Louder than an economic boom!!!

FROM THE EDITOR

Welcome to Issue 16 of *EcoNZ@Otago*!

As most readers know already, *EcoNZ@Otago* is a magazine about contemporary economic issues, published by the University of Otago's Department of Economics.

The contents of the previous 15 issues of *EcoNZ@Otago* are listed at the back of this issue, and single issues are available on request (our addresses are below).

If there are any economic issues that you would like examined in a future issue of *EcoNZ@Otago*, then please email your suggestions to: econz@otago.ac.nz

Or you can write to *EcoNZ@Otago*, Department of Economics, University of Otago, PO Box 56, Dunedin.

I hope you enjoy this issue – my last as editor. Thanks to you all – both readers and authors – for your support over the last three years.

Best wishes
Paul Hansen

# Immigration to New Zealand – Kiwis by *choice* rather than accident

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I'd move to Los Angeles if New Zealand and Australia were swallowed up by a tidal wave, if there was a bubonic plague in England and if the continent of Africa disappeared from some Martian attack - Russell Crowe.

MANY FACTORS influence a person's decision to move to another country. These include the economic and social conditions in the person's country of origin relative to those in the destination country, as well as travel and relocation costs. This article seeks to unravel the relative importance of these factors for immigration to New Zealand.[1]
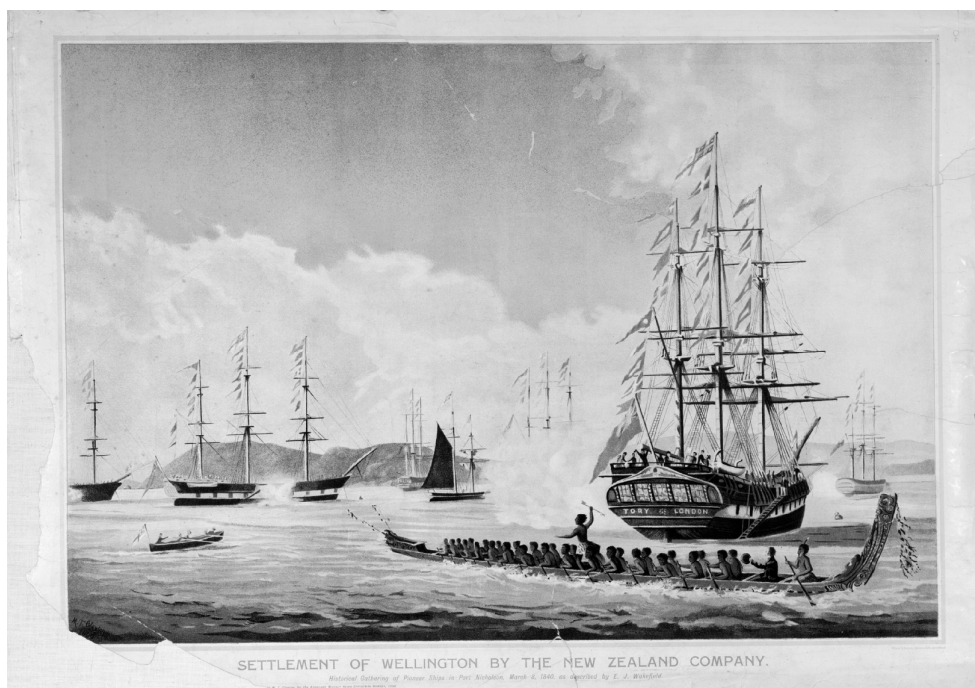
(By Matthew Thomas Clayton, Alexander Turnbull Library, Wellington, C-033-005)

European settlers arriving in New Zealand.

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[1] For a discussion of the pros and cons of immigration for New Zealand, see an earlier *EcoNZ@Otago* article, King & MacDougall (2003).

A nation of immigrants

According to the 2001 Census, one in five New Zealand residents was born overseas; in Auckland, the ratio is about one in three (Statistics New Zealand 2002). Figure 1 shows the birthplaces of foreign-born New Zealand residents in recent years. About 58% were born in Europe, 27% in Asia, and about 14% in the Pacific Islands.

The predominance of immigrants from the UK and Ireland is not new. It started even before the signing of the Treaty of Waitangi in 1840, when the New Zealand government subsidised the costs of immigration, especially for white Europeans, mainly from the UK and Ireland.

Until recently, immigration policy operated as part of labour market policy, with the aim of easing skill shortages in particular sectors of the economy. Rapid assimilation into the community was also deemed to be very important, and so immigration policy favoured white Europeans, with Asians and black Africans refused entry into New Zealand. In other words, New Zealand had a "traditional source country preference" (Bedford 2003).

There were also immigrant flows from neighbouring South Pacific island countries. This was mainly to allow Pacific Island people to fill gaps in the unskilled labour market, whereas skilled workers remained predominantly from the traditional "white" source countries.

In 1974, after high levels of immigration, the British and Irish were also required to apply for permits, just like everyone else.

During the 1980s, the Labour governments' policy was to select immigrants according to a defined set of criteria based on an occupational priority list that addressed the needs of the economy. The traditional source country preference was also abolished to discourage racial discrimination.

Recent immigration policy

Since 1990, when the National Government announced its belief that New Zealand's standard of living depended on high levels of immigration, immigration policy has been treated specifically as an instrument for promoting economic growth and not just as a means of filling specific labour market shortages. The occupational priority list was replaced with a points system similar to ones operating in Australia and Canada.

With the aim of regulating their number and quality, *economic* immigration applicants (under the skills/business stream – in contrast to applicants under the family sponsored or international humanitarian streams) are awarded points for their qualifications, work experience, age, ability to speak English and financial resources. High-scoring applicants are expected to be the most productive and therefore of the greatest use to the New Zealand economy.

Since the 1990s, the points system and the categories under which potential immigrants can apply have become more refined, but the main aim remains (NZIS 1997):

> to allow entry to migrants who would make the highest contribution to employment and income growth … [and] … to maximise the gain in productive human capital while maintaining provisions for migrants to enter New Zealand for social and humanitarian reasons.

Having considered the characteristics that New Zealand (at least, its governments) looks for in its immigrants, we next look at the *'demand side'* of immigration. That is, we consider why people choose to apply (i.e. 'demand') to come to New Zealand.

Figure 1: Birthplaces of New Zealand residents born overseas, 1991, 1996 and 2001
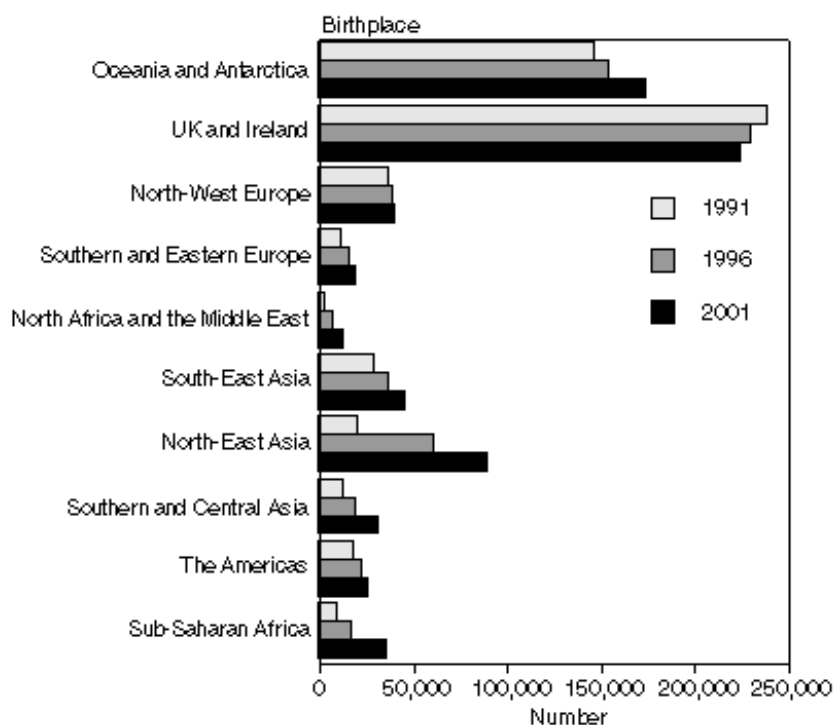
Source: Statistics New Zealand (2002)

The economic theory of migration

According to this theory, the decision to relocate to another country is based on a cost-benefit analysis, whereby a person chooses to migrate if the expected returns from doing so are positive.

These returns will be greater the better a person's human capital characteristics; e.g. her/his educational qualifications and ability with the language of the destination country. In addition, individual, social or technological factors that lower the costs of migration – e.g. support for new immigrants, cheap air or sea travel – lead to higher rates of migration.

Furthermore, the presence of a critical mass of people from the origin country or networks in the destination country may provide additional information with which to judge the potential success or payoff of the decision to migrate.

All of these factors (and others, as noted below) are likely to be important to some extent, and so we empirically tested for their relative importance using statistical regression analysis.

The econometric model

Our model sought to *explain* the number of applications from 56 origin countries to immigrate to New Zealand under the Skilled Migrant category, for the period 1997 to 2000, according to the following potential determinants.

- *Characteristics of the origin country*: measures of the material standard of living in the origin country (as proxied by GDP per person), corruption, income inequality, pollution, infant mortality and unemployment rates.

- *Characteristics of the population in the origin country*: the age distribution of the population and average years of education.

- *Affordability of relocation*: travel costs relative to the average income in the origin country.

- *Networks in New Zealand*: the number of people from the origin country to have arrived in New Zealand over various periods of time.

Results

Based on our preliminary estimations, we found that the number of applications to immigrate to New Zealand is positively related to recent arrivals in New Zealand from that country (between 1 and 4 years ago) and corruption in the origin country, and negatively related to travel costs.

Thus there may be an element of 'wait and see how things go for others' before people follow to New Zealand. Not surprisingly, immigrants are averse to corruption in their origin country (which may limit their economic opportunities) and the costs of relocation.

We also found that there are more applications the higher is the origin country's GDP, but only up to a point, beyond which New Zealand (or any other country) is no longer an attractive destination. It seems that there is no need to leave your country if your standard of living is high already.

This result is consistent with the other finding from our study: although immigration applications are positively related to the applicant's education and the percentage of the population that is young in the origin country, more highly educated young people would not choose to come to New Zealand. This means that New Zealand may be limited in its ability to 'free ride' off other nation's educational investments by attracting their 'best and brightest'. The low international purchasing power of NZ$ wages may make New Zealand less attractive than other (competing) destination countries.

Conclusion

As predicted by the economic theory of migration, the decision to apply to immigrate to New Zealand (or any other country) is based on the costs and potential income opportunities.

It is difficult to suggest policy prescriptions here given that the key factors identified are outside the direct control of the government. That New Zealand may have relatively low returns to education – which may negatively impact on its ability to attract applicants from developed countries – is probably not something that can be changed easily.

Some questions to think about

1. What recent world events have made New Zealand an even more attractive destination?

2. What arguments are used to support the idea that immigration is an instrument for promoting economic growth (as mentioned in the article)?

Further reading

For the history of New Zealand immigration, see Belich (1996). For a survey of international migration, see *The Economist* (2002).

Useful websites

For information on immigration to New Zealand, see Statistics New Zealand's and Immigration New Zealand's websites: www.statistics.govt.nz & www.immigration.govt.nz (here you can even calculate your own immigration points score!).

Information on international migration is available from the International Migration Organisation's website: www.iom.int

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How efficient are New Zealand's secondary schools?

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Each year, New Zealand's 330-odd secondary schools use over $1.5 billion worth of resources – teachers, support staff, computers, sports equipment, buildings, etc. – to educate more than 250,000 students (The Treasury 2005; Ministry of Education 2006). Given secondary education's importance to young people (and their families) and New Zealand in general, it is worthwhile investigating how efficiently New Zealand secondary schools use their inputs.

What is efficiency?

The term 'efficiency' means different things in different settings, and so it is important to be clear about its meaning in the present context. Here we mean 'technical efficiency', which can be explained easily via a simple imaginary example involving just two secondary schools, 'School *A*' and 'School *B*'.

Suppose School *A* and School *B* each use a single input, *x* (e.g. teachers), to produce a single output, *y* (e.g. pupils who pass their exams). School *A* uses 1.5 units of *x* to produce 10 units of *y* whereas School *B* uses 2 units of *x* to produce the same amount of output.

Furthermore, assume that the production technology (the means by which inputs are transformed into outputs) is such that 10 units of *y* is the most that 1.5 units of *x* can produce.

Thus School *A* can be said to be (technically) efficient as it is utilising its inputs as efficiently as possible. In other words, its efficiency is 100%.

On the other hand, School *B* is not efficient as it is using more inputs than is technically necessary to produce 10 units of *y* – i.e. 2 units rather than 1.5. School *B*'s efficiency is only $1.5/2 \times 100 = 75\%$ – i.e. the ratio of the inputs used by a fully efficient school (e.g. School *A*) to those actually used, multiplied by 100.
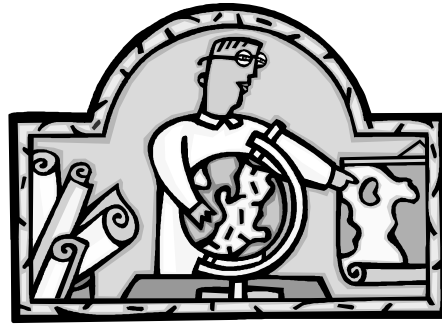
The inefficiency of School *B* is simply 100% minus its efficiency in percentage terms (75%): 25%. This implies that School *B* could reduce its inputs by 25% without reducing its output, thereby making savings in its costs of production.

A graphical representation

The concept of efficiency discussed above can also be illustrated graphically, as in Figure 1.

For simplicity, let's assume that schools' production technology exhibits *constant returns to scale*, which implies that if a school increases its inputs by a factor of *k*, its output will increase by a factor of *k* as well. For example, doubling the inputs doubles the outputs; quadrupling the inputs quadruples the outputs, and so on.

This assumption of constant returns to scale means that the production function (representing the relationship between inputs and output – here one of each) can be graphically represented by the straight line 0U in Figure 1. In the figure, output *y* (e.g. pupils who pass their exams) is on the vertical axis and input *x* (e.g. teachers) on the horizontal axis, and the line 0U shows the maximum output (*y*) for any level of input (*x*).

For example, as discussed in the previous section, the maximum output that can be produced by 1.5 units of *x* is 10 units of *y*; if 3 units of *x* are employed, then the maximum output is 20, and so on. As the line represents the maximum output possible for any level of input, it is also called the 'production frontier'.

If a school's input-output combination lies *on* the production frontier, it is 100% efficient at using inputs. On the other hand, if its input-output combination lies *below* the production frontier, it is less than 100% efficient – i.e. it is inefficient. (It is impossible for a school to be *above* the frontier.)

Schools *A* and *B* are represented in Figure 1, where it can be seen that *A* (on the production frontier) is 100% efficient, whereas B (below the frontier) is not.

Figure 1: A production function for schools
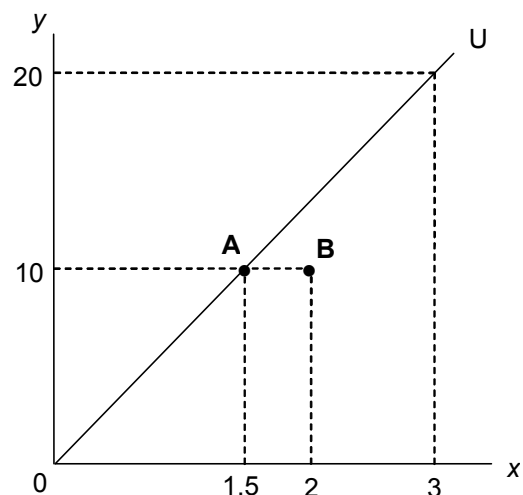
Why does efficiency matter?

Clearly if schools are inefficient, then resources are being wasted. If a school knows it is inefficient it may be able to identify and implement better practices so that it can either reduce its inputs (and hence its costs) without reducing its output or increase its output without having to use more inputs (i.e. at no extra cost).

Multiple inputs and outputs

The ideas explained in the previous section can be generalised to more than just one input and one output.

Specifically, we assume that a secondary school's main goal is to produce academic qualifications for its pupils using inputs like teachers, teacher aides, administrative resources, student learning resources and other resources, as well as the pupils themselves.

We used three output variables: the sum of all marks gained in all papers by a school's pupils in School Certificate exams (for 2001); the number of year 12 students gaining Sixth Form Certificate; and the number of students gaining four Cs or better in University Bursary exams.

We used 11 input variables: the number of pupils at each of the year levels 11, 12 and 13 and all other school years combined; the numbers of full-time teacher equivalents and teacher aides; learning resources and administration expenditures; depreciation and property management expenses; and expenditures for raising local funds.

Data for these variables for 324 secondary schools for 2001 were supplied by the Ministry of Education. For more information about them and our study overall, see Alexander & Jaforullah (2004).

Measuring efficiency

If the production frontier of the secondary schools were known (the line 0U in Figure 1), it would be straightforward to calculate the efficiency of a given school by comparing it with a similar school on the frontier. (If the school is on the frontier then it is fully efficient.) Unfortunately, however, this frontier is not known and so it has to be estimated.

To do this we used Data Envelopment Analysis (DEA), as developed by Charnes, Cooper & Rhodes (1978) and implemented in Coelli's (1996) software.

DEA works by constructing a best-practice benchmark for each school (324 of them in our study) and then calculating each school's efficiency relative to the benchmark. The benchmark (which lies on the production frontier) is a combination of schools that are fully efficient and similar to the individual school in terms of inputs and outputs.

So, are they efficient or not?

Although information on the performance of individual schools cannot be reported here (because of confidentiality issues), a summary of the main results, in aggregate, appears in Table 1.

It can be seen that New Zealand secondary schools vary considerably with respect to their measured efficiency. On the bright side, almost half of the 324 schools were highly efficient (≥ 90% efficiency). On the other hand, 11 schools were highly inefficient (< 50% efficiency).

Clearly it would be worthwhile trying to identify the sources of apparent inefficiencies, with a view to improving performances. It is important to note, however, that the 'raw' abilities and socio-economic statuses of each school's pupils were not included in the analysis.

It can also be seen from the table that the average overall efficiency of New Zealand secondary schools is 86%. In other words, the average level of inefficiency is 14%. This implies that if all schools could eliminate their inefficiencies by adopting the best practices of their benchmarks, then, on average, they could reduce their inputs by up to 14% and still have the same outputs.

Table 1: The efficiency of NZ secondary schools

Efficiency	Number of schools (%)
100%	99 (31%)
90% - 99%	58 (18%)
80% - 89%	74 (23%)
70% - 79%	45 (14%)
60% - 69%	30 (9%)
50% - 59%	7 (2%)
40% - 49%	7 (2%)
30% - 39%	4 (1%)
0% - 29%	0 (0%)
Total: 324 (100%)	
Mean efficiency	86%
Standard deviation	15%

Further reading

For more information about the study discussed here, including other results, see Alexander & Jaforullah (2004). For more information about the measurement and analysis of efficiency, see Coelli, Rao & Battese (1998).

Useful websites

A wide range of statistics and other information about New Zealand's education system (including secondary schools) is available from the Ministry of Education's website: www.minedu.govt.nz

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Deep & meaningful?
The *fundamental* determinants of economic development

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Average living standards, as conventionally measured by per capita GDP (gross domestic product), are more than 100 times greater in the richest countries in the world than in the poorest countries.[1] Why are some countries rich and others so poor, and what can be done to reduce such differences?

A DEFINITIVE explanation of this staggering variation is the 'holy grail' of modern macroeconomics, because important insights could lead to drastic improvements in the welfare of a large proportion of the world's population.
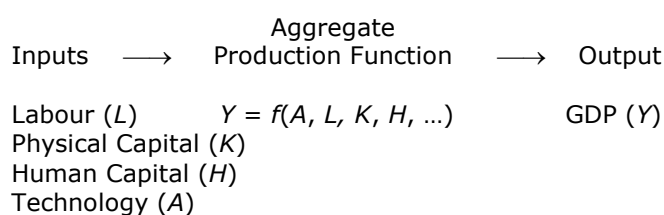
'Proximate' versus fundamental determinants

Much of the research on economic growth in the last 20 years has adopted a 'production function' approach. This relates a country's aggregate output (GDP) to the level of its inputs into the productive process, as illustrated in Figure 1.

Inputs, or 'factors of production', include labour (the number of workers or hours worked), physical capital (machinery, factories and infrastructure, such as roads and airports), human capital (reflecting the quality of the human inputs into production due to the level of education, on-the-job training and health status) and technology (the available knowledge about how to produce output).

Growth of output arises due to the *growth* of inputs into the production process, particularly technological change and accumulation of physical and human capital.

Figure 1: Determination of aggregate output – the production function approach

Aggregate
Inputs $\longrightarrow$ Production Function $\longrightarrow$ Output

Labour (L) $Y = f(A, L, K, H, …)$ GDP (Y)
Physical Capital (K)
Human Capital (H)
Technology (A)

This type of decomposition can allow us to determine empirically, for example, that the US is richer than Chad because the US has a higher rate of physical capital investment, a more highly educated labour force, and uses these inputs more efficiently. However, although such an analysis provides useful insights, it does not fully explain the underlying sources of the US's advantages in producing output and raises as many questions as it answers.

Why has the US saved and invested more than Chad and so accumulated higher levels of physical and human capital? Why does the US use its inputs more efficiently than Chad?

Lower rates of accumulation of physical and human capital, technological backwardness and inefficiency in the use of the factors of production can themselves be viewed as *outcomes*, and thus are often labelled 'proximate determinants' of aggregate output. There must be some more *fundamental* or 'deeper' underlying factors that lead to these outcomes which, in turn, lead to the divergence in economic well-being across nations.

To try to get to the root of this, a recent body of research has evolved that distinguishes between the proximate determinants of differences in living standards across countries (such as physical and human capital accumulation and technology) and the deep, fundamental or ultimate factors that determine the proximate determinants and, consequently, income levels.

What sort of factors could potentially be deep/fundamental determinants of investment, technology and efficiency?

Usually, the search focuses on relatively slowly changing, durable characteristics that have a pervasive effect on a country's economy over extended periods of time. These include a country's geography, the quality of its institutions, the extent to which it is integrated into the international trading system, and a society's culture, reflected in its attitudes, beliefs and values. Most of the recent debate has centred on institutions versus geography, so we will concentrate on these here too.

Geography and economic development

There is a long tradition of emphasising the importance of geography for economic development – e.g. the French philosopher Montesquieu remarked in 1748 that "people are more vigorous in cold climates" – but geographical factors were, initially, largely ignored in most of the empirical work on economic growth. However, the role of geography has recently been re-emphasised, most notably by the biologist Jared Diamond in his widely acclaimed book *Guns, Germs and Steel* (1997). Among economists, 'geographical fundamentalism' is most strongly associated with economist Jeffrey Sachs and his colleagues.

Geography can affect a country's openness to international trade through its access to the coast, which determines its ability to ship goods by sea, and its proximity or remoteness to major markets. Climate directly affects agricultural productivity and the incidence of diseases has an impact on the

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[1] Using GDP per capita in current 'international' dollars, derived using purchasing power parity (PPP) exchange rates, in 2003 the per capita GDP of Luxembourg was $62,298 compared to $548 in Sierra Leone (World Bank 2005).

quality of labour inputs. Resource endowments (including water, minerals and energy resources) can also affect the path of development, although there is much debate about why the abundance of natural resources spurs economic growth in some countries but appears to be a 'curse' in others.

Overall, the *geography hypothesis* maintains that the climate, topography, landmass orientation, rivers, access to the sea, location, geology, ecology and prevalence of diseases of a nation profoundly influence the incentives, technologies and outcomes in a society. According to this view natural geographical factors are the primary fundamental determinants of the wealth of nations.

This does not necessarily imply that "geography is destiny", as Napoleon Bonaparte is reputed to have observed, but it would mean, as Sachs has argued, that environment-specific types of investment may be required to overcome, for example, malaria in tropical areas or inaccessibility and high transport costs in landlocked countries.

Diamond (1997) argues that the emergence of sedentary agriculture was first initiated in mid-latitude areas where the bio-geographical potential in terms of suitable plants and animals for domestication was most favourable. This allowed societies to move out of a hunter-gatherer lifestyle, to acquire immunity to animal-borne diseases and to develop a non-food producing sector of the economy so that people could specialise, and study to build up their human capital and innovate.

In addition, the East-West axis of Eurasia (as opposed to the North-South axis of the African and American continents) meant that animal and plant species and advances in agricultural technology were more easily diffused across areas with a similar climate. This in turn induced a sustained process of institutional development. Overall, according to Diamond, the key in explaining these outcomes was geography.

Institutions and economic development

The *institutions hypothesis* maintains that "institutions in societies … are the underlying determinant of the long-run performance of economies" (North 1990, p. 107). "Institutions are the rules of the game in a society … the humanly devised constraints that shape human interaction" (p. 3). Consequently, "Third World countries are poor because the institutional constraints define a set of payoffs to political/economic activity that do not encourage productive activity" (p. 110).

This argument also has a long history; for example, Adam Smith observed in 1776 in the *Wealth of Nations* that:

Commerce and manufactures can seldom flourish long in any state which does not enjoy a regular administration of justice, in which the people do not feel themselves secure in the possession of their property, in which the faith of contracts is not supported by law, and in which the authority of the state is not supposed to be regularly employed in enforcing the payment of debts from all those who are able to pay. Commerce and manufactures, in short, can seldom flourish in any

state in which there is not a certain degree of confidence in the justice of government.

This view has experienced a recent major revival in the economics literature. The 'new comparative economics' emphasises the importance of property rights, legal systems and the rule of law, land tenure, political stability and other formal and informal social institutions.

These factors had been neglected for some time because it was previously felt that such institutions developed *as a result of* economic development, but the institutions hypothesis argues that institutions are a *causal determinant of* growth and development. They are seen as a fundamental determinant because they affect the incentives to accumulate physical and human capital, and to innovate and adopt new technology, thus having an important effect on the proximate determinants of output.

'Good institutions' are regarded as having three main characteristics: (i) security of property rights for a broad coverage of individuals in society; (ii) effective constraints on the abilities of powerful subgroups or elites (including politicians) to expropriate the returns from production, and (iii) some degree of equality of opportunity applying to a broad cross section of society (Acemoglu 2003).

There are different views on how institutions have developed to produce, for example, different degrees of protection of property rights.

The *legal origin* viewpoint emphasises historic differences in legal traditions as the main reason for cross-country differences in property rights. It highlights the difference between English common law and French civil law, which developed to reflect the historical contexts in their host countries and spread through colonisation and imitation to become the most widely used legal systems worldwide. Common law places more emphasis on private property rights, is regarded as more flexible in responding to a changing economy, and is therefore argued to be more favourable for economic development.

An alternative view maintains that differences in *endowments*, such as climate, disease environment, crops and natural resources, affected the type of institutions developed.

For example, Acemoglu, Johnson & Robinson (2001) emphasise the importance of disease environment for European colonisation strategies. They argue that where settler mortality rates were high because of an unfavourable disease environment, as in many parts of Africa and Latin America, European colonists set up '*extractive colonies*'. Rather than settling in large numbers and establishing institutions that protected property rights for a broad coverage of the population, they concentrated on extracting the returns to be made from minerals, plantation crops and other natural resources for the benefit of the privileged colonising minority elite, often using slave labour, as in the Caribbean, or forced indigenous labour, as in Central America.

By contrast, where settler mortality rates were low, because of a more favourable disease environment, colonisers settled in larger numbers and brought with them or created institutions that

enforced property rights for the bulk of the population, limited the power of the state and avoided creating extreme inequality in wealth and income. Classic examples of such 'settler colonies' are Australia, Canada, New Zealand (e.g. see the picture on the cover of this issue) and the US.

A crucial part of the above argument is that the early institutions persisted after the end of colonisation and so continued to have long-lasting effects on current institutions and economic activity that endure to the present day. In short, favourable disease environments initially made for good institutions and unfavourable environments for bad institutions, and these largely endured to affect current living standards around the world.

Although this view of the development of institutions emphasises the role of geographical endowments, it differs crucially from the geography view in that it argues that any effect of geography is *indirect* – it is only to the extent that geography affects institutions that geography has any effect on development.

Geography vs institutions – which matters more?
How can we empirically distinguish between the competing, though not necessarily mutually exclusive, geography versus institutions views? At face value, the distribution of (the natural logarithm of) levels of GDP per capita by latitude (see Figure 2) appears to lend strong support to the geography view. Tropical regions, on average, have low levels of

GDP per capita whereas countries in higher latitudes have higher income levels.

But, although there is a strong *correlation* between geography and average income levels, this does not, in itself, prove *causation*. There are many different explanations about why different aspects of geography affect development (the endowments variant of the institutions hypothesis provides one such alternative to the direct effect of geography), there are usually exceptions (e.g. Singapore and Hong Kong), and there could be other factors behind these associations.

'Institutionalists' point to the '*reversal of fortune*' as an important argument against the geography hypothesis. Former European colonies that were relatively wealthy in 1500, before colonisation (e.g. Bolivia), are among the less well-off today, and former colonies that are relatively wealthy today (e.g. New Zealand) were poor in 1500.[1]

At face value, this constitutes a natural experiment because geography is held constant. The changes in economic fortunes are argued to stem from systematic changes in institutions brought about during colonisation. However, critics of this view argue that the only spectacular reversal of fortune involved the four 'neo-European' British colonies (Australia, Canada, New Zealand and the US) and question whether past political systems, such as democracy or dictatorship, are reliable predictors of current institutions.
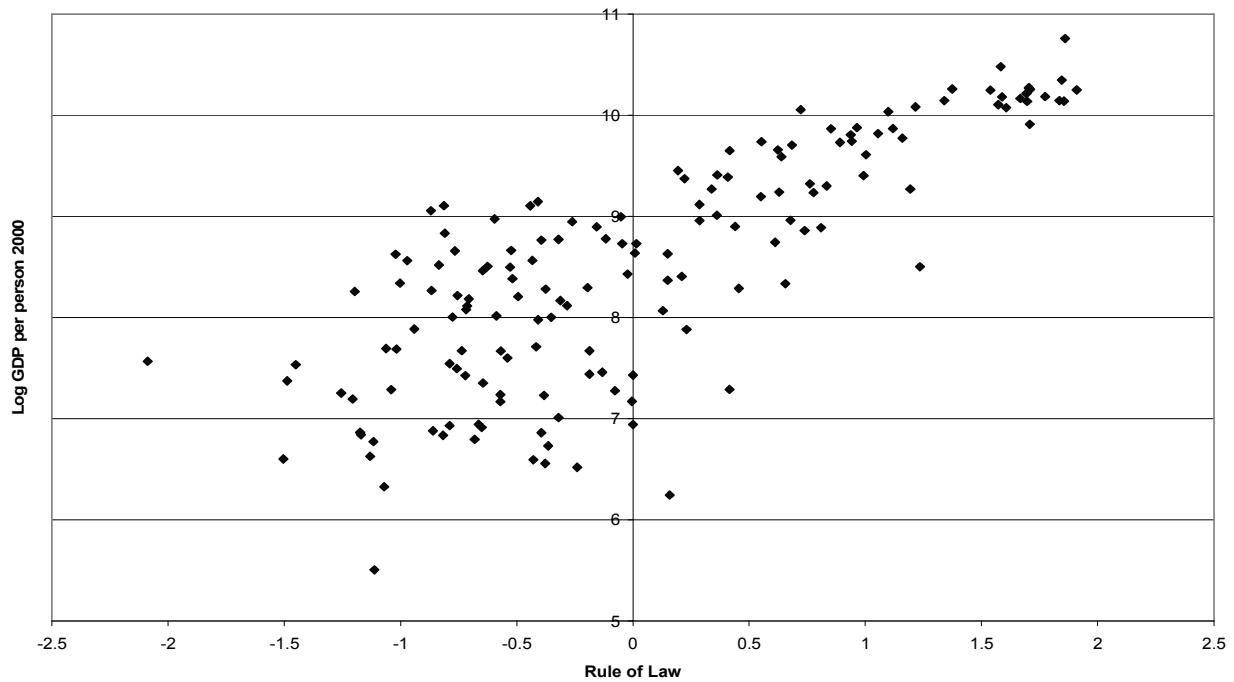
Figure 2: Countries further from the Equator have higher incomes

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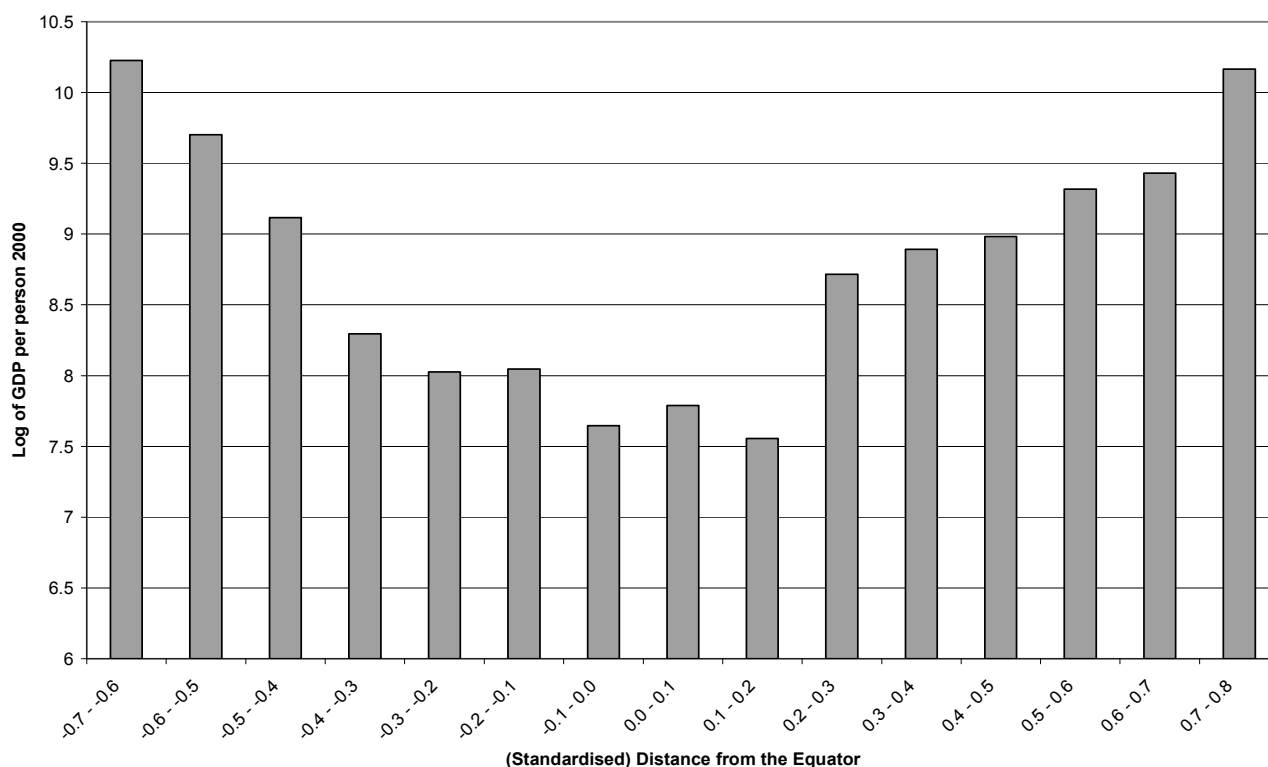
[1] Usually, prosperity in 1500 is measured by population density or urbanization rates on the grounds, for example, that only relatively developed societies could sustain bigger cities.

Figure 3: Countries with better institutions have higher incomes

Plots of GDP per capita against measures of the quality of institutions (see Figure 3) also reveal a strong association.[1] As well as the same sorts of concerns raised about the latitude-GDP correlations, there is a further problem with institutions. Institutions, being 'humanly devised', are at least partly endogenously determined by a variety of factors, including the level of income of the country.[2] Richer countries like New Zealand can afford higher quality institutions; poorer countries have fewer resources available for building institutions.

This suggests that institutions co-evolve with a country's wealth – economists term this *reverse causality*. Reverse causality makes it difficult to look at the association in Figure 3 and separate out the effects of institutions on GDP per capita from the effects of GDP per capita on institutions. To distinguish these two effects, economists need to find something that provides an exogenous explanation of the variation in institutions across countries that is unaffected by a country's development.

The endowments variant of the institutions hypothesis provides a clever way of approaching this problem. Acemoglu, Johnson & Robinson (2001) use mortality data on settlers in the colonies, which should be exogenous with respect to current institutions, as predictors of the institutions established during colonisation, which, they argue, persist. So, settler mortality should provide an exogenous source of variation that can explain current institutions.

Although very innovative and widely used, there are some potential problems with this approach. Settler mortality is likely to be correlated with the present-day disease environment, which could have a direct effect on current GDP per capita that has nothing to do with institutions. Also, settlers took with them human capital, which in itself would have fostered economic development and institution building, so the linkages involved are far from unambiguous. Another argument used against the institutions hypothesis is that while institutions can persist, they also do often change over time, so that finding an exogenous source of variation for historical institutions may not provide a good explanation for current institutions.

Although it is recognised that economic development is a complex phenomenon, recent empirical studies have used simple empirical models to attempt to evaluate the overall and relative importance of geography versus institutions in explaining cross-country variations in income levels. The results from the earliest studies (e.g. Acemoglu, Johnson & Robinson 2001 and Rodrik, Subramanian & Trebbi 2004) suggest that, although geographic conditions affect development, they do so only through their impact on the development of different types of institutions; after controlling for institutional quality, geography appears to have little direct effect on income.

As a counter example, however, Sachs (2003) demonstrates that a measure of malaria transmission is statistically significant when added to representative specifications from these studies, implying that geographical variables have a direct effect on GDP per capita as well as an indirect effect via institutions. Olsson & Hibbs (2005) also present evidence that Diamond's arguments have statistical support, so the initial apparent consensus on the primacy of institutions has been blunted by more recent empirical work.

Conclusion

Although institutions and geography have received attention from social scientists and economic historians, economic studies of the impact of institutions and other fundamental determinants on

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[1] The institutions measure in Figure 3, 'Rule of Law', is a measure of protection afforded to property rights.
[2] In contrast, geography is not endogenous in this sense; New Zealand's latitude, for example, will not change as a result of an increase in its GDP per capita!

economic development are relatively recent. More research is required to resolve some of the conflicting results obtained, to identify the different mechanisms by which the fundamental determinants affect factor accumulation and technological progress, and to draw out the policy implications that point to relevant reforms that will aid developed and developing countries. It is clear that these issues will continue to fascinate economists for some time to come.

Some questions to think about

1. What particular aspects of tropical climates are hostile to economic development?

2. According to Jared Diamond's theory (discussed above), how did differences in geography affect economic development in Europe and Latin America?

3. Why would 'settler colonies' end up with superior institutions to 'extractive colonies'? Why would such institutions persist?

Further reading

The June 2003 issue of the journal, *Finance & Development*, contains several non-technical articles on the roles of institutions and geography in economic development. These are available from: www.imf.org/external/pubs/ft/fandd/2003/06/index.htm

For a lucid summary of earlier studies emphasising the importance of institutions, see *The Economist* (2002). For a fascinating account of the pivotal role of geography in determining relative levels of development around the world, see Diamond (1997).

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How does monetary policy work in the Caribbean?

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Many economists argue that monetary policy can significantly influence economic behaviour, and hence economic output. But what is the transmission mechanism by which these effects occur? Much of the empirical research has focused on developed countries. In contrast, this article sheds some light on how monetary policy affects economic behaviour in a region of the developing world – the Caribbean.

ALTHOUGH MANY economists agree that monetary policy affects economic behaviour via two broad channels – the money channel and the credit channel (both explained below) – there is as yet no consensus about the relative strength of these channels (or transmission mechanisms). Identifying the monetary transmission mechanism is important for a number of reasons.

First, as financial markets develop, the link between the financial and 'real' (i.e. output-based) sector of an economy is likely to change. Therefore, it is important to determine which of the financial aggregates monetary policy impacts upon.

Second, an understanding of the transmission mechanism helps policy makers to decide which market disturbances warrant changes in monetary policy and which do not.

Finally, knowledge of the transmission mechanism may promote higher investment and a faster pace of economic growth if it leads to a better choice of target variables. In particular, if the credit channel is an important part of the transmission mechanism, bank portfolios should be the focus of more attention. On the other hand, if the money channel is crucial, then the central bank may need to focus on an interest rate target.

The money channel
The money channel may be explained as follows. For simplicity, assume there are only two types of financial asset: bank deposits and all other types of financial asset (e.g. bonds).

A tightening of monetary policy (M) causes a rise in the real interest rate (r) and hence an increase in the marginal rate of return on bank deposits. To increase their earnings, individuals adjust their portfolio by switching into bank deposits and away from other financial assets (e.g. bonds).

As the supply of bonds increases, their price falls, corresponding to a rise in the return on bonds (the yield). Consequently, the return on real assets (investment projects) falls relative to bonds, so investment spending (I) falls, thereby producing a fall in aggregate demand and output (Y).[1] This relationship may be schematically represented as:

$$\downarrow M \Rightarrow \uparrow r \Rightarrow \downarrow I \Rightarrow \downarrow Y$$

The credit channel
The credit channel has two separate components: a balance-sheet channel and a bank-lending channel.

The balance-sheet channel operates through the net worth of firms. The idea is that information asymmetries restrict the ability of firms to obtain finance externally (by borrowing). A restrictive monetary policy will cause equity (share) prices (Pe) to fall, thereby reducing the net worth and credit worthiness of firms. This leads to less borrowing (L) and hence lower investment spending and a drop in output:

$$\downarrow M \Rightarrow \downarrow Pe \Rightarrow \downarrow L \Rightarrow \downarrow I \Rightarrow \downarrow Y$$

In the bank-lending channel, restrictive monetary policy has a direct impact on the loan-making ability of banks:

$$\downarrow M \Rightarrow \downarrow L \Rightarrow \downarrow I \Rightarrow \downarrow Y$$

The bank-lending channel is more applicable to small firms as larger firms can directly access credit through the share and bond markets without going through the banks.

Further, the bank-lending channel is likely to be more relevant in developing countries because it is based on the premise that borrowers can only finance projects through loans and that the supply of loans is directly influenced by policy changes. As alternative sources of credit are very limited or even non-existent, customers cannot replace lost bank credit with other types of finance and so are forced to cut back on investment spending which results in a fall in output.

Overall, if the credit channel is operational, monetary policy is likely to have its impact from the asset side of the balance sheet because a tightening of monetary policy reduces the quantity of loans that can be made available.[2]

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[1] Two key conditions are necessary for the money channel to work: (1) It must not be possible for banks to perfectly shield transaction balances from changes in reserves; and (2) There must be no close substitutes for money for conducting transactions in the economy.

[2] Two conditions are necessary for the credit channel to work: (1) Banks must not be able to shield their loan portfolio from changes in monetary policy; and (2) Borrowers must not be able to fully insulate their real spending from changes in the availability of bank credit.
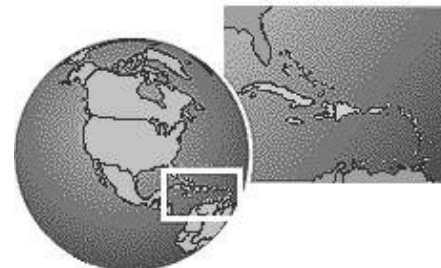
Another channel?

The exchange rate is sometimes regarded as a third channel through which monetary policy can affect the real sector.[3] A tightening of monetary policy stimulates an appreciation of a country's exchange rate (E), causing net exports (NX: exports – imports) to fall, and hence output:

$$\downarrow M \Rightarrow \uparrow r \Rightarrow \uparrow E \Rightarrow \downarrow NX \Rightarrow \downarrow Y$$

Naturally, this relationship is strongest for countries with fully flexible exchange rates.

The Caribbean

The four largest economies in the Caribbean are Jamaica, Trinidad and Tobago, Barbados and Guyana.

Until the 1980s, these countries all had fixed exchange rate systems (and exchange controls). Since then, they have all liberalised their economies, although the pace of reform has not been even. Jamaica and Trinidad and Tobago were the first to liberalise, followed, more recently, by Guyana and Barbados. By the late 1990s, exchange controls had largely been abolished, with only Barbados maintaining a pegged system.

The 1980s and 1990s saw a major transformation of the financial sectors in Trinidad and Tobago, Jamaica and Barbados. Indirect policy instruments were introduced together with measures to improve the functioning and development of financial markets. There have also been institutional developments aimed at promoting greater efficiency.

In contrast, the financial sector in Guyana has not experienced the same degree of improvement. When commercial banks emerged in the 1970s, the socialist government subjected them to significant state control. 'Moral suasion' was the main instrument of monetary policy in the 1970s and this continued into the 1980s and 1990s.

The transmission of monetary policy shocks in these four countries ought to reflect two main features. First, even by the end of the study period (2000), the capital market in each country was at a very early stage of development, which means that commercial banks were (and still are) the main source of external finance for firms. Second, economic liberalisation has occurred quite recently; hence adjustments have mainly taken place in the monetary sector.

Given this, as the conduit of monetary policy in these four countries, we would expect a weak role for the money channel and a strong role for the credit channel (in particular, the bank-lending channel).

Method and results

One way of empirically investigating the transmission mechanism is to use a vector auto regression (VAR) methodology. The idea behind this is that the variable of interest is explained by its past values and those of the other (explanatory) variables in the model. Here, output is the variable of interest (the real sector variable); bank deposits, bank loans and the exchange rate are the transmission variables; and reserves is the policy instrument variable.

Thus output is explained by past values of output and past values of bank deposits, loans, the exchange rate and reserves. From the analysis, it is possible to trace out the response of output to a change in reserves, and also to estimate how much of the variability in output is due to deposits, loans and the exchange rate. This can then be used to gauge the relative importance of the various monetary transmission channels.

In all four Caribbean countries, for the period 1970-2000, as expected, the credit channel (bank lending) was found to play the main role in transmitting impulses from the financial sector to the real sector. In all of these countries, investors face a fairly limited portfolio choice and remain highly dependent on the banking system for external funding. Given the money market is relatively undeveloped, the money channel plays a minor role in transmitting monetary policy shocks to the real economy.

Conclusion

Many economist agree that monetary policy can be a powerful tool for affecting the real sector of the economy. However, its effectiveness depends on policy makers being able to accurately assess the timing and effects of their policies on the economy, which requires an understanding of the mechanisms through which monetary policy operates.

The research reported in this article has, hopefully, shed some light on this in the context of a region of the developing world (where, by definition, economic growth is especially important) – the Caribbean.

A question to think about

1. As the economies of the Caribbean develop in the next 10 to 20 years and financial markets become more established, how might the transmission mechanism of monetary policy change?

Further reading

This article is a greatly condensed version of Ramlogan (2004). For more information on monetary policy transmission mechanisms, see Mishkin (1995).

Useful website

Research on the monetary transmission mechanism in both developed and developing countries is available from The Bank of International Settlements' website: www.bis.org/publ/plcy.htm

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[3] This channel is controversial. Because it involves the interest rate, like the channels discussed above, some economists deny that it has an independent role.

Commentary on the New Zealand economy

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In the seven years since the recession induced by the Asian Financial Crisis, the New Zealand economy has grown at a respectable 3.7% p.a. on average and created almost 370,000 additional jobs.

THE END result of this impressive performance is that the unemployment and labour force participation rates are at their lowest and highest levels, respectively, for at least two decades. Sadly, though, this implies that the economy's capacity to *continue* to grow at this rate has been exhausted.

As the limit of the domestic economy to expand production of goods and services approaches, constraining domestic demand growth becomes necessary to avoid it spilling over into either inflation and/or a growing current account imbalance. Failure to do so increases the risk of a sharp 'correction' (or hard landing) further down the track.

Throughout 2005, the rates of growth in consumption and (especially) investment have been tracking down, presumably in response to the steady rise in interest rates over the last two years. Nevertheless, the single largest component of domestic demand, consumption, is still growing at a relatively rapid rate – twice that of domestic production – and this is reflected in the current account deficit's recent rise.

What are the prospects of consumption demand growth quickly slowing to a more sustainable pace and taking the pressure off the current account?

A clue comes from the recent pattern of goods imported to satisfy this demand. Over the last three years, the volume of consumer good imports generally grew by just under 30%, but imports of consumer durables in particular – e.g. appliances, furniture, etc. (but excluding vehicles, which grew at the average rate) – rose by 71%.

Hence, households – encouraged by cheap imported goods (thanks to the dollar's strength), high employment rates, high house prices (easing households' borrowing constraints) and (until recently) low interest rates – have followed businesses by upgrading their own capital stock. Once house prices soften and unemployment starts to rise again (as expected in 2006), spending on consumer durables is likely to ease back relatively sharply.

	Sep 2005	Jun 2005	Quarter Mar 2005	Dec 2004	Sep 2004
GDP (real, annual growth rate, %)	2.6	3.1	3.7	4.4	4.4
Consumption (real, annual growth rate, %)	5.0	5.4	5.7	6.4	6.5
Investment (real, annual growth rate, %)	5.8	7.5	9.1	14.4	16.1
Employment: full-time (1000s)	1637	1615	1602	1589	1580
Employment: part-time (1000s)	454	451	452	467	441
Unemployment (% of labour force)	3.4	3.6	3.9	3.6	3.8
Consumer Price Inflation (annual rate, %)	3.4	2.8	2.8	2.7	2.5
Food Price Inflation (annual rate, %)	1.6	1.1	1.5	1.2	0.5
Producer Price Inflation (outputs, annual rate, %)	4.1	3.0	3.2	2.6	2.4
Producer Price Inflation (inputs, annual rate, %)	6.1	4.7	4.2	3.4	2.5
Salary & Wage Rates (annual growth rate, %)	3.0	2.6	2.5	2.5	2.2
Narrow Money Supply (M1, annual growth rate, %)	0.4	0.0	0.7	3.2	2.9
Broad Money Supply (M3, annual growth rate, %)	9.2	8.1	6.1	6.2	5.9
Interest rates (90-day bank bills, %)	7.09	7.03	6.99	6.71	6.64
Exchange rate (TWI, June 1979 = 100)	70.3	71.0	70.7	69.0	67.1
Exports (fob, $m, year to date)	30,763	30,618	31,088	30,712	30,048
Imports (cif, $m, year to date)	36,561	35,793	35,446	34,915	34,128
Exports (volume, June 2002 [not seas. adj.] = 1000)	964	992	1001	1029	950
Imports (volume, June 2002 [not seas. adj.] = 1000)	1474	1468	1429	1388	1369
Terms of Trade (June 2002 = 1000)	1085	1091	1105	1081	1077
Current Account Balance (% of GDP, year to date)	–8.5	–8.0	–7.4	–6.7	–6.0

Sources: Statistics New Zealand (www.stats.govt.nz), Reserve Bank of New Zealand (www.rbnz.govt.nz)

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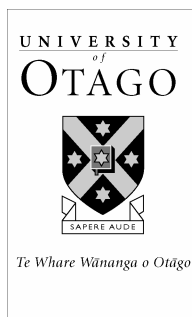- *Options* made easy, by Colin Smithies

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Forty of the best articles from Issues 1 to 11 have been revised and published in a book by Pearson Education: *Keeping Economics Real: New Zealand Economic Issues*, edited by Paul Hansen & Alan King. See page 10 of this issue of *EcoNZ@Otago* for details.

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