Monetary & Exchange Rate Policy in a Small Commodity-Exporting Economy

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The experience & motivation
• Historically Iranian economic policy has placed a relatively high weight on nominal exchange-rate (ER) stability, particularly when external economic and political conditions were accommodating.

• In above trend oil revenues periods large volumes of foreign currency were thrown into the market to control inflation through stabilization of ER as the de facto nominal anchor of monetary policy.

• The role of ER in the conduct of monetary policy in Iran, except for continued aversion to a free float, has not been quite clear.

• Control of nominal ER along with pro-cyclical fiscal & credit policy failed to keep a lid on inflation over medium term. The result was extended episodes of RER appreciation, the Dutch Disease, & tradable output contraction.
The experience & motivation

• Inflation rate was a key variable for forming a fairly strong correlation between TOT & RER. C

• Release of built-up misalignments in ER have often been in the form of dramatic appreciation of nominal market rates, resulting in occasional very high risk in this market.

• With no hedge instruments, except outright hoarding of foreign currency, large currency fluctuations can result in significant balance sheet effects, hence contractionary devaluations as the “original sin” literature suggests.

• We will discuss optimal ER policy in the context of an inflation-targeting framework in an economy with structural features resembling those of Iran & the type of policies & institutional requirements/reforms needed for implementation of this framework.
conducted in an open economy. OP is not independent of structural & institutional features of economy, particularly in small dev. Economies

**Frictionless Decentralized Competitive Market System**

- When prices are flexible & allocate resources efficiently, it does not matter if ER is fixed or flexible (Engel 2009).

**Market System competitive market or Monop. Comp & frictions**

**Institutional Setup** assignment to an Independent CB with transparent goals.

**Small-developing Semi-market, Centralized governance Structures**

- Fiscal dominance dents CB policy independence PE of ER determination PP: not clear cut Fear of Floating

**Policy Paradigm: social planner**

**Technical Solution:**

- Canonical: FIT to remove domestic price distortion+ floating ER result similar to closed economy  Devine Coincidence.
- Various elements in an open economy divert optimal policy from price stability: , LCP (D & E 2003), home cons. bias (M & F 2008), TOT externality (B & B 2003), IIRS (Corseti et al 2010)

**Institutional & Technical Solutions**

- complicating issues: commodity exporters, TOT, Presence of NR agents Government spending & SWF
Structural features of the Iranian Economy & Monetary/ER practices

• Exogenous TOT shocks have been a major source of economic disturbance in Iran.

• Existence of institutional link between oil revenues, Govt. budget, & CB balance sheet in the Iranian economy provided a link between external shocks & economic cycles & underpinned correlation of TOT & RER.

• The Openness ratio is 0.55, degree of exchange rate pass-through to domestic prices is around 0.48, though this ratio tend to increase significantly during shock periods which heightens complementarily between ER & CPI inflation--also DPI due to imported intermediate goods.
Structural features of the Iranian Economy

• Domestic financial markets are not deep & not well integrated into the world markets. Capital account is semi-open.

• ER policies affect socio-economic groups differently. Given that the bulk of foreign currency supply to the economy is through nationalized oil industry, its price and allocation is a political economy consideration.

• The model presented here integrates main structural features of the Iranian economy: it combines fear of floating with exogenous external TOT shocks & presence of non-Ricardian agents & government propensity to spend out of oil revenues.
Loss Function:

\[ \text{Min} \ L = \sum_{0}^{\infty} \beta^{t} \left[ \lambda_{1}(\pi_{t}^{H})^{2} + \lambda_{2}(x_{t})^{2} + \lambda_{3}(q_{t} - q^{*})^{2} \right] \]

Economic Structure:

\[ x_{t+1} = \beta_{1}x_{t} - \sigma(1 - \gamma_{G})(1 - \lambda_{NR})(i_{t} - E_{t} \pi_{t+1}^{cpi}) + (1 - \gamma_{G})\beta_{2}(q_{t} - E_{t}q_{t+1}) + \gamma_{G}(g_{t} - E_{t}g_{t+1}) - \beta_{3}E_{t}rp_{t+1} + \lambda_{NR} \left( \frac{1 + \phi}{1 - \sigma} \right)(n_{t} - E_{t}n_{t+1}) + \xi_{t+1} \quad \text{IS equation.} \]

\[ \pi_{t}^{H} = \alpha_{1}\pi_{t-1}^{H} + (1 - \alpha_{1})E_{t}\pi_{t+1}^{H} + \alpha_{2}x_{t} + \alpha_{3}q_{t} + \epsilon_{t}^{\pi} : \text{Domestic Inflation P.C.} \]

\[ \pi_{t}^{F} = (1 - \Omega)\pi_{t-1}^{F} + \Omega(\pi_{t}^{*} + e_{t} - e_{t-1}) \quad \text{Imported inflation P.C.} \]

\[ \pi_{t}^{cpi} = (1 - \kappa)\pi_{t}^{H} + \kappa\pi_{t}^{F} \quad \text{CPI Inflation} \]

\[ q_{t} = (1 - \phi)E_{t}q_{t+1} + \phi q_{t-1} - (i_{t} - E_{t} \pi_{t+1}^{cpi}) + (i_{t}^{f} - E_{t} \pi_{t+1}^{*}) + rp_{t} \quad \text{U.I.P.} \]

\[ rp_{t} = \rho_{rp}rp_{t-1} + \psi_{q}q_{t} + \epsilon_{t}^{rp} \quad \text{Endogenous E.R. risk Premium} \]

\[ g_{t} = \omega_{1}(e_{t} + oil_{t}) + \omega_{2}R^{ss}(e_{t} + (i_{t}^{f} - E_{t} \pi_{t+1}^{*}) + f_{t-1}) - \omega_{2}(e_{t} + f_{t}) + t_{t} \quad \text{Gvt budget} \]

\[ f_{t} = f_{t-1} + \theta oil_{t} \quad \text{SWF and reserve accumulation} \]
**Case I**, with high financial vulnerability, presence of non-Ricardians, no SWF.

- When government makes no saving out of oil revenues, incidence of an adverse TOT, leading to subsequent RER depreciation results in a higher endogenous ER risk premium in UIP. Simulation runs show contractionary effect of adverse TOT shocks (contractionary devaluations).

- Contractionary devaluations due to the negative effect of ER risk premium on aggregate demand (IS equation) renders RER stabilization optimal (fear of floating). Despite better inflation stabilization performance in FCIT and FDIT, RERT has the lowest loss.
• **Case II, Case I with SWF as a policy instrument**
  • Here govt, expenditures are filtered through a fiscal rule to save oil revenue windfall in a SWF, RER standard deviation is lower (0.4) compared to the previous scenario.
  • In this case the social loss is lower compared to the previous case I, indicating an improvement in policy tradeoffs.
  • The variation of output and inflation is also lower compared to case I.
  • When government operates within a fiscal rule (save the differential between the actual & SS oil revenue) output, inflation and RER variations is reduced (even though the economy is assumed to have high financial vulnerability).
  • FCIT is the optimal monetary policy regime and CB does not need to react to RER fluctuations.
Case III, case II with a very high ratio of non-Ricardian

The presence of large number of NR consumers makes govt. fiscal rule (SWF) more effective so far as inflation and output gap stabilization are concerned, since there is no Ricardian equivalence in this model.

Standard deviations for output & inflation is lowered for the optimal monetary policy regime of FCIT.

RER standard deviation has increased slightly compared to the second Scenario.

It can be inferred that fiscal policy rule impact on macroeconomic stabilization is more influential where there is a large no. of NR. HHs.
Policy Discussion & Suggestions

• In an oil-exporting economy, higher oil prices & pro-cyclical fiscal policies result in higher domestic prices & RER appreciation. Standard inflation targeting practice of controlling domestic inflation & floating ER may not suffice if ER fluctuations negatively influence price & output stability.

• RER (ratio of foreign to domestic CPI in one currency) is the link between CPI inflation & TOT. Generally, inflation stabilization in commodity currencies with exogenous & volatile TOT can be achieved through weaker correlation between TOT & RER via flexible ER & counter-cyclical fiscal policy.

• Installation of a fiscal rule & an SWF reduces cyclicality of fiscal policy & stabilizes RER via reserve accumulation during boom years & also limits growth of monetary base.

• This is a form of policy coordination which enables CB to focus on inflation targeting and MP instrument need not react strongly to movements in RER. Increased policy credibility will help to anchor inflation expectation.

• Adoption of a fiscal rule facilitated conduct of inflation targeting in a number of countries.
Policy suggestions, continued

• In this setup, management of international reserves through an SWF also helps to insulate RER from exogenous TOT shocks (as in Chile, Aizman et al 2011).

• After a positive TOT shock, reserve accumulation via SWF is a way to stabilize ER. After a negative real shock (negative TOT or a downward shift of export demand) SWF facilities & ER flexibility can be relied upon to restore balance. In this sense, the reserve fund (SWF) can reduce the extent of ER fluctuations instability.

• ER flexibility buttressed by an SWF is a more feasible option than a floating currency which requires an open capital account. A small open economy needs to have deep markets, otherwise the economy can be subject to excessive currency risk & currency mismatch.

• With shallow financial markets & weak global links, reliance on floating ER for undermining the link between TOT and RER may entail welfare costs via increased output gap fluctuations. Hence, a floating ER policy and reacting to increased inflation through exclusive reliance on higher interest rates may not be the optimal policy.
Policy suggestions, continued

• The afore mentioned form of policy coordination has been used in the first stages of implementation of IT in countries like Chile & Mexico.

• Filtering TOT shocks through a fiscal-rule also helps to accumulate foreign reserves & helps in risk sharing for an economy where foreign investors have limited choice of domestic assets and control on capital flows exist. Official holdings of foreign currency, was used a substitute for private holdings of foreign assetsin Southeast Asia.

• As institutions develop, MP becomes more credible, & goods and financial markets integrate into the world market, the speed of exchange rate pass-through moderates, a higher degree of exchange rate flexibility may be desirable (Devereux & Yetman 2014).
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اموریت ها، اهداف انتصاب سياسات و تفویض اختیارات
Real exchange rate and real oil revenues
Strong Correlation between TOT & RER during oil-price boom & relatively fixed nominal ER
Implementation of fiscal-rule helps to achieve better results for inflation targeting CBs.

Thank you for your attention