Research Proposal

Determinants of the Choice of Exchange Rate Regime in Oil Exporting Countries

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March 26, 2013
1 Objectives

In the economic literature much attention has been devoted to the choice of exchange rate regime. Often policymakers are challenged to choose between fixed exchange rate regime, which may provide the trade gains and “policy crutch”, and floating exchange rate regime, which does not undermine the independence of monetary policy and accommodates the terms of trade shocks. Until recently the economic literature was extensively studying the growth effects of exchange rate regimes (Gosh et al., 2002; Levy-Yeyati and Struzenegger, 2003; Husain et al., 2004). More recent literature draws possible endogeneity of the choice of exchange rate regime to the front line and focuses on the determinants of this choice rather than its effects on macroeconomic variables (Markiewicz, 2006; Levy-Yeyati et al., 2010; Berdiev et al., 2012).

The literature agrees that there is no single exchange rate regime right for all countries (Frankel, 1999) and often focuses on special set of determinants and group of countries with similar characteristics. The problem of choosing appropriate exchange rate strategy is even sharper in oil exporting countries (OECs) that are exposed to large and volatile foreign exchange windfalls. There is an empirical evidence that fuel exporters are more likely to have a pegged exchange rate regime (Klein and Shambaugh, 2009). Such behavior may have a rationale, as an economy dependent on a single export commodity that is denominated in dollars in the world market may benefit from pegging its currency to dollar\(^1\). Then the questions arise whether the determinants of exchange rate regime differ between OECs and other countries and more importantly what determines the choice of exchange rate regime in OECs? To our knowledge there is no empirical study that focuses on these questions. In this research we are planning to fill this lack by addressing these questions.

The main objective of the research is finding the specific determinants of the choice of exchange rate regime in oil exporting countries (OECs). Given the nature of the dependent variable we will run multinomial logit regressions for an unbalanced panel data set of about 180 countries over the 1974-2011 period. In the first stage we will compare oil-rich and oil-poor countries to see the difference in the determinants of exchange rate regime between these two sets of countries. In the second stage we are planning to explain the difference (if any) in results. Specifically we will focus on the effects of oil-richness measure and its interaction term with specific set of variables on the choice of exchange rate regime. A priori by using this technique we expect uncovering unique determinants of the choice of exchange rate regime in OECs.

2 Practical contribution of research

The research will contribute to the ongoing debate on the determinants of the choice of exchange rate regime. Despite a massive literature studying this issue, to our knowledge there is no multi-country empirical research that focuses solely on the determinants of exchange rate flexibility in OECs. We will examine this issue in OECs featuring large and volatile windfall revenues. Moreover our sample will cover longer time period and richer set of control variables. Our inspiration comes from the recent trends in the economies of

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\(^1\)In face of volatile and huge petrodollar inflows, a small oil exporting economy may benefit from pegging its currency to dollar. Our theoretical model (Aliyev, 2012b) predicts that pegging the exchange rate allows softening the negative effects of Dutch Disease and partially stabilizes the economy in the face of volatile natural resource revenues. In the model we demonstrate that the fixed exchange rate regime outperforms price level targeting or laissez-faire policies by delivering higher isolation and hence smaller vulnerability to shocks in foreign revenues.
oil rich post-Soviet countries, such as Azerbaijan, Kazakhstan, and Russia. However the results of this project would be valuable for policy makers in other OECs as well as in other natural resource exporting countries and aid receiving countries due to similarities between aid and windfall revenue inflows.

3 Hypotheses

Our research hypothesis is that the choice of exchange rate regime in OECs is determined by different factors compared to other countries. The rationale behind this hypothesis is that a less flexible exchange rate regime delivers higher isolation from, and smaller vulnerability to shocks in foreign exchange inflows. This in turn can deliver stabilization and higher economic growth. Under a fixed exchange rate regime oil revenues are accumulated/decumulated as central bank’s international reserves during the period of high/low oil exports, and therefore countries with pegged exchange regime will have higher isolation. Saving the source of the curse, i.e. petro-dollars outside of the economy may help improve the situation. Therefore the choice of exchange rate regime in OECs may have different determinants. The alternative hypothesis is that there are no substantial differences in the determinants of the choice of exchange rate regime between oil-rich and oil-poor countries.

We will test these hypotheses by using cross-country and cross time multi-country test for a sample of about 180 countries over the thirty-two years period. Additionally the test will allow us to uncover the specific determinants of the choice of different exchange rate regimes, namely fixed, managed floating, and floating in OECs.

4 Literature Review

4.1 Theoretical Determinants of Exchange Rate Regime Choice

In the economic literature three major approaches that explain the choice of exchange rate regimes are (i) Optimal Currency Area (OCA) theory, (ii) financial view, and (iii) political view.

According to the OCA theory (originally formulated by Mundell, 1961) geographical location, trade links, size, openness and the intrinsic shocks are the main determinants of the exchange rate regime. From this perspective the trade and welfare gains from a stable exchange rate is compared with the benefits of exchange rate flexibility as a shock absorber. Therefore more open countries are more likely to have a pegged regime. Given the fact that smaller countries trade more, one can expect that these countries also tend to have less flexible regimes.

The predictions of this theory is tested by including country’s openness (the share of exports plus imports in GDP), size (real GDP), geographical concentration of trade among other determinants of the exchange rate regime.

The Financial view is based on the impossible trinity hypothesis, according to which only two can be attained out of three goals: exchange rate stabilization, free capital mobility, and independent monetary policy. Recent global financial deepening and innovation diminished the effectiveness of capital controls. In the presence of free capital mobility the impossible trinity dilemma reduced to the bipolar view of exchange rate regimes which defines fixed exchange rate regime and independent monetary policy tradeoff. According to this view low financial development should increase the probability of adopting pegs.

To test the financial view we include capital control index, the Chinn-Ito index (measures a country’s degree of capital account openness), liability dollarization, the ratio
of private credit to GDP and some other explanatory variables to characterize financial development.

The Political view highlights political factors as a determinant of exchange rate regime. Less developed countries experiencing low institutional credibility may adopt a peg as a policy crutch. These countries are more corrupted and have higher level of bureaucracy, therefore need to have a stable currency to attract international investors and possibly to provide illegal opportunities for influential members of the society. In contrast in more democratic countries governments are more interested in influencing economy and hence are more likely using flexible regimes.

To capture the effect of political factors on the choice of exchange rate regime we use different measures of democracy and the stability of the political system.

4.2 Classification of Exchange Rate Regimes

The classification of the exchange rate regimes deserves some explanation. Until recently most of the research relied on the the de jure exchange rate regime classification which is based on countries’ official announcements to the IMF (IMF’s Annual Report on Exchange Rate Arrangements and Exchange Restrictions). However, in practice, countries usually demonstrate fear of floating and do not allow exchange rate to float against their official reports (Calvo and Reinhart, 2002; Levy-Yeyati and Struzenegger, 2005). Therefore there is a growing popularity of using de facto regimes which describes better the exchange rate strategies rather than de jure regimes.

Levy-Yeyati and Sturzeneggers’ (2003, 2005) de facto exchange rate regime classification is based on the volatility of the bilateral nominal exchange rate, the volatility of exchange rate changes and the volatility of foreign reserves. Reinhart and Rogoffs’ (2004) approach is more sophisticated and accounts for country chronologies which includes information on the official exchange rate regime, the anchor currency and other important economic events and differences between the official and parallel exchange rates.

The coding of both research are widely used as de facto exchange rate classifications by many scholars. Interestingly the de facto classifications significantly differ from the de jure one and researches based on the former one deliver more reasonable results.

For example, Gosh et al. (2002) use the de jure exchange rate regime classification and find that a fixed exchange rate regime has a positive effect on economic growth. Levy-Yeyati and Sturzenegger (2003) using their own de facto classification and find that in non-industrialized countries fixed exchange rate brings about slower growth and higher output volatility. Berdiev et al. (2010) by using the similar classification by Levy-Yeyati and Sturzenegger (2005) emphasize the role of political factors such as wings of governments (left/right), democratic institutions, central bank independence and financial development among other factors determining the choice of exchange rate regime. Estimations based on the alternative de facto classification of Reinhart and Rogoff (2004) indicate that only rich and financially developed countries can benefit from the flexibility of exchange rate regimes (Reinhart and Rogoff, 2004; Husain et al., 2005; Aghion et al., 2006).

4.3 Exchange Rate Regimes in OECs

What makes OECs differ from other countries is a huge and volatile inflow of foreign exchange. In face of these windfalls OECs are challenged in achieving stabilization and economic growth. As it is mentioned above Klein and Shambaugh (2009) find that fuel exporters are more likely to peg. Moreover, it has been documented that the price of oil has a significant effect on real exchange rates in OECs, precisely, higher oil price lead to
appreciation of the real exchange rate in these countries (Korhonen and Juurikkala, 2009). The effects of oil price change on domestic economy are mainly transmitted through fiscal policy (Husain et al., 2008).

The intuition behind these phenomena is straightforward: soaring oil prices or discovery of oil reserves increase government’s income denominated in foreign exchange and fiscal expansion based on these resources creates appreciation pressure on the domestic currency. In this situation, the monetary authorities can choose only one side of the stick: it can either stabilize nominal exchange rate at the cost of inflation or it can control inflation by letting nominal exchange rate to adjust.

The evidence supports that monetary authorities in OECs mainly choose the first option. Aliyev (2012b) shows that besides arguments of existing theories of exchange rate determination there may be another rationale for pegging exchange rate in resource-rich countries. Precisely, by fixing exchange rate monetary authorities in OECs may contribute to achieving consumption smoothing across generations and softening the negative effects of Dutch Disease during the oil boom.

To our best knowledge there is no empirical study that focuses on the determinants of exchange rate regime in OECs, and we are planning to fill this gap in the proposed research.

5 Methodology

5.1 Estimation

Given the nature of the dependent variable we run multinomial logit regressions for an unbalanced panel data set of about 180 countries over the 1974-2011 period. Multinomial logit regression technique is the most relevant in a discrete choice analysis since the choice set includes more than two alternatives. The dependent variable is a categorical variable that takes three values: 0 for flexible, 1 for intermediates and 2 for pegs. The discrete variable \( R_{it} \) which denotes the choice of exchange rate regime by country \( i \) at period \( t \) is defined as:

\[
R_{it} = \begin{cases} 
  j = 0, & \text{if country } i \text{ at period } t \text{ implements flexible regime} \\
  j = 1, & \text{if country } i \text{ at period } t \text{ implements intermediate regime} \\
  j = 2, & \text{if country } i \text{ at period } t \text{ implements fixed regime}
\end{cases}
\]

(1)

Since exchange rate choices \( R_{it} \) are ordered logically, we use an ordered logit model. The choice of exchange rate regime is described by a latent variable \( Y_{it}^{*} \) which denotes the unobserved utility that government \( i \) derives in year \( t \) from pegged regime. \( Y_{it}^{*} \) is determined as a linear function of different explanatory variables \( X_{it} \), oil-richness dummy \( D_{oil}^{it} \) (which also controls pre- and post-oil extraction periods) and its interaction term with specific set of variables \( Z_{it} \):

\[
Y_{it}^{*} = X_{it} + D_{oil}^{it} + D_{oil}^{it} \times Z_{it} + u_{it}, \text{ for } i = 1, 2, ..., N; \ t = 1, 2, ..., T_i
\]

(2)

Where \( N \) denotes the number of countries and \( T_i \) is the number of observations for country \( i \). We assume that the error term \( u_{it} \) is i.i.d. and follows logistic distribution. The probabilities of country \( i \) choosing regime \( j \) are defined by the following way:

\[
R_i = 0, \text{ if } Y_{i,t}^{*} < c_1 \text{ and } Pr(R_i = 0) = Pr(Y_{i,t}^{*} < c_1),
\]

(3)
\[ R_i = 1 \text{ if } c_1 < Y_{i,t}^* < c_2 \text{ and } Pr(R_i = 1) = Pr(c_1 < Y_{i,t}^* < c_2), \]  
\[ R_i = 2 \text{ if } Y_{i,t}^* > c_2 \text{ and } Pr(R_i = 2) = Pr(Y_{i,t}^* > c_2), \]  
where \( c_1 \) and \( c_2 \) (\( c_1 < c_2 \)) are thresholds defining the edges between different regimes. The estimates of the coefficients of \( X_{i,t} \) and of the thresholds \( c_1 \) and \( c_2 \) are obtained by using maximum likelihood technique.

We are planning to use the following control variables \( X_{i,t} \) in our regressions:

**OCA theory:**
- openness (the share of exports plus imports in GDP)
- size (real GDP)
- geographical concentration of trade (the share of exports to the reference currency country multiplied by openness)
- terms of trade volatility (computed as the standard deviation of terms of trade changes over the previous five years weighted by the degree of openness)

**Financial view:**
- capital control index (lagged)
- The Chinn-Ito index that measures a country’s degree of capital account openness
- the ratio of private credit to GDP to characterize financial development (lagged)
- de facto capital account openness (the sum of the absolute value of inward and outward flows of portfolio investments and financial derivatives as a share of GDP and The country’s gross stock of foreign assets over GDP)
- a financial development dummy
- a measure of liability dollarization to proxy for the presence of currency mismatches

**Political view:**
- the number of years that the incumbent administration has been in office
- the degree of central bank independence
- Herfindahl index of congressional politics
- a legislative index of electoral competitiveness
- a measure of government weakness (the number of veto points in the political system which measures directly the difficulties or steps required by a government to push its agenda)

Following relevant interest variables that capture distinctive features of OECs \( Z_{i,t} \) that are also part of \( X_{i,t} \) will be used:

- oil income (and possibly forecast during the next 5-10 years)
- non-oil GDP
- fiscal stance (fiscal expenditure over GDP)
- share of oil in the fiscal revenues
- presence of well functioning stabilization mechanisms i.e. sovereign welfare funds
5.2 Data

The full sample contains annual observations for about 180 countries over the period 1974-2011. We borrow de facto exchange rate regime classifications from Levy-Yeyati and Struvenegger (2003, 2005) and Reinhart and Rogoff (2004) which are freely available at the authors’ web-page. All other macroeconomic data can be obtained from the International Financial Statistics (IFS) and World Economic Outlook (WEO) by the IMF, World Development Indicators (WDI) by the World Bank and from the United Nations Statistics Division. The measure for the central bank independence, political factors and other variables from different sources are also free and publicly available.

6 Expected Research Output

As an outcome of this research we expect to find that the choice of exchange rate regime is defined by different factors in OECs and other countries. These factors can be determined by focusing on the effects of interaction terms between oil-richness measure and specific set of variables on the choice of exchange rate regime in a cross country analysis. A priori by using this technique we expect uncovering distinctive determinants of the choice of exchange rate regime in OECs.
7 Bibliography


8 Participant

Ruslan Aliyev - project head

- Junior Researcher, Center for Economic Research and Graduate Education - Economics Institute (CERGE-EI)
- Participant, Czech National Banks Call for Research Projects 2010, The Impact of Monetary Policy on Financing of Czech Firms
- Project head, 11th Global Development Network Regional Research Competition, Monetary Policy in Resource-Rich Developing Economies
- Advanced Student Fellowship, Macroeconomic Forecasting Project with Institute for Democracy & Economic Analysis (IDEA)
- Research Assistant, Center for Economic Research and Graduate Education - Economics Institute (CERGE-EI)
- Economist, The Central Bank of Azerbaijan, Monetary Policy Department
## Project timetable

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