A Simple Effective Demand Model of Capital Flow, Asset Prices and Output

Rilina Basu**

and

Ranjanendra Narayan Nag**

In recent times, international financial markets have been subject to a high degree of volatility, which produces cascading effect in employment and output. Naturally, it is important to analyze the link between the real sector and the financial sector. Towards this end, we construct an open economy model based on effective demand principle. At the heart of the model is the link between net capital flows, exchange rate, Tobin’s q and different components of aggregate demand. The paper shows that a capital outflow can lead to contraction of the real sector through change in asset prices, namely exchange rate and Tobin’s q.

JEL Classification: G01, G12, F32, F36

Keywords: Financial liberalization, capital flow, Tobin’s q, effective demand

1. Introduction

Global financial landscapes have changed considerably since the 1990s primarily due to increased capital flows to emerging markets. This has been influenced by liberalization of international transactions and structural reforms in many emerging markets. Preliminary

---

* Department of Economics, St. Xavier’s College (Autonomous), Kolkata. Address for correspondence: Flat 5A, Dhanshree Towers, 70, Diamond Harbour Road, Kolkata 700023, West Bengal, India. Email: banerjee.rilina@gmail.com. Contact Number: + 91 98304 04312.

* We are grateful to Ambar Nath Ghosh, two anonymous referees and editor of this journal for useful comments and suggestions. However, the usual disclaimer applies.

** Department of Economics, St. Xavier’s College (Autonomous), Kolkata. Address for correspondence: P-36, CIT Scheme V1 M(S), Kolkata – 700054, West Bengal, India. Email: rmag12@rediffmail.com. Contact Number: 0332628229

© Jadavpur University.
statistical analysis shows that the short-term capital inflows to emerging markets have been primarily in equity markets. The vulnerability of the domestic economy is critically sensitive to the share of foreign investment in the stock market. Naturally, transmission mechanism of a financial shock to the real sector operates through change in asset prices, which can be analyzed from two alternative perspectives, namely market based view and bank based view. The market-based view emphasizes how well-functioning equity markets can contribute to macroeconomic development by boosting investment. On the other hand, the bank-based view stresses the effectiveness with which banks provide external finance and fund new firms. This paper chooses market-based view and examines how stock market and real sector respond to change in capital flow. The choice of market based view can be justified in view of capital flows to emerging market economies and its macroeconomic implications. In the wake of financial meltdown capital flows to emerging economies have moderated since August, 2007, coming down from previous high rates. One consequence of this trend has been reflected in the downward swing of the emerging equity markets. This is observed from fig. 1a and 1b.

Fig. 1a. Reversal in capital flow          Fig. 1b. Decline in stock market valuation


1 There has been a surge of capital flows into the stock markets of the emerging economies, growing roughly around $ 200 billion per year. (Global Development Finance, 2005).
The reversal in capital flow has led to recession in not only developed but also emerging markets as shown in figure 2.

**Fig. 2. Real GDP Growth in Developed and Emerging Markets**

![Real GDP Growth Chart]


In this context mention can be made of an interesting recent literature on interrelation between asset prices, namely stock price and exchange rate. While one line of research shows that increase in stock prices has a positive impact on the value of domestic currency (Ajayi and Mougoue, 1996), the other shows that the causality is the other way round (Yu, 1997, Mahmood and Dinniah, 2009). However, what is missing in the literature is theoretical analysis linking short-run output adjustment and movement of asset prices in presence of multitude of contemporaneous changes in policy regime, namely current account convertibility, capital account and stock market liberalization, interest rate deregulation and import of capital goods. In the existing literature, short run macro economic implications of capital flow has been analyzed in terms of change in exchange rate and its consequent effect on net exports. However, the effect of capital flow on stock market valuation and its attendant implications for investment has hardly been addressed in the literature. The objective of this paper is to develop an effective demand model of interconnectedness between the financial sector and the real sector with specific focus on macroeconomic implications of reversal in capital flow. The forcing variables in this model

---

4In Sen (2004) and Rakshit (2009) the effect of capital flow is examined purely through exchange rate. The logic in these papers is that a fall in capital flow causes exchange rate depreciation which leads to a rise in exports and output expansion.
are exchange rate and Tobin’s q, which can be used as a proxy for stock market valuation and investment opportunities.\textsuperscript{5}

The organization of the paper is as follows. In section 2, we build up the model. Section 3 examines the impact of the reversal of capital flow on the real sector. Section 4 concludes the paper.

2. An Open Economy, Effective Demand Model

The model in this paper draws on the analytical framework developed by Tobin (1970) and Blanchard (1981) and in order to highlight the interconnectedness between capital flow and stock market development, we have accommodated openness of an emerging market economy. An important aspect of the current process of globalization is the import of capital goods. In developing countries, investment goods typically carry high import content and liberalization episodes lead to more imports of capital goods.\textsuperscript{6} In spite of this evidence, capital goods imports have not received the attention it deserves in aggregative open economy models. In this paper, we have incorporated imports of two different types of products - capital goods and consumption goods along with non-FDI capital flows. Imported capital is purely an intermediate input which is combined with domestic component to produce final goods. On the other hand, imported consumption goods account for a fixed share of total consumption expenditure which solely depends on the level of income. By their nature non-FDI capital flows do not influence aggregate demand directly, but rather through the intermediation of the domestic financial sector. This may lead to the emergence of different types of channels for the transmission of capital flows to domestic demand. In this paper, we focus on real exchange rate and stock market price index as important transmission channels for capital flows.

The following symbols will be used in the formal representation of the model:

\begin{align*}
Y & : \text{Domestic output} \\
C & : \text{Consumption} \\
I & : \text{Investment} \\
X & : \text{Export} \\
q & : \text{Tobin’s q}
\end{align*}

\textsuperscript{5}Kaplan and Zingales (1997) and Lamont, Polk and Saa Requejo (2001) use firms’ market to book ratios as proxies for Tobin’s q. However, it is clearly difficult if not impossible to measure q accurately (Ericson and Whited, 2000).

\textsuperscript{6}Alfaro and Hammel (2006) observe that stock market liberalizations are associated with a significant increase in the share of import of capital goods in a cross-country analysis.
e : Nominal exchange rate\(^7\)
P : Domestic price which is fixed
P* : Foreign price level
M : Currency
Q : Consumer’s Price Index
R : the rate of return on capital equity required by stock holders
F : Net capital inflows
\(\gamma\) : Proportion of investment expenditure on domestic capital
1-\(\gamma\) : Share of investment expenditure on imported capital
\(\alpha\) : Share of consumption expenditure on domestically produced goods
1-\(\alpha\) : Share of consumption expenditure on imported goods
\(\pi\) : Profit earned by the firms
\(\dot{a}\) : \(\frac{da}{dt}\), change in any variable, say, a over time

2.1. Structure of the Model
2.1.1. The Capital Market

There are three assets in the economy, viz. money, equity and government bond. Bond and equity are considered to be perfect substitutes.\(^8\) However, equity is a very special asset. The reason is that its market fundamental depends on its future prices. Hence, expectation plays an important role in determining the dynamics of the stock price. We assume that all economic agents have perfect foresight concerning relevant variables of an economic system other than unanticipated shocks.\(^9\)

The demand for money depends on real income, and the interest rate. An important point to note is that the real money balance is deflated by consumer’s price index, which is a weighted average of both domestic price level and import price: \(Q = Q(eP^*, P)\)

\(^7\) In this paper, commodity price level is assumed to be fixed and hence, nominal interest rate is same as the real interest rate.
\(^8\) We assume perfect substitutability between equity and bonds. See Blanchard (1981), Gavin (1989).
\(^9\) The perfect foresight assumption is a special case of rational expectation in a non-stochastic framework and hence, the expected rate of change of Tobin’s q is same as the actual rate of change.
Equations (1) and (2) describe mechanisms of asset valuation in the capital market. Equation (1) is the money market equilibrium. Equation (2) is the arbitrage condition on assumption that bonds and stocks are perfect substitutes and hence, their returns are equalized. We also note that equation (2) represents an inter-temporal condition of capital market equilibrium, since it is entailed by correct expectations of \( \hat{q} \) and \( r \) at all future dates. The return on equity is obtained from both capital gains\(^{10}\) as well as from dividends. We assume that the entire profit is distributed as dividends.\(^{11}\)

### 2.1.2 The Goods Market

The demand for domestic output is composed of domestic demand and foreign demand. The adjustment in the commodity market is given by equation 3.

\[
\dot{Y} = \lambda \left[ \alpha C(Y - T) + \gamma I(q) + \frac{X(e)}{P} - \bar{Y} \right]
\]

Equation (3) shows output adjustment in response to excess demand in home market. Aggregate demand consists of domestic consumption, investment expenditure on domestically produced capital goods and exports. Domestic investment depends on Tobin’s \( q \). The investment function is \( I = I(q) \) with \( I_q = \frac{\partial I}{\partial q} > 0 \) and \( I(1) = 0 \). We further assume that government expenditure is financed by lump sum tax. Exports vary directly with real exchange rate.

### 2.1.3 The Balance of Payments Equilibrium

Choice of exchange rate regime in an emerging market economy is one of the most controversial issues in modern international economics.\(^{12}\) In this paper we assume that exchange rate is

---

\(^{10}\) i.e. \( \frac{\hat{q}}{q} \). In a non-stochastic framework, rational expectation boils down to perfect foresight.

\(^{11}\) Since this is a short run model, capital stock is fixed.

\(^{12}\) See Fischer, (2001)
flexible and any insipient balance of payment (BOP) surplus or deficit is instantaneously eliminated by change in exchange rate.

\[
X\left(\frac{eP^*}{P}\right) - \frac{eP^*}{P} (1-\alpha)C(Y-T) - \frac{eP^*}{P} (1-\gamma)I(q) + \frac{e}{P} F = 0
\]

(4)

The BOP equilibrium under flexible exchange rate is represented by equation (4). The model includes import of both capital goods and consumer goods. In particular, import = \((1-\alpha)C(Y-T) + (1-\gamma)I(q)\). Exports vary directly with the real exchange rate. Flow of financial capital to the home country is assumed to be exogenous\(^{13}\).

Equation (4) can be solved for \(e\) as follows:

\[
\frac{e}{P} = \phi(Y, q; F), \text{ where } \phi_Y > 0, \phi_q > 0, \phi_F < 0
\]

2.2. Dynamic Adjustment and Steady State

The dynamics of the system and the overshooting of stock market valuation are analyzed from the perspective that emphasizes different speeds of adjustment in commodity and asset markets. The dynamics of the system can be described by the behaviour of the state variables \(q\) and \(Y\) which is represented by adjusting equations (2) and (3).

\[
\dot{q} = r - \frac{\pi(Y)}{q} = g(q, Y, F)
\]

(5)

\[
\dot{Y} = \lambda \left[ \alpha C(Y-T) + \gamma I(q) + X\left(\frac{e}{P}\right) - Y \right] = f(q, Y, F)
\]

(6)

In this model, \(Y\) is a slow moving variable and it evolves continuously while \(q\) is a jump variable, which adjusts instantaneously.

Equations (5) and (6) can be represented in the matrix form:

\[
\begin{bmatrix}
\dot{Y} \\
\dot{q}
\end{bmatrix} =
\begin{bmatrix}
f_1 & f_2 \\
g_1 & g_2
\end{bmatrix}
\begin{bmatrix}
Y - \bar{Y} \\
q - \bar{q}
\end{bmatrix}
\]

(7)

\(^{13}\) See Rakshit, (2003)
where,

\[ f_1 = \frac{d\dot{Y}}{dq} > 0 \]

\[ f_2 = \frac{d\dot{Y}}{dY} < 0 \]

\[ g_1 = \frac{dq}{dq} > 0 \]

\[ g_2 = \frac{d\dot{q}}{dY} \]

In the steady state we have \( \dot{Y} = 0 \) and \( \dot{q} = 0 \). Given perfect foresight, the model has the standard property of saddle path stability. In implicit forms, the dynamics of Tobin’s q and output can be expressed as are \( \dot{Y} = f(q, Y) = 0 \) and \( \dot{q} = g(q, Y) = 0 \) respectively. This is shown in figures 3.1(a) and 3.1(b).
In order to depict equilibrium, we draw $\dot{Y} = 0$ and $\dot{q} = 0$ on $(Y, q)$ plane. The arrows indicate adjustment of the two variables, $Y$ and $q$ in different quadrants. First, the locus $\dot{Y} = 0$ gives the combination of Tobin’s $q$ and output that maintains $\dot{Y} = 0$ in the $(q, Y)$ plane. From the system of equations, this has the slope $\frac{dq}{dY}_{\dot{Y}=0} = -\frac{f_2}{f_1} > 0$. Intuitively the slope of the $\dot{Y} = 0$ locus can be explained as follows. An increase in $q$ for any given exchange rate has two effects. On one hand, $q$ raises investment and hence, import of capital goods rise (in equation (3)). To maintain BOP equilibrium exchange rate depreciates. Hence, exports rise (in equation (3) via equation (4)). Beginning with $\dot{Y} = 0$, there is an excess demand in the commodity market and hence, $\dot{Y} > 0$. However, given $q$, an increase in $Y$, although raises consumption and also exports by raising $e$ via equation (4), entails an excess supply in the commodity market.\textsuperscript{14} Thus, $\dot{Y}$ would fall. Hence, the $\dot{Y} = 0$ locus is positively sloped.

Likewise, $\dot{q} = 0$ is the locus of combination of output and Tobin’s $q$ consistent with asset market equilibrium. The slope of $\dot{q} = 0$ is given by

$$
\frac{dq}{dY}_{\dot{q}=0} = -\frac{g_2}{g_1} < 0, \text{ if } g_2 > 0
$$

$$
\frac{dq}{dY}_{\dot{q}=0} = -\frac{g_2}{g_1} > 0, \text{ if } g_2 < 0.
$$

The intuitive explanation for the slope of $\dot{q} = 0$ is this. An increase in the stock value has two effects. First, as $q$ rises, dividend falls. Again as $q$ rises, through the channel of capital goods imports, exchange rate depreciates which leads to a rise in consumer price index. To maintain money market equilibrium, given $Y$, $r$ has to rise. Combining these two effects, we get $\dot{q} > 0$. Again, an increase in output has two effects on bond yield. From the money market, $r$ rises as $Y$ rises. There is a further effect on $r$ through the increase in consumer price index. Dividend paid by the firm increases with an increase in $Y$. However, the net effect on $\dot{q}$ is ambiguous. There are two possible cases: case I in which $\dot{q} = 0$ is downward sloping and case II in which $\dot{q} = 0$ is positively sloped\textsuperscript{15}. In the latter case, though the slope of $\dot{q} = 0$ is positive, it is flatter than the $\dot{Y} = 0$ locus for saddle path stability under perfect foresight.

The stable saddle path, SS is given by the equation

\textsuperscript{14} This is necessary for the stability of the system.

\textsuperscript{15} See Blanchard (1981)
\[(q - \bar{q}) = \left(\frac{\lambda_1 - f_1}{f_2}\right)(Y - \bar{Y})\]

Or equivalently as \[(q - \bar{q}) = \left(\frac{g_2}{\lambda_1 - g_1}\right)(Y - \bar{Y})\]

The slope of the saddle path (SS)\(^{16}\) is given by:

\[\frac{dq}{dY} = \frac{\lambda_1 - f_1}{f_2} = \frac{g_2}{\lambda_1 - g_1}\]

3. Comparative Static Exercise: Reversal in Capital Flow

International financial markets are subject to contagion effects in which international investors make sudden revisions about prospects for an economy, primarily an emerging market economy. It needs to be noted that these revisions in risk-perception (or risk-appetite) of international investors are not warranted by underlying fundamentals. Accordingly, we examine how reversal in capital flow can produce macroeconomic outcomes. The steady state effects of change in capital flows are easily discernible. With capital outflow, exchange rate depreciates, real balance falls and Tobin’s q declines. This leads to fall in private investment. However, current account balance improves as exports increase along with a fall in import of capital goods and consumption goods. If we assume that the price effect on export is dominated by the stock valuation effect on investment, contraction ensues as a result of withdrawal of capital flows.

Next we consider the transitional dynamics in the wake of reversal in capital flow. Starting from an initial steady state \(E_0\), exchange rate depreciation due to capital outflow reduces real money balance. Immediately, the interest rate rises to equilibrate asset market. This leads to \(\dot{q} > 0\) which entails downward shift of the \(\dot{q} = 0\) curve. Moreover, when \(F\) falls, BOP equilibrium at an unchanged \((q, Y)\) requires \(e\) to rise (via equation (4)), thereby boosting exports. Hence, the \(\dot{Y} = 0\) curve shifts to the right. The diagrammatic representation of the different cases is given below in figure 4.1. It needs to be noted that Tobin’s q neither overshoots nor undershoots whenever output level remains unchanged. However, overshooting or undershooting of Tobin’s q is case-sensitive.

\(^{16}\) See the appendix for derivation of the saddle path.
Fig. 4.1(a) - Output level remains unchanged and q neither undershoots nor overshoots

Fig. 4.1(b) - Output level contracts

Case I: q overshoots

Case 2: q undershoots
The ambiguous steady state effect on $Y$ arises due to different effects of reversal in capital flow on various components of aggregate demand. Two components of aggregate demand, namely investment and export play crucial role in determining final effect of change in capital flow on output level. On the one hand, we have fall in private investment. On the other hand, export rises due to depreciation. This is depicted in fig.4.2. The BP curve in the $(e, q)$ space is obtained from the balance of payment equilibrium condition. A rise in Tobin’s $q$ leads to rise in investment which entails an increase in imports of capital goods. Balance of equilibrium is maintained by depreciation of exchange rate. The AA curve is obtained from the asset market equilibrium in the steady state. A rise in exchange rate causes an increase in the consumer price index and hence the real money balance declines. This leads to rise in the interest rate and the Tobin’s $q$ declines to maintain the asset market equilibrium. It is to be noted that the BP curve and the AA curve are drawn for any given level of output. The reversal in capital flow causes rightward shift of the BP curve, exchange rate depreciates and Tobin’s $q$ declines. Thus, export increases and investment

\[ \frac{\dot{q}}{q} = 0 \]
declines. Consequently, change in capital flow produces ambiguous effect on aggregate demand and output. This is shown in Fig. 4.2.

4. Conclusion

The effective demand model constructed in this paper has practical significance as a workable and realistic framework to address macroeconomic dimensions of financial liberalization. In this paper we have examined the role of capital flow in the macroeconomic process of output determination. Our aim has been to allow the crucial role which capital outflow can play in overall macroeconomic developments in an emerging market economy. This is especially true if shareholders have forward looking expectations, for then expected asset prices could influence present macroeconomic developments. In this paper we have shown that reversal in capital flow may precipitate recession through stock market channel, which involves fall in Tobin’s q and consequent decline in investment. The short-run policy is definitely monetary expansion, which
can arrest fall in stock market valuation. Moreover, a higher dividend payout ratio can mitigate the recessionary effects of capital outflow. However, long term policies cannot brush aside importance of appropriate regulation of foreign exchange market and management of capital flow.

Appendix

First we derive the condition for existence of unique saddle path. The differential equations are:

\[ \dot{q} = g(q, Y); \quad \dot{Y} = f(q, Y) \]

Using the Taylor series approximation of these two equations around the initial steady state values \((\overline{Y}, \overline{q})\), we get,

\[
\begin{bmatrix}
\dot{Y} \\
\dot{q}
\end{bmatrix} =
\begin{bmatrix}
f_1 & f_2 \\
g_1 & g_2
\end{bmatrix}
\begin{bmatrix}
Y - \overline{Y} \\
q - \overline{q}
\end{bmatrix}
\]

Now suppose that at time 0, it is announced that parameters are to be increased at time \(T \geq 0\). Therefore, the new steady state after the shifts have occurred are specified by

\[
\begin{bmatrix}
\dot{Y} \\
\dot{q}
\end{bmatrix} =
\begin{bmatrix}
f_1 & f_2 \\
g_1 & g_2
\end{bmatrix}
\begin{bmatrix}
Y - \overline{Y} \\
q - \overline{q}
\end{bmatrix}
\]

As long as the shifts are additive, so that co-efficient \(a_{ij}\) remain unchanged between two regimes, the Eigen values, \(\lambda_1, \lambda_2\), say of equations (1) and (2) are identical.

We assume that \(\lambda_1 < 0, \lambda_2 > 0\), such that \(f_1g_2 - f_2g_1 < 0\). Now for \(0 \leq t \leq T\), the solutions for \(Y\) and \(q\) are:

\[ Y(t) = \overline{Y}_1 + A_1 e^{\lambda_1 t} + A_2 e^{\lambda_2 t} \]

\[ q(t) = \overline{q}_1 + \left(\frac{\lambda_1 - f_1}{f_2}\right) A_1 e^{\lambda_1 t} + \left(\frac{\lambda_2 - f_1}{f_2}\right) A_2 e^{\lambda_2 t} \]

Over \(t \geq T\),

\[ Y(t) = \overline{Y}_2 + A'_1 e^{\lambda_1 t} + A'_2 e^{\lambda_2 t} \]

Interested readers can easily work out how rise in money supply and higher dividend ratio can help an economy avoid destabilizing influence of capital outflow.
\[ q(t) = \tilde{q}_2 + \left( \lambda_1 - \frac{f_1}{f_2} \right) A'_1 e^{\lambda t} + \left( \lambda_2 - \frac{f_1}{f_2} \right) A'_2 e^{\lambda t} \]

It is noted that \( Y(t) \) and \( q(t) \) do not diverge as \( t \to \infty \), when \( A'_2 = 0 \) and hence \( Y(t) = \overline{Y}_2 + A'_1 e^{\lambda t} \)

\[ q(t) = \tilde{q}_2 + \left( \lambda_1 - \frac{f_1}{f_2} \right) A'_1 e^{\lambda t} \]

The remaining constants \( A_1, A_2, A'_1 \) are obtained by solving the equations \( A_1 + A_2 = 0 \)

\[ (A_1 - A'_1) e^{\lambda t} + A_1 e^{\lambda t} = dY \]

\[ \left( \lambda_1 - \frac{f_1}{f_2} \right) (A_1 - A'_1) e^{\lambda t} + \left( \lambda_1 - \frac{f_1}{f_2} \right) A_2 e^{\lambda t} = d\overline{q} \]

\( dY \) and \( d\overline{q} \) are shifts of steady state in \( Y \) and \( q \) respectively. Eliminating \( A'_1 e^{\lambda t} \) from these equations, we get the equation of the stable saddle path equation as

\[ (q - \tilde{q}_2) = \left( \frac{\lambda_1 - f_1}{f_2} \right) (Y - \overline{Y}_2) \]

\[ = \left( \frac{g_2}{\lambda_1 - g_1} \right) (Y - \overline{Y}_2) \]

Next, we derive steady state effects of capital outflow on output level and Tobin’s q.

\( \dot{Y} = f(q, Y, F), \quad f_1 > 0, f_2 < 0, f_3 < 0 \)

\( \dot{q} = g(q, Y, F), \quad g_1 > 0, \) sign of \( g_2 \) depends on bad news or good news case, \( g_3 < 0 \)

Differentiating with respect to \( F \), we get

\[ \begin{pmatrix} f_1 & f_2 \\ g_1 & g_2 \end{pmatrix} \begin{pmatrix} \frac{\partial q}{\partial F} \\ \frac{\partial Y}{\partial F} \end{pmatrix} = \begin{pmatrix} -f_3 \\ -g_3 \end{pmatrix} \]

Using Cramer’s rule we get,
\[ \hat{q} = \left( \begin{array}{cc} -f_3 & f_2 \\ -g_3 & g_2 \end{array} \right) \Delta = -f_3g_2 + f_2g_3 \]

\[ \frac{\partial Y}{\partial F} = \left( \begin{array}{cc} f_1 & -f_3 \\ g_1 & -g_3 \end{array} \right) \Delta = -f_1g_3 + f_3g_1 \]

where \( \Delta = f_1g_2 - f_2g_1 < 0 \) for saddle path stability.

The ambiguous effect on output is immediately clear. Output falls, remains unchanged or increases according as \(-f_1g_3 + f_3g_1 \leq or \geq 0\). This condition can be related to relative vertical shifts of \( \hat{Y} = 0 \) and \( \hat{q} = 0 \) curves.

Vertical shift of \( \hat{Y} = 0 \) curve is given by: \( f_1dq + f_3dF = 0 \) or \( dq = -\frac{f_3}{f_1} dF \).

Vertical shift of the \( \hat{q} = 0 \) curve is given by \( g_1dq + g_3dF = 0 \) or \( dq = -\frac{g_3}{g_1} dF \).

Output will fall, remain unchanged or rise if the vertical shift of \( \hat{Y} = 0 \) curve is less than, equal to or greater than that of \( \hat{q} = 0 \) curve, i.e. if \(-\frac{f_3}{f_1} dF \leq or \geq -\frac{g_3}{g_1} dF \).

References


