

New Zealand's Risk Premium and Its Role in Macroeconomic Imbalances

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- Slow growth
- Current account imbalance and external debt position

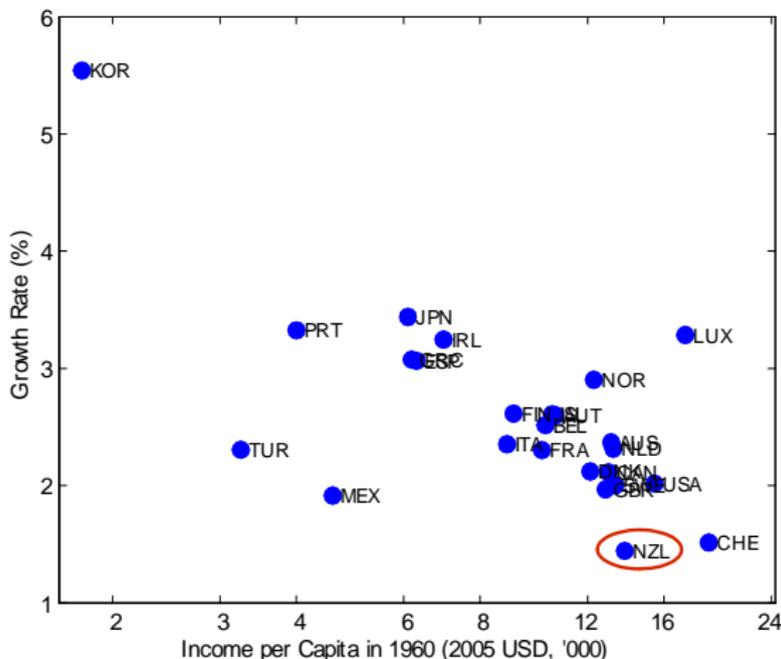
The Role of the Risk Premium

- NZ interest rates are relatively high
- NZ has a relatively low investment rate
 - Are high interest rates the cause of the low investment rate?
 - And are they, therefore, through the investment channel, the cause of low growth?
- NZ's high interest rates attract foreign capital
 - Does the monetary policy reaction to these foreign inflows magnify NZ's business cycles?

- Are high interest rates the cause of the low investment rate?
 - High interest rates reflect NZ's exposure to rare and extreme global shocks
 - Australia also has high interest rates and has exposure to these same global shocks, but has a higher investment rate and faster growth
 - A lower risk exposure in either country would raise investment in either country
 - Interest rates are a symptom of a deeper cause
- Does monetary policy exacerbate business cycles?
 - Probably not! I did not find evidence that monetary tightening influences expectations in a way that fuels further speculation.
 - If anything, standard macro models might suggest a more aggressive, not less aggressive, response to the inflationary pressure associated with capital inflows.

Slow growth and low investment

- Since 1960, NZ has had the slowest growth in real per capita income in the OECD (1.4% per annum).

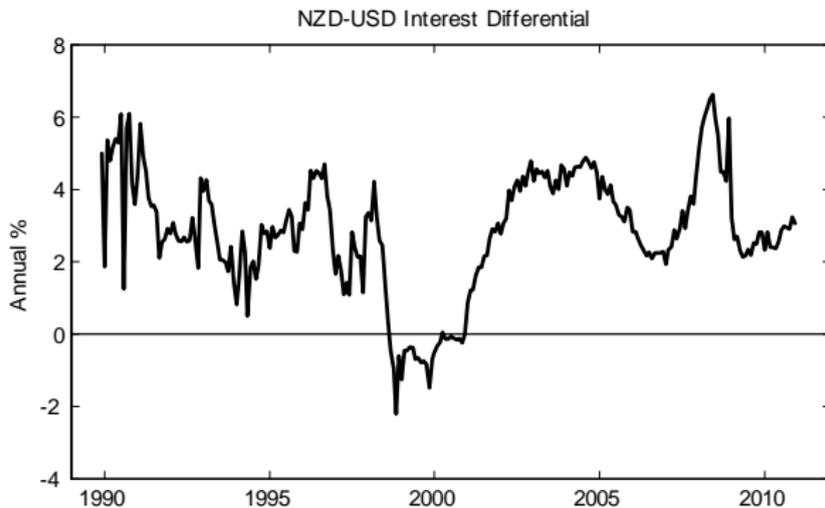


Slow growth and low investment

- Since 1960, NZ has had the slowest growth in real per capita income in the OECD (1.4% per annum).
- NZ has slipped from 4th to 18th in income level
- NZ's investment rate has consistently been ranked about 20th in the OECD
- In this group of countries the investment rate and growth rate are highly correlated, consistent with simple theoretical models
- So, at face value high interest rates seem like a plausible explanation for slow growth.

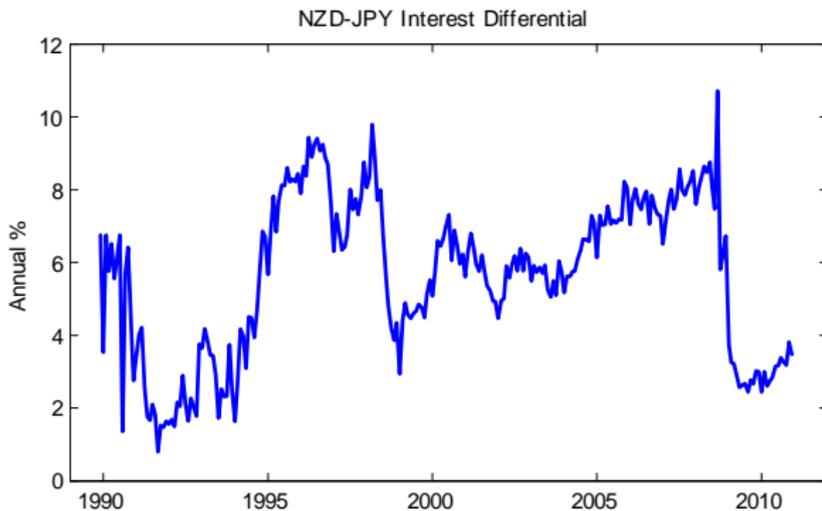
Are interest rates high?

Yes, average interest differential versus the USD = 2.8%



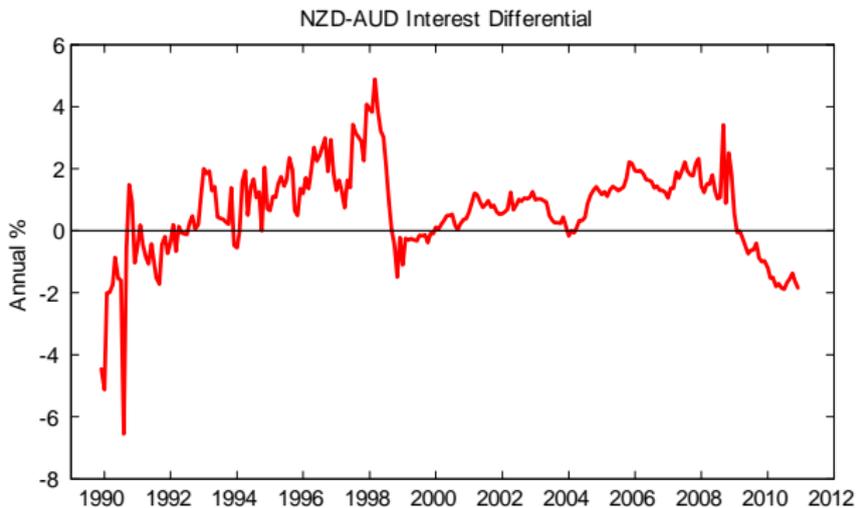
Are interest rates high?

Yes, average interest differential versus the JPY = 5.6%



Are interest rates high?

Yes, average interest differential versus the AUD = 0.7%



Interest rates and uncovered interest parity

- UIP: expected % change in value of NZD = $i^{\text{FOR}} - i^{\text{NZ}}$
- Do high interest rates just reflect high rates of expected depreciation?
- If the answer to this question is “yes” then borrowing costs are not ex-ante different across two currencies.

Interest rates and uncovered interest parity

- UIP: expected % change in value of NZD = $i^{\text{FOR}} - i^{\text{NZ}}$
- Do high interest rates just reflect high rates of expected depreciation?
- The answer to this question is somewhat sample dependent
- If the recent financial crisis is *excluded* from the sample
 - Vis-a-vis the yen and the US dollar, the answer is no
 - Vis-a-vis the Australian dollar, the answer is close to yes

Interest rates and uncovered interest parity

- UIP: expected % change in value of NZD = $i^{\text{FOR}} - i^{\text{NZ}}$
- Do high interest rates just reflect high rates of expected depreciation?
- The answer to this question is somewhat sample dependent
- If the recent financial crisis is *included* in the sample
 - Vis-a-vis the yen and the US dollar, the answer is a borderline no
 - Vis-a-vis the Australian dollar, the answer is yes

Testing UIP: Regressions

Regress actual depreciation on the interest differential

	1990–2010			1990–2007		
	$\beta_0 \times 100$	β_1	R^2	$\beta_0 \times 100$	β_1	R^2
USD	-0.09 (0.50)	-0.09 (2.12)	0.000	0.52 (0.37)	-2.81 (1.34)	0.021
JPY	0.17 (0.92)	-0.10 (2.11)	0.000	1.59 (0.53)	-3.30 (1.10)	0.026
AUD	-0.01 (0.11)	0.16 (0.81)	0.000	-0.10 (0.13)	0.39 (0.90)	0.001

Testing UIP: Carry Trade Profits

	1990–2010			1990–2007		
	Mean	SD	SR	Mean	SD	SR
USD	5.4 (2.9)	11.3 (0.9)	0.48 (0.27)	5.3 (2.6)	9.4 (0.7)	0.56 (0.28)
JPY	5.4 (3.4)	14.3 (1.3)	0.37 (0.25)	6.7 (3.1)	12.3 (0.7)	0.54 (0.26)
AUD	2.3 (1.5)	7.3 (0.4)	0.32 (0.21)	3.0 (1.6)	6.8 (0.4)	0.44 (0.24)

Risk-Based Explanations of the Interest Differential

expected % change in value of NZD – risk premium = $i^{\text{FOR}} - i^{\text{NZ}}$

- Standard risk-based explanations, based on observed sources of risk, don't work
- Carry trades in the NZD are not sufficiently exposed to US consumption growth, US stock market returns, etc., to explain the magnitude of the profits earned.

- Basic idea is that a risk-based explanation works, but that there are “large” shocks, such as the GFC, that investors fear, that are underrepresented in the observed data
- So even though

$$\text{expected \% change in value of NZD} - \text{risk premium} = i^{\text{FOR}} - i^{\text{NZ}}$$

this is difficult to confirm with observed data.

The Importance of Extreme Events

Direct Evidence in the Data

- Tests of UIP versus are very sensitive to whether the 2008–10 period is included in the sample.
- But more specifically, they are sensitive to whether August–December 2008 is included in the sample.
- GFC excluded: UIP strongly rejected versus USD and JPY
- GFC included: UIP only weakly rejected versus USD and JPY

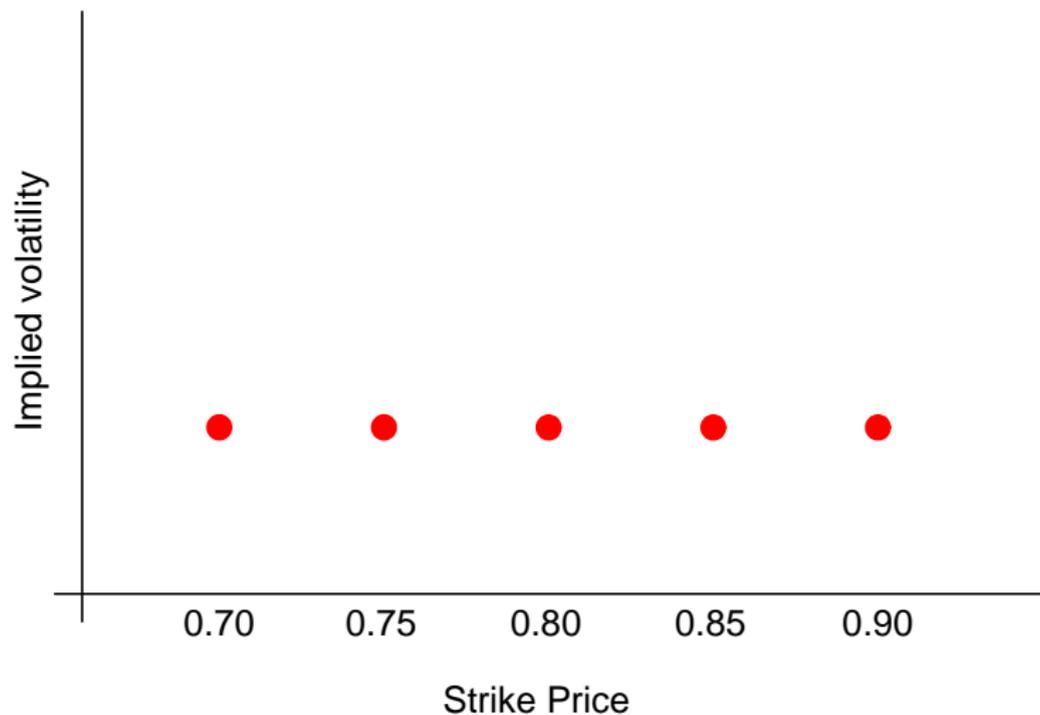
The Importance of Extreme Events

Indirect Evidence from Currency Options Data

- Currency options data can be used to infer investor beliefs about the underlying distribution of the exchange rate
- Options protect investors against sharp upward or downward movements in the NZD
- Options prices are quoted in terms of “implied volatility”
 - Say an investor is long 1 NZD and buys insurance against it dropping below 0.70 or 0.75 USD in value, when the current spot price is 0.80 USD
 - Rather than quoting outright prices for the two options (the first one obviously being cheaper), dealers quote the price in terms of the underlying volatility that would make the outright price consistent with (i) risk neutral pricing and (ii) a normal (bell-shaped) distribution of the exchange rate around the forward rate
 - If the assumptions are correct all options would have the same “implied volatility”

Implied Volatility in Theory

Assuming Risk Neutrality and a Normal Distribution



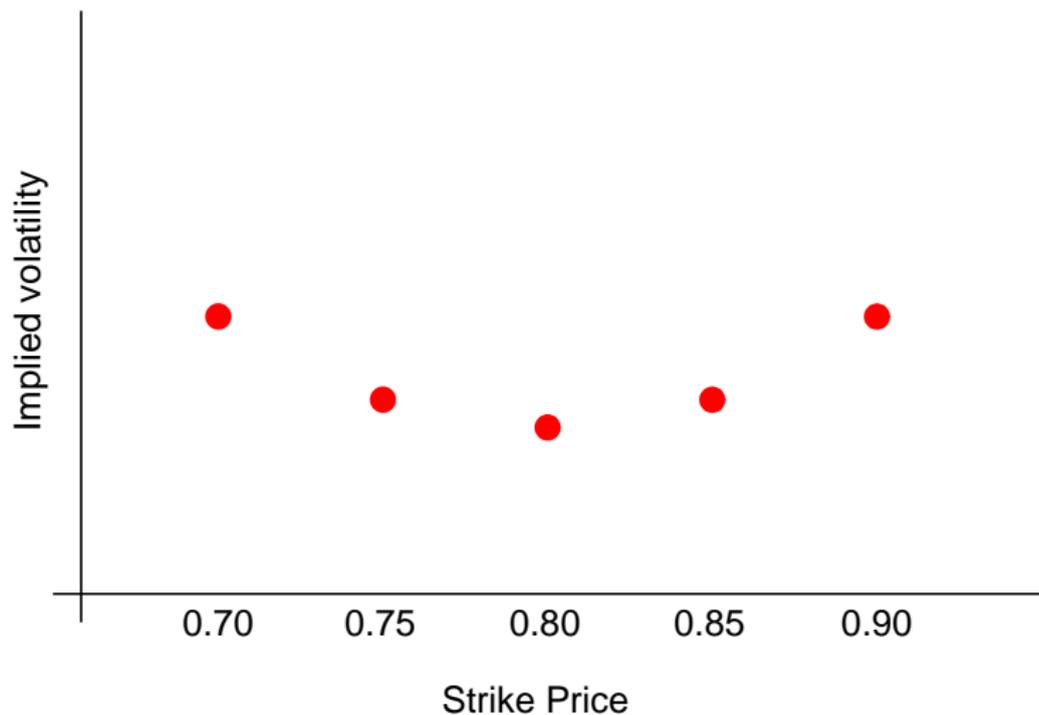
The Importance of Extreme Events

Indirect Evidence from Currency Options Data

- Typically implied volatility is higher the further the strike price of the option is away from the current forward rate.
- Suggests that either (i) investors are risk averse and/or (ii) they believe the underlying distribution of the exchange rate has fat tails relative to a normal distribution.

Implied Volatility in Reality

Most Currency Options Display a Volatility Smile



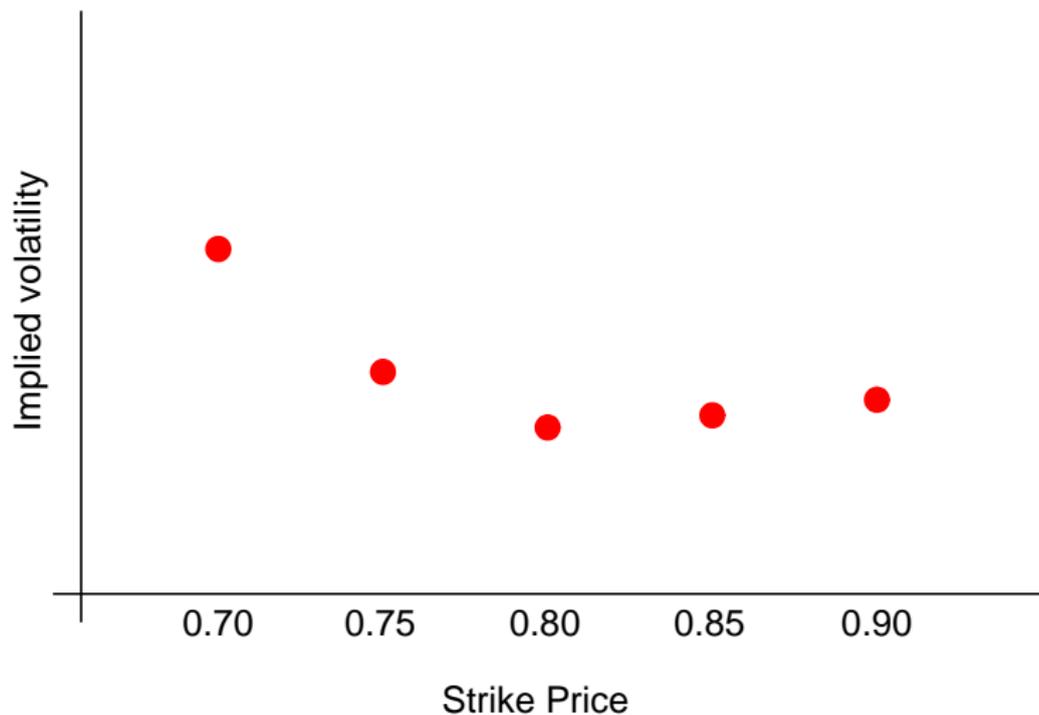
The Importance of Extreme Events

Indirect Evidence from Currency Options Data

- In the case of the NZD, implied volatility is especially high for options that protect against downward shifts in the value of the currency (negative implied skewness)
- Suggests that either (i) the NZD has a tendency to depreciate at times that are especially bad for investors (ii) investors believe the underlying distribution of the exchange rate is negatively skewed (has more extreme negative than positive outcomes).

Implied Volatility for the NZD

Typically NZD Options Display a Volatility Smirk



Modeling Extreme Events

- In the paper I put some structure on a model of extreme events for NZ.
- This model combined with the options data suggest that when extreme events occur, the average depreciation of the NZD is expected to be about 5% in one month
- The model also implies that investors level of risk aversion rises sharply during these episodes, suggesting that these are episodes that resemble the GFC.
- I also conclude that Australia has a very similar exposure, on average, to these extreme events as New Zealand does—suggesting it is shared, rather than idiosyncratic, characteristics of the two economies that drive the risk premium.

Time-Variation in the Risk Premium

- I also generate model-specific estimates of the risk premium period by period using options data for 10 major currencies for the period 1997–2010
- Underlying these model-specific estimates is a forecasting model of the NZD-USD exchange rate that is built from global (non-NZD) variables and NZD variables
- I find the model provides improved forecasts during the pre-GFC period relative to a model that uses only the NZD-USD interest differential as a predictor
- If NZD-specific variables are replaced by AUD-specific variables, the forecasting ability of the model is unchanged
- This tends to confirm my previous conclusion that the risk premium is driven by a combination of investor aversion to extreme events, and Australasian exposure to these events.

Policy Implications of the Risk Premium Analysis

- The size of the risk premium is not a primary factor in driving NZ's low investment rate, at least not relative to that of Australia.
- UIP approximately holds between the AUD and NZD
- The USD-NZD risk premium seems to be driven by factors that also affect the value of the AUD
- Structural differences between the two economies are more likely to explain Australia's higher investment rate

Policy Implications of the Risk Premium Analysis

- High interest rates against the USD and JPY reflect NZ's exposure to extreme events
- Is the investment rate in NZ lower as a function of this risk premium?
- Yes, but this level of investment could be interpreted as “optimal” given the risk exposure.
- What are the underlying causes of the risk exposure? (Recall, these should be shared by Australia)
 - Commodity currency
 - Net foreign debtor with a recent history of current account deficits
 - Institutional memory of earlier turmoil?
- These are not factors that can be easily addressed and are not fruitfully addressed (in my opinion) by quick fixes, such as fixed exchange rates, common currencies, etc.

Monetary Policy and Speculative Dynamics

- One view of inflation targeting is that in high interest rate countries it may inherently exacerbate business cycles and speculative dynamics
- Moutot and Vitale (2009): low interest rates in large economies create credit that seeks yield elsewhere; if the recipient country is an inflation targeter, its exchange rate (and other asset values) will appreciate, wealth effects will drive up consumption, central bank will raise rates to contain inflation, this attracts more capital, etc.
- Plantin and Shin (2011): formalize this in a model of speculative dynamics; formally, inflation targeting can destabilize equilibrium if it is sufficiently aggressive; policy rate increases drive up short-run expectations of recipient country exchange rates

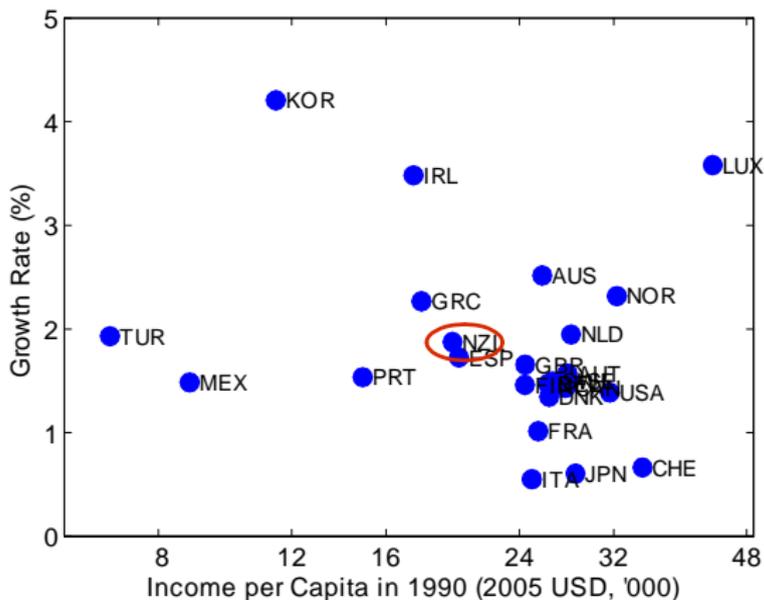
Monetary Policy and Speculative Dynamics

- I find little evidence that the RBNZ's policy rate innovations drive up investor expectations of the value of the NZD inferred from my forecasting model
- Plantin and Shin's model suggests that if monetary policy is sufficiently aggressive to cause destabilizing currency fluctuations, then we should observe sharp depreciations of recipient country exchange rates that are independent of global extreme events
 - I find little evidence of downward skewness in the NZD outside the GFC period
- Optimal policy prescriptions require a formal model, but existing models suggest that optimal monetary policy, described in terms of what to target, is independent of the source of shocks.
 - Small open economy literature tends to suggest targeting nontraded prices (rather than the overall CPI), but this would probably have meant more aggressive, not less aggressive, policy on the part of the RBNZ

Growth

Solid Growth Performance since 1990

- According to the Penn World Table data, NZ's growth since 1990 is ranked 9th out of 25 OECD countries



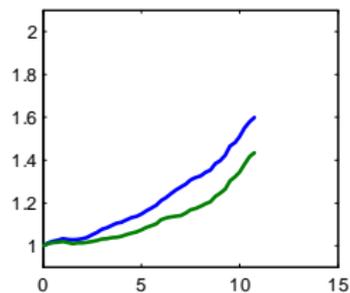
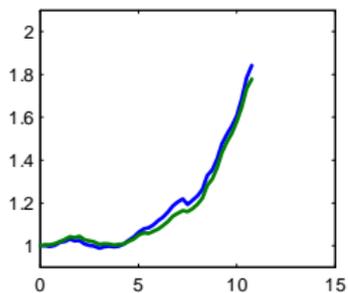
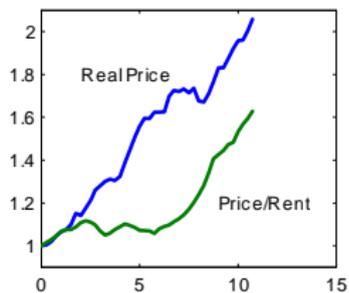
Net External Position

- My view on the size of the external position is mixed
- The good news is that a substantial portion of NZ's external obligations are in the form of FDI, and a substantial portion of its external debt is denominated in domestic currency.
 - Implies that NZ is naturally hedged against the risks that I have discussed.
- The bad news is that regardless of how it is ultimately measured, the external position is large, and continual growth in the size of the position is unsustainable
 - Continue and extend policies favoring increased private saving
 - Continue to target fiscal policy at a reduced the stock of outstanding debt
 - Take steps towards tax policies that do not favor housing over other types of assets

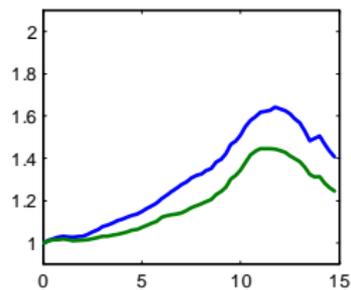
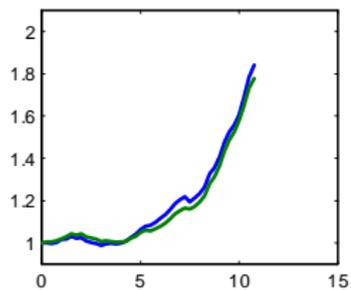
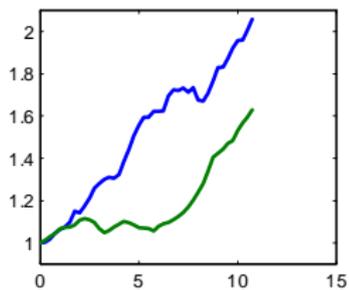
Conclusion

- NZ went through a challenging economic period between 1960 and 1990
- Do not be like Woody Allen or my Scottish relatives
 - Much has been achieved despite the pain of reform, so have a rosier outlook.
- NZ does have remaining policy challenges, most specifically with the size of its external position
- Policies aimed at increased national saving, and moderating price booms in the housing sector
- Unlike the countries facing crisis in Europe
 - NZ is naturally hedged, through its exchange rate, against the risks it faces
 - NZ is not facing a fiscal crisis.

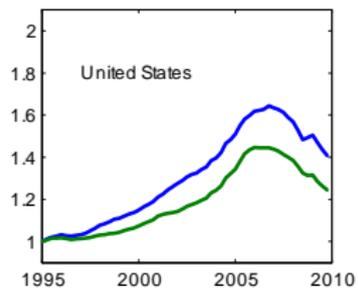
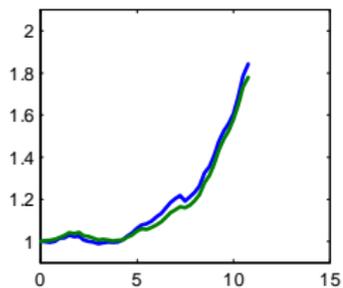
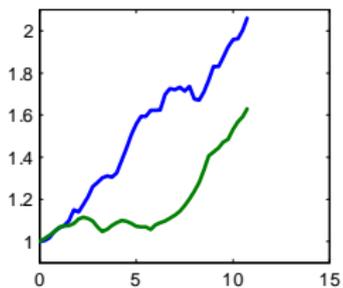
Anatomy of 3 housing booms



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