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**SMALL IS DIFFERENT
A FORECASTING MODEL FOR
VERY OPEN ECONOMIES**

Featuring DeLisle Worrell

April 18, 2017

Small is Different: A Forecasting Model for Very Open Economies

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Seminar

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This presentation discusses ...

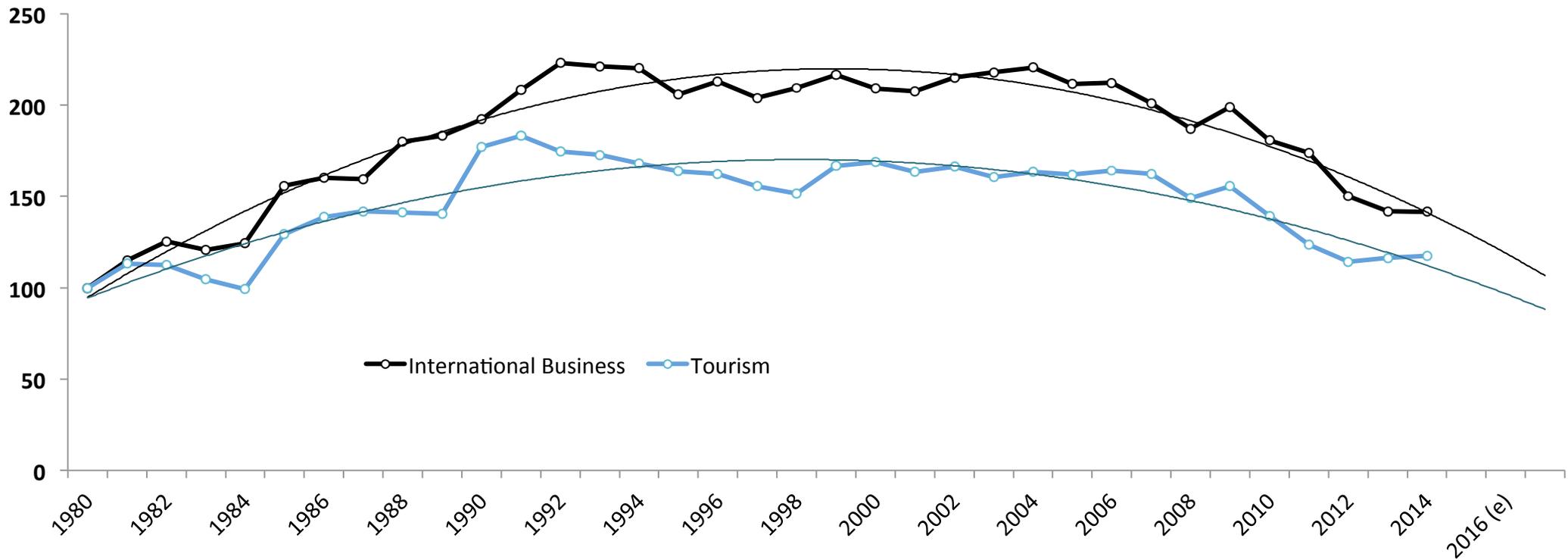
- A framework for forecasts to formulate and implement policies of stabilisation and growth small open economies, based on the Barbadian experience;
- The strengths and weaknesses of the framework;
- Its general applicability.

Barbados' growth strategy is based on its international competitiveness

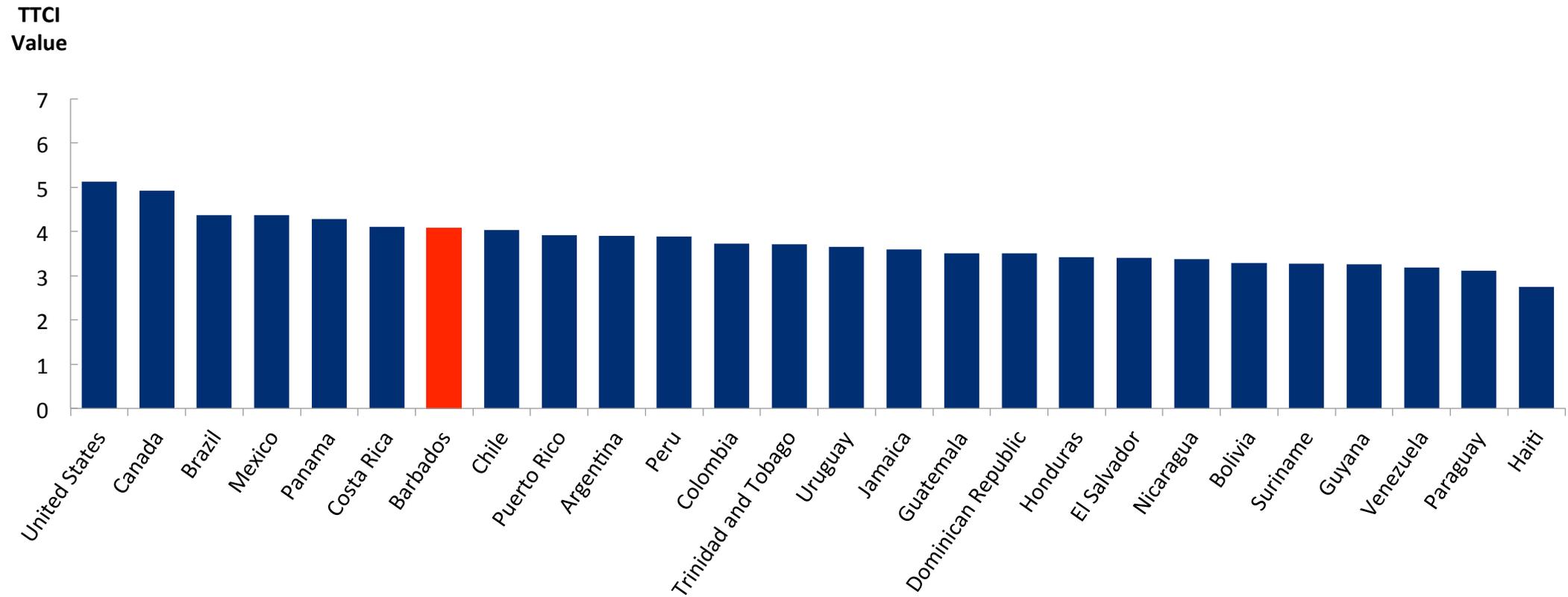
- Tourism is the main export and there is no significant import substitution, though there is great promise in renewable energy.
- Barbados is a price taker in international markets.
- Barbados is among the most competitive tourism destinations in the Americas. Supportive gov't policies make an important contribution to competitiveness.
- Barbados has maintained its market share of Caribbean tourism.
- But labour productivity has stagnated; and
- Gov't services have deteriorated.

Barbados' prices for tourism and other traded services, relative to Caribbean and Central American competitors

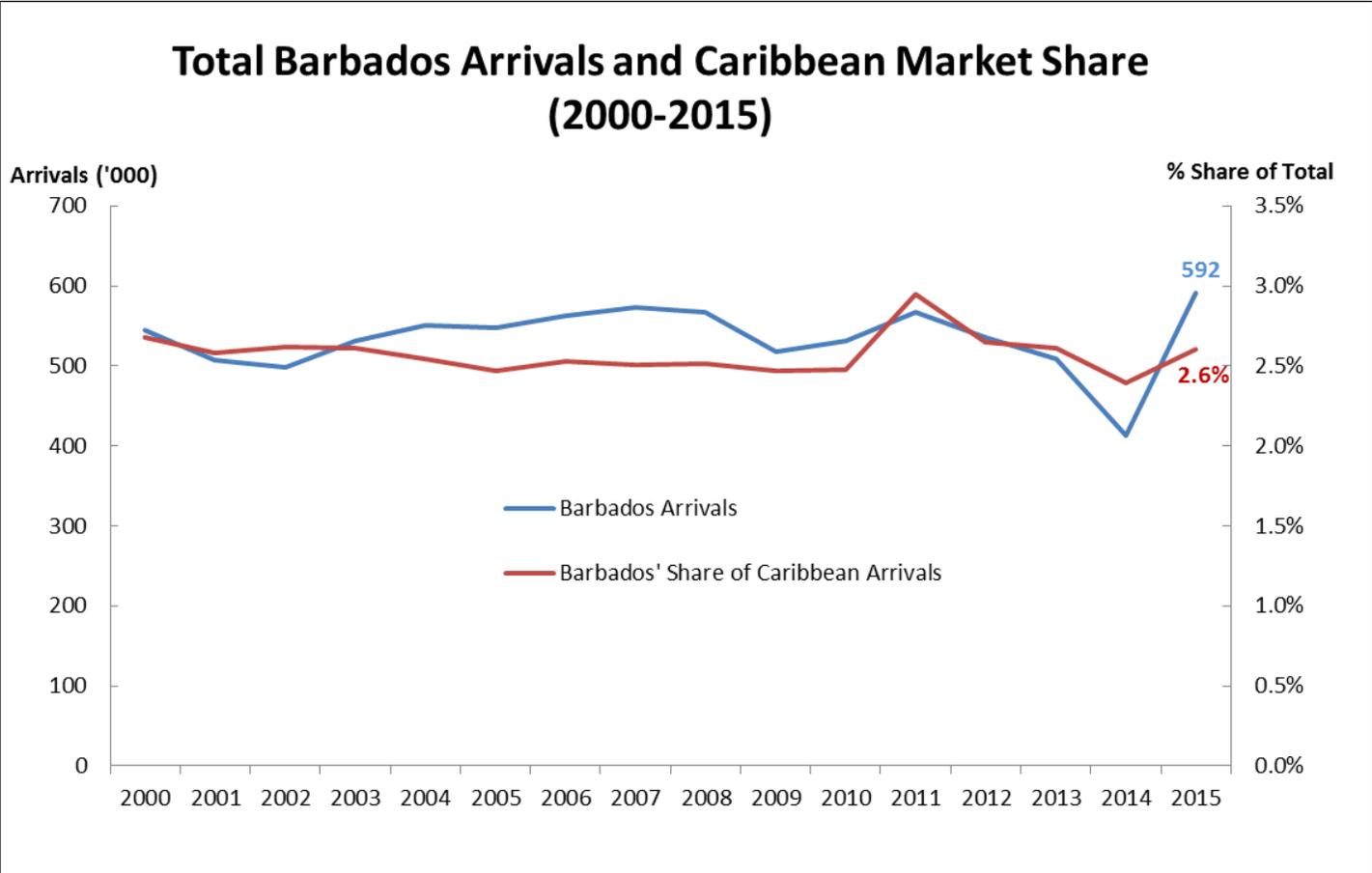
Index
1980=100



Barbados' tourism ranking in the Americas

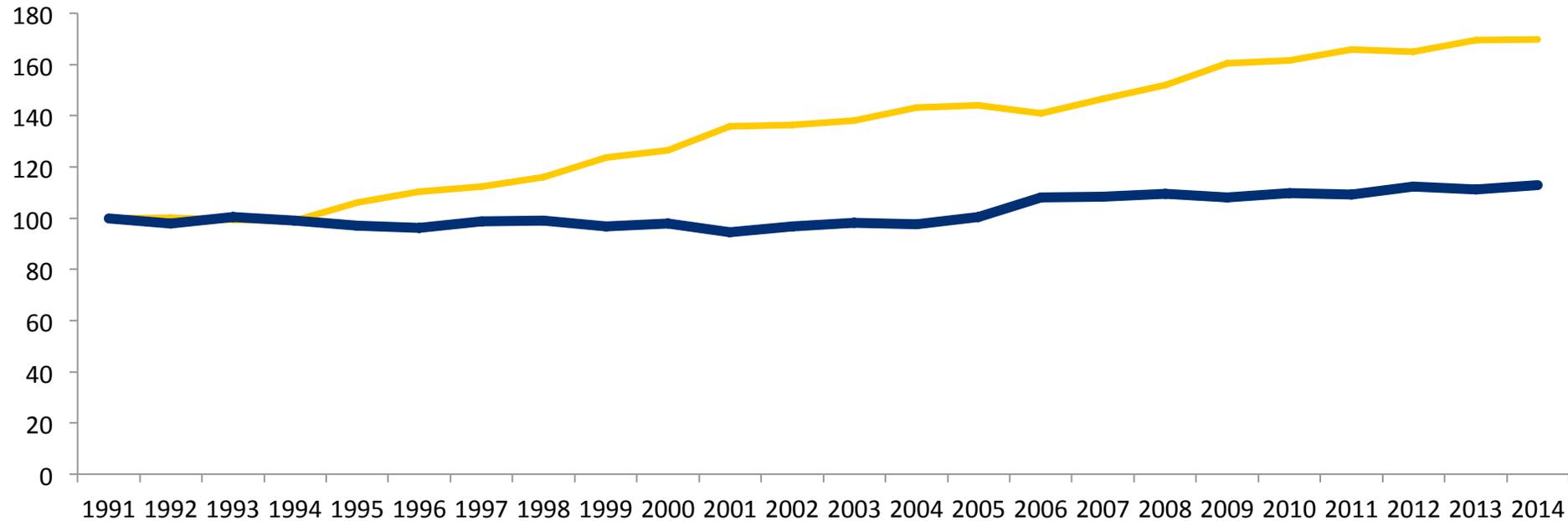


Barbados has recovered its market share



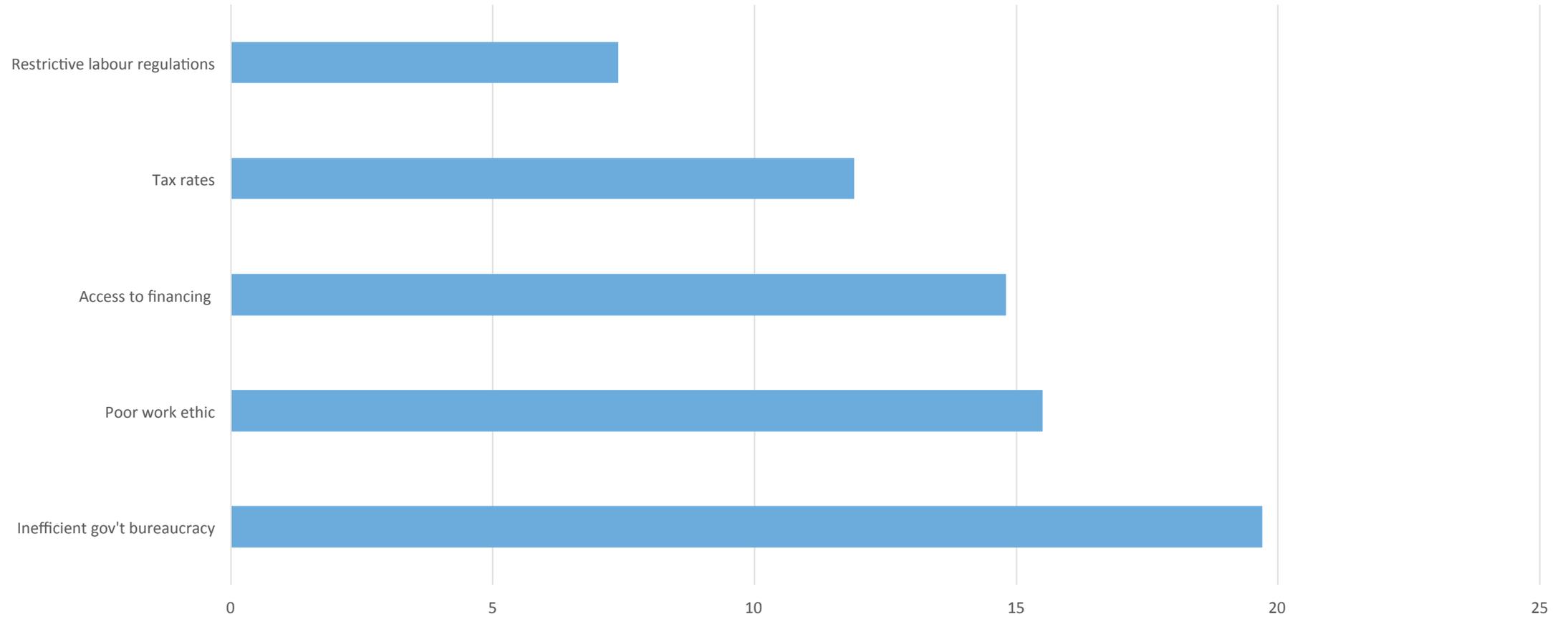
But labour productivity has stagnated

Index
1991=100



— ULC — Real Output per worker

Most problematic for doing business



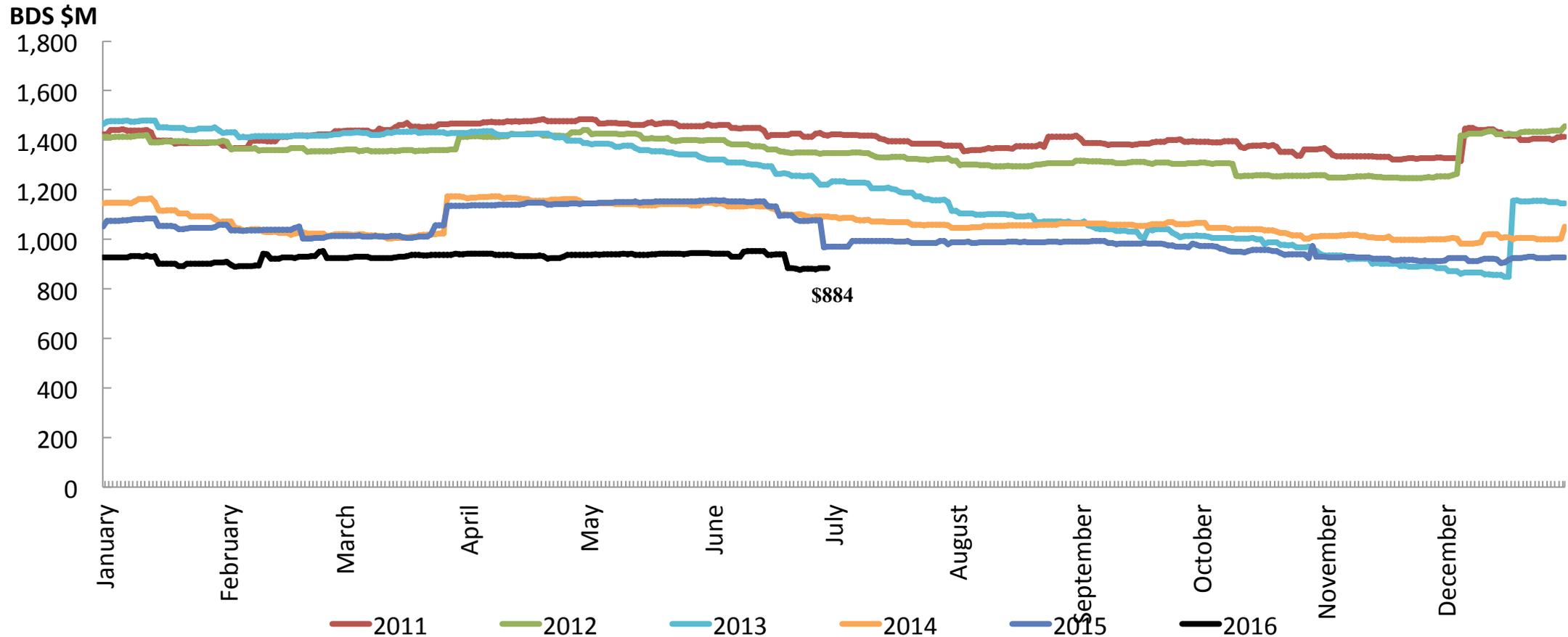
Features of a model to forecast growth

- Two output sectors, tradable and nontradable, with prices in the tradable sector determined in the international market. Labour and finance costs are the same in both sectors, and both sectors are highly import dependent.
- The critical quantifiable variable is real unit labour cost. That is the key variable for maintaining competitiveness in the forecast model.
- The forecast based on projected unit labour cost is modified in light of informed qualitative judgement about:
 - The effectiveness of branding and product enhancement;
 - Indices of the effectiveness of public sector reform;
 - Evidence of deeper market penetration and the development of new export markets.

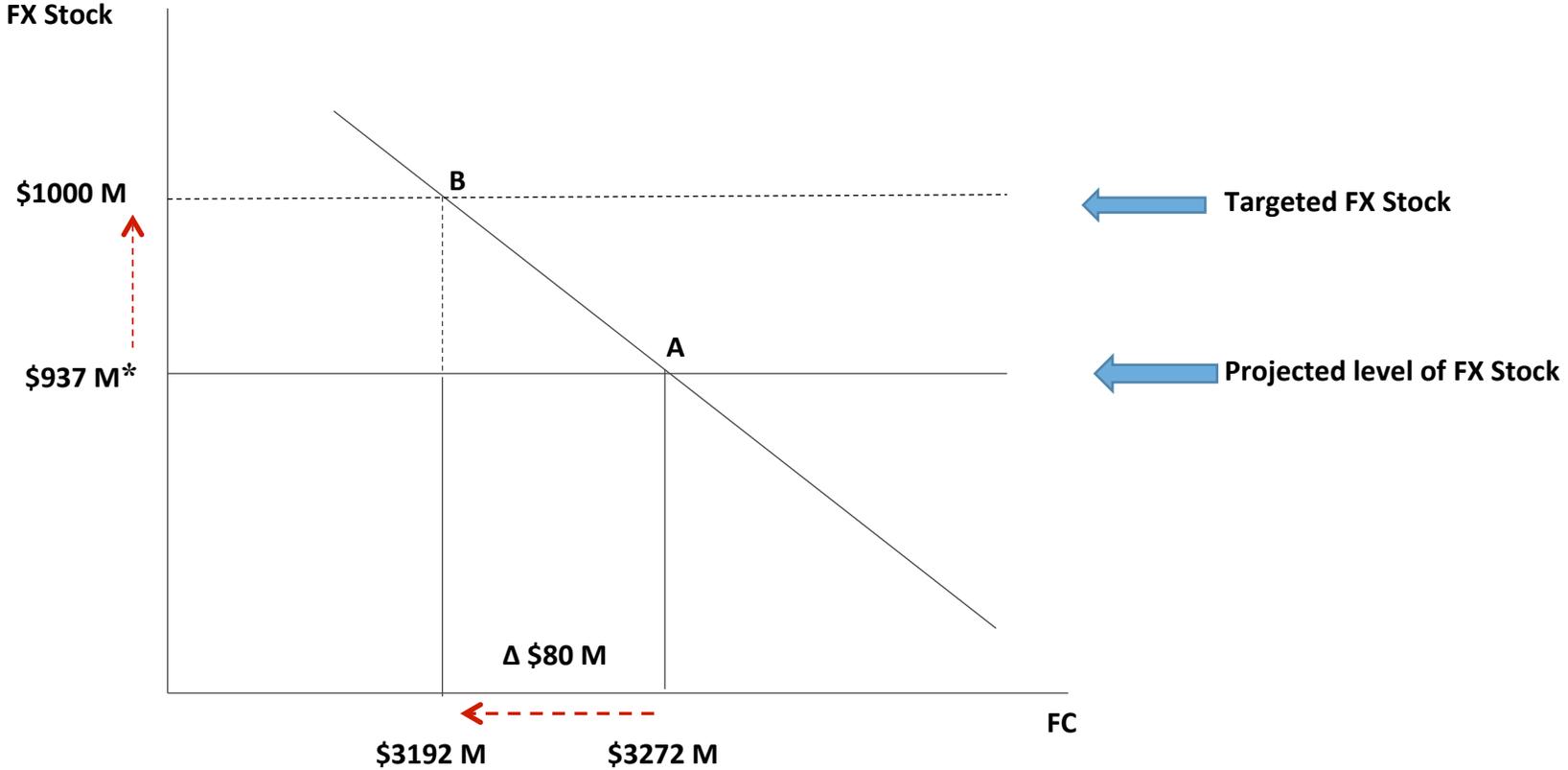
The growth strategy must be based on a foundation of economic stability

- Adjustment policy in B'dos is grounded on the exchange rate anchor, with the peg secured by maintaining a balance between the supply and demand for foreign exchange at the pegged rate.
- The demand is contained by tightening fiscal policy as needed, to reduce aggregate expenditure and the demand for imports.
- Supply is augmented by investment in export capacity and productivity improvements. Investment takes time to bear fruit; in the meanwhile, demand must be reduced with a combination of foreign reserve drawdowns and reduced expenditure.

The key to timely stabilization is real time monitoring of central bank's foreign reserves



A severe loss of foreign reserves as in 2013 requires appropriate fiscal contraction to reduce the demand for imports



*Projected

FC: Fiscal Contraction
FX Stock: Stock of Foreign Reserves

A simple model for forecasting growth and adjustment policy

1. $q_t = q_t(p_t, s, r)$
2. $q_n = q_n(q, p_n/p_t, r, dh)$
3. $p_n = p_n(q_n, p_t, s, r)$

Identities

4. $dh = dCRGMA/p + dFXR/p$
5. $Y = p_t \cdot q_t + p_n \cdot q_n$

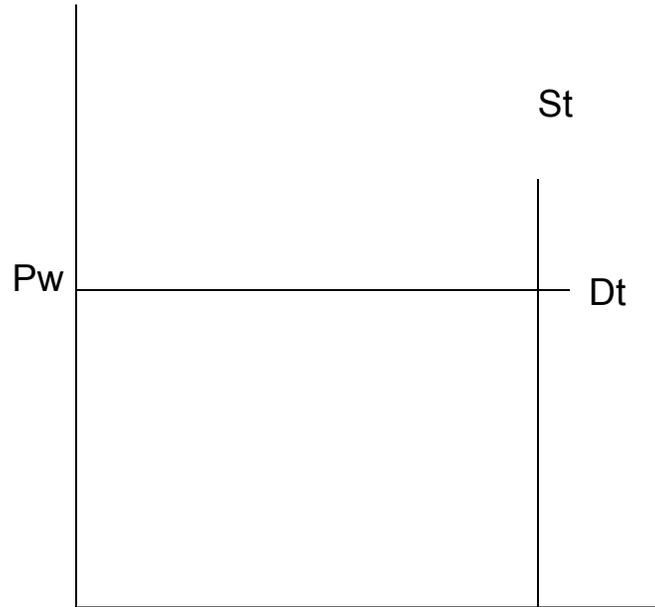
6. $m = m(q, p_n/p_t, r, dh)$
7. $x = x(q_t)$

Identity

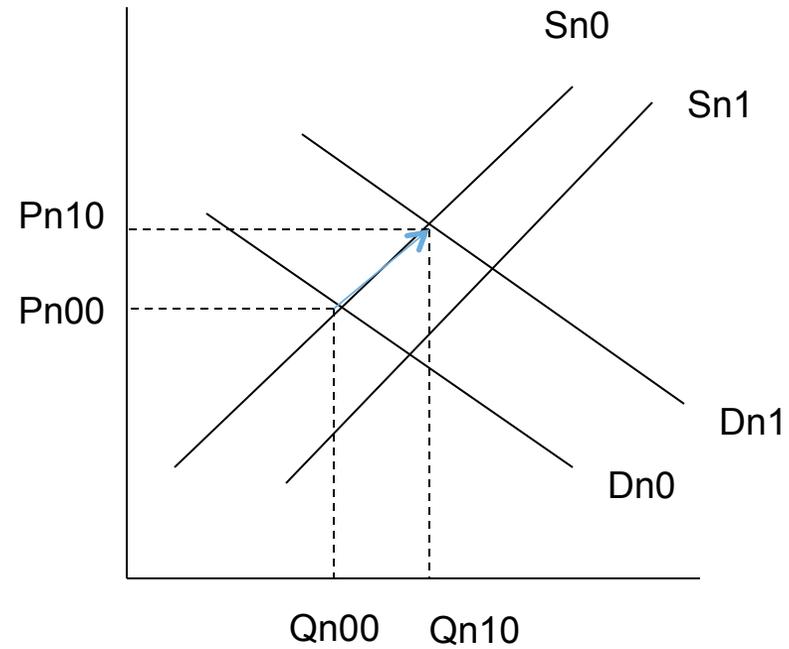
13. $dFXR = (x - m)p_t + K_p + K_g + OTH$

Nominal & Real GDP, Prices

Tradables

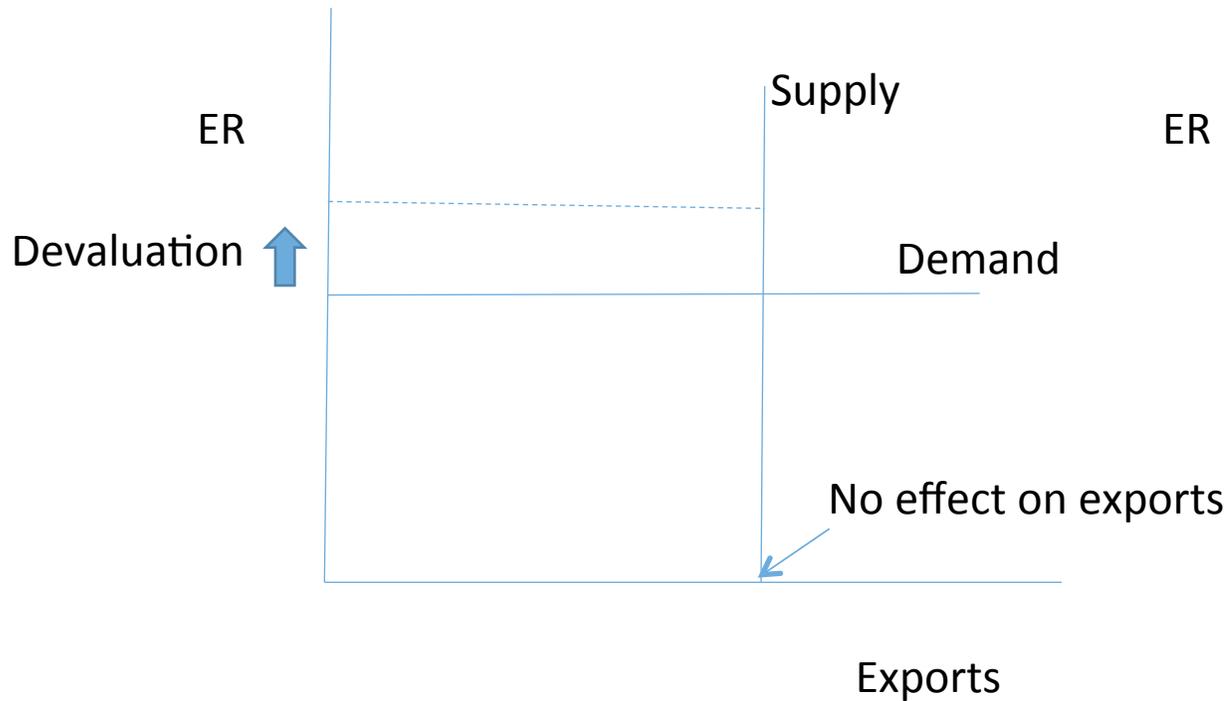


Nontradables

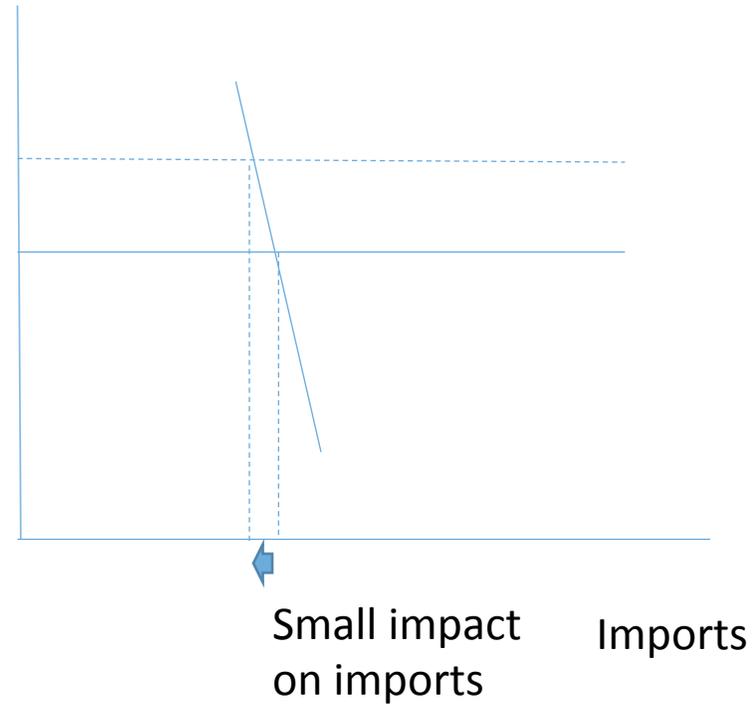


The effects of devaluation on the SVOE: import and export elasticities

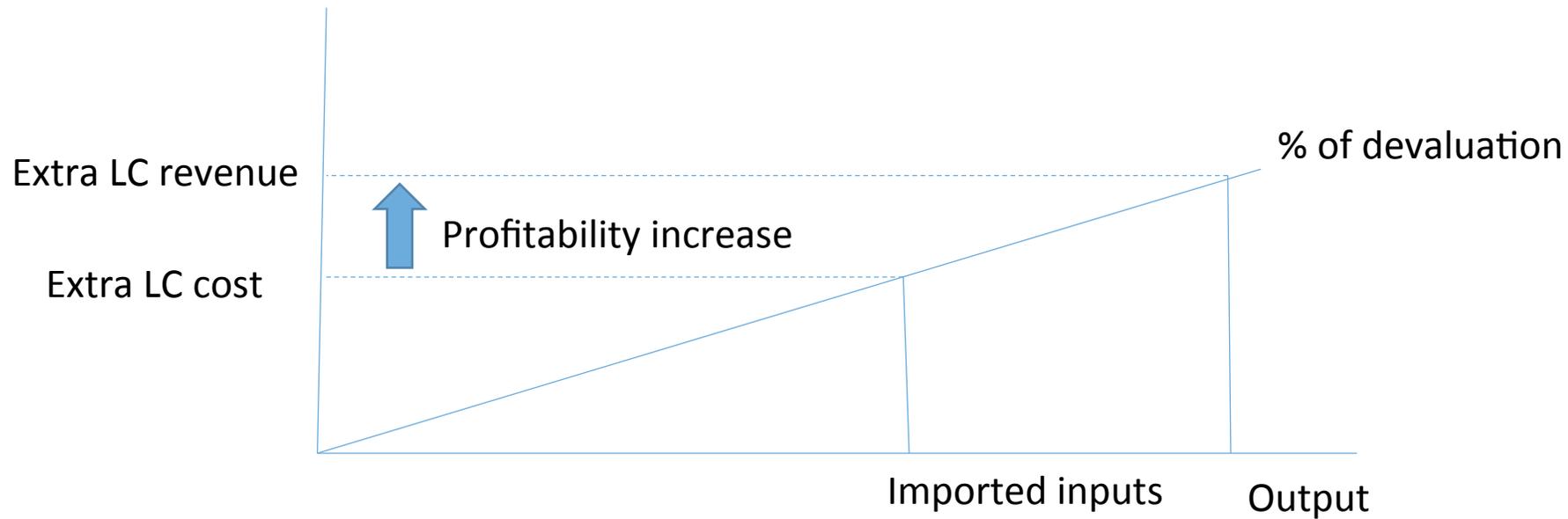
Exports



Imports



Effect of devaluation on profitability of tradables



Policy variables and outcomes

- Policy variables:
 - s , the unit labour cost
 - $dCRGMA$, money creation
- Outcomes:
 - $dFXR$, the change in central bank's foreign reserves
 - q, Y, p , real and nominal GDP and prices
- Exogenous:
 - r , world interest rate plus the country premium
 - K_p, K_g FDI

The role of monetary policy is limited to interest rate smoothing

- Headline inflation is principally driven by international prices and exchange rate changes, if any.
- The main effect of interest rate changes is on financial inflows and outflows, and depends on the degree of uncertainty in financial markets. The main domestic source of uncertainty is the fiscal stance, and government's borrowing requirement, compared to the availability of funding.
 - If government's borrowing requirement is high and finance is scarce, uncertainty rises. If the central bank intervenes to *raise* interest rates under these circumstances, there is capital flight, exchange market pressure rises, and the exchange rate tends to depreciate, causing *inflation*.

Periodicity and forecast errors

- The model is estimated and forecast in annual and quarterly versions.
- Policy and outcome variables are monitored at the highest frequency available: foreign reserves and central bank advances daily, prices monthly, output quarterly.
- Monthly evaluation meetings with decisions about necessary policy changes, monitoring of implementation. More frequent meetings when the situation warrants.
- The statistical variance of forecasts is unacceptably large, even for one period ahead; hence the need for constant monitoring, revision and policy intervention.

Model structure

- After years of experimentation with newer techniques, my preference is for simple methods and modular structures (real sector, fiscal, BoP, monetary, prices). This allows for better intuition in comparing forecasts with actuals.
- Few if any of the assumptions needed for scientific rigour are possible (independence of observations, completeness of information, availability of good proxies for the variables of interest, etc).
- The policy levers and the processes through which they impact the economy are more obscure in more rigorous models.

The institutional framework

- The framework requires joint policy making and monitoring by monetary authorities (who manage the foreign reserve war chest, and provide credit to fill gaps in government financial needs) and the fiscal authorities, who manage the expenditure adjustment tools.
- Monetary policy is limited to reducing uncertainty about the evolution of the real interest rate, which is governed by the foreign rate and the country and local currency premiums.
- There is an ever present danger of fiscal dominance: where the fiscal deficit is thought by market participants to be unsustainable, intervention to raise interest rates further undermines policy credibility and results in capital flight.

How well has this framework worked in Barbados?

- It has undoubtedly been the main factor behind the durability of the exchange rate anchor since 1975.
- However, the peg remains vulnerable to fiscal excess: currently, the administration in Barbados has embarked on what appears to be a programme of fiscal expansion to prime the pump for elections which have to be held within a year's time, in circumstances where there is no fiscal space. On the contrary, foreign reserves are below the market's comfort level, an indication that fiscal *contraction* is called for.

Strengths and weaknesses of the forecast system

- It uses a really powerful signaling mechanism, namely foreign reserves, which is available accurately at high frequency. The need for corrective action can be detected early.
- The exchange rate anchor is a powerful incentive in the open economy, because the dominant source of inflation is international prices. Loss of the peg excites fear of loss of value of local-currency-denominated pensions and other savings, and therefore provokes widespread capital flight.
- The system is vulnerable because successful defence of the peg via fiscal policy and containment of aggregate spending requires a long view; the impact of excess money creation on foreign reserves is seldom immediate. Political considerations may override the long view, leading to failure of the adjustment policy.

References and sources

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