

Foreign Exchange Intervention at the Zero Lower Bound

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Key message of the paper

- Foreign exchange rate intervention has very small effects on aggregate output during `normal' times.
- When the ZLB is binding, these effects can be much bigger.
- Consistent with standard DSGE analyses, BoI model implies:
 - the more binding the ZLB is, the larger is the impact of *any* policy that increase aggregate demand,
 - examples include increase in government purchases and policies that stimulate net exports.

Outline

- Why does the ZLB matter so much?
- Was the ZLB binding in Israel in 2008?
- Is the ZLB binding now?
- The limits to monetary policy in a small open economy.

A Simple Taylor Rule

$$i = \pi + \phi_1 (\pi - 2) - \phi_2(\text{Output Gap}) + r$$

- i : short-term policy rate
- r : real interest rate (2%) and BOI's target inflation rate is 2%
 - If $\pi = 2$ and the output gap zero, then the policy rate is 4 percent.
- For each one-point increase in π , raise policy rate by $1 + \phi_1$ percentage points.
- For each one percentage point rise in the output gap, reduce the policy rate by ϕ_2 percentage points.

Assume we're below full employment

- Say government increases spending on goods.
- Leads to a rise to a rise in aggregate demand, even taking associated rise in tax liabilities into account.
- Employment and output rise.
- Rise in output leads to a rise in real wages, other production costs.
- Firms react to rising marginal costs by raising prices, so inflation rises.

The normal multiplier

- BoI responds to rise in inflation by raising real interest rate.
- Consumption and investment demand fall so aggregate demand rises by less than one-to-one with the rise in government spending.
- Rise in G crowds out consumption and investment.
- So multiplier will be positive but less than one.

Exchange Rate Intervention

- Push down value of NIS by selling NIS / buying \$'s
- Resulting fall in relative price of Israeli goods boosts exports, lower imports.
- Like an increase in G, this policy raises *aggregate demand* for Israeli goods
 - Even more powerful than increase in G because there are no offsetting tax effects.
- Problems:
 - A weaker NIS generates inflation, so BoI will raise rates, offsetting boost in aggregate demand.
 - How long can you can lower relative prices for?
 - How responsive are exports to a temporary change in relative prices?

The Zero Lower Bound

- The Taylor rule:

$$i_{ff} = \pi + \phi_1 (\pi - 2) - \phi_2(\text{Output Gap}) + 2$$

- Key constraint: i can't be (too) negative.
- Suppose ZLB is binding

$$\text{Real interest rate (t)} = R(t) - \pi^e(t) = -\pi^e(t)$$

- When the ZLB binds and there's *high* expected inflation, the real rate is *low*.

Virtuous Cycles in the ZLB

- An increase in G leads to a rise in output, marginal cost and expected inflation.
- With nominal interest rate stuck at zero, resulting *rise* in expected inflation drives *down* real interest rate, driving up private spending.
- This rise in spending leads to a further rise in output, marginal cost and expected inflation, a further decline in the real interest rate and a rise in consumption.
- Net result is a large rise in inflation and output.
- Multiplier can be much larger than one.

Exchange rate interventions in the ZLB

- Same logic applies to intervention that leads to depreciation in NIS.
- Depreciation leads to a rise in net exports.
 - A rise in demand for Israeli goods.
 - Similar to a rise in government spending.
- Pass through inflation leads to a separate inflationary channel which lowers real interest rate (in ZLB).

The size of the multiplier

- The exact value of the multiplier depends on various factors.
- Structural new-Keynesian models
 - Multiplier is large when output cost associated with ZLB problem is large.
 - Highly correlated with the size of the output gap.
- Is the output gap big in Israel?

Output Gap / Unemployment in Israel



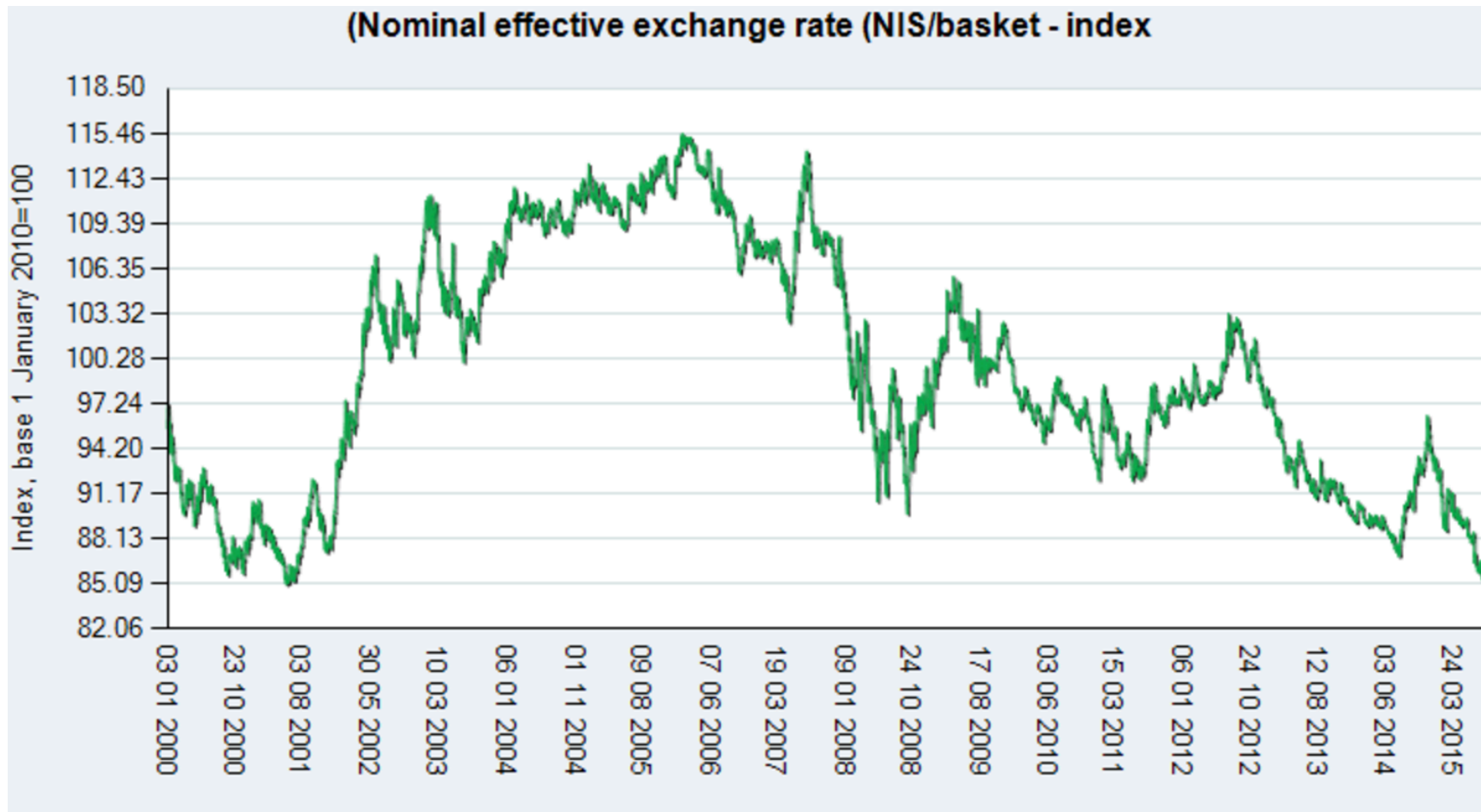
Mixed signals: depends on whether you look at output gap (production function based) or unemployment rate.

Inflation in Israel



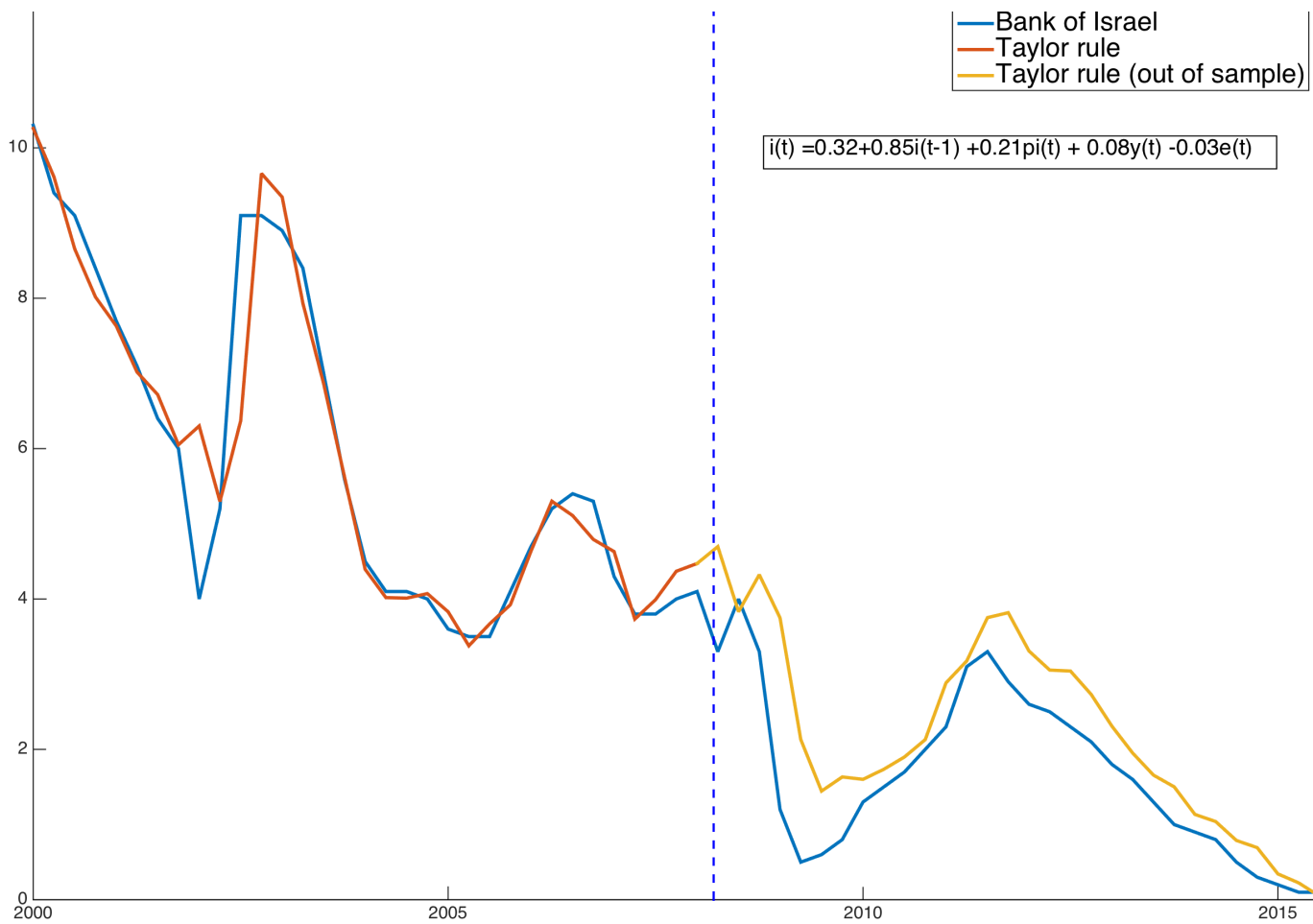
CPI inflation is very low.

Exchange Rates



A drop in this exchange rate measure indicates an appreciation of the NIS

Taylor Rule for Israel



Why is the ZLB border-line binding?

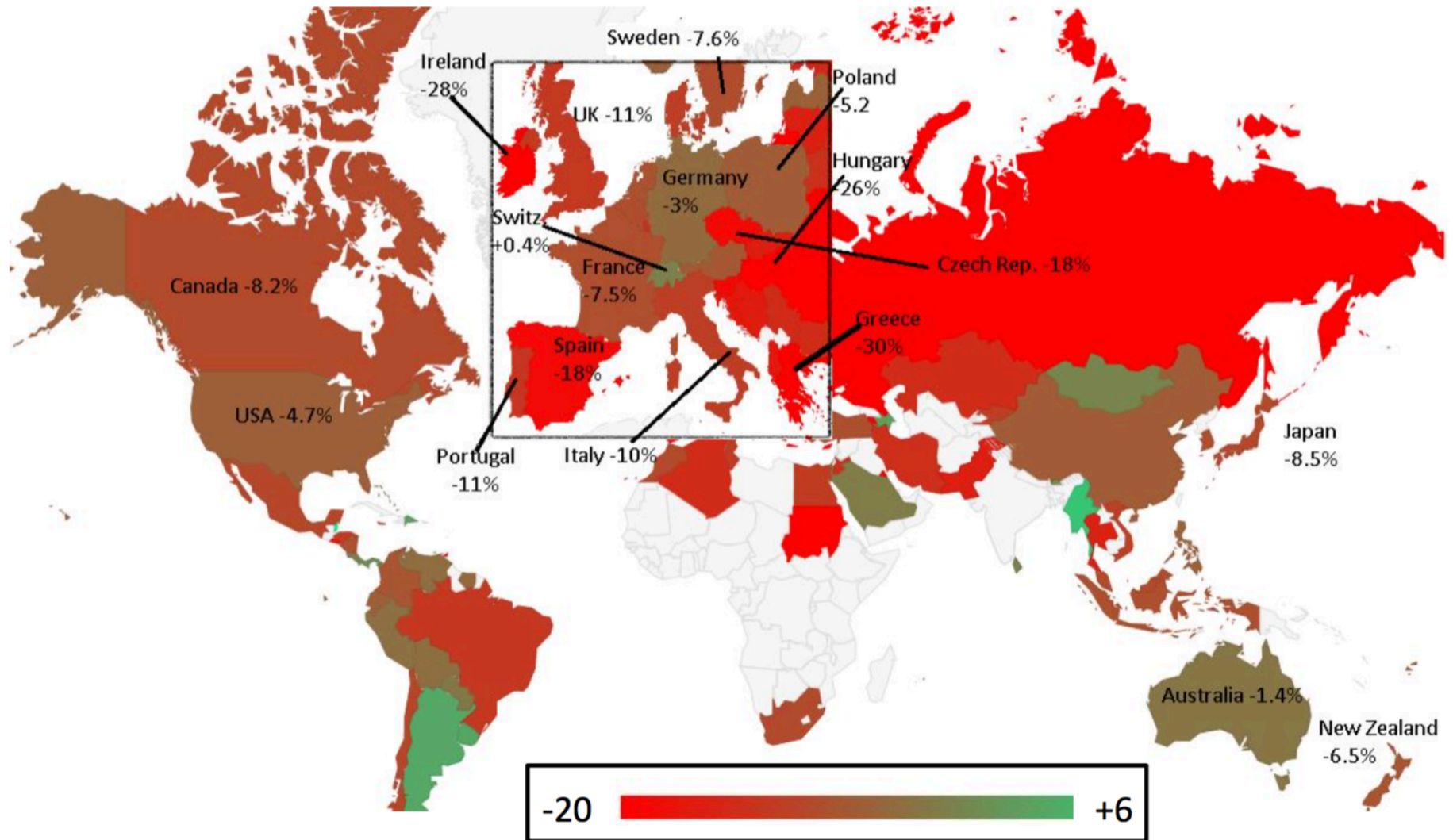
- It's not because of a large output gap.
 - Mixed signals on sign of output gap.
 - OECD projects GDP growth to be roughly 3.5% in 2016 and 2017.
- Main reason ZLB might is border line binding in Israel: CPI inflation is so low.
- Absent a compelling argument that output gap is very large, a desire to increase inflation per se seems like a strange reason to intervene in exchange rate market.

Israeli exports *have* been weak

- Primarily reflects the global slowdown.
- That weakness raises two related, much larger issues.
- What is the correct real interest rate to put in Israel's Taylor rule?
 - If interest rate is lower, the ZLB is more binding than standard calculations indicate.
- **Secular stagnation hypothesis**: real interest are now permanently and substantially lower than 2%
 - Perhaps as low zero (Summers).
 - Reflects persistently lower growth rate in the rest of world.
- Combination of low growth, low real interest rates, low inflation rates suggests it's a global 'demand' problem, not a supply problem.

Falling Potential A Global Phenomenon

Change in 2014 Potential Output Estimate Since 2007



Sources: Laurence Ball "Long-Term Damage From The Great Recession in OECD Economies", IMF WEO 2008 & 2015

Declining Real Interest Rates and Inflation Expectations

10 Year Interest Rates, Now and Two Years Ago						
	USA*		Japan		Germany	
	Nov-13	Now	Nov-13	Now	Nov-13	Now
Nominal	2.75	2.19	0.59	0.28	1.76	0.55
Real	0.92	1.07	-0.37	-0.50	0.22	-0.45
Inflation	1.83	1.12	0.96	0.78	1.53	1.00

* Adjusted to Fed's preferred PCE measure

If Summers is correct...

- Lower real interest rates will be a *very persistent* problem.
- Conventional monetary is unlikely to have strong effects.
- It's unlikely that interventions that *temporarily* affect the real exchange rate can have a big impact on Israeli output.
- Israel should focus on fiscal policy and structural reforms to increase its competitiveness.