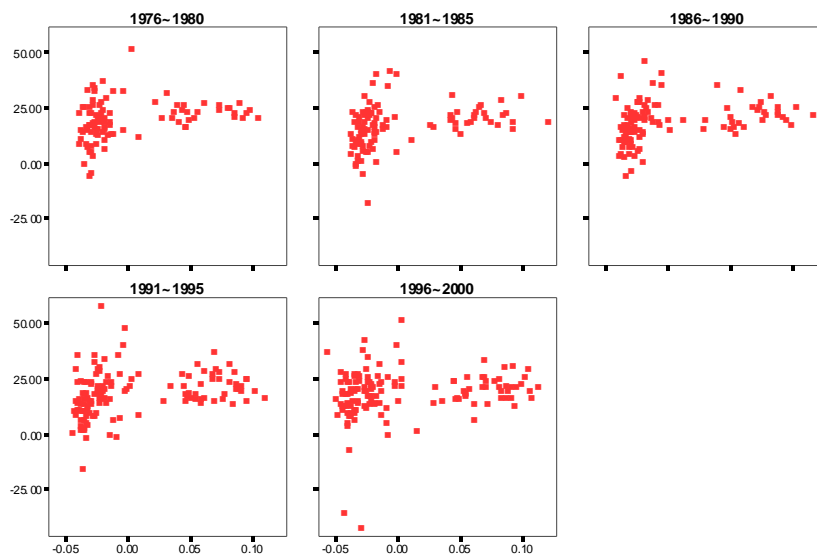


Figure 6: Savings and Population 15-64

Y: Gross National Saving (% of GDP)

X: Difference to World Average, Share of population aged 15-64

Source: WDI

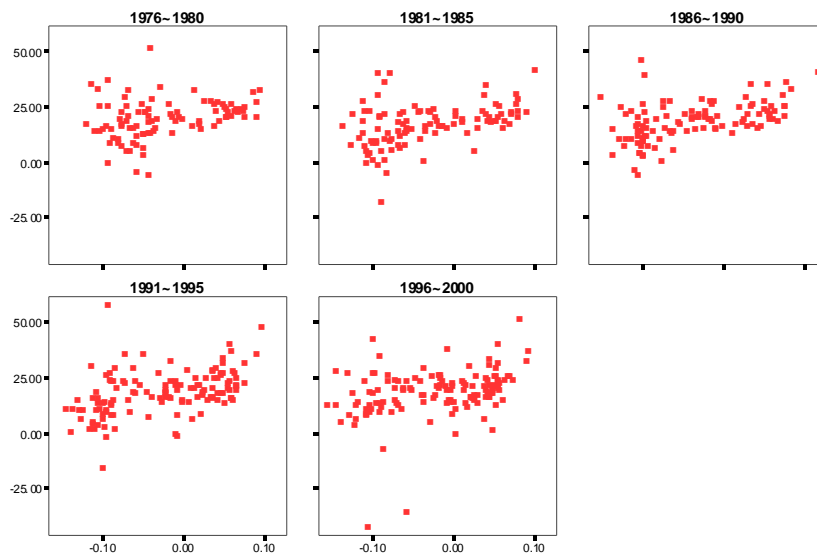


Figure 7: Investment and Youth

Y: Gross Capital Formation, % of GDP

X: Difference to World Average, Share of population

Source: WDI

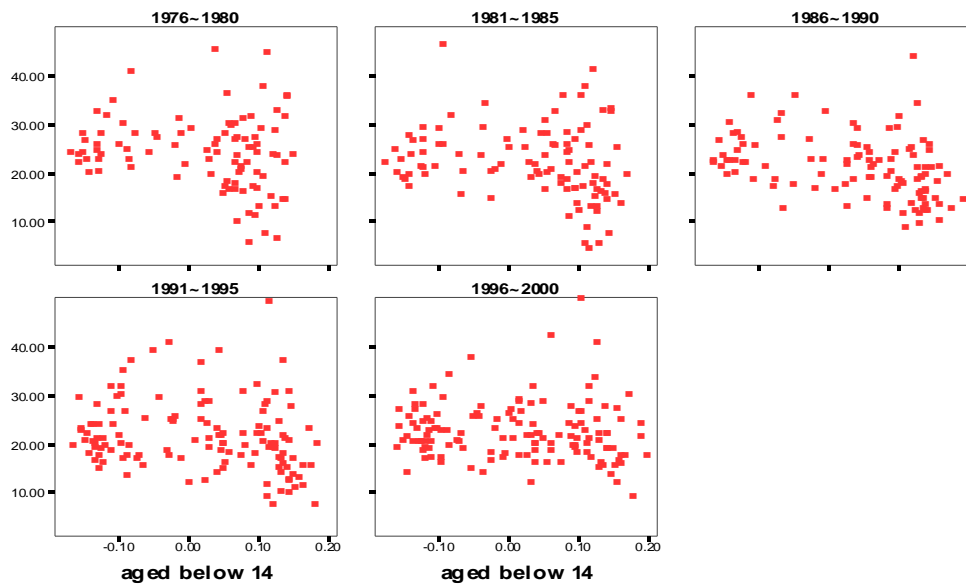


Figure 8: Investment and Population 65 and up

Y: Gross Capital Formation, % of GDP

X: Difference to World Average, Share of population aged 65 and over

Source: WDI

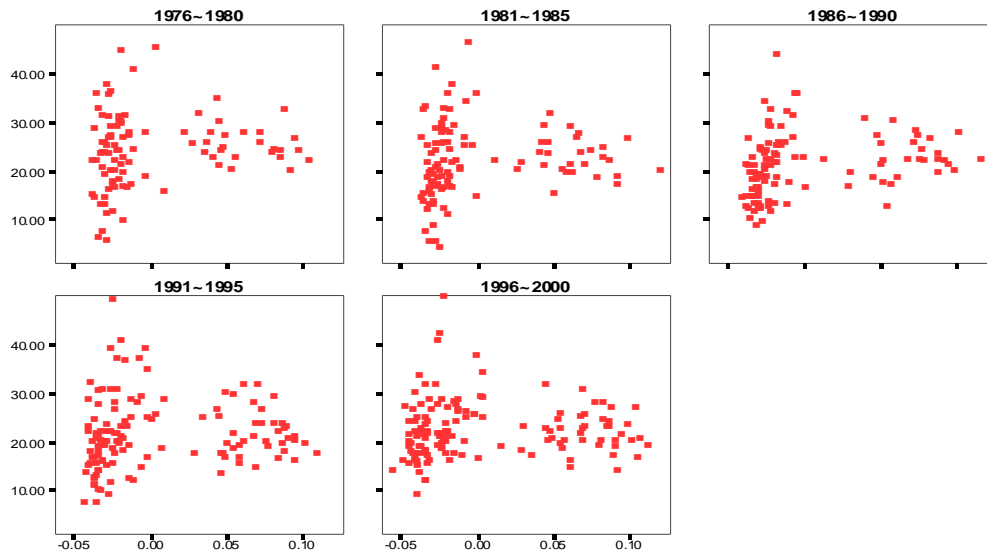


Figure 9: Investment and Population 15-64

Y: Gross Capital Formation, % of GDP

X: Difference to World Average, Share of population aged 15-64

Source: WDI

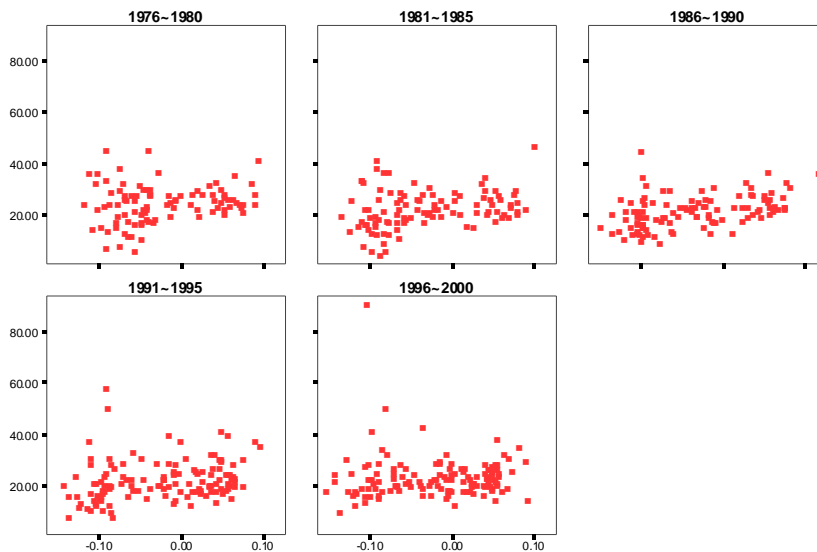


Figure 10: Current Account Balance and Youth

Y: Current Account Balance, % of GDP

X: Difference to World Average, Share of population aged below 15

Source: WDI

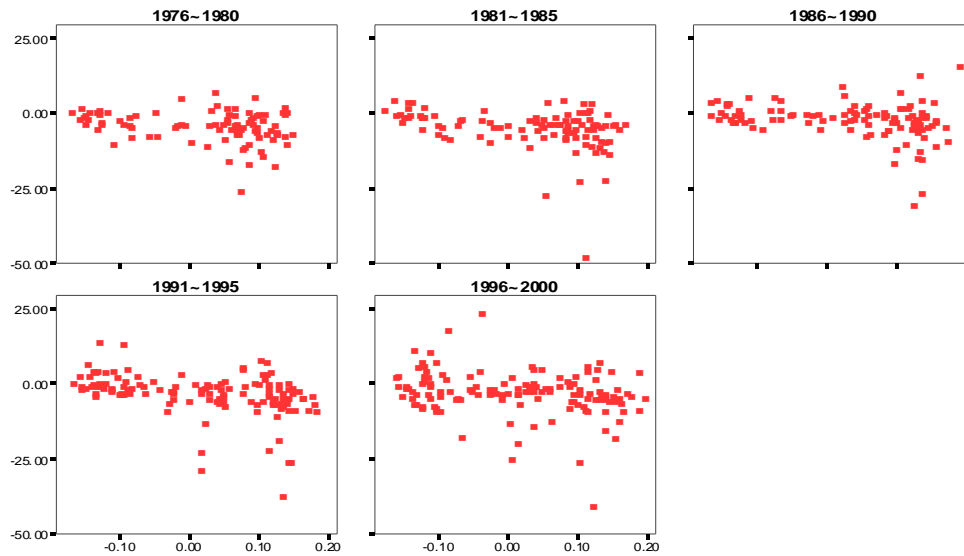


Figure 11: Current Account Balance and Population 65 and up

Y: Current Account Balance, % of GDP

X: Difference to World Average, Share of population aged 65 and over

Source: WDI

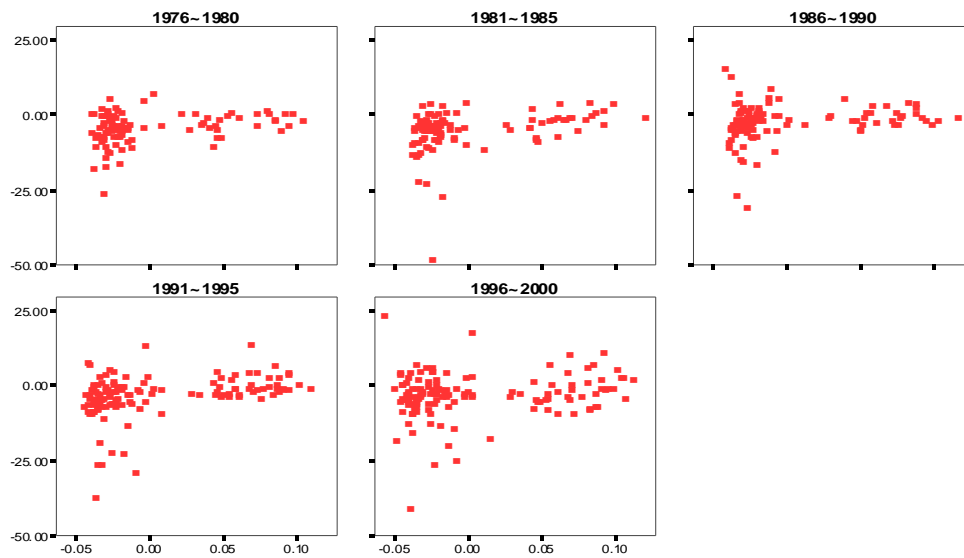


Figure 12: Current Account Balance and Population 15-64

Y: Current Account Balance, % of GDP

X: Difference to World Average, Share of population aged 15-64

Source: WDI

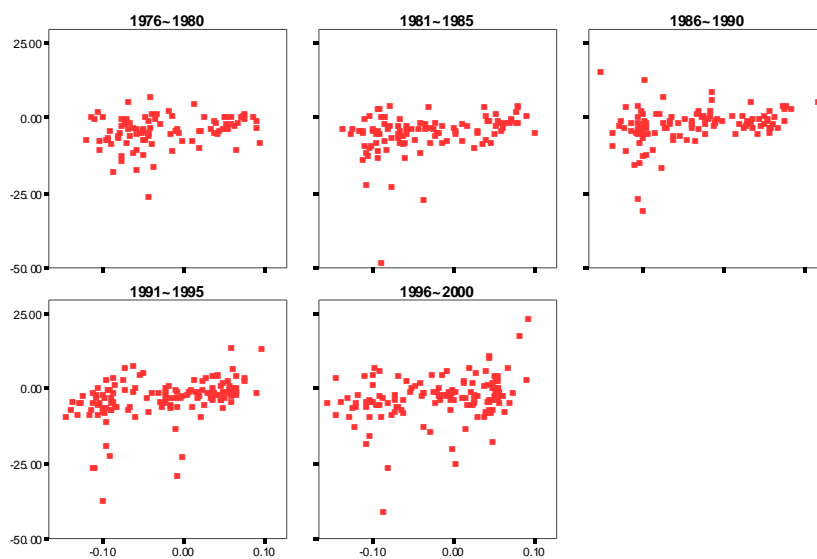


Figure 13: Projected Elderly Age Shares by Continent: 2000-2050

Y: % share of population aged 65 and over

X: Year, 2000 – 2050

Source: US Census Bureau International Data Base

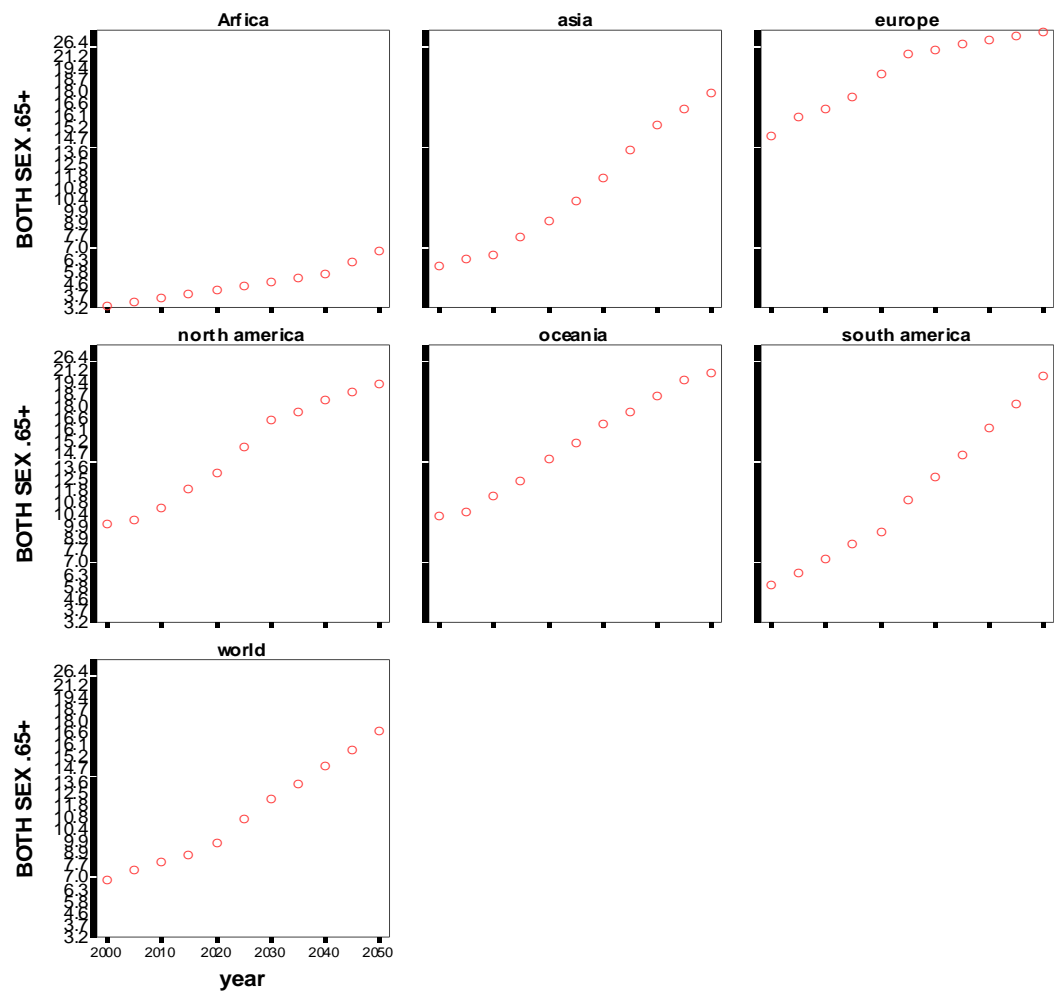


Figure 14: Projected Youth Age Shares by Continent, 2000-2050

Y: % share of population aged below 15

X: Year, 2000 – 2050

Source: US Census Bureau International Data Base

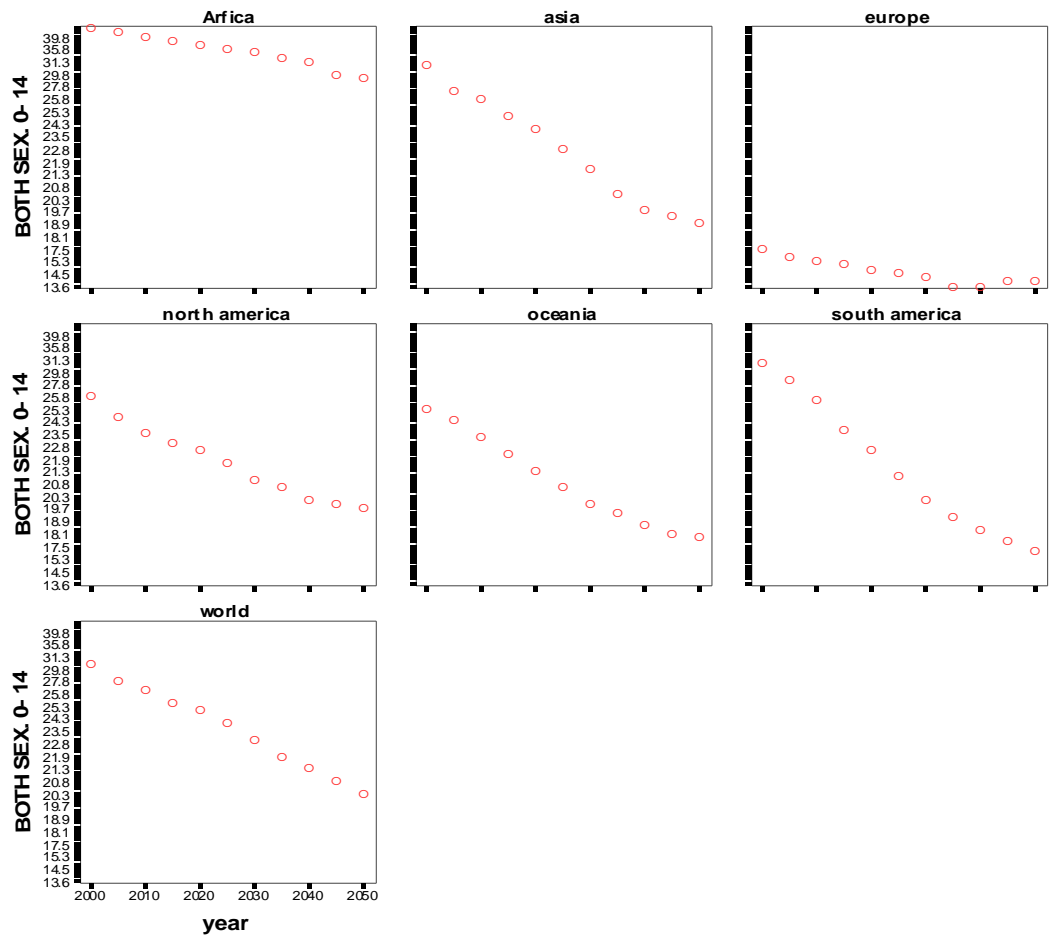


Figure 15: Projected Age Shares 15-64 by Continent, 2000-2050

Y: % share of population aged 15 - 64

X: Year, 2000 – 2050

Source: US Census Bureau International Data Base

