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The *Monitor* provides an update of developments in Pacific economies and explores topical policy issues.

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Highlights

- **Pacific growth softening.** Economic growth in the Pacific moderated to 7.3% in 2012, from a post-crisis high of 8.3% recorded in the previous year. This regional trend was driven primarily by the performance of the region's larger, natural resource-extracting, economies. Growth slowed slightly, but remained high in Papua New Guinea (PNG) and Timor-Leste. Economic growth in the Pacific islands also moderated to 2.5% in 2012, from 2.8% a year ago. Growth in Solomon Islands moderated from double-digit rates as log revenues leveled off. Economic stimulus from infrastructure projects was lower in Kiribati, the Federated States of Micronesia, Samoa, and Tonga.
- Against this trend, increased tourist arrivals supported economic growth in the Cook Islands and Vanuatu. Nauru grew due to high phosphate production, while infrastructure spending and fishing revenues prompted growth in the Republic of the Marshall Islands and Tuvalu.
- Inflation moderated to 5.3% in 2012 from 8.5% in 2011 as international food and fuel prices stabilized, albeit at high levels. The appreciation of the PNG kina and other currencies used in the region helped lower price pressures. However, inflation rates varied sharply across the region due to country-specific factors.
- **Growth seen to moderate further in 2013, before picking up in 2014.** Prospects for the global economy appear to be improving slightly, driven by accelerating growth in large developing economies, particularly the People's Republic of China. However, growth in the Pacific region is projected to slow to 5.2% in 2013. Completion of large infrastructure projects, particularly the PNG liquefied natural gas (LNG) pipeline project, plays a leading role in explaining the weaker growth outlook. Damages from Cyclone Evan are projected to weigh down 2013 growth in Fiji and Samoa. Regional growth is seen to pick up to 5.5% in 2014, in line with the improved global economic outlook, commencement of PNG's LNG exports and public infrastructure projects in a number of smaller Pacific islands, and post-cyclone reconstruction efforts.
- Inflation is projected to accelerate to 6.1% in 2013 and to 6.3% in 2014, despite moderating international food and fuel prices, as the muting effect of strong regional currencies on import prices is seen to dissipate in several countries. Public expenditure growth is also seen to add to regional price pressures.
- **Powering the Pacific's future.** The theme of this issue's policy briefs is energy in the Pacific. The first article, contributed by the New Zealand Aid Programme, outlines challenges facing the Pacific in its drive for energy security, highlighting key issues to be considered at the Pacific Energy Summit. The second article discusses the long-term energy demand outlook for the region, suggesting that energy requirements may double by 2020. The third article, contributed by the Pacific Infrastructure Advisory Center, examines the impact of ownership and regulatory arrangements on the performance of Pacific power utilities. Privately owned and independently regulated utilities are found to have higher labor productivity, better financial performance, lower technical losses, and greater fuel efficiency. The final article concludes that Samoa could realize 10% annual energy savings and create up to 400 new jobs through simple energy-efficiency measures.

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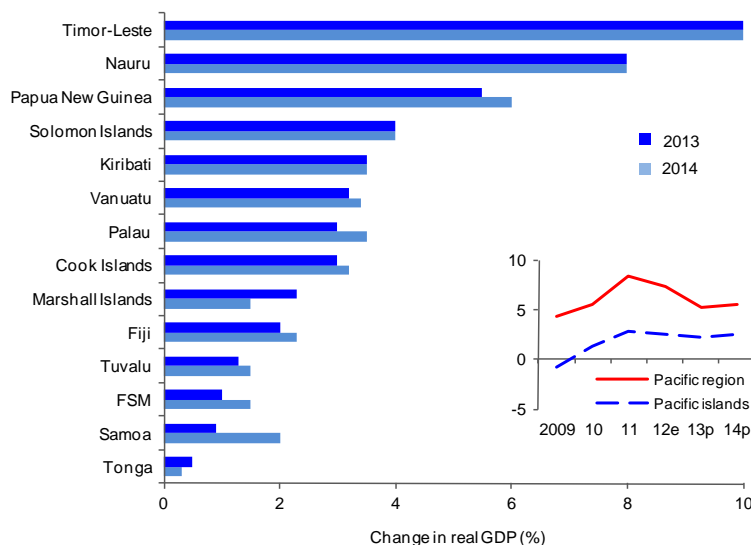
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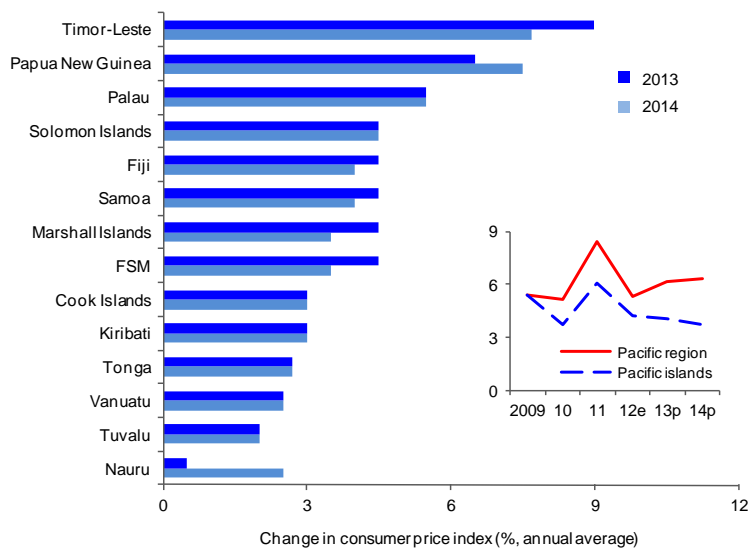
Abbreviations

\$	US dollar, unless otherwise stated
ADB	Asian Development Bank
A\$	Australian dollar
e	estimate
EPC	Electric Power Corporation
ECM	energy conservation measures
F\$	Fiji dollar
fas	free alongside
FEA	Fiji Electric Authority
fob	free on board
FSM	Federated States of Micronesia
FY	fiscal year
IMF	International Monetary Fund
GDP	gross domestic product
GHG	greenhouse gas
KWh	kilowatt-hour
lhs	left-hand scale
LNG	liquefied natural gas
MWh	megawatt-hour
m.a.	moving average
NZ\$	New Zealand dollar
p	projection
PEEP	Promotion of Energy Efficiency in the Pacific
PIC	Pacific island country
PNG	Papua New Guinea
PRC	People's Republic of China
rhs	right-hand scale
RPC	refugee processing center
RMI	Republic of the Marshall Islands
US	United States
VAT	value-added tax
y-o-y	year-on-year

Asian Development Bank Projections
GDP growth



Inflation



e=estimate, FSM=Federated States of Micronesia, GDP=gross domestic product, p=projection

Note: Projections are as of March 2013 and refer to fiscal years. Regional averages of gross domestic product (GDP) growth and inflation are computed using weights derived from levels of gross national income in current US dollars following the World Bank Atlas method. Averages for the Pacific islands exclude Papua New Guinea and Timor-Leste. Timor-Leste GDP is exclusive of the offshore petroleum industry and the contribution of the United Nations.

Source: ADB estimates.

Notes

This *Monitor* uses year-on-year (y-o-y) percentage changes to reduce the impact of seasonality, and 3-month moving averages (m.a.) to reduce the impact of volatility in monthly data.

Fiscal years end on 30 June for the Cook Islands, Nauru, Samoa, and Tonga; 30 September in the Marshall Islands, the Federated States of Micronesia (FSM), and Palau; and 31 December elsewhere.

International and regional developments

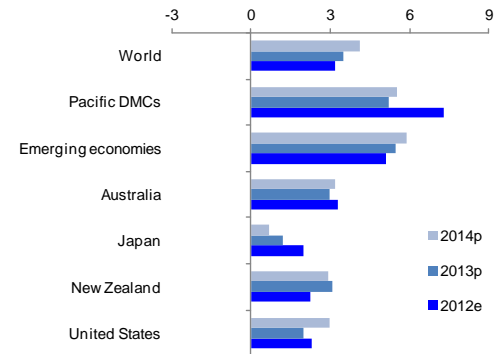
Slightly higher growth in 2013

- The prospects for world economic growth are expected to improve slightly in 2013, rising to 3.5% from 3.2% in 2012 (but still well below the 5% rate recorded in 2010), according to the International Monetary Fund's (IMF) latest *World Economic Outlook Update* (January 2013). The modest rise in growth is seen to be driven by projected accelerations in large developing economies such as Brazil, India, the People's Republic of China (PRC), and the Russian Federation. The United States' economy is projected to continue to grow in 2013, albeit at a slower pace compared to a year ago, supported by growth in private consumption. The Euro area is poised to enter its second consecutive year of economic contraction, although France and Germany will likely realize positive growth. Growth in Japan will be supported by another round of fiscal stimulus, as well as increased exports due to a weakening yen.
- Monetary authorities in advanced economies have generally maintained accommodative policy stances, keeping policy interest rates at record lows and purchasing financial assets. The US Federal Reserve Bank has stated its intention to keep the federal funds rate low until the unemployment rate falls below 6.5% and longer-term inflation rises to 2.5%. The Bank of Japan has adopted a 2% inflation target and will pursue open-ended purchases of financial assets starting in 2014.
- Crude oil prices in 2012 were 20% lower than the peak reached in July 2008. Other commodity prices similarly fell from 2011 highs, most notably coconut oil (35.8%, y-o-y) and logs (7.7%). The IMF expects crude oil prices to decline by about 4% over the next 2 years, while nonfuel commodity prices are projected to fall by around 3%, driven by improving global supply conditions.
- The Australian economy continues to grow, supported by expansion of the mining sector, although a slowdown is noticeable from its peak in the March 2012 quarter. The price of iron ore, which fell by more than 20% in 2012, appears to have bottomed out and started to rise again in the December 2012 quarter, in tandem with stronger PRC economic growth during the same period.
- The New Zealand economy has also seen decelerating growth after peaking during the March 2012 quarter. The unemployment rate reached 7.3% in the September 2012 quarter, which is above the high recorded during the recent economic recession. Unemployment among Pacific is more than twice the national average. Growth prospects for 2013 will be driven by post-earthquake reconstruction, export demand, and the degree of fiscal consolidation.

Pacific trade balances with major partners worsen

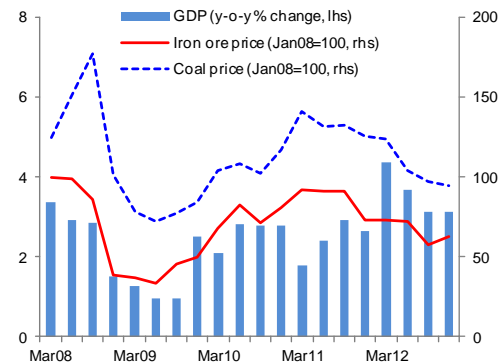
- The value of Pacific imports from Australia increased by 18.7% in 2012 compared with 2011, as Papua New Guinea (PNG) increased imports of machinery and transport equipment associated with its liquefied natural gas construction project. During the same period, the value of exports to Australia decreased by 5% (y-o-y). This was also due largely to PNG, whose exports (mostly of gold and petroleum) decreased by 6.5% in 2012, possibly because of the appreciation of the kina against the Australian dollar. These developments caused the Pacific's trade surplus with Australia to fall by 71.7% (y-o-y) to A\$295 million in 2012.

GDP growth
(%, annual)



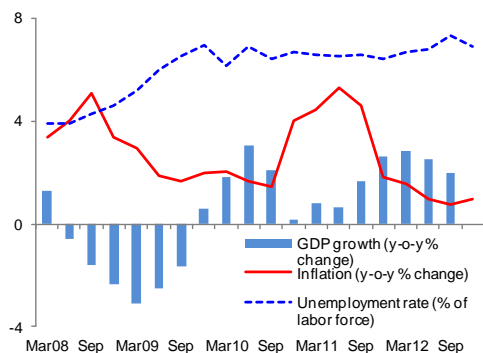
DMC=developing member country, e=estimate, p=projection
Sources: International Monetary Fund. 2013. *World Economic Outlook Update* (January 2013 and October 2012); and ADB estimates.

Australia GDP and commodity export prices
(quarterly)



GDP=gross domestic product, lhs=left hand scale, rhs=right hand scale, y-o-y=year-on-year
Sources: Australian Bureau of Statistics; and World Bank Commodity Price Data (Pink Sheets).

New Zealand economic indicators
(quarterly)



GDP=gross domestic product, lhs=left hand scale, rhs=right hand scale, y-o-y=year-on-year
Source: Statistics New Zealand.

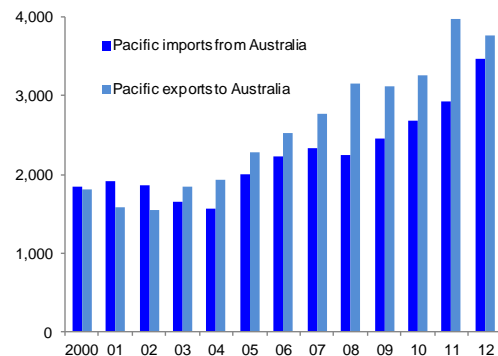
International and regional developments

- The value of Pacific exports to New Zealand increased by 2.5% in 2012 compared with 2011, supported by greater exports from Nauru (phosphate) and PNG (coffee and food products). Fiji's exports of agricultural products to New Zealand fell by 11% during the same period, partly reflecting lower sugar production. Pacific imports from New Zealand fell by 8% in 2012, largely because 2011 numbers were inflated by the Republic of the Marshall Islands' one-off importation of a ship. The Pacific's trade deficit with New Zealand widened by 9.2% (y-o-y) to NZ\$845.2 million in 2012.
- Pacific fuel imports from Singapore grew by 3.1% in 2012 compared to 2011—a significant slowdown from the 12.2% growth (y-o-y) realized in the previous year. Diesel continued to dominate Pacific fuel trade with Singapore, but import volumes remained largely unchanged from 2011. Less demand in Fiji and PNG was offset by higher import growth elsewhere.

Good tourism performance seen to continue

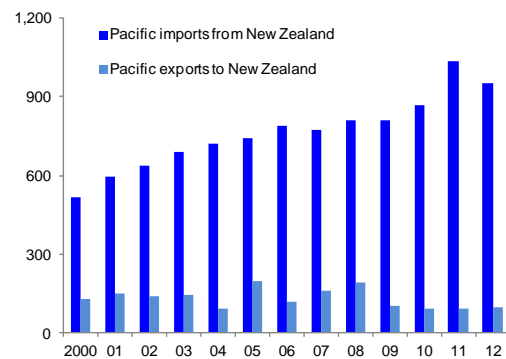
- Tourism to most Pacific destinations remained robust in 2012, building on historic highs set during the previous year. The continuing strength of outbound tourism from Australia and New Zealand buoyed tourist numbers in most South Pacific destinations, while the resilience of tourism from East Asia supported growth in visitor arrivals in the North Pacific.
- Departures from Australia to the South Pacific maintained modest overall growth in 2012, despite some decline in the number of Australian visitors to Fiji, its main destination. This weakening is attributed to the effects of successive floods in the early months of 2012. However, as was observed following the 2009 Fiji floods, destination substitution again yielded substantial gains for Vanuatu. Double-digit growth in Australian tourism was also recorded in (i) the Cook Islands, largely because of the reintroduction of underwritten Sydney–Rarotonga flights; (ii) Samoa, where accommodation rates have been discounted; and (iii) Tonga, through its aggressive tourism marketing campaign.
- In 2012, New Zealand tourism to the South Pacific grew at its fastest rate since 2005. This was driven in part by improved economic conditions in New Zealand relative to the previous year. Departures from New Zealand to Samoa and Vanuatu were particularly high following contractions in the previous year, while those to the Cook Islands maintained a steady expansion despite some moderation from the high growth in 2011. Departures to Fiji and Tonga also posted modest gains.
- Visitor arrivals in Palau continued to grow at a near double-digit rate in 2012. This was primarily driven by a sharp rise in arrivals from the Republic of Korea and the steady growth of tourist numbers from Japan and Taipei, China.
- Looking ahead, the outlook for tourism to the Pacific remains positive, underpinned by projected steady performance of major source markets. Tourism Research Australia projects about a 6% increase in total outbound tourism in 2013–2014, supported by expectations of strong consumer spending and an appreciating currency. The Asia and Pacific region is seen to remain as the key driver of global tourism growth, which is projected at 3%–4% in 2013 (following an estimated expansion of about 4% in 2012), according to the World Tourism Organization.

Pacific trade with Australia
(A\$ million, annual)



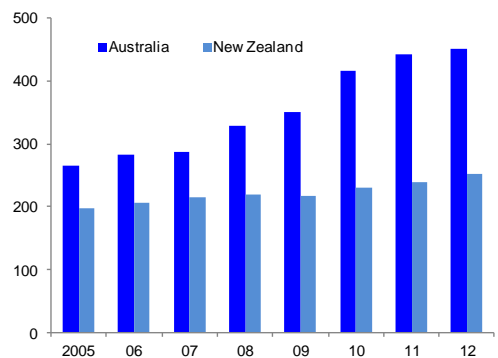
Source: Australian Bureau of Statistics.

Pacific trade with New Zealand
(NZ\$ million, annual)



Source: Statistics New Zealand.

Tourist departures to Pacific destinations
('000, annual)

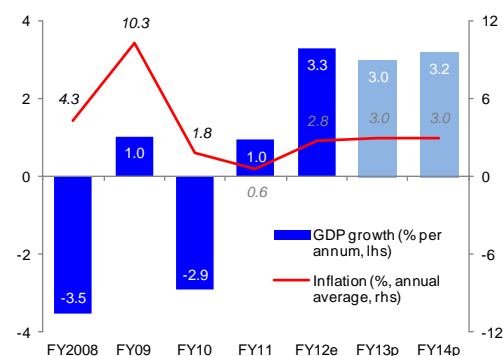


Sources: Australian Bureau of Statistics and Statistics New Zealand.

Cook Islands

- Growth accelerated in FY2012 (ended 30 June), building on the economic recovery achieved in the previous year. The acceleration was driven by public spending on infrastructure projects and the continuing strong performance of the tourism sector. Inflation rose slightly in FY2012 with rising transport and utilities prices.
- Tourism, driven by sustained high arrivals from New Zealand and Australia, will continue to spur growth. GDP growth is projected to moderate slightly in FY2013 with an anticipated winding down of infrastructure spending and declines in the agriculture sector. It is seen to accelerate again in FY2014, given expectations of improving economic conditions in Australia and New Zealand. Inflation is expected to remain relatively low through FY2013–FY2014 as commodity prices ease.
- Tourist arrivals have grown by an average of 8% over the past 2 years. Future growth may be constrained if tourism service providers do not expand facilities. In the peak months, occupancy rates in Rarotonga are virtually 100%. Without additional rooms, which take time to build, hotel charges will likely rise and erode the Cook Islands' tourism market share. Government infrastructure investments to provide complementary public services, and efforts to create a favorable business and investment environment (e.g., enhanced regulation of monopoly pricing), could facilitate expansion of tourism capacity.

GDP growth and inflation (annual)



e=estimate, lhs=left-hand scale, p=projection, rhs=right-hand scale

Note: Numbers in normal type are GDP growth rates, and numbers in italics are inflation rates.

Sources: Cook Islands Statistics Office; and ADB estimates.

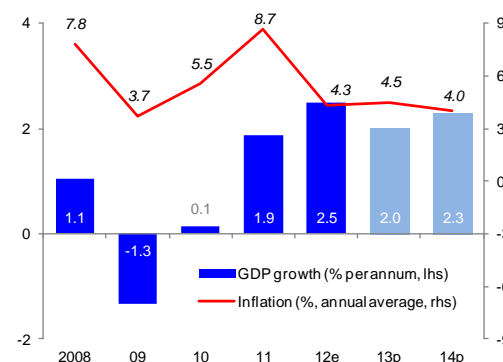
Lead author: Malie Lototele.

Fiji

Recent developments

- Latest official estimates, as contained in the 2013 Budget, are that GDP growth picked up to 2.5% in 2012. The Reserve Bank of Fiji reports that new lending for consumption and investment increased by 25.4% and 28.1%, respectively, last year. There has been a steady buildup in private sector credit, with lending up by 4.7% through December 2012. Net value added tax (VAT) collection increased by 4.9% in real terms, reflecting higher consumption prompted by personal income tax rate cuts, public sector pay raises, and increased consumer lending. The increase in net VAT collections was lower than the 14.9% increase recorded in 2011. Sales of cement increased by 7.5% through the first 10 months of the year on the back of higher capital spending.
- Performance of some sectors of the economy worsened relative to 2011. Sugar production fell 7.1%, reflecting weak global demand and the impact of floods early in the year. Gold production also fell by 8%, but bauxite production remained buoyant. Tourist arrivals declined by 2.1% in 2012. December arrivals were driven down due to flight cancellations caused by Cyclone Evan. The cyclone caused an estimated \$42 million (about 1% of GDP) in damage, just under half of which was to the non-sugar agriculture sector. Given these developments in key sectors, 2012 growth estimates are likely to be adjusted downward.
- Floods in early 2012 contributed to higher inflation in the first few months of the year. For the year as a whole, inflation was 4.3%—less than half of the rate in 2011.

GDP growth and inflation (annual)



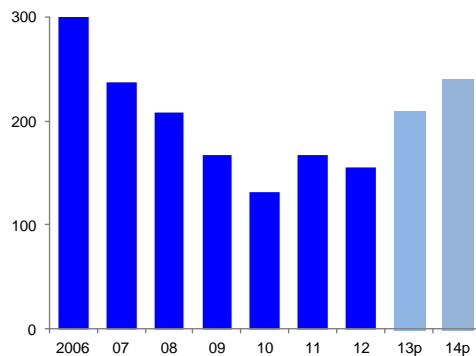
e=estimate, lhs=left-hand scale, p=projection, rhs=right-hand scale

Note: Numbers in normal type are GDP growth rates, and numbers in italics are inflation rates.

Sources: Fiji Bureau of Statistics; and ADB estimates.

Fiji

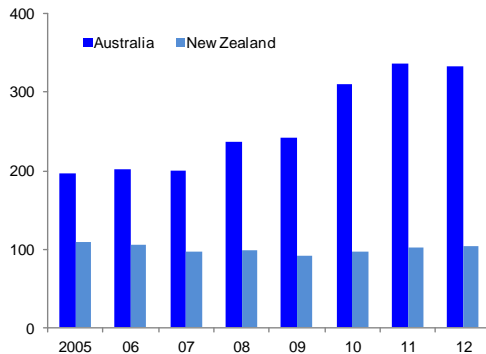
Sugar production
(’000 metric tons, annual)



p=projection

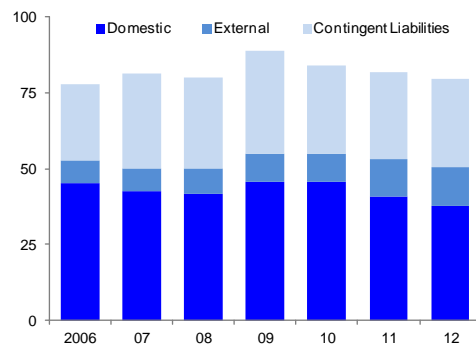
Source: Fiji Ministry of Finance. *Economic and Fiscal Update: Supplement to the 2013 Budget Address.*

Departures from Australia and New Zealand
(’000 persons, annual)



Sources: Australian Bureau of Statistics and Statistics New Zealand.

Debt
(% of GDP)



Source: Fiji Ministry of Finance. *Economic and Fiscal Update: Supplement to the 2013 Budget Address.*

- Public debt is relatively high at 50.4% of GDP, and latest estimates of the value of contingent liabilities indicate these total 28.7% of GDP. The bulk of public debt (about 37% of GDP) is held domestically, supported by government bond purchases by the Fiji National Provident Fund.

Outlook

- ADB forecasts that Fiji's economy will grow by 2.0% in 2013, on the back of projected recoveries in tourism and increased public capital expenditure. Post-flood and post-cyclone rehabilitation of infrastructure, and an ambitious program for construction of new transport infrastructure, are expected to spur growth and result in a net budget deficit of 2.8% of GDP. ADB projects that growth will accelerate to 2.3% in 2014 due to public infrastructure work, election-related expenditure, and further expansion in tourism in line with an improving global economy.
- As a result of supply disruptions caused by Cyclone Evan, inflation is expected to increase in 2013, particularly early in the year. ADB projects full year average inflation will run at 4.5% as upward price pressures arise from capital spending. Inflation is seen to slow to 4.0% in 2014 in line with declining international food and fuel prices.

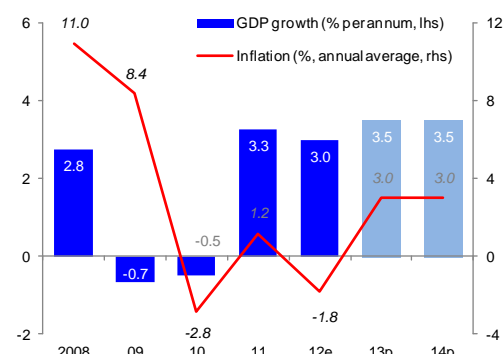
Key issues

- Fiji's net budget deficit is set to increase in 2013 as expenditures increase, with capital spending ramping up to 31.7% of total expenditures. If economic growth is below the government's assumption of 2.7%, then the deficit would be larger. Planned sales of government real estate assets to the Fiji National Provident Fund also underpin the government's projected deficit.
- Despite significant investments in recent years, the outlook for Fiji's sugar industry remains uncertain. In 2012, 20% of mature sugarcane sustained damage due to natural disasters, which will impact on sugar output this year. The recent government announcement that it will purchase mechanized equipment to raise production efficiency may not be sufficient to overcome the industry's challenges in its efforts to competing internationally. There is a need to embark on deeper structural adjustment. Ongoing negotiations around the contract price of sugar are likely to result in a lower price owing to the global supply glut.
- Fiji's growth performance over the medium term faces a number of challenges. While new investments and signs of greater interest from investors are encouraging, actual realization of foreign investment will be impacted by the country's political situation. The country's vulnerability to natural disasters and limited fiscal space (due to current debt level) are factors also constraining growth prospects.
- Recent enhancements in Fiji's social welfare system will improve targeting and coverage of the vulnerable, enabling it to benefit nearly 13,000 poor households. This will expand coverage from the current 3% to 10% of the population. This level of commitment to protecting the vulnerable puts Fiji at the forefront of development of social safety nets in the Pacific.

Kiribati

- Growth is estimated to have slowed slightly in 2012. This was a result of delays in the implementation of seaport reconstruction and road works projects funded by development partners.
- Imports from Australia—Kiribati's main trading partner—fell sharply from the high levels seen in 2011. This was partly due to delays in infrastructure works, but the appreciation of the Australian dollar (the currency used in Kiribati) also reduced the costs of imports from other countries and may have prompted shifts in import patterns. Such a shift toward cheaper import sources is also consistent with the general decline in consumer prices observed in 2012.
- Economic growth is projected to accelerate in 2013 and 2014 as public construction activity increases with the implementation of delayed infrastructure projects. Inflation is also projected to rise due to increased demand generated by project implementation, and as the effects of a strong Australian dollar dissipate.
- Sustainability of the Revenue Equalization Reserve Fund remains a concern, due to recent drawdowns that greatly exceeded government targets. Increased fishing license revenues in 2012 alleviated fiscal pressures, but long-term sustainability of government spending will hinge on private sector development to broaden the revenue base. This will require improvements in Kiribati's business environment (ranked 117th out of 185 countries in the World Bank's *Doing Business 2013* survey).

GDP growth and inflation (annual)



e=estimate, lhs=left-hand scale, p=projection, rhs=right-hand scale

Note: Numbers in normal type are GDP growth rates, and numbers in italics are inflation rates.

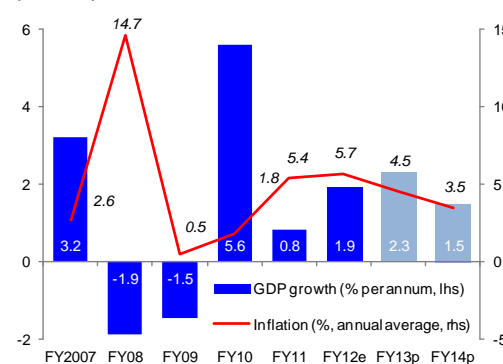
Sources: Kiribati National Statistics Office; and ADB estimates.

Lead author: Malie Lototele.

Marshall Islands

- In FY2012 (ended 30 September), the Republic of the Marshall Islands' (RMI) economy grew by 1.9% due to continued good performance of the fishing sector and resumption of the Majuro airport upgrade project. Inflation accelerated slightly, to 5.7% from 5.4% in FY2011, consistent with increases in international food and fuel prices that occurred during the year.
- The economy is seen to grow by 2.3% in FY2013 as the stimulus effect of the airport upgrade is augmented by spending related to the RMI's hosting of the Pacific Islands Forum. Growth is expected to slow to 1.5% in FY2014 as public works projects end.
- Inflation in the RMI will continue to track global trends. It is seen to slow to 4.5% in FY2013 and 3.5% in FY2014, alongside expected declines in international food and fuel prices.
- The RMI's continued reliance on infrastructure development and government spending, supported by US Compact grants, highlights the need to develop private sector-led sources of growth in preparation for the Compact's expiration in FY2023. Investment performance and capital contributions to the Compact Trust Fund are falling well short of levels needed to ensure the RMI's long-term fiscal self-sufficiency.
- Reforms to update and streamline the tax system, currently pending in Parliament, are necessary to create a more business-friendly environment. These should be complemented by continuing the efforts to improve public financial management, as well as pursuing other measures to strengthen public institutions and, ultimately, ensure that the gains from reform are sustained into the future.

GDP growth and inflation (annual)



e=estimate, lhs=left-hand scale, p=projection, rhs=right-hand scale

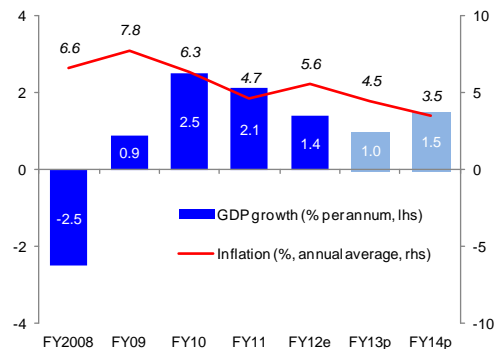
Note: Numbers in normal type are GDP growth rates, and numbers in italics are inflation rates.

Sources: RMI Fiscal Year 2011 Economic Review; IMF, 2012. *Article IV Preliminary Conclusions*; and ADB estimates.

Lead author: Cara Tinio.

Micronesia, Federated States of

GDP growth and inflation (annual)



e=estimate, lhs=left-hand scale, p=projection, rhs=right-hand scale

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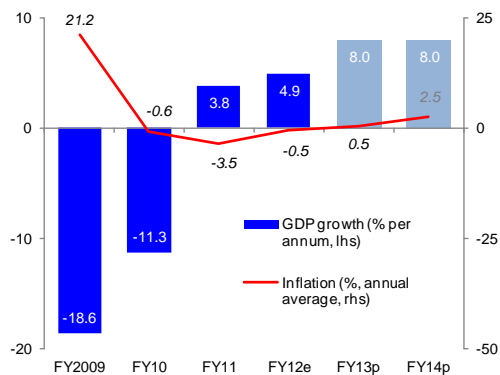
Sources: IMF. *Federated States of Micronesia 2012 Article IV Consultation Staff Report*; and ADB estimates.

Lead author: Rommel Rabanal.

- The pace of economic expansion slowed further in FY2012 (ended 30 September), as the series of airport improvement projects financed through US Federal Aviation Authority grants moved toward completion. While favorable fishing conditions supported good growth in fish catches and revenue, economic activity elsewhere in the private sector remained weak. The value of food imports from the US, a useful gauge of domestic demand, fell in FY2012 compared with the previous year.
- Inflation rose in FY2012 on the back of higher global prices for food and fuel, and credit expansion. Costs of food and fuel, which together make up about half of the average consumption basket in the Federated States of Micronesia (FSM), were elevated during the early part of the fiscal year.
- With no major infrastructure projects scheduled, the recent trend toward moderating growth is projected to continue through FY2013. Growth is then seen to pick up in FY2014, when a port upgrading project is expected to commence. Inflation is projected to maintain a slight downward trend over the next 2 years based on expectations of lower international food and fuel prices.
- The FSM's extensive exclusive economic zone has the potential to enlarge the fisheries sector's role as a driver of growth. However, income and employment generation in the sector remains limited. Improving the business environment could encourage private sector investment in fisheries and other labor-intensive sectors such as tourism and related services.

Nauru

GDP growth and inflation (annual)



e=estimate, lhs=left-hand scale, p=projection, rhs=right-hand scale

Note: Numbers in normal type are GDP growth rates, and numbers in italics are inflation rates.

Sources: IMF-Pacific Financial Technical Assistance Centre; and ADB estimates.

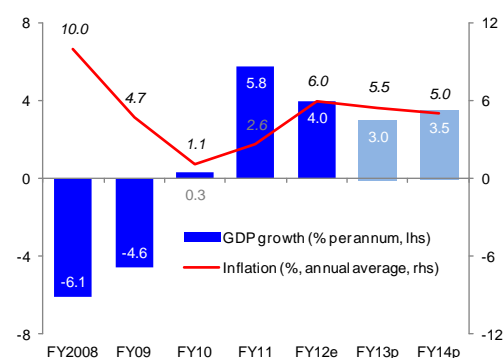
Lead author: Milovan Lucich.

- The economy expanded by 4.9% in FY2012 (ended 30 June) due to strong phosphate production and aid inflows. Phosphate exports reached 519,000 metric tons during the year, the highest level since production recommenced in FY2007.
- Growth is expected to increase to 8% in FY2013 and FY2014, despite some projected declines in phosphate production because of developments outside mining. Construction, hotels, restaurants, and retail trade, along with government finances, are expected to get a boost from the regional processing center (RPC), which reopened in September 2012. The RPC directly creates 200 jobs. Partial payment of government salaries in arrears—equivalent to 1.3% of GDP—will be financed from RPC-related revenues, and is expected to boost domestic consumption.
- The appreciation of the Australian dollar (the currency used in Nauru) has resulted in deflation from FY2010 to FY2012. Deflation has persisted, but RPC-related economic activity is seen to result in average annual inflation of 0.5% for FY2013 and 2.5% in FY2014.
- The Nauru government needs to carefully manage the benefits of the RPC's reopening. Terms of the land lease being negotiated for two of the three RPC sites must be settled to allow the facility to be scaled up to its intended maximum capacity of 1,500 persons. In addition to spurring employment and construction, scaling up the facility could increase visa fee revenues to as much as A\$16 million per year, once the Australian and Nauruan governments agree on fees. Like phosphate revenues, RPC earnings may be transitory, so the government should consider saving RPC-related revenues for future generations and investing in priority infrastructure projects.

Palau

- Growth remained relatively robust, albeit with some moderation, in FY2012 (ended 30 September) due to the continued strong performance of the tourism sector. Visitor arrivals again grew at a double digit rate, the third consecutive year of high growth, on the back of increasing number of tourists from Japan, Taipei, China, and Republic of Korea.
- The slowing of visitor arrivals and GDP growth in FY2012 can be attributed to factors such as peak-period capacity constraints in tourism-related facilities and infrastructure, and the difficulty of sustaining high rates of growth (i.e., market saturation).
- Supply bottlenecks and solid demand in tourism-related sectors added to inflationary pressures from high global prices for food and fuel. These factors led to a sharp rise in prices over FY2012.
- The moderation in arrivals and GDP growth is expected to continue through FY2013. Growth in FY2014 is dependent on the government's forward investment plans. Easing global supply conditions for food and fuel are projected to result in declining inflation over the next two years.
- Private sector activity in Palau stands to benefit from the launch of an online secured transactions registry in January 2013. This promises to expand the availability of credit and encourage entrepreneurial activity.

GDP growth and inflation (annual)



e=estimate, lhs=left-hand scale, p=projection, rhs=right-hand scale

Note: Numbers in normal type are GDP growth rates, and numbers in italics are inflation rates.

Sources: IMF. *Republic of Palau 2012 Article IV Consultation Staff Report*; and ADB estimates.

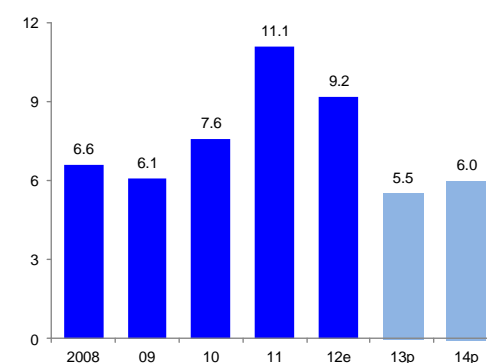
Lead author: Rommel Rabanal.

Papua New Guinea

Recent developments

- In 2012, PNG was one of the fastest-growing economies in Asia and the Pacific with near double-digit growth. The non-mineral sector performed most strongly, led by construction, transport, finance, and retail trade, as domestic demand created by the building of a liquefied natural gas (LNG) project reached its peak. Mining output recovered from technical disruptions and unfavorable weather experienced in 2011. Government expenditure was higher than expected. Falling oil output due to declining reserves dragged down overall growth. Growth in agriculture, forestry, and fisheries output slowed as a result of poorer growing conditions and moderating export prices, which led to lower coffee, copra, and cocoa output.
- Signs of a cooling off in business activity began to emerge late in the year. The employment index showed slowing in private sector job growth. A drop in cement imports from Japan and Australia, PNG's main suppliers, suggested a potential slowdown in construction sector activity. Growth in vehicle imports from Japan, which has been a good indicator of consumption demand in the past, also eased. Anecdotal evidence suggests that housing prices may have peaked at least in the near term, as new supply comes onto the market and demand softens.
- Inflation fell significantly in 2012, to just 4.1%, but this likely underestimates the rate of price growth as PNG's consumer price index basket is outdated. Lower import prices, reflecting the impact of kina appreciation and the government's tariff reduction program, drove the inflation decline. In late 2012, lower import prices flowed through to reduce growth in domestic prices.

GDP growth (% per annum)

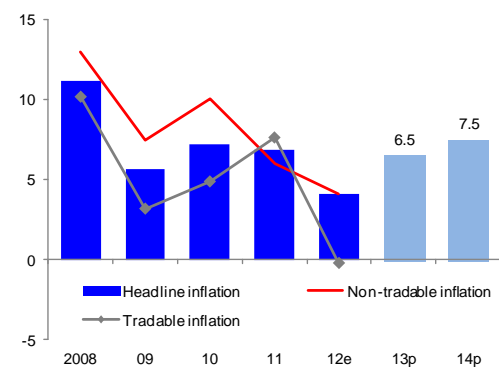


e=estimate, p=projection

Sources: PNG Department of Treasury; and ADB estimates.

Papua New Guinea

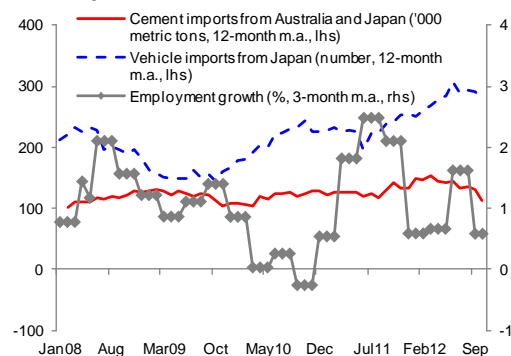
Inflation
(%, annual average)



e=estimate, p=projection

Sources: Bank of Papua New Guinea; and ADB estimates.

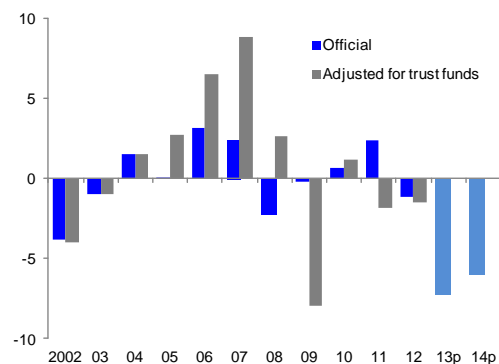
Leading economic indicators
(monthly)



lhs=left-hand scale, m.a.=moving average, rhs=right-hand scale

Sources: Australian Bureau of Statistics; Japan e-Stats website; Bank of Papua New Guinea; and ADB estimates.

Fiscal balance
(% of GDP, annual)



p=projection

Source: PNG Department of Treasury; and ADB estimates.

Outlook

- Economic growth is projected to ease to 5.5% in 2013, as the scaling down of LNG project construction reduces construction and transport activity, with spillovers to other sectors such as retail and wholesale trade. Moderating prices of key agricultural exports and a strong kina are expected to depress rural incomes and consumption. Continued declines in oil production, due to depletion of reserves in major fields, will likely also weigh down 2013 growth. Increasing mining output will partly offset the declines in other sectors, as production bottlenecks are addressed at key gold and copper mines, and production at the new Ramu nickel and cobalt mine ramps up. The onset of LNG exports in late 2014 will boost mineral output, with overall growth in the sector expected to reach more than 60%. ADB projects the economy will grow by 6.0% in 2014.
- The national budget plans large budget deficits in 2013 and 2014. The government plans large increases in funding for infrastructure to raise long-term growth and service delivery standards. However, the extent to which this supports economic activity will hinge on how much private investment is crowded out by government spending.
- Inflation is projected to reach 6.5% in 2013 and 7.5% in 2014. High public expenditures are likely to stoke price growth for domestic goods and services. Expected depreciation of the kina is likely to lead to resurgent imported inflation. Downward pressures on prices will largely come from the winding down of LNG construction as shortages of skilled labor and private sector capacity constraints subside. Associated falls in capital imports are also likely to ease port congestion.

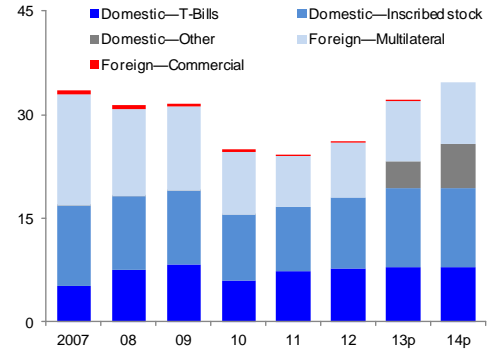
Key issues

- Although large budget deficits are planned for 2013 and 2014, public debt is expected to remain low by historical standards—peaking at around 35% of GDP in 2014. Nevertheless, PNG needs to ensure that higher spending does not undermine the fiscal buffers that have allowed the country to withstand recent economic shocks such as the 2008 global financial and economic crisis. To achieve this, a number of policy actions are suggested.
- First, spending must remain within the government's deficit reduction plan. To keep public debt below 35% of GDP, the 2013 budget plans for zero nominal growth in the public wage bill, and low growth in goods and services spending up to 2017. These targets will be difficult to achieve and could starve basic service delivery activities (e.g., education and health) of much-needed funding. Thus, a shift in spending from capital investment toward recurrent goods and services may be needed to ensure that service delivery targets can be achieved while staying within the deficit reduction path.
- Second, the government will have to manage the growing challenge of financing its deficit spending. While domestic bank liquidity remains high, local commercial banks are approaching regulatory limits on lending to government. There is a need to diversify the government's sources of deficit financing. Options include direct placement of bonds with local investors, loans from financial institutions, or US dollar-denominated bond issuances overseas. However, each of these options could increase borrowing costs and PNG's exposure to exchange rate risk (especially for overseas bond issuances).

Papua New Guinea

- Third, the government would benefit from restructuring its debt to reduce how often refinancing is required. External debt is mainly long term and concessional in nature, but the domestic debt stock (roughly 70% of the total) has an uneven maturity profile. About 30% of domestic debt is made up of Treasury bills with maturities between 3–6 months. The rest is longer-term debt, much of which will need to be repaid around the same time. If government revenues were to fall or commercial banks decide to reduce their PNG government bond holdings, raising additional financing or rolling over existing debt may become difficult. Such risks are amplified in PNG because, even after a decade of high growth, PNG’s financial sector remains thin with three major commercial banks, only one of which is domestic.
- Finally, fiscal risks created outside the budget process must be better managed. The reduction in public debt over the last decade has been offset by a rise in borrowing outside of the regular budget process. This borrowing includes financing for government equity and contingent liabilities related to the LNG project, and large unfunded superannuation liabilities. Reducing such liabilities gradually over time would lower overall fiscal risks.
- PNG’s medium term growth outlook remains strong. Public debt remains low by historical standards. While Government plans to increase investment in critical national infrastructure and social services are commendable, this priority must be balanced with maintaining fiscal buffers that will allow PNG to withstand future economic shocks. Raising the economy’s resilience will be vital to avoid the boom-bust growth cycles PNG has suffered in the past.

Public debt, by type
(% of GDP, annual)



p=projection
Source: PNG Department of Treasury; and ADB estimates.

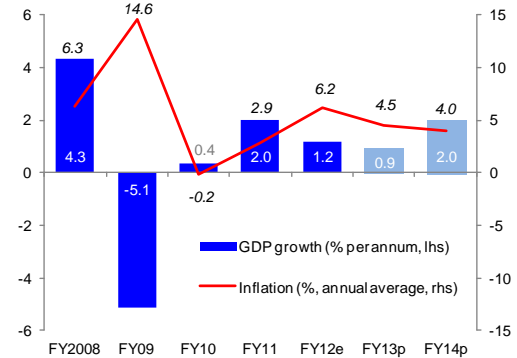
Lead author: Aaron Batten.

Samoa

Recent developments

- Economic growth moderated to 1.2% in FY2012 (ended 30 June) from 2.0% in the previous year. Samoa experienced lower growth over the past year as reconstruction and rehabilitation following the 2009 tsunami wound down.
- In the first quarter of FY2013, GDP growth picked up, reaching 2.1% (y-o-y) supported by the manufacturing sector. However, at the end of the second quarter, Cyclone Evan hit, causing damage estimated at more than \$210 million (equivalent to around 30% of GDP). Agriculture and tourism were the hardest hit, incurring losses estimated at \$28 million each. Transport, power, and water and sanitation infrastructure also suffered significant damage, as did school buildings and housing. Restoration of production capacity and reconstruction of essential infrastructure are expected to take about 2–3 years.
- In FY2012, remittances continued to grow—the second consecutive year of modest expansion. However, when adjusted for inflation, remittance levels have been nearly flat. The level of remittances can be expected to increase in the coming months as overseas Samoans provide relief for families and communities adversely affected by the cyclone.
- Inflation rose to 6.2% in FY2012, largely driven by higher food prices. Over the first half of FY2013, inflation has been on a declining trend, with deflation recorded in every month from September to December 2012.

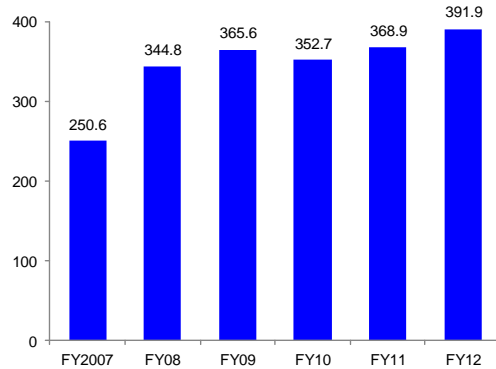
GDP growth and inflation
(annual)



e=estimate, lhs=left-hand scale, p=projection, rhs=right-hand scale
Note: Numbers in normal type are GDP growth rates, and numbers in italics are inflation rates.
Sources: Samoa Bureau of Statistics; and ADB estimates.

Samoa

Private remittances
(tala million, annual)



Source: Central Bank of Samoa.

Lead author: Caroline Currie.

Outlook

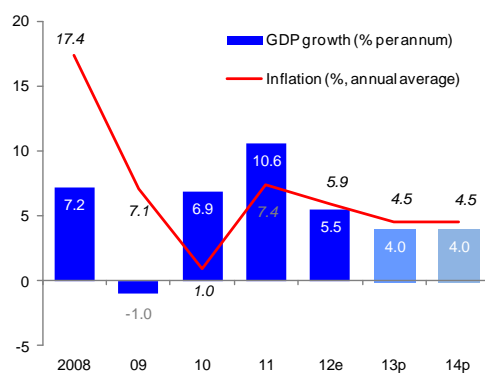
- Growth is now projected at 0.9% for FY2013. This reflects declining output from agriculture, tourism, and other productive sectors due to infrastructure damage caused by Cyclone Evan. Economic recovery efforts, once fully in place, are expected to have a positive impact on GDP in FY2014, with projected growth of 2%.
- Inflation can be expected to rise over the second half of FY2013 with higher domestic food prices arising from supply disruptions. Full year inflation is now projected at 4.5%, and is seen to slow to 4.0% in FY2014 in line with declining international food and fuel prices, and restoration of the distribution network.

Key issues

- The government exceeded its budget deficit target in FY2012. With fallout from the cyclone, including an expected decline in tax revenues and increased expenditure to restore essential infrastructure, an even larger budget shortfall is likely in FY2013. Rising public debt (45% of GDP in FY2012) means that the government has limited fiscal space to undertake the necessary rehabilitation efforts.

Solomon Islands

GDP growth and inflation
(annual)



e=estimate, p=projection

Note: Numbers in normal type are GDP growth rates, and numbers in italics are inflation rates.

Sources: Central Bank of Solomon Islands; and ADB estimates.

Recent developments

- Growth slowed to 5.5% in 2012, from 10.6% in the previous year, due to declines in agriculture and steady forestry output. Log production remained at 2011's record levels due to strong external demand and higher investment in the sector. Production of cocoa and copra slumped due to sluggish demand overseas.
- Industrial (e.g., mining, manufacturing, and construction) and service (e.g., trade, transport, and communications) sectors drove growth in 2012. Gold production in the Gold Ridge mine ramped up, with exports 2.4 times higher in 2012 compared with 2011. One-off events such as the hosting of the Festival of Pacific Arts and the British royal visit, and higher foreign direct investment, fueled growth in non-mining sectors.
- Falling international prices of logs (by 7.7% in 2012) and agricultural commodities reduced export revenues and generated a trade deficit in the second quarter of 2012—the first after 4 consecutive quarters of trade surpluses. The current account deficit for 2012 is likely to remain in single digits (around 6% of GDP) as higher grants from development partners offset declines in export revenues. The country has seen a significant rise in its foreign reserves as a result of large inflows of grants and foreign direct investment. Recently, higher fishing license revenues have also been a source of foreign currency inflows. Foreign exchange reserves reached an equivalent of 10.4 months of imports (up from 8.9 months in December 2011).

Solomon Islands

- Inflation declined from 7.4% in 2011 to 5.9% in 2012, as a result of slower economic growth, and the revaluation of the domestic currency and mopping up of excess liquidity by the Central Bank of Solomon Islands. In October 2012, the central bank pegged the Solomon Islands dollar to a basket of currencies (previously, it was pegged to the US dollar).
- The government incurred a fiscal deficit equivalent to 1.9% of GDP in 2012 (from a surplus equivalent to 5.1% of GDP in 2011), due to lower than expected revenues and increased spending. Revenues came in at less than half of the budget target due to slowing growth and higher-than-expected revenue losses from an adjustment of the personal income tax-free threshold. Rises in spending were related to the hosting of the Festival of Pacific Arts (totaling about 2.5% of GDP) and increased constituency funds paid to members of Parliament.
- Public debt continued to fall from 19% of GDP in 2011 to 15% in 2012. The country resumed concessional borrowing to finance power-related and underwater internet cable projects.

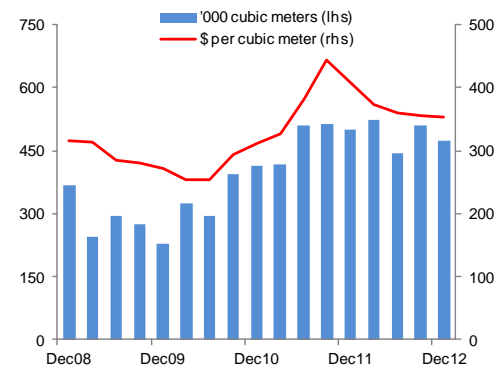
Outlook

- Growth is expected to slow further, to 4%, in 2013. Although agricultural production and gold output are projected to increase, log production is seen to decline. A scaling up of gold mining is expected as the Gold Ridge mine reaches its full production capacity (i.e., at 95,000 ounces per year, up from 79,400 ounces in 2012). In 2014, growth is projected to remain at 4% due to continued investment in mining and its spillover effects on the economy. Additional investment is also expected in telecommunications to harness opportunities created by the Broadband for Development project.
- Due to a lag observed in the effect of changes in international prices on the Solomon Islands economy, international food price rises from mid-2012 are expected to impact inflation in early 2013, but to dissipate by midyear. Over full-year 2013, average inflation is expected to ease to 4.5% as economic growth slows.

Key issues

- Constituency funds for projects in Parliament members' electoral areas have increased substantially in recent years. They now total about 4% of GDP and largely remain an unaccountable part of government spending. Projects financed by these funds are not enumerated in the budget or medium-term development plans. Capping and increased monitoring of use of constituency funds is warranted.
- Logging accounts for 15% of government revenue, 60% of exports, and 32% of foreign exchange earnings. It is the largest source of formal sector employment (second only to the government), accounting for about 5,000 jobs. Forests have been extensively exploited—logging rates have been estimated to have reached several times the sustainable rate in recent years. One study warns that natural forest resources may be exhausted before 2020. A decline in logging would adversely impact government finances and necessitate new sources of government revenues (e.g., a new taxation regime for the mining sector) to maintain government expenditures.

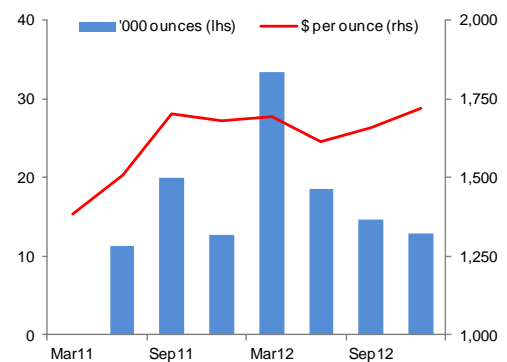
Log exports (quarterly)



lhs=left-hand scale, rhs=right-hand scale

Source: Central Bank of Solomon Islands and World Bank Commodity Price Data (Pink Sheets).

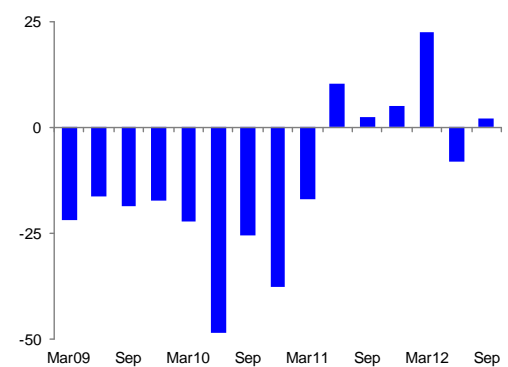
Gold exports (quarterly)



lhs=left-hand scale, rhs=right-hand scale

Source: Central Bank of Solomon Islands and World Bank Commodity Price Data (Pink Sheets).

Trade balance (\$ million, quarterly)

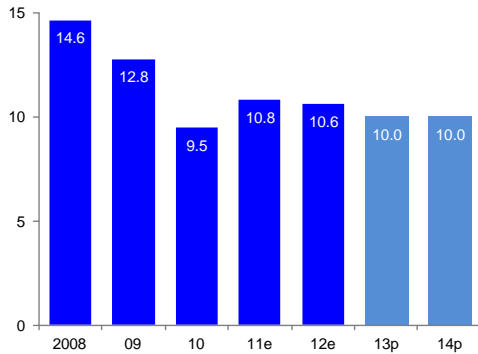


Source: Central Bank of Solomon Islands.

Lead authors: Milovan Lucich and Joel Hernandez.

Timor-Leste

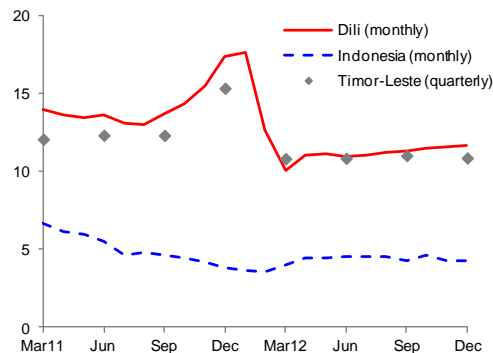
GDP growth (%, annual)



e=estimate, p=projection

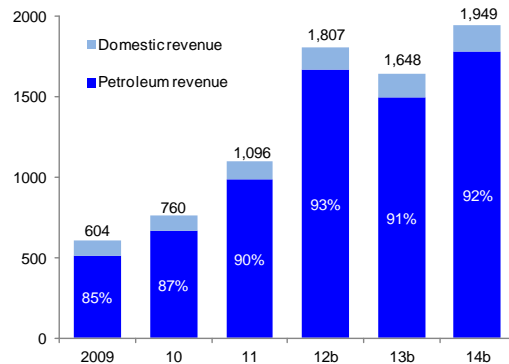
Source: Timor-Leste National Statistics Directorate; and ADB estimates.

Consumer price index (y-o-y % change)



Sources: Bank Indonesia and Timor-Leste National Statistics Directorate.

Government revenues, by source (\$ million, annual)



b=budget

Source: Timor-Leste 2013 State Budget.

Recent developments

- Strong economic growth continued in 2012, with nonpetroleum GDP (hereafter referred to as GDP) expanding by 10.6%. Government spending, particularly on capital expenditures, continued to drive the economy both directly and through spillover effects on business activities outside the petroleum sector. Total government expenditure of more than \$1.8 billion was 64.8% higher than in 2011. The pullout of the United Nations mission in Timor-Leste at the end of 2012 appears to be having little impact on economic activity in the country, with that impact focused on service businesses in Dili. This is likely due to the fairly small share of GDP tied to the UN mission (estimated at around 1% of GDP) and continued high government spending.
- Inflation slowed but remained high at 10.9% on an annual average basis in 2012 compared with 13.1% in the previous year. Over the year, inflation fluctuated less sharply than in previous years. Lower world food prices and declining import costs reduced price pressures, but temporary loss of freight handling capacity at Dili's international port in October and government spending spurred inflation.
- In 2012, the government recorded another large budget surplus (\$1.8 billion, about 1.4 times annual GDP). However, this surplus was considerably smaller than those registered in recent years (e.g., the 2011 surplus was 242% of GDP). Petroleum revenues were \$3.0 billion in 2012, down from \$3.5 billion in 2011. As in years past, petroleum revenues dwarfed the \$146 million in government domestic revenues. Public savings (Petroleum Fund plus foreign exchange reserves) of \$11.6 billion are valued at more than 9 times GDP.
- There was a 15% increase in the value of goods and services imported by Timor-Leste in 2012. This was a slower rate of growth than in 2011, when the government imported large amounts of heavy construction equipment for its infrastructure development efforts. Nonpetroleum exports increased by 10.9% on the back of a favorable coffee harvest, but remained a small fraction of imports of goods (4.4%). The income account surplus stemming from petroleum revenue continued to more than offset the wide trade deficit in 2012.

Outlook

- Strong economic growth is expected to continue in 2013 and 2014, propelled by government expenditures and modest rises in investment outside the petroleum sector. With total expenditures of \$1.6 billion, the government's 2013 budget is 8.8% lower than in 2012. However if this amount is fully executed, it would be a 38.0% increase in actual expenditure. This reflects the low execution rates in recent budgets, where actual expenditure has been significantly lower than planned expenditure.
- Inflation is expected to remain high (9.0%) but continue to decelerate in the first half of 2013. This seems to reflect government efforts to stem inflationary pressures (e.g., planned cuts in expenditure). Other factors seen to drive the more moderate inflation include the pullout of the UN mission and dissipation of inflationary pressures from one-time events that raised prices in 2012 (e.g., election-related spending, temporary loss of capacity at Dili's international port). Inflation is projected to continue to moderate in 2014 despite the planned increase in total government expenditures.

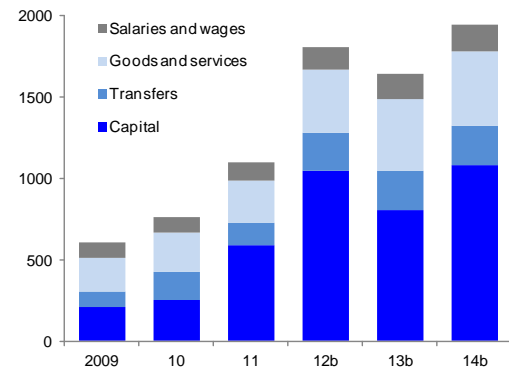
Timor-Leste

- World oil prices are projected to fall slightly in 2013 and 2014. This is seen to negatively affect Timor-Leste's petroleum revenue as well as budget and current account surpluses.

Key issues

- Long-term prospects for the economy and private sector development are encouraging, as the spillover effects of government spending create business opportunities and successes from past investments gather momentum. Government's efforts improve the country business environment, such as the "One-Stop-Shop" initiative (reducing and easing procedures for starting a new business) and passage of a public-private partnership framework, and progress toward developing a new law to govern land titles aid, support this positive trend.
- The government's drive to extend growth benefits to the predominantly rural population must be balanced with resource and capacity constraints. Although the country currently enjoys enviable fiscal and macroeconomic positions, its fiscal reserves are not large relative to its resource needs. Difficulties in implementing the government's ambitious development plans, and inefficiencies associated with project fast-tracking, suggest that the country could benefit from leveraging its petroleum wealth, as some financing offers additional benefits (e.g., technical capacity and knowledge sharing) as well as increasing access to greater financial resources.

Government expenditure, by appropriation category (\$ million, annual)



b=budget

Source: Timor-Leste 2013 State Budget.

Lead author: Christopher Edmonds.

Tonga

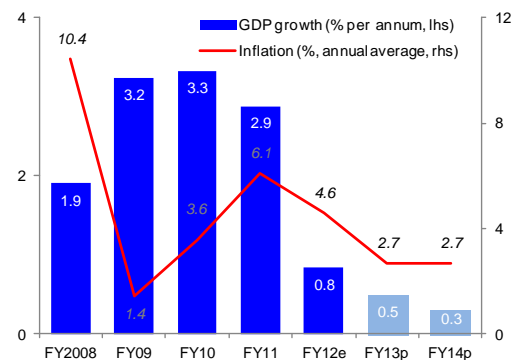
Recent developments

- Growth slowed considerably in FY2012 (ended 30 June), falling to 0.8% from 2.9% in the previous year. Weak remittances and declining private sector borrowing, along with the completion of large development partner-financed public investment projects, weighed down growth.
- Inflation fell to 4.6% in FY2012, down from 6.1% in FY2011. Winding down of infrastructure projects and weak domestic activity relieved pressures on domestic prices, despite slight rises in international food and fuel prices during the fiscal year.
- Remittances totaled \$67 million (about 15% of GDP) in FY2012, while they were as high as \$107 million (30% of GDP) in FY2008. Despite a 3.7% increase in remittances in November 2012 compared with the previous year (the first increase after 21 consecutive months of decline), developments in foreign labor markets bear watching. For example, the jobless rate in the US state of California, the major host market for Tongan workers overseas, remains in double digits, with few signs of improvement in key sectors such as residential construction.

Outlook

- GDP growth is projected at 0.5% in FY2013 and 0.3% in FY2014. The completion of public investment projects, weak business activity, and slow recovery in remittances and private sector credit are expected to continue to drive low growth.

GDP growth and inflation (annual)



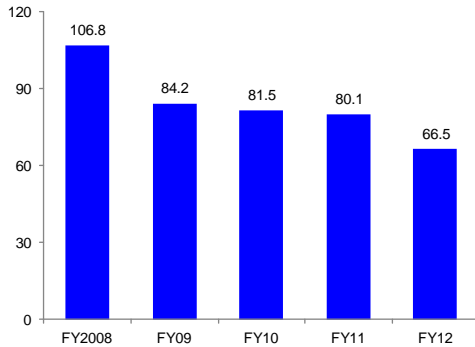
e=estimate, lhs=left-hand scale, p=projection, rhs=right-hand scale

Note: Numbers in normal type are GDP growth rates, and numbers in italics are inflation rates.

Sources: Tonga Department of Statistics; and ADB estimates.

Tonga

Private remittances
(\$ million, annual)



Sources: National Reserve Bank of Tonga; and Tonga Ministry of Finance and National Planning.

Lead author: Laisiasa Torā.

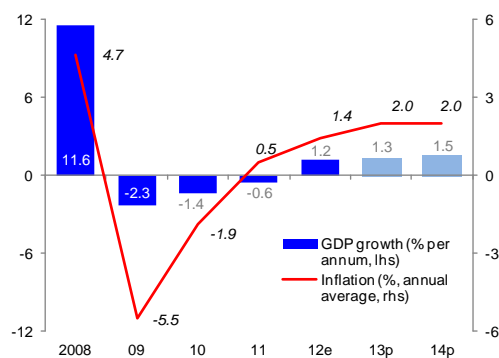
- Inflation is expected to moderate to 2.7% in FY2013 and to stabilize at that level through FY2014. This is driven by the low growth outlook, coupled with declining international food and fuel prices.

Key issues

- Tonga's planned fiscal consolidation efforts aim to reduce overall public debt from the current level of about 45% of GDP. Given Tonga's high risk of debt distress, the consolidation needs to be appropriately paced to avoid further contraction in an already weakened economy.
- Tonga's debt repayments are expected to increase by 34.5% in FY2014, 38.5% in FY2015, and 13.0% in FY2016. Without further budget support, the government will be unable to maintain current levels of basic services. The large wage bill, which makes up around 51% of the national budget, limits flexibility to reallocate expenditure.
- The government needs to maintain its implementation of structural reforms. These are central to the joint policy reform matrix for budget support agreed to with development partners.
- Reforms to Tonga's financial sector and business regulatory environment parliamentary submission of receivership and bankruptcy legislation in 2013 and 2014 that will allow smoother recovery of nonperforming loans and reduce the risk of lending in the future. If implemented, these reforms would have a lasting positive impact and stem the decline in private sector lending.

Tuvalu

GDP growth and inflation
(annual)



e=estimate, lhs=left-hand scale, p=projection, rhs=right-hand scale

Note: Numbers in normal type are GDP growth rates, and numbers in italics are inflation rates.

Sources: Tuvalu Central Statistics Division; and ADB estimates.

Lead author: Malie Lototele.

- After contracting in 2009–2011, the economy expanded by 1.2% in 2012 due to continued growth in development spending and retail trade. Inflation also accelerated in 2012, driven by higher transport prices as well as higher food prices early in the year.
- The economy is expected to grow by about the same rate in 2013 and 2014, largely driven by the upgrade of the Tuvalu airport and continued retail growth. The strong Australian dollar (used in Tuvalu), increased retail competition, and declining seafarer remittances should all keep inflation low during this period.
- The government posted a surplus of about 8% of GDP (A\$2.7 million) in 2012 due to higher fishing license revenues and aid inflows, and lower spending. A budget deficit of about 15% of GDP is projected in 2013 largely due to increased recurrent expenditures. The government raised the consumption tax rate from 4% to 7% in 2013, but this will be partly offset by higher thresholds for tax-free income.
- The market value of the Tuvalu Trust Fund recovered during the past year, but remains below the target level and cannot be used to augment the 2013 and 2014 budgets. However, achievement of 2012 fiscal performance benchmarks prompted additional financial assistance from development partners.
- The 2013 budget provides the first explicit subsidies to public enterprises (electricity, banking, telecommunications) to deliver services in the outer islands. Direct and transparent subsidies should improve the commercial operation of public enterprises.

Vanuatu

Recent developments

- The economy is estimated to have grown by 2.0% in 2012 on the back of recovery in the tourism sector. Following 2 years of decline, tourist arrivals increased by about 15% in 2012, largely due to higher arrivals from major markets (Australia and New Zealand). The hosting of the African Caribbean Pacific/European Union Conference also increased visitor arrivals and provided a small boost to construction activity.
- Increased government spending also supported growth. Election-related spending and the introduction of subsidies to copra farmers fueled expenditure growth. With almost no growth in tax revenue and declining grants, the budget deficit had increased to an equivalent of 1.7% of GDP by September 2012. This deficit was financed by domestic borrowing.
- External grants declined for the third straight year, falling by 28.7% in real terms over the first 9 months of 2012. This could worsen an ongoing 3-year slump in construction activity.
- The agriculture sector, which accounts for 23% of the economy, contracted (through the first 3 quarters of 2012) due to declines in the production of kava, beef, and coconut oil. Although copra production increased by a third in 2012, it only accounts for about 5% of the agriculture sector.
- Coming from a 0.9% increase in the consumer prices in 2011, inflation is estimated to have increased to 1.4% in 2012—driven by higher food prices early in the year. Consumer prices trended lower during the second and third quarters of the year driven by food and utility price falls.

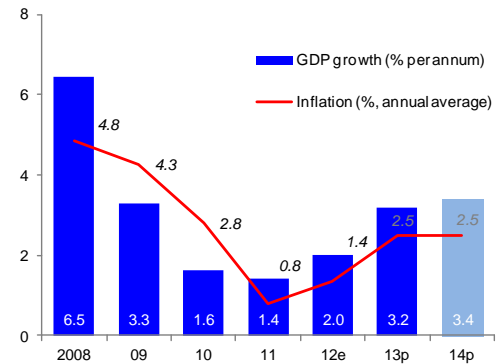
Outlook

- Growth is expected to pick up to 3.2% in 2013 and 3.4% in 2014, as delayed construction projects begin to be implemented and agricultural production recovers. Tourist arrivals are also expected to grow in 2013, partly due to diversion of visitors from Fiji due to Cyclone Evan.
- Inflation is expected to rise to 2.5% in both 2013 and 2014. Accelerating economic growth and implementation of major construction projects will exert upward pressure on prices.

Key issues

- Economic growth has slowed significantly in recent years. The economy grew by 6.5% in 2008 compared with an average of 2.1% in 2009–2011. The completion of large development partner-funded projects and declining property investment fueled this decline. Expanding the economic and export bases, and development of better infrastructure to facilitate easier movement of goods and persons, should help support economic growth and job generation moving forward.
- A benign inflation outlook and modest growth projections provide the Reserve Bank of Vanuatu scope to loosen monetary policy and lower borrowing costs to increase private credit. After peaking at 43.7% (y-o-y) in the fourth quarter of 2008, private credit growth slowed to 9.7% by mid-2012.

GDP growth and inflation (annual)

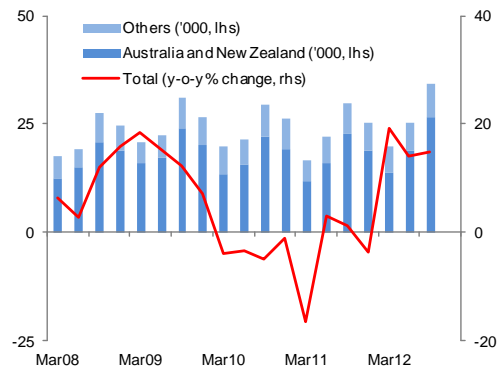


e=estimate, lhs=left-hand scale, p=projection, rhs=right-hand scale

Note: Numbers in normal type are GDP growth rates, and numbers in italics are inflation rates.

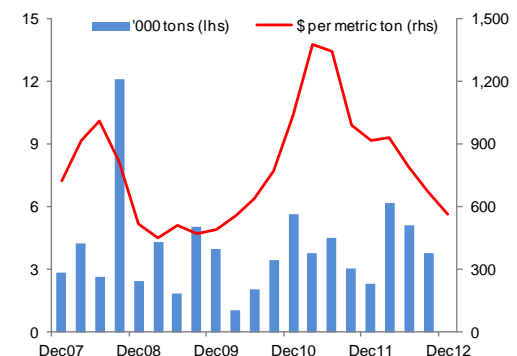
Sources: Vanuatu National Statistics Office; and ADB estimates.

Visitor arrivals, by source country (quarterly)



lhs=left-hand scale, rhs=right-hand scale
Source: Vanuatu National Statistics Office.

Price and volume of copra exports (quarterly)



lhs=left-hand scale, rhs=right-hand scale

Sources: Vanuatu National Statistics Office; and World Bank Commodity Price Data (Pink Sheet).

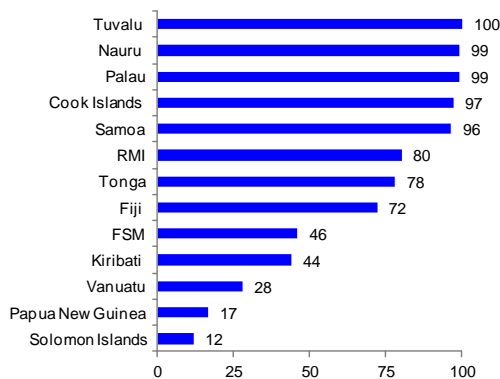
The energy security challenge in the Pacific

Pacific countries face rising challenges in terms of making tangible and sustainable progress toward greater energy security. Access to affordable and sustainable energy is fundamental to achieving sustainable development and social goals of Pacific island countries (PICs). Recognizing the great potential for cooperation on the issue, the Pacific Energy Summit, hosted jointly by New Zealand and the European Union on March 24–26, 2013 in Auckland, will bring together all PICs and development agencies with a focus on increasing access to clean, affordable, and reliable energy services.

The Pacific Energy Summit aims to catalyze the implementation of renewable energy and energy efficiency initiatives, and to provide Pacific island leaders the opportunity to network with other Pacific leaders, private sector businesses, development partners, and international financial institutions. It will also give participating countries the opportunity to showcase and promote their energy projects and initiatives that are designed to reduce reliance on expensive imported fuel.

The energy security challenges faced by the Pacific are vast. The region's near-total reliance on imported fuels hinders its development, particularly in smaller states with higher levels of vulnerability. In addition, only around 30% of households have access to electricity. This ranges from less than 30% in countries such as Papua New Guinea, Solomon Islands, and Vanuatu, to more than 95% in smaller states (e.g., the Cook Islands, Nauru, Palau, Samoa, Tuvalu). The Pacific's unique geographical characteristics, small populations, and limited economic base limit its capacity to achieve greater energy security.

Figure 1: Pacific electrification rates
(% of households connected to utility grid, latest available year)

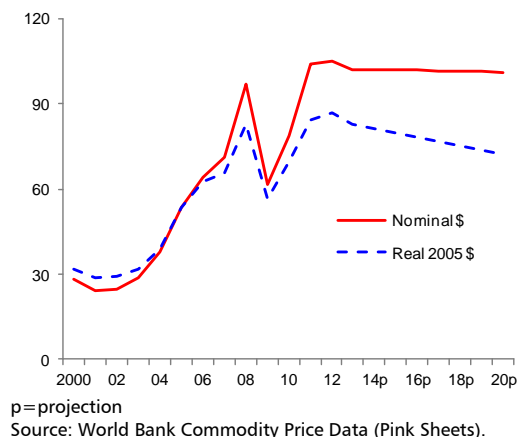


FSM=Federated States of Micronesia, RMI=Republic of Marshall Islands

Source: Secretariat of the Pacific Community. National Minimum Development Indicators online database.

The international price of crude oil more than doubled between 2002 and 2005. It increased further, by more than 50%, in 2007–2008, registering a peak price of \$132.80 per barrel in July 2008. Although oil price growth was suppressed due to the global recession, by 2011 the average annual price had broadly returned to the 2008 average level. Long-term forecasts suggest that petroleum prices are likely to continue to increase in coming decades. This general trend and the structural factors behind this increase remain unchanged. In countries where 5%–30% of GDP is being spent on importing fossil fuels, scarce resources are diverted from other productive uses and investment.

Figure 2: Crude oil prices
(\$ per barrel, annual)



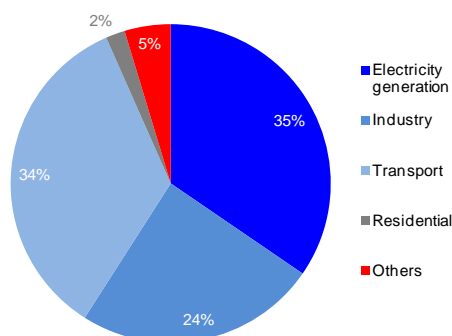
p=projection
Source: World Bank Commodity Price Data (Pink Sheets).

In response, many Pacific island countries have set ambitious renewable electricity or energy targets, and focused on switching from diesel-generated to renewable electricity. Many countries in the region have developed, or soon will develop, national road maps and strategies setting goals and frameworks for meeting these targets. If implemented, these would shield PICs from some of the volatility of international oil prices.

Despite recent progress, distinct challenges remain. Tangible action and investment has often lagged behind ambition, and identifying the factors that underlie delays is vital to the Pacific's energy future. Although switching to renewable energy technologies can help buffer Pacific island countries from volatile oil prices, there are a number of challenges that need to be addressed. Most notably, electricity generation uses only about a third of total fuel imports by the region. The remainder is consumed by transport, industry, and—to a lesser extent—residential users. While switching to renewable energy sources for electricity generation is an important (and sometimes low-cost) option, alone it will not address the Pacific's import fuel addiction as long as transport and industry continue to rely on imported oil.

The energy security challenge in the Pacific

Figure 3: Uses of petroleum
(% of total)



Source: ADB. 2009. *Energy Statistics in Asia and the Pacific (1990–2006)*. Manila.

Facing the need to expand access to energy while reducing dependence on imported fuels, policy makers in the Pacific need to focus on demand management as well as on improving the efficiency of energy supply. The potential benefits of demand management are significant and, if ranked by cost, can have greater economic impact and reduce greenhouse gas emissions at a lower price than new generation. Efficiency improvements can arguably put more immediate downward pressure on consumer tariffs than switching to renewable energy. Increasing supply-side efficiency and reducing technical and nontechnical losses can help close the gap between “generated energy” and “billable energy.” This can yield savings for both utilities and consumers. Switching to renewable energy sources does not necessarily translate to lower tariffs, even if the economy does become more shielded from the international price of oil.

Some Pacific energy markets may also benefit from introducing competition and enabling private-sector companies to supply renewable energy technology, equipment, and services can provide significant improvements in the quality and efficiency of energy production and distribution in the Pacific. This aligns well with the priorities of Pacific island countries that include a focus on technologies that are mature, reliable, and have been commercially available in the Pacific for some years. Piloting of new and emerging technologies is important, although it does come with risks that need to be carefully managed.

Innovation is especially important in Pacific countries that have no or few “cheap” renewable energy options—such as hydropower and, potentially, biomass or geothermal energy—to provide base load electricity supply. Intermittent (e.g., wind or solar power

generation) and “new” renewable energy options (e.g., tidal power, alternative sources of biofuel) are often more expensive and limited in their ability to supply 100% of energy needs.

Although there are ongoing technology and efficiency improvements, some renewable energy technologies struggle to compete with the avoided cost of diesel generation—especially if costs of electricity storage are included. The expectation that renewable energy will provide cheap or free electricity is common but often inaccurate. The cost of assets needs to be accurately appraised and—irrespective of the source of initial capital funding—tariff structures need to capture ongoing operation and maintenance costs, the cost of periodic replacement parts, and the cost of replacement at the end of the assets’ economic life. Sustainable financing and management of infrastructure investments is vital to increasing the likelihood that projects will remain operational for their full planned life. Proper costing and planning of renewable energy investments can help create a sound commercial footing for Pacific power utilities.

Opportunities for private sector investment in energy generation projects in the Pacific through long-term independent power producer arrangements represent a promising avenue for improving the region’s energy security. Substantial work is under way to improve the enabling and investment environments in Pacific island countries, and private sector interest in this area is growing. Injecting private sector capital, expertise, asset management, and maintenance regimes can devolve some of the technical risk, and technology development and selection, away from Pacific governments and power utilities, and onto third parties who can price that risk accordingly.

While the challenges seem nearly insurmountable, notable progress is being made and the Pacific Energy Summit will provide Pacific island countries the opportunity to showcase a full array of future energy sector investments, projects, and priorities they are developing. The summit aims to bring together the main parties active in the Pacific energy sector and to catalyze a quantum leap forward toward fulfilling the Pacific’s energy ambitions.

Lead author: Joseph Mayhew, Development Manager Energy, New Zealand Aid Programme.

Pacific energy demand outlook

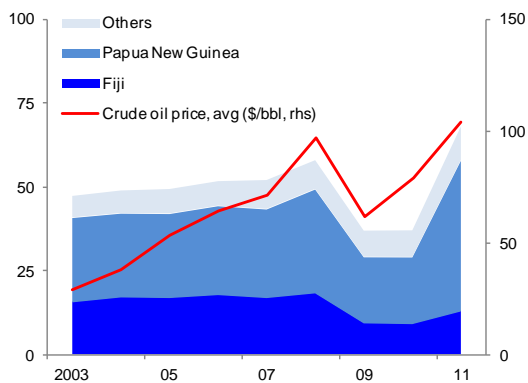
Growth and energy demand have a highly complex relationship that varies across countries, but studies suggest that this relationship can be mutually reinforcing. Energy (in the form of electricity and fuel) literally powers economic growth by running capital equipment, commercial spaces, and machinery, and helping the transportation sector link together the various segments of an economy, and an economy with the rest of the world. Economic growth in turn helps drive energy demand as households spend more income to increase their consumption and firms reinvest their earnings to expand operations.

This article seeks to profile energy consumption in eight Pacific developing member countries (Fiji, Kiribati, Papua New Guinea, Samoa, Solomon Islands, Timor-Leste, Tonga, and Vanuatu) and examine how this is shaped by economic growth. The findings, together with ADB's current economic outlook for these countries, will be used to estimate energy demand through 2020. The article then outlines country strategies and the role of ADB in meeting this estimated demand and helping to ensure economic growth.

Introduction

Energy consumption in ADB's 14 Pacific developing member countries (DMCs) increased in every year over the past decade except 2009 (Figure 1). Primary energy consumption in the Pacific consists almost exclusively of imported petroleum, which accounted for 80%–100% of energy consumption in each of these countries in 2008. The major user of petroleum in the region is Papua New Guinea (PNG), and a large increase in consumption in 2011 reflects the growth in the PNG economy.

Figure 1: Petroleum consumption ('000 barrels per day)

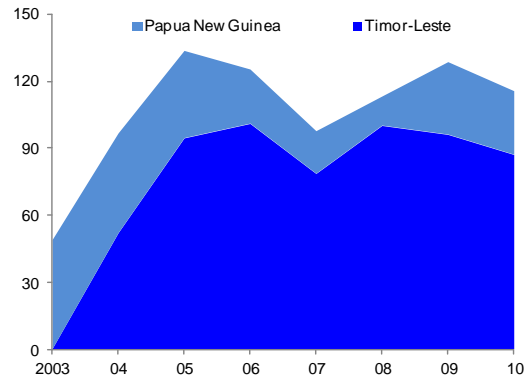


bbl=barrel, rhs=right hand scale
Source: US Energy Information Administration.

While PNG and Timor-Leste are both exporters of crude oil (Figure 2) and tend to derive most economic output from their petroleum sectors, both also remain net importers of refined petroleum products to meet their

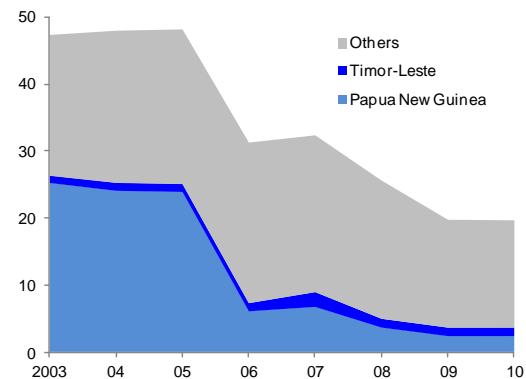
energy needs (Figure 3). This situation further highlights the Pacific's general reliance on imported petroleum products for energy supply. PNG's net imports of refined petroleum products, however, have declined in recent years as it built up capacity to refine some of its own crude oil.

Figure 2: Exports of crude oil ('000 barrels per day)



Source: US Energy Information Administration.

Figure 3: Net imports of refined petroleum products ('000 barrels per day)



Source: US Energy Information Administration.

Economic growth–energy demand nexus in the Pacific

Industrial activity in the Pacific is fairly limited—with the exception of Fiji, which has a relatively significant manufacturing sector, and economies dominated by resource-extraction industries (Table 1). Fiji's manufacturing sector accounts for about 14% of the country's economy. With the resumption of phosphate mining in Nauru, the mining sector contributes 20% to the country's total economic output. In PNG, two sectors (mining and petroleum, and construction) account for close to a quarter of GDP. The extraction of crude petroleum and natural gas in Timor-Leste, about 80% of GDP, dwarfs the contribution of other sectors.

Pacific energy demand outlook

Table 1: Final energy consumption, by sector
(shares in total, 2006)

	Industry	Transport	Others ^a	Total
Cook Islands	0	5	3	8
Fiji	186	247	104	537
Kiribati	0	3	3	6
Nauru	25	9	0	34
Palau	1	31	12	44
Papua New Guinea	553	344	131	1,028
Samoa	0	20	35	55
Solomon Islands	3	30	80	113
Timor-Leste	0	23	28	51
Tonga	0	36	9	45
Vanuatu	0	7	25	32
TOTAL	768	755	430	1,953

^a Includes residential, commerce and public services, and other unspecified sectors.

Source: ADB. 2009. *Energy Statistics in Asia and the Pacific (1990–2006)*. Manila

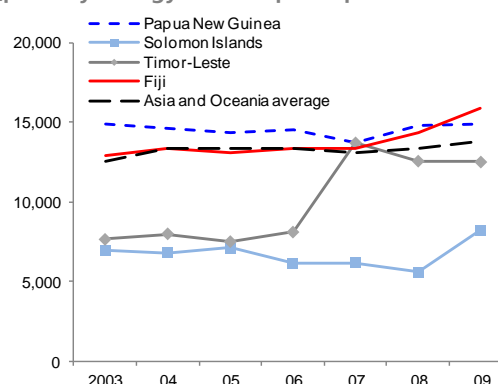
The presence of industrial activity in Fiji, PNG, and Timor-Leste explains why their energy intensity (i.e., total primary energy consumption per dollar of GDP) is much higher relative to their Pacific peers. Energy intensity in PNG has consistently exceeded the average for the Asia and Oceania region, and in recent years the same has been the case in Fiji (Figure 4). For PNG, this can be attributed to the significant (about 10%) share of the energy-intensive mining and petroleum sector to total economic output and, increasingly, the expanding construction sector due to liquefied natural gas (LNG) projects. With the start of LNG production in 2015, energy intensity is expected to increase, although this may be partly offset by declining petroleum production. For Fiji, energy intensity above the Asia–Oceania average coincided with the decline in electricity generated from less expensive hydropower plants (due to the adverse effect of El Niño on water levels in reservoirs) and greater reliance on more costly diesel and heavy fuel oil plants. From 2007–2011, the share of hydropower-generated electricity to total generation fell by 9% (from 66% to 57%), while that of electricity from thermal power plants increased from 34% to 42%.

Energy intensity in smaller Pacific economies is relatively low compared with the Asia and Oceania average, reflecting limited industrial activity (Figure 5).

Measuring energy elasticities of GDP in the Pacific

An indicator of the empirical relationship between economic activity and energy consumption is the energy elasticity of GDP, which measures the percentage change in energy consumption associated with a percentage change in real GDP. While energy consumption is

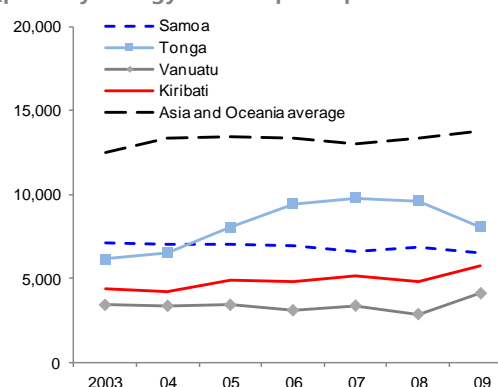
Figure 4: Energy intensity in larger Pacific economies
(primary energy consumption per dollar of GDP)



Note: Primary energy consumption in British thermal units per year, GDP measured in US dollars at 2005 prices and market exchange rates.

Source: US Energy Information Administration.

Figure 5: Energy intensity in smaller Pacific economies
(primary energy consumption per dollar of GDP)



Note: Primary energy consumption in British thermal units per year, GDP measured in US dollars at 2005 prices and market exchange rates.

Source: US Energy Information Administration.

Pacific energy demand outlook

generally expected to increase with growing economic output, the rate of increase will depend on a number of factors including the structure of the economy, energy supply mix, and efficiency of energy use.

Simple linear regressions between the natural logarithms of primary energy consumption and real GDP yield rough estimates of the energy elasticity of GDP. Table 2 shows estimated energy elasticities for Pacific DMCs using this simplified modeling approach, generally covering the period from 1990 to 2009 (model for PNG starts from 1996; Timor-Leste from 2003; and Vanuatu from 1998).

Table 2: Estimated Energy–GDP elasticities

Fiji	1.5
Kiribati	0.8
Papua New Guinea	2.0
Samoa	0.6
Solomon Islands	0.6
Timor-Leste	2.0
Tonga	1.5
Vanuatu	1.4
Average	1.3

Source: ADB estimates.

On average, the estimated energy elasticity of GDP of Pacific DMCs covered (i.e., those with available data on primary energy consumption) is about 1.3. This is consistent with the general observation that energy elasticities of GDP in developing countries tend to be greater than 1, which implies that energy consumption increases at a faster rate than economic output. Energy is considered a superior good, whose share in expenditure rises as incomes increase. As an economy develops, production tends to shift toward more energy-intensive sectors, particularly during the industrialization phase. Households, now realizing higher incomes, also consume more energy-intensive goods and services. This can be more pronounced in settings where electrification rates are low to begin with, as is the case on some Pacific islands.

Estimated energy elasticity of GDP is highest in the two petroleum exporting economies, PNG and Timor-Leste, largely because the energy-intensive resource-extracting industries in these economies account for a substantial share of total output. Fiji, with an industry sector built around sugar and fish processing as well as some mining and manufacturing, is in the middle of the range along with Tonga and Vanuatu. Estimated energy elasticities are relatively low in Kiribati, given its narrow economic base that relies primarily on the government sector; Samoa, with its more services-oriented economy and increasing use of renewable energy sources; and

Solomon Islands, where resource extraction mainly involves a relatively less energy-intensive forestry sector and the electrification rate is very low.

These derived energy elasticities of GDP can also be used to gauge the potential increase in the Pacific's primary energy consumption, given the prevailing outlook for economic growth over the long term. Table 3 summarizes energy demand or consumption outcomes consistent with estimated energy elasticities of GDP and ADB's current growth outlook for Pacific economies (i.e., projected growth in 2013–2014, 5-year moving average thereafter) until 2020.

Assuming energy intensities remain close to recent levels over the long term, primary energy consumption in the Pacific may more than double by 2020. This is largely driven by the nature of projected economic growth in PNG and Timor-Leste, which is expected to remain high while also moving toward increasing industrialization. Total primary energy consumption can grow by as much as 10% per annum from 2012 to 2020 on the back of these two larger high-growth economies. By 2020, the Pacific could require the equivalent of close to 75 terawatt hours (factoring in energy demand from the 6 other Pacific DMCs (the Cook Islands, the Republic of the Marshall Islands, the Federated States of Micronesia, Nauru, Palau, and Tuvalu) of additional primary energy on top of its estimated consumption level in 2012. The high proportion of households still without access to electricity in some Pacific DMCs means that energy demand may increase even more if substantial improvements to electrification coverage are achieved.

Meeting the Pacific's rising energy requirements

With economic growth comes rising demand for energy. Absent any marked shift in the Pacific's energy mix, energy policy, or energy use efficiency, rising demand for energy will largely translate to greater demand for imported petroleum. Meeting this demand could become difficult in light of concerns about the sustainability of the global petroleum supply and geopolitical tensions that could curtail access to the same. This could result in high and volatile costs of imported fuel, exerting pressure on Pacific DMCs' external and fiscal accounts (as fuel claims a significant share in most of their import baskets) and dampening these countries' growth prospects. It is therefore important to manage the growth in energy demand, even as Pacific economies develop and undergo structural transformation, in order to minimize the macroeconomic impacts of rising fuel imports.

Pacific energy demand outlook

Table 3: Estimated increase in primary energy consumption by 2020

	2012p	2020p	Change from 2012 to 2020		
	(trillion Btu)	(trillion Btu)	(% p.a.)	(trillion btu)	(GWh)
Fiji	49.9	62.6	2.9	12.6	3,706.6
Kiribati	0.7	0.8	2.8	0.2	47.8
Papua New Guinea	140.6	356.0	12.3	215.4	63,131.7
Samoa	2.7	2.9	1.0	0.2	61.6
Solomon Islands	4.8	6.1	3.0	1.3	377.0
Timor-Leste	8.3	29.2	17.1	20.9	6,129.4
Tonga	2.4	2.9	2.2	0.5	137.3
Vanuatu	2.3	3.3	4.7	1.0	299.9
Total	211.7	463.8	10.3	252.1	73,891.4

Btu=British thermal units, GWh=gigawatt-hour, p.a.=per annum
Source: ADB estimates.

The ADB strategy in the Pacific energy sector (see *Pacific Energy Update 2012*) is ultimately oriented toward reducing the region's dependence on imported petroleum products. Besides supporting the conversion to renewable sources of energy, ADB is focused on promoting more efficient electricity generation and use while expanding household access to electricity. On the supply side, rehabilitating existing power generation equipment that uses old, inefficient technology can yield substantial gains in supply efficiency at affordable costs. Such supply rehabilitation and upgrading efforts could include the resizing of transformers, retrofitting of overhead line conductors, and replacement of inefficient generator sets. On the demand side, relatively simple measures (e.g., promoting efficient lighting and buildings, adopting minimum energy performance standards for appliances, and mounting public awareness campaigns) can likewise lead to significant savings in energy consumption.

These measures will not only enhance Pacific DMCs' energy efficiency, but—coupled with efforts to develop alternative sources of energy—can also improve economic production and overall Pacific economic prospects over the longer term.

Lead authors: Joel Hernandez, Rommel Rabanal, and Cara Tinio.

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Power benchmarking in the Pacific: assessing key influences on operational performance

Introduction

Economic activity is highly dependent on a reliable supply of electricity. This enables the delivery of other infrastructure services (such as information and communications technology) and contributes to the delivery of essential government services, including health and education.

Regulatory and ownership arrangements in the electricity sector affect the quality and cost of power supply. The Pacific Power Association's benchmarking exercise, conducted with the support of the Pacific Region Infrastructure Facility (PRIF) in the period 2011, provides a snapshot of power utility performance in Pacific economies (Pacific Power Association et al. 2011). This article uses data from the exercise to assess the impact of regulatory arrangements on the performance of Pacific power utilities.

Approaches to power sector regulation

Over the last 30 years, approaches to power sector regulation have changed dramatically. The electricity sector was once considered a natural monopoly, with state-owned power utilities around the world supplying electricity as "vertically integrated" monopolies. The regulatory environment began to change in the 1980s. There was a push in many countries to introduce competitive practices and private sector participation to the sector, with the objective of increasing efficiency and lowering generation costs.

State-owned electricity monopolies in many countries were "unbundled" as part of this process, with the generation, distribution and transmission, and retailing roles of power utilities separated. This enabled the introduction of competition into generation and retailing businesses, often with the involvement of the private sector. Competition and private sector involvement were less common in transmission and distribution, as these functions were still considered to be a natural monopoly and remained more highly regulated by the state (Besant-Jones 2006; Pedell 2006).

Electricity provision in many developing countries is inefficient and the quality of electricity services is poor. This largely stems from managers not having appropriate incentives to improve performance. Several significant reasons are (i) politically determined prices are commonly too low; (ii) utilities are required to meet noncommercial objectives, without compensation; (iii) managers are appointed on a political basis; and (iv) utilities are not exposed to competitive forces.

Introducing competition and involving the private sector in power supply are commonly advocated to address these problems. Ensuring tariff levels are adequate and power utility managers have proper incentives will lead to improved worker productivity, and better financial and technical performance. Reform may also facilitate private sector investment, potentially widening access to electricity through expansion of electricity grids and generation capacity (although the evidence for investment is not as strong as for efficiency improvements) (Choynowski 2004; Gratwick and Eberhard 2008; Rosenzweig et al. 2004).

Power sector reform in the majority of developing countries, however, has been modest. In an extensive review of electricity sector reform in 150 countries, Besant-Jones (2006) found that vertically integrated monopolies remained in place in 79 countries, while in 52 countries, independent power producers sold electricity to a single buyer.

The power sector in the Pacific

Reform of the power sector in the Pacific has also been limited. In most Pacific economies, electricity continues to be supplied by vertically integrated, state-owned monopolies. There are only two private sector power suppliers in the Pacific, although private sector generators are increasingly supplying power to state-owned companies (often using alternative or renewable energy technologies).

Electricity prices in the Pacific are also often politically determined. This commonly results in electricity prices that are below the cost of service provision, placing financial strain on power utilities that are consequently made reliant on periodic and ad hoc injections of funds by the government.

Table 1: Regulatory arrangements for Pacific power utilities

	Independent price regulation	No independent price regulation
State-owned	4	13
Private-owned	2	-

There are a number of reasons why reforms have been of limited scope and success in the Pacific. One is the small size of electricity grids in the region. This presents a challenge to competition, with many grids being too small to support more than one power utility. Independent regulation of electricity prices can be difficult for the same reason, with the fixed costs involved in establishing an independent regulatory body outweighing corresponding benefits.

Power benchmarking in the Pacific

There are cases of successful reform in Pacific economies. In Fiji, a series of gradual steps since 2001 has seen the Fiji Electricity Authority (FEA) become one of the best-performing utilities in the region. These changes were made possible by clear directives from government about commercial objectives and the appointment of an experienced management team. The implementation of independent price regulation in Fiji in recent years has enabled continuing improvement. Increases in feed-in and retail tariffs are facilitating investment in renewable energy by the FEA and independent power producers.

There has been progress in the establishment of independent price regulation in the region. Several countries now have independent regulators, including Fiji, Tonga, and Vanuatu. Regulators are often responsible for more than one infrastructure sector, and outsource specialized functions for tariff determination where required. This arrangement is a means of addressing the challenges presented by small size.

The arrangements appear to be working to date. Removal of political influence over electricity tariffs has resulted in tariff rates that provide utilities with funds for investment and maintenance, thereby improving service delivery. Power utilities in these countries are also generally given clear commercial objectives as part of reform in the sector. At the same time, “lifeline tariffs” ensure that electricity remains affordable for low-income households. Lifeline tariffs are a community service obligation and should be reimbursed by the government.

Regulation, ownership, and performance

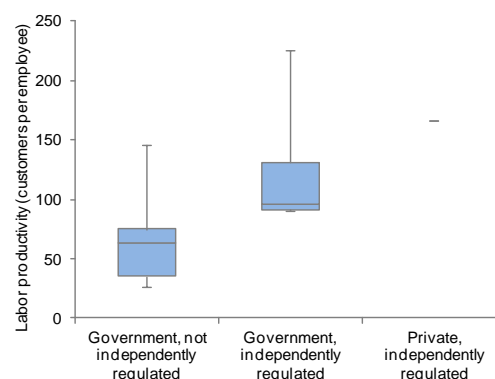
Power utilities are likely to perform better when they operate within a sound regulatory framework and when managers are given clear objectives for which they are held accountable. These factors provide the incentives, resources, and certainty necessary for improvements in efficiency and performance. Private sector ownership and independent price regulation, which both minimize political involvement, would therefore be expected to improve the performance of power utilities in the Pacific.

The results of the Pacific power benchmarking survey support these arguments. Figure 1 shows that efficiency, as measured by the productivity of labor, is higher where electricity tariffs are regulated by an independent body (as is the case for both private sector utilities and state-owned enterprises where independent price regulation has been established—the two categories on the right side of the graph).

The survey also shows that the financial performance of electricity utilities, measured by return on equity, is also better on average where price regulation is independent (Figure 2). There are two explanations for this. First, the clear commercial objectives of utility managers operating

under independent price regulation lead to higher productivity and improved financial performance. Second, tariffs set or influenced by politicians are likely to be lower, given political imperatives. Indeed, the survey shows that the average Pacific utility operating under government regulation records a negative return on equity of almost 5%.

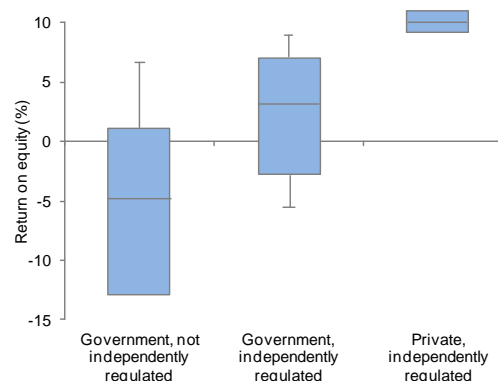
Figure 1: Labor productivity under different regulatory and ownership structures



Note: The box and whiskers plot demonstrates lower (25%), middle (50%), and upper (75%) quartiles, as well as the highest and lowest values.

Source: Authors' analysis using power benchmarking data.

Figure 2: Financial performance under different regulatory and ownership structures



Note: The box and whiskers plot demonstrates lower (25%), middle (50%), and upper (75%) quartiles, as well as the highest and lowest values.

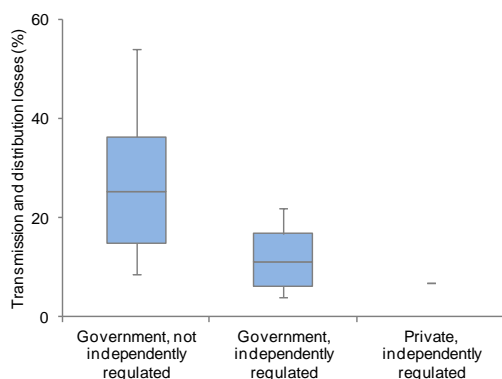
Source: Authors' analysis using power benchmarking data.

Poor financial performance reduces the ability of a utility to operate and maintain its equipment effectively. A forthcoming PRIF study on infrastructure maintenance in the Pacific has found that under-resourcing of maintenance is a significant factor behind poor-quality infrastructure services in the region (Alejandrino-Yap et al. 2013). The impact of regulatory and ownership arrangements on transmission and distribution losses (e.g., technical losses, nontechnical losses, including stolen

Power benchmarking in the Pacific

electricity), which offer good indicators of technical performance, is shown in Figure 3. Losses are lower where prices are set by an independent regulator. Power utilities operating in this regulatory environment are likely to be in a better financial position and have incentives in place to ensure high-quality power supply and minimization of losses.

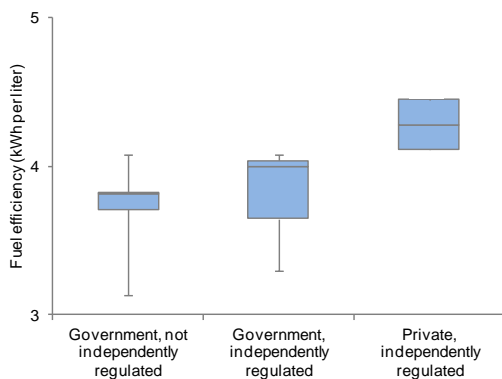
Figure 3: Technical losses under different regulatory and ownership structures



Note: The box and whiskers plot demonstrates lower (25%), middle (50%), and upper (75%) quartiles, as well as the highest and lowest values.

Source: Authors' analysis using power benchmarking data.

Figure 4: Fuel efficiency under different regulatory and ownership structures



Note: The box and whiskers plot demonstrates lower (25%), middle (50%), and upper (75%) quartiles, as well as the highest and lowest values.

Source: Authors' analysis using power benchmarking data.

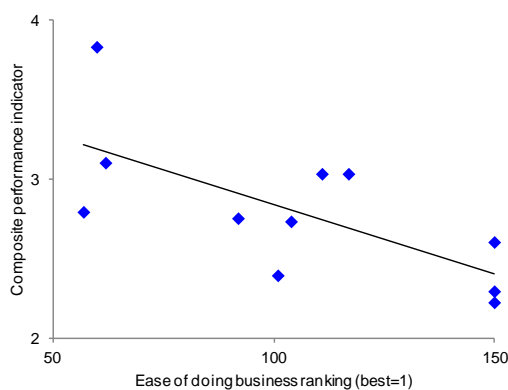
Another measure of technical performance included in the 2011–2012 benchmarking survey is fuel efficiency of oil-based generators. Higher fuel efficiency results in cost savings for the utility and provides an indication of how well a utility operates and maintains its generation capacity. To illustrate this point, the Public Utilities Board in Kiribati found that fuel efficiency increased from 3.71kWh/L to 3.86 kWh/L in June 2009 as a result of a maintenance overhaul (Alejandrino-Yap et al. 2013). Figure 4 shows that fuel efficiency is highest for the

small number of private sector operators, and is generally higher where prices are independently regulated. This result is consistent with the arguments made above.

Other factors

A number of other factors also appear to affect the performance of utilities. The survey data show a statistically significant correlation between technical performance indicators and ease of doing business ranking (Figure 5). A possible explanation for this is that governments that establish independent price regulation are likely to do so as part of a broader reform program to enhance the business environment.

Figure 5: Ease of doing business and utility performance



Note: Ease of doing business is a World Bank survey measuring the quality regulatory arrangements across economies. Results are available at www.doingbusiness.org.

Source: Authors' analysis using power benchmarking data.

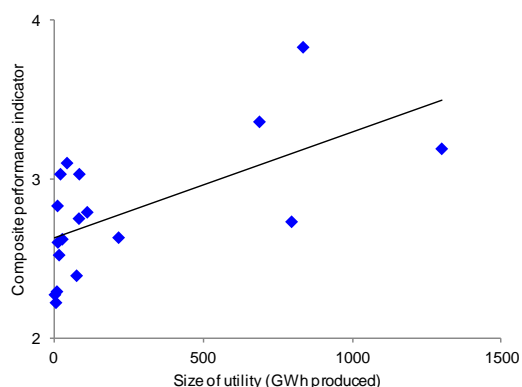
Another factor worth discussing is the relationship between performance and the size of the power utility. A comparison of the amount of power a utility generates and its technical performance shows a statistically significant correlation, both for labor productivity and for a composite performance indicator combining measures of fuel efficiency, asset utilization, system losses, and overall labor productivity (Figure 6). Larger Pacific power utilities are likely to perform better on a range of technical indicators when compared with smaller Pacific power utilities. However, these results should be interpreted with care. The relationship between size and performance does not hold for small utilities, and disappears when several large utilities are removed from the comparison.

There are a number of reasons for expecting a positive correlation between size and performance. The first is that large power utilities benefit from economies of scale, which enable them to supply power at a lower cost. The second is that large power utilities are more likely to be able to attract and retain employees with necessary technical skills for sound operation and

Power benchmarking in the Pacific

maintenance of equipment. This point is also supported by a forthcoming PRIF study on infrastructure maintenance in the Pacific (Dornan et al. 2013). The third reason is that independent regulation is often not feasible for small power utilities, meaning that the associated benefits discussed above accrue primarily to medium and larger-size utilities. This last point highlights the potential merit of a regional approach for small Pacific islands, with specialized functions for tariff determination being outsourced to a regional body.

Figure 6: Utility size and performance



Source: Authors' analysis using power benchmarking data.

None of this is to argue that utility size determines performance. Smaller utilities are on average likely to perform less well than larger utilities, but there is significant variation between utilities of equal size. Rather, these comparisons suggest that there is considerable scope for improving the performance of Pacific power utilities. Power sector reforms that provide the necessary incentives and resources are a means of achieving such improvement.

Concluding remarks

Power sector reform has been advocated around the world in response to problems arising from political involvement in power utility operations.

This article has presented data from the power benchmarking survey 2011 to assess the effect of regulatory and ownership arrangements in Pacific economies. The analysis shows that the introduction of independent price regulation, when accompanied by the establishment of commercial objectives, has a positive impact on the technical and financial performance of power utilities.

These are modest reforms when compared with those implemented in many developed countries, but they can be effective. Independent regulation is also more feasible for small economies than "advanced" reforms such as establishment of wholesale markets, especially when involving a multisector regulator that draws on outside

expertise. It remains unclear whether the multisector regulator model is cost-effective for small island states in the region.

Finally, reform efforts do not preclude government involvement to meet equity or other objectives. Utilities may be required to meet community service obligations, but when these are clearly identified, priced, and financed via targeted subsidies, the utilities can maintain their commercial orientation and strong performance incentives. The importance of establishing an unambiguous commercial orientation within the power utilities is a crucial determinant of their financial performance and should be a priority in power utility reform efforts.

The next power benchmarking survey is expected to be published in mid-2013.

Lead authors: Matthew Dornan, Research Fellow, Development Policy Centre, Australian National University; John Austin, Manager, Pacific Infrastructure Advisory Center; and Maria Corazon Alejandrino-Yap, Research Officer and Benchmarking Project Manager, Pacific Infrastructure Advisory Center.

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Savings from energy efficiency: the case of Samoa

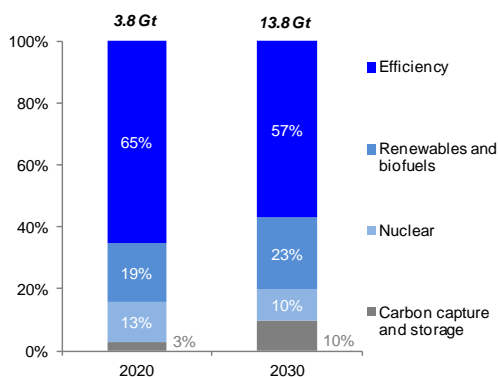
What is energy efficiency?

Energy efficiency refers to a reduction in the energy used to provide a given level of energy services (lighting, refrigeration, cooling, electric motor power, etc.) to a household, building, or facility. The optimization of end-user energy consumption is usually associated with technological changes but can also be achieved by improving energy management processes or by adjusting operational procedures (e.g., readjusting temperature set-points of thermostats to a higher level to save on air conditioning energy use). Increased energy efficiency can mitigate climate change, reduce fuel imports, improve trade balances, and strengthen the overall economy.

A cost effective way to mitigate climate change

Improving energy efficiency is generally considered the lowest-cost option to tackle current and future constraints in energy supply, and achieve necessary reductions in greenhouse gas (GHG) emissions. The Stern Review on the Economics of Climate Change (2006) estimates that climate change caused by excessive GHG emissions produces economic losses equal to 5%–20% of global GDP per year. The potential importance of energy efficiency in mitigating climate change impacts was addressed by the International Energy Agency, which estimated that an additional \$10.5 trillion of investment is needed in a scenario defined to limit the global surface temperature rise to 2°C (i.e., the 450 parts per million scenario). Under this scenario, measures to boost energy efficiency account for most of the cost-effective abatement through to 2030 (Figure 1). The needed global GHG abatement by 2020 is 3.8 gigatons, of which 65% is expected to be contributed by energy efficiency. By 2030, the needed GHG abatement is 13.8 gigatons, of which 57% is expected to be contributed by energy efficiency.

Figure 1: World abatement of energy-related CO₂ emissions, 2020 and 2030
(% share by technology, in gigatons per year)



CO₂=carbon dioxide, Gt=gigatons

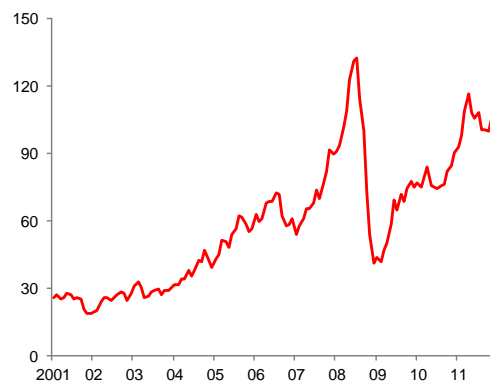
Note: Estimates are under the 450 parts per million scenario of the International Energy Agency.

Source: International Energy Agency. *World Energy Outlook 2009*. Paris.

Reducing the economic burden of imported fuel dependency

The growing realization that the world is now at, or very close to, the peak of conventional oil production is fueling a steady increase in world oil prices. From 2001 to 2011, oil prices have been highly volatile, peaking at \$132.8 per barrel in July 2008. High oil prices, and the parallel need for strong ongoing GHG emissions abatement, constitute a large concern for most countries in the world—especially in the Pacific, where fuel imports claim a large proportion of GDP.

Figure 2: Price of crude oil, 2001–2011
(\$ per barrel, monthly average)



Source: World Bank Commodity Price Data (Pink Sheets).

Pacific developing member countries (DMCs) are particularly vulnerable to fuel price increases. Their total, or near total, dependence on fossil fuel imports for all energy needs creates an important economic burden for end users and governments. Table 1 shows imported fuel as a percentage of GDP in Pacific DMCs.

High potential savings from energy conservation

In 2008, five Pacific DMCs (the Cook Islands, Papua New Guinea, Samoa, Tonga, and Vanuatu) sought ADB assistance to better understand the potential costs and savings derived from energy conservation measures (ECMs). In response, ADB approved regional technical assistance for the Promoting Energy Efficiency in the Pacific (PEEP) project. Phase 1 of PEEP considered a number of ECMs, such as retrofitting buildings (particularly government buildings and hotels), using energy-efficient residential and street lighting, and encouraging use of energy-efficient appliances. The resulting study, based on energy use data collected on a limited sample, showed that Pacific DMCs introducing several ECMs could attain up to 14% average annual energy savings. Table 2 summarizes the potential average and peak load savings for each participating

Savings from energy efficiency: the case of Samoa

Table 1. Pacific fuel imports
(% of GDP)

	2000	2005	2006	2007	2008	2009	2010	2011
Cook Islands	---	4.0	11.1	8.5	6.1	5.9	5.3	5.4
Fiji	9.1	15.3	18.8	17.8	21.7	12.6	17.7	17.5
Kiribati	5.1	11.8	14.8	14.1	---	---	---	---
RMI	18.4	---	---	---	---	---	---	---
FSM	---	8.7	10.7	11.2	13.1	14.6	13.3	14.7
Nauru	---	4.4	---	---	---	---	---	---
Palau	0.0	19.2	---	---	---	---	---	---
Papua New Guinea	4.1	7.1	7.9	9.4	6.2	4.9	6.5	6.0
Samoa	0.0	8.5	9.9	9.0	12.6	8.1	9.3	11.0
Solomon Islands	4.8	9.6	11.2	10.3	13.8	8.5	7.6	11.7
Timor-Leste	---	7.7	6.5	0.0	10.7	4.8	4.7	4.7
Tonga	8.4	12.0	12.4	13.5	15.0	14.8	11.7	13.0
Tuvalu	3.2	12.4	---	---	---	---	---	---
Vanuatu	---	4.3	4.3	6.9	6.9	5.8	5.3	6.9

FSM=Federated States of Micronesia, RMI=Republic of Marshall Islands

Sources: Central banks and statistical bureaus of Pacific developing member countries; International Monetary Fund Article IV reports.

Table 2. Potential savings from energy conservation measures in Pacific developing member countries
(% of GDP)

Country	Number of ECMs	Annual savings potential			Peak load reduction		Simple payback for all ECMs
		%	MWh	\$ million	kW	%	Years
Cook Islands	5	14.4	3,800	1.4	900	24%	2.4
PNG	7	4.1	29,500	9.9	5,550	4%	2.2
Samoa	7	9.8	8,600	2.8	1,640	11%	3.2
Tonga	5	13.4	5,010	1.8	1,310	20%	2.3
Vanuatu	6	9.9	5,400	2.1	1,290	12%	2.9

ECM=energy conservation measure, kW=kilowatts, MWh=megawatt-hours, PNG=Papua New Guinea

Source: ADB. 2011. *Promoting Energy Efficiency in the Pacific* (TA 6485-REG). Final Report. Manila.

country. The longest payback period for the ECMs considered would be 3.2 years.

Under Phase 2 of the project (PEEP2), ADB is assisting the five Pacific DMCs in scaling up the implementation of several ECMs. This phase also expands the collection of energy use data by conducting household surveys to detail residential energy use and building audits to assess the major sources of energy consumption. This will enable better estimates of energy savings from ECMs and more precise identification of the ECMs to deliver the highest savings. PEEP2 has also earmarked \$2.3 million to support Pacific DMCs' proposals for scaling up the most viable ECMs.

Samoa's experience shows that energy-efficiency measures can benefit the whole economy

A recent case study illustrates how energy-efficiency measures can deliver benefits throughout the Samoan economy. Although data collection is ongoing, PEEP2 has made progress in detailing the economic benefits of energy-efficiency measures. In 2011, Samoa imported 90.8 million liters of fuel. The total amount of diesel used for power generation that year was 20.9 million liters, equal to 47.7% of all diesel imports and 23.0% of all fuel imports. In addition, petroleum imports were equal to about 10% of GDP on average between 2007 and 2012.

Savings from energy efficiency: the case of Samoa

Table 3. Samoa's imports of petroleum products, 2007–2011
(million liters)

Year	Automotive diesel oil	Unleaded petroleum	Dual purpose kerosene	LPG and other	Total
2007	36.3	25.9	14.2	3.0	79.4
2008	37.8	26.0	16.1	4.6	84.5
2009	40.0	27.3	18.6	2.3	88.2
2010	41.8	29.3	17.1	3.0	91.2
2011	43.9	29.4	13.9	3.6	90.8

LPG=liquefied petroleum gas

Source: Samoa Ministry of Finance. *Samoa Energy Review, 2007–2011*.

Table 4. Potential savings from energy conservation measures

Sector	Consumption	EE potential	EE potential
	'000 kWh	% Saving	'000 kWh
Domestic	26,530	10.0%	2,653
Industrial	5,299	7.5%	397
Commercial	39,038	10.0%	3,904
Hotels	3,278	12.5%	410
Government	8,573	15.0%	1,286
Religious	4,925	5.0%	246
Schools	2,093	5.0%	105
Total	89,736	-	9,001

EE=energy efficiency, kWh=kilowatt-hours

Source: Author's estimates.

The case study shows that energy savings through energy efficiency could reduce the total amount of fuel imported by Samoa by up to 15%, valued at \$3.9 million (5%–6% of total fuel expenditures). This result is based on a conservative assumption of 10% average savings per ECM.

Impact on Samoa's power utility sector

In 2010–2011, Samoa's Electric Power Corporation (EPC) used 19.5 million liters of diesel fuel to generate an average of 3.78 kilowatt-hours (kWh) per liter. In Savaii, all generation is diesel-based, while Upolu uses a mix of diesel and hydroelectric power. This hydroelectric power is much cheaper than diesel, but cannot meet 100% of Upolu's generation requirements. EPC's generators also use imported lube oil (106,000 liters in 2011).

The study estimates that total potential savings from energy conservation measures could reach 9 megawatt-hours (MWh), as shown in Table 4.

Because of EPC's technical losses from transmission and distribution (approximately 18% of generated electricity), end use savings of 9.0 MWh implies

generation savings of 10.9 MWh. Assuming the diesel generation rate is 3.8 kWh per liter, these generation savings will lead to fuel savings of 2.9 million liters of diesel and 20,000 liters of lube oil. These savings represent 14.8% of the total diesel and lube oil used in electricity generation. At the current price of 3 tala (\$1.29) per liter, the monetary savings for diesel would be 8.6 million tala (about \$3.8 million), and for lube oil an additional 200,000 tala (\$86,500).

The loss of sales due to energy use reduction will, in turn, lead to reduced revenue to EPC. The revenue losses will vary by consuming sector, since low-income residential consumers (those who use less than 50 kWh per month) are charged 0.86 tala (\$0.37) per kWh and all other consumers pay 1.03 tala (\$0.45) per kWh. Assuming 10% of the total energy savings are from low-income residential consumers and 90% from all others, then the revenue loss to EPC will be 9.12 million tala (\$3.9 million). This, however, is almost entirely offset by fuel cost savings. In addition, EPC could realize additional savings in operation and maintenance costs of the diesel power stations due to the reduced generation activity.

Savings from energy efficiency: the case of Samoa

Energy efficiency measures are estimated to reduce future generation needs by 1,755 kilowatts (kW) in Upolu and 271 kW in Savaii. Given a rough installed capital cost of 2,000 tala (\$865) per kW for new diesel power plants, the reduced investment needs are 4.1 million tala (\$1.8 million). At a capital amortization factor of 10%, this works out to annual savings of 405,000 tala (\$175,163). This option is cheaper than installing renewable generation. For instance, the cost to install solar photovoltaic panels can be as high as 11,000–13,000 tala (\$4,758–\$5,623) per kW, or 22–26 million tala (\$9.5 million–\$11.2 million) for 2,000 kW.

Impact on Samoa's broader economy

In the case of the ECMs considered in Samoa, investment costs can be recovered over 3 to 5 years. Assuming an average payback period of 4 years, a one-time investment of 36.0 million tala (\$15.6 million) would yield end-use savings of 9.0 MWh, or about 9.1 million tala (\$39.4 million). Most ECMs are expected to have lifetimes of 10–20 years.

Investing in ECMs could also improve Samoa's long-term balance of payments position. The price of imported diesel fuel is estimated at 2.0 tala (\$0.87) per liter and lube oil at 11.5 tala (\$4.97) per liter. Reduced power generation requirements are expected to lower imports by 5.9 million tala (\$2.6 million) annually. The reduced expenditures on petroleum imports will help Samoa reduce its trade deficit and make funds available for investments in domestic social or other nationally important programs such as health, education, and other basic government services.

Investments in energy efficiency projects can also help create local jobs in Samoa. It is difficult to estimate the employment effects without input-output type models, which are often not available for small countries. Several studies suggest a positive impact of energy efficiency investments on the creation of new jobs. These include direct employment for contractors and installers, among others, plus indirect jobs resulting from spillover effects of consumer savings in the economy. For example, a recent study by the United States-based Institute for Market Transformation concluded that energy efficiency investments can create 10–15 jobs per million dollars invested based on an input-output model of the US economy. A Central European University survey of the economic benefits of energy efficiency found positive employment impacts of 10–30 jobs per million Euros invested. Although these studies may not directly apply to Samoa, these estimates suggest that the estimated energy investments of 36.0 million tala (\$15.6 million) will create 160–400 new jobs in Samoa.

Concluding remarks

The Samoan case study shows that investments in energy efficiency offer “win-win” solutions for Pacific DMCs. Fuel savings from implementing ECMs can be beneficial even if greater energy efficiency negatively impacts utilities' revenues. More efficient energy use can lead to improved trade balance and higher economic growth through job creation.

Lead author: Martina Tonizzo, ADB Pacific Department Energy Team.

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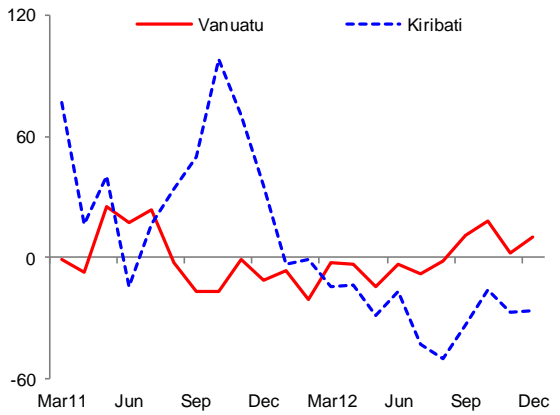
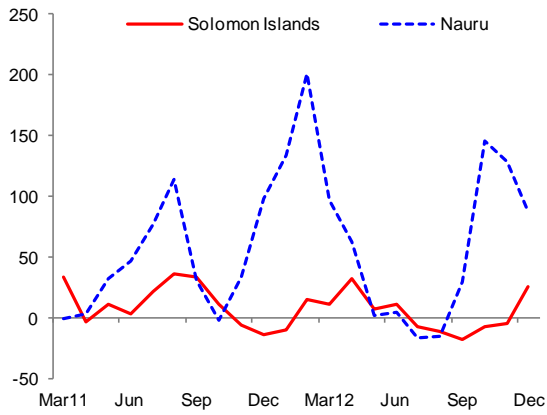
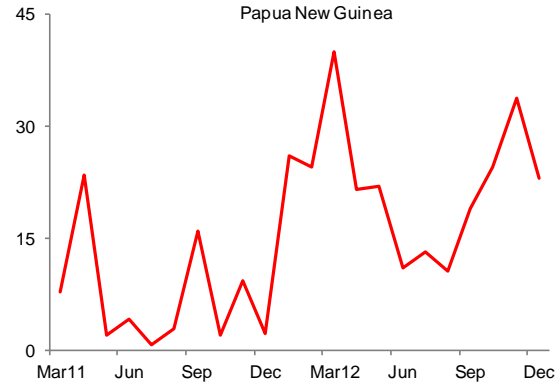
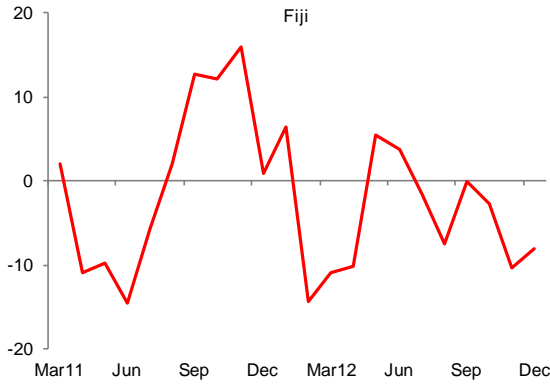
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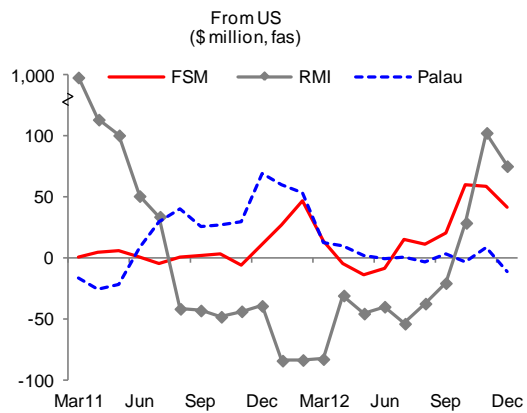
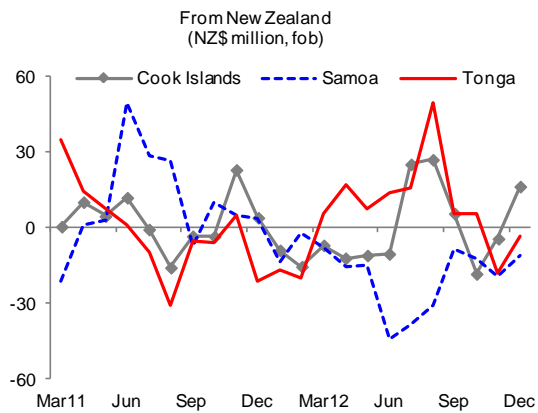
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Nonfuel merchandise exports from Australia
(A\$; y-o-y % change, 3-month m.a.)



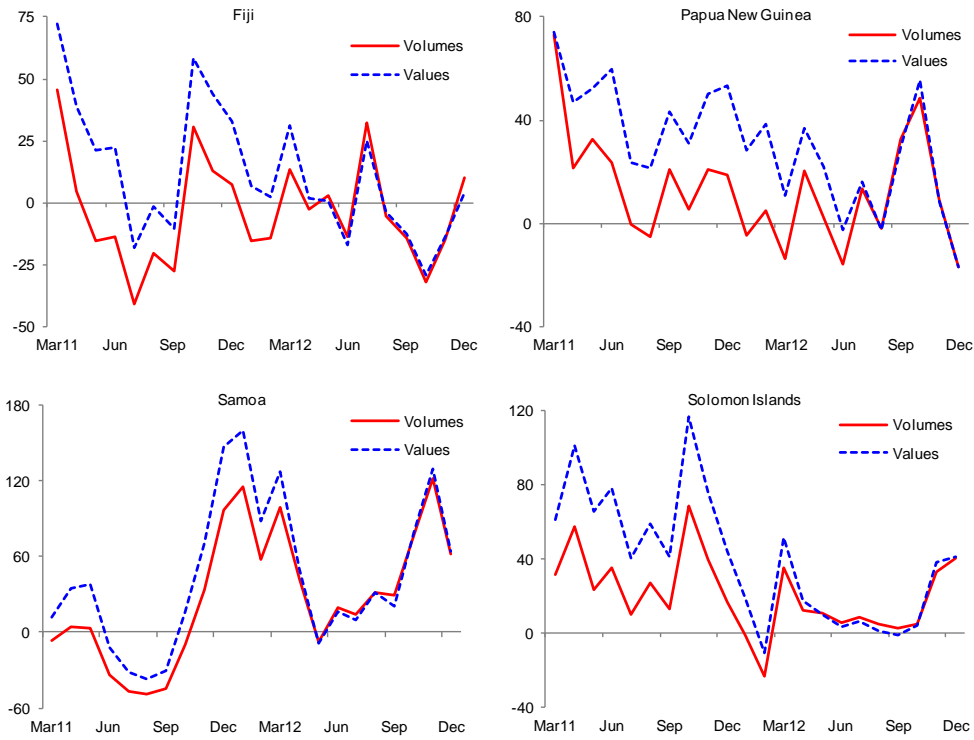
A\$=Australian dollars, m.a.=moving average, y-o-y=year on year
Source: Australian Bureau of Statistics.

Nonfuel merchandise exports from New Zealand and the United States
(y-o-y % change, 3-month m.a.)

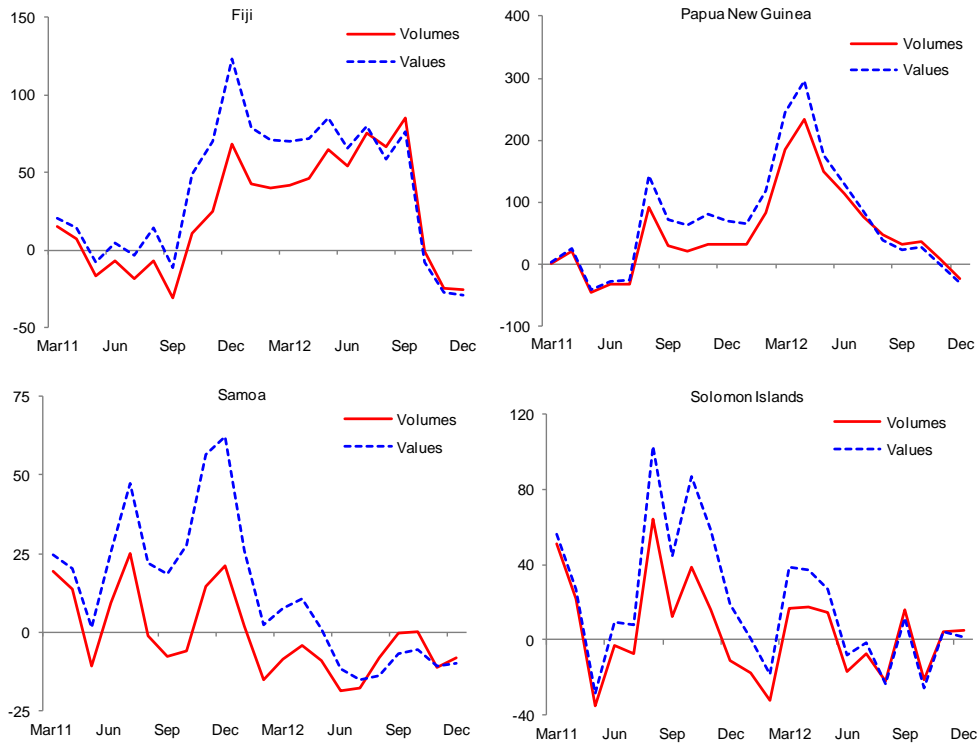


FSM=Federated States of Micronesia, fas=free alongside, fob=free on board, m.a.=moving average, NZ\$=New Zealand dollar, RMI=Republic of the Marshall Islands, US=United States, y-o-y=year on year
Sources: Statistics New Zealand and US Census Bureau.

Diesel exports from Singapore
(y-o-y % change, 3-month m.a.)

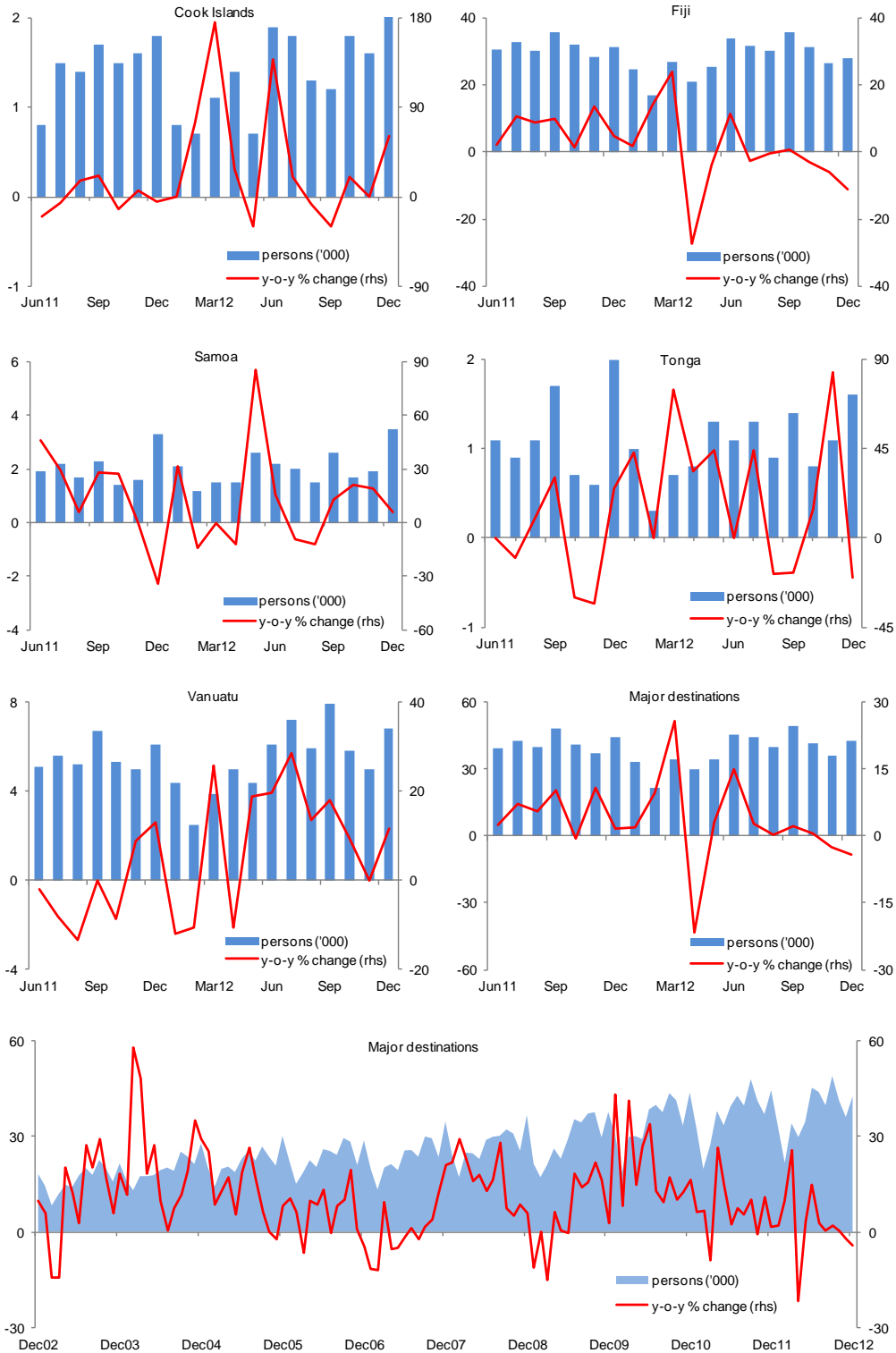


Gasoline exports from Singapore
(y-o-y % change, 3-month m.a.)



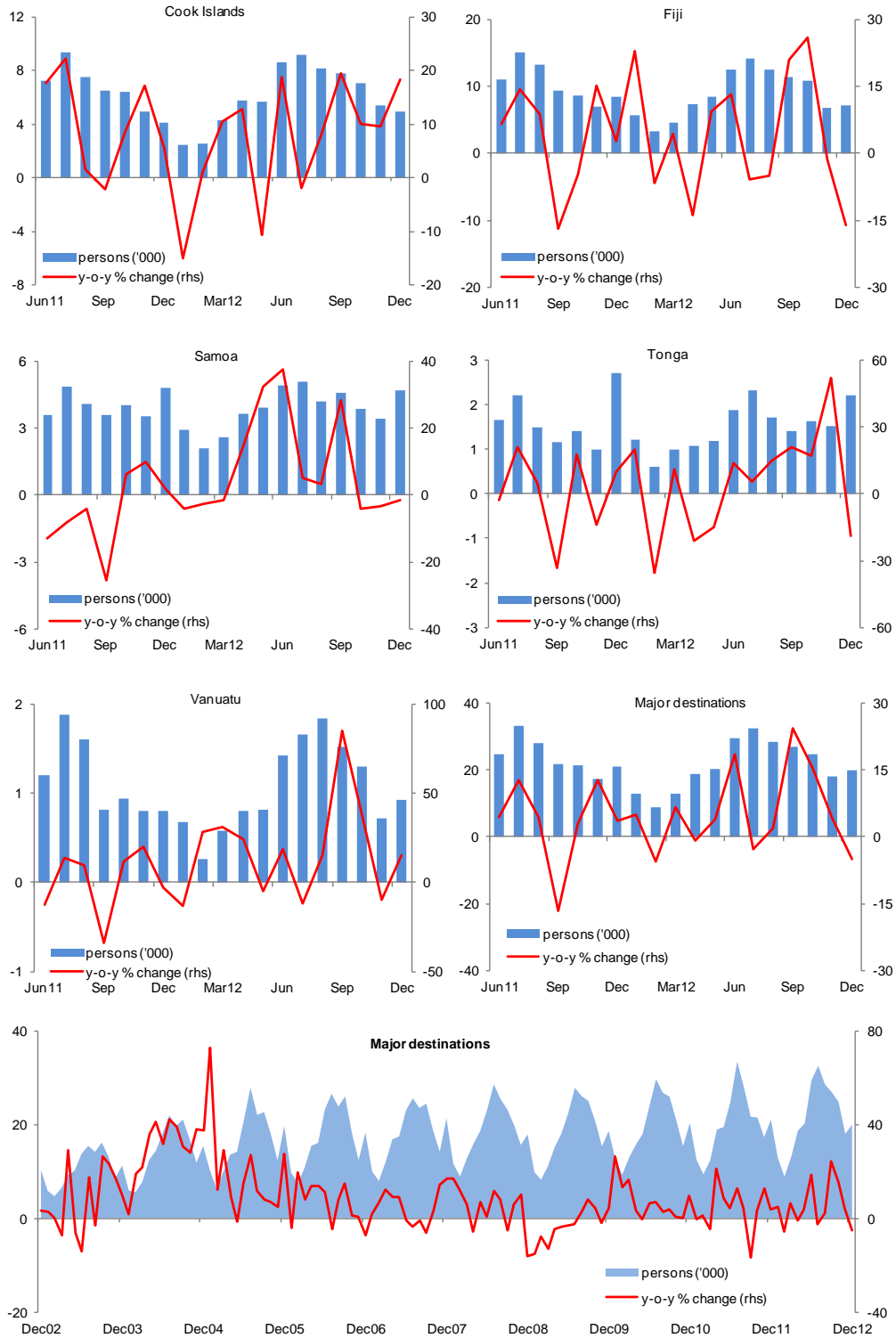
m.a.=moving average, y-o-y=year on year
Source: International Enterprise Singapore.

Departures from Australia to the Pacific (monthly)



rhs=right-hand scale, y-o-y=year on year
 Source: Australian Bureau of Statistics.

Departures from New Zealand to the Pacific (monthly)



rhs=right-hand scale, y-o-y=year on year
 Source: Statistics New Zealand.

Latest Economic Updates

	GDP Growth	Inflation	Credit Growth ^a	Trade Balance	Import Cover	Fiscal Balance
	(%, 2013p)	(%, 2013p)	(%)	(% of GDP)	(months)	(% of GDP)
Cook Islands	3.0	3.0	-2.0 (Jun-Q 2012)	-46.0 (FY2012e)	—	-2.2 (FY2012e)
Fiji	2.0	4.5	4.7 (Dec 2012)	-26.1 (2011e)	4.5 (Feb 2013)	-1.6 (2012e)
Kiribati	3.5	3.0	—	-48.0 (2010e)	—	-10.0 (2012e)
Marshall Islands	2.3	4.5	10.4 (FY2011e)	-37.7 (FY2012e)	—	-1.1 (FY2012e)
FSM	1.0	4.5	-0.9 (FY2011e)	-41.4 (FY2011e)	—	0.4 (FY2011e)
Nauru	8.0	0.5	—	—	—	-1.2 (FY2012e)
Palau	3.0	5.5	—	-53.2 (FY2011e)	—	-2.3 (FY2011e)
PNG	5.5	6.5	10.0 (Sep 2012)	7.7 (Jan-Sep 2012)	10.5 (Sep 2012)	-1.2 (2012p)
Samoa	1.2	4.5	-1.2 (Dec 2012)	-18.6 (Jul-Dec 2012)	5.8 (Sep 2012)	-0.7 (Jul-Sep 2012)
Solomon Islands	4.0	4.5	5.7 (Dec 2012)	1.5 (Jan-Sep 2012)	10.2 (Jan 2013)	-1.9 (2012e)
Timor-Leste ^b	10.0	9.0	18.6 (Dec 2012)	-56.1 (2011e)	—	135.2 (2012p)
Tonga	0.5	2.7	-10.0 (Dec 2012)	-11.0 (Jul-Dec 2012)	9.3 (Dec 2012)	3.0 (FY2012e)
Tuvalu	1.3	2.0	—	-19.5 (2011e)	6.7 (2011e)	7.6 (2012e)
Vanuatu	3.2	2.5	6.1 (Dec 2012)	-21.9 (Jan-Sep 2012)	7.4 (Oct 2012)	-1.7 (Jan-Sep 2012)

— = not available, e=estimate, GDP=gross domestic product, FSM=Federated States of Micronesia, PNG=Papua New Guinea, p=projection, Q=quarter

^a Credit growth refers to growth in total loans and advances to the private sector.

^b Timor-Leste GDP is exclusive of the offshore petroleum industry and the contribution of the United Nations.

Notes: Period of latest data shown in parentheses; import cover for PNG is months of nonmining and oil imports.

Sources: ADB. 2012. *Asian Development Outlook 2012 Update*. Manila; and statistical releases of the region's central banks, finance ministries and treasuries, and statistical bureaus.

Key data sources:

Data used in the *Pacific Economic Monitor* are in the ADB PacMonitor database, which is available in spreadsheet form at www.adb.org/pacmonitor.

About the Asian Development Bank

ADB's vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries reduce poverty and improve the quality of life of their people. Despite the region's many successes, it remains home to two-thirds of the world's poor: 1.7 billion people who live on less than \$2 a day, with 828 million struggling on less than \$1.25 a day. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

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