10

From a Capital Account Surplus to a Current Account Deficit

Hamid Raza and Gylfi Zoega

Introduction

This paper is about the causes of current account deficits in the run-up to a financial crisis. Financial crises have occurred in many countries following the collapse of the Bretton Woods system in 1971–1973 and the move towards floating exchange rates. There have been several waves of financial crises during these almost five decades as discussed by Robert Aliber in another chapter of this book. In most cases, there were both banking crises and currency crises. The first wave occurred in the early 1980s, affecting Mexico, Brazil and Argentina and ten other developing countries, the second wave affected Japan, Finland and Sweden in the early 1990s and a third wave occurred in 1997 when a crisis hit Thailand, Malaysia, Indonesia, the Philippines and South Korea. The recent

---

H. Raza
Aalborg University, Aalborg, Denmark

G. Zoega (✉)
Department of Economics, University of Iceland, Reykjavik, Iceland
e-mail: gz@hi.is

Western crises in the US, the UK, Ireland, Spain, Portugal, Greece, the Baltic countries and Iceland constitute the fourth wave. The last wave may soon start in Argentina, Turkey and probably other emerging economies.

In each of these countries, the crises were preceded by an economic boom that lasted several years and coincided with large current account deficits or, as in the case of Japan, a fall in the current account surplus. The question posed in this paper is whether the boom and the accompanying current account deficits can be traced to domestic causes or have a common cause in global capital markets that create capital inflows leading to a real exchange rate appreciation and a stock market boom. To this end, we will explore data from Iceland, a country that became a symbol of the Western crisis that started in 2008.

A Brief History of Iceland's Boom and Bust

Following the privatization of its banking system in 2003, Iceland experienced a credit boom from 2004 to 2008, fuelled by a combination of excess liquidity in world capital markets and the willingness of the owners of the banks to use a good credit rating—derived from the sovereign's good rating—to borrow abroad to finance massive investment in domestic shares and foreign companies. The banking system expanded rapidly (from 1.74 GDP in 2004 to 7.44 GDPs at the end of 2007) and soon became too big to save and the country's net investment position deteriorated. The assets of the three largest banks grew by between 50 and 60% annually during this period. The net investment position became negative amounting to one GDP but this statistic concealed vastly larger gross debt accumulation, gross debt being six times the country's GDP in 2008. The expanding credit created an impressive stock market bubble that raised stock prices by a factor of ten and an increase of house price from 2004 to 2008. Household and business debt increased rapidly—private business debt mostly in foreign currency denominated debt—and consumption boomed creating a current account deficit of around 20% of GDP.[1]

---

[1]See Benediktsdottir et al. (2011) on the crash in Iceland.
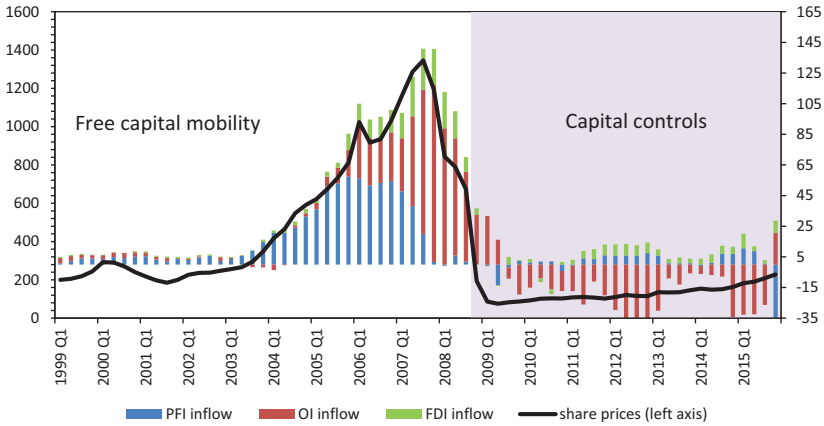
Fig. 10.1 Capital inflows to GDP and share prices (*Note* Gross inflows to annual GDP are calculated as four quarter moving averages)

For Iceland, the openness to capital flows took place at a time of increased financialization in global markets.[2,3] Figure 10.1 shows that a large proportion of inflows into Iceland was in the form of portfolio investments (PFI) and bank borrowing (OI), while the proportion of FDI remained smaller in the initial years of liberalization.[4] Iceland in the early 2000s borrowed by issuing fixed income securities in the international market and later in 2006–2007 by offering higher interest rates on its deposits in foreign currencies. High interest rates in Iceland also resulted in a large volume of short-term inflows (the carry trade), which made the ISK appreciate (ISK). The overvaluation and expected

---

[2]It has been argued that innovations in the financial markets have increased short-termism in the corporate sector, which has resulted in an increased volume of financial investments (see, e.g., Özgr Orhangazi [2008], Till Van Treeck [2008]).

[3]Financialisation here is defined as an increase in financial investment compared to the volume of real investments.

[4]There is an increase in FDI in Iceland during 2006–2008, where a large proportion of investment was in export projects (e.g. aluminum smelting). However, the scale of the current account deficit was far larger than the sums invested in these export projects.

appreciation of the domestic currency and high domestic interest rates encouraged domestic borrowers to borrow in foreign currencies. Tradable-sector firms (e.g., fishing) borrowed in foreign currencies because their revenues and partly also costs were in foreign currencies, but unhedged parties such as local communities, businesses serving the home market and households also borrowed in foreign currency while their earnings were mainly in ISK.

Figure 10.1 also shows that the episode of capital inflows coincided with the stock market boom. Apart from investors purchasing stocks, the banks also heavily relied on shares as collateral and regularly purchased their own shares in the market, which drove share prices above their true value. There is a close nexus between inflows, share prices and the exchange rate in Iceland.

The channels through which capital inflows may interact with stock prices and real exchange rate are obvious, however, identifying the channels through which stock prices and real exchange rates are connected is more complicated. From a theoretical perspective, the interaction between stock prices and exchange rates is usually analysed from two perspectives, "flow oriented" models as in Dornbusch and Fischer (1980), and "stock oriented" models, as proposed by Frankel (1983) and Branson (1983). The flow oriented models tend to associate exchange rate depreciations with stock market booms. The argument is that exchange rate appreciation can make the current account balance deteriorate, which in turn can adversely affect the stock performance of firms. In these models, stock prices respond to movements in the exchange rate. Stock-oriented models, in contrast, associate rising stock prices with exchange rate appreciation via wealth effects. In these models, real exchange rates respond to movements in the stock market. The relationship in the empirical literature is also ambiguous, as some studies find a positive relationship between the variables while some found a negative relationship.[5] Overall, it appears that the

---

[5]For example, Aggarwal (1981) found a positive effect of US exchange rate on stock prices. Diamandis and Drakos (2011) concluded a positive effect of real exchange rate on stock prices for Latin countries. On the other hand, Goodwin et al. (1992) and Soenen and Hennigar (1988) found a negative effect of US exchange rate on stock prices. Moreover, the results regarding direction of causality are also mixed (see, e.g., Granger et al. 2000; Pan et al. 2007, among others).

relationship differs across the countries and also has a tendency to change over time within the same economy. We now proceed to investigate the nexus between capital inflows, share prices, and real exchange rate.

Empirical Analysis

To explore the interaction between capital inflows, stock prices, and real exchange rate in Iceland, we use quarterly data from 1995Q1–2017Q4. First, we use the full-sample and then split it into the free capital mobility regime (1995Q1–2008Q3) and the capital controls regime (2009Q1–2017Q3).

The variables used in the empirical section are the gross capital inflow to GDP *(F)*, stock prices *(S)*, and real exchange rates *(R)*. Figure 10.2 shows the evolution of gross capital inflows to GDP, stock prices and the real exchange rate. There is a clear positive co-movement between gross capital inflows and stock prices from 1995 up to the financial crash in 2008. In particular, the co-movement in the boom years leading to the crisis is very strong. This coincides with the period in which the banks increased their lending for stock purchasing and in some cases directly accepted each other's stocks as collateral. Gross capital inflows also seem to have a positive co-movement with the real exchange rate in the period of free capital mobility (i.e., 1995–2008). In the post-crisis period, in contrast, the two series no longer move together, indicating a major shift in the dynamics of the relationship marked by the implementation of strong capital controls.

Model

We now formally investigate the interactions among variables using a Vector autoregression (VAR) model.[6] The model is represented as follows. The reduced form VAR model in levels can be represented as:

$$x_t = \mu_0 + A_1 x_{t-1} + A_2 x_{t-2} + \ldots + A_p x_{t-p} + e_t, \ (t = 1, 2 \ldots T)$$
(10.1)

---

[6]Before estimating the model, we adjust all the variables for seasonal variations. We then test all the variables for a unit root finding that they are non-stationary.
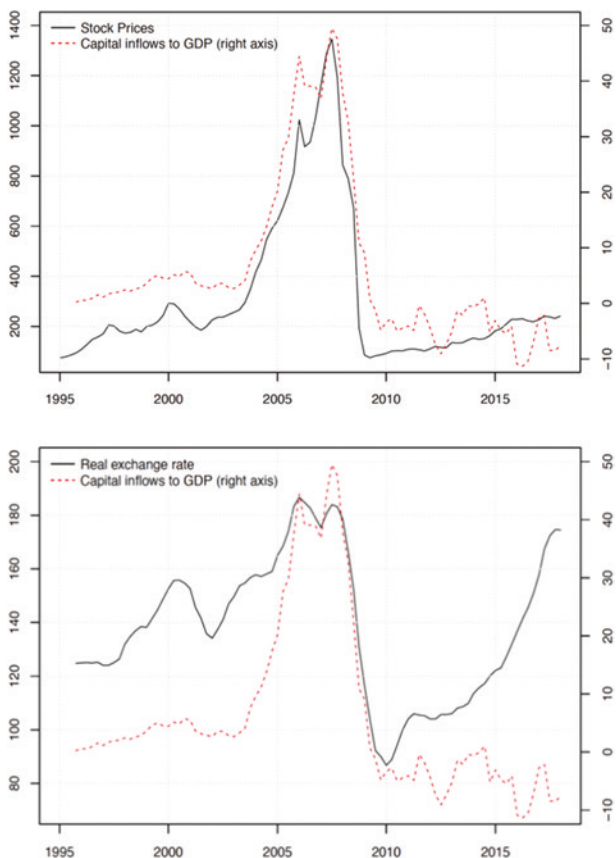
Fig. 10.2 Capital inflows, stock prices, and real exchange rate

where μ_0 is a $n \times 1$ vector of constants, x_t is a $n \times 1$ vector of variables in the model, A_p is a $n \times 1$ matrix (*with $i = 1,..p$*) of parameters, e_t is a $n \times 1$ vector of error terms.

Since, we estimate our model in first differences, the vector of our endogenous variables takes the following form:

$$x_t = [\Delta F, \; \Delta lnS, \; \Delta lnR]'$$

F represents gross capital inflows to GDP.[7] S represents the stock prices. R represents the real exchange rate.

The structural VAR (SVAR) model in its general form can be written as:

$$Bx_t = \mu_0 + B_1 x_{t-1} + B_2 x_{t-2} + \ldots + B_p x_{t-p} + \varepsilon_t, \ (t = 1, 2 \ldots T)$$

(10.2)

where B is a contemporaneous matrix. Note that multiplying Eq. (10.2) with the inverse of B will result in reduced form VAR as represented in Eq. (10.1), i.e., $A_i = B^{-1} B_i$ (*for i = 1,..p*).

We follow Cholesky decomposition to identify our shocks by imposing restrictions on the contemporaneous matrix B as follows:

$$B = \begin{matrix} \Delta F \\ \Delta S \\ \Delta R \end{matrix} \begin{bmatrix} 1 & 0 & 0 \\ * & 1 & 0 \\ * & * & 1 \end{bmatrix}$$

The ordering of the variables implies that capital inflows shocks contemporaneously affect stock prices and real exchange rates while shocks to stock prices and real exchange rates affect gross capital inflows with a lagged effect. Our ordering regarding capital inflows preceding other variables is in line with economic theory. The argument, as also discussed earlier, is that gross capital inflows make the real exchange rate appreciate and increase the demand for assets, which increases asset prices. Regarding the interaction between stock prices and real exchange rates, there is no general consensus on how should they be ordered. For example, the flow-approach would require placing the real exchange rate before stock prices in a VAR model, however, stock oriented models would require placing stock prices before the real exchange rate. Given, Iceland's experience, it is natural to assume that the stock model approach is suitable for modelling this interaction as the episode of stock price boom coincides with a real exchange rate appreciation. However, before

---

[7]We use trend of annual GDP in order to normalize our measure of capital inflows.

explaining our main results we relax this assumption and change the ordering of stock prices and real exchange rates. We find that the ordering has some effect on the magnitude of the shock, i.e., the shock tends to be relatively stronger in magnitude when contemporaneous effects are incorporated but the impulse responses are robust in their shapes. Overall, the ordering assumption does not alter our results in any fundamental way.

Results and Discussion

The results of our structural VAR model are presented in Fig. 10.3, which shows the cumulated impulse responses. Focusing on the effects of capital inflows, the results indicate that capital inflows shocks increase stock prices as well as making the real exchange rate appreciate. The effect of the shock in both cases lasts for one year. There is also a significant feedback effect from stock prices to capital inflows, i.e., shocks to stock prices induce capital inflows. This effect lasts for 1–2 quarters. A shock to stock prices also makes the real exchange rate appreciate, which is consistent with the wealth effects of the equity market. A shock to real exchange rate increases stock prices but has no significant effect on capital inflows.

There are significant differences between the regimes of free capital mobility and capital controls. The cumulated impulse responses reported in Fig. 10.4 show major differences in the results. The results indicate a strong interaction between capital inflows, stock prices and the real exchange rate in the period of free capital mobility but the interaction appears to have vanished in the capital controls regime. In particular, our results indicate that a shock to capital inflows increases stock prices and makes the real exchange rate appreciate in the period of free capital mobility but the effect is zero in the period of capital controls. There is also a significant feedback effect from stock prices to capital inflows, indicating that a booming stock market encouraged capital inflows. Overall, we find that the effects of all shocks in the capital control regime are statistically not different from zero.
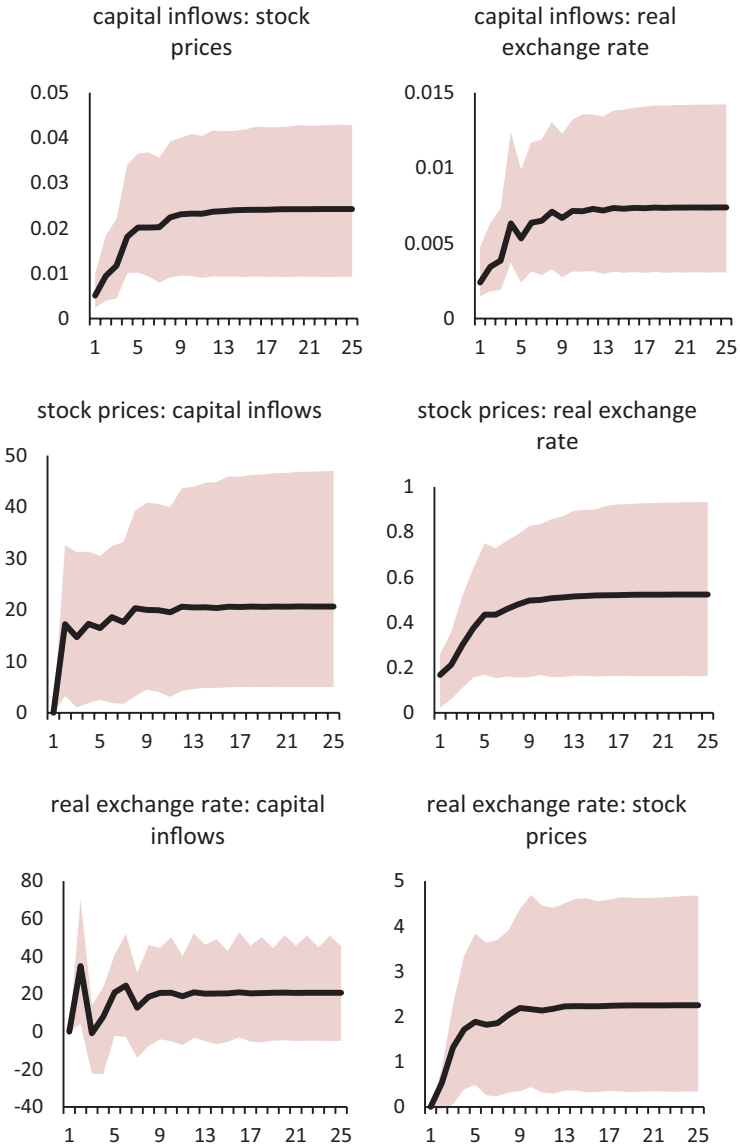
Fig. 10.3 Cumulated impulse responses for period 1995Q1–2017Q3 (*Note* The structural shocks are plotted with 90% confidence bands)
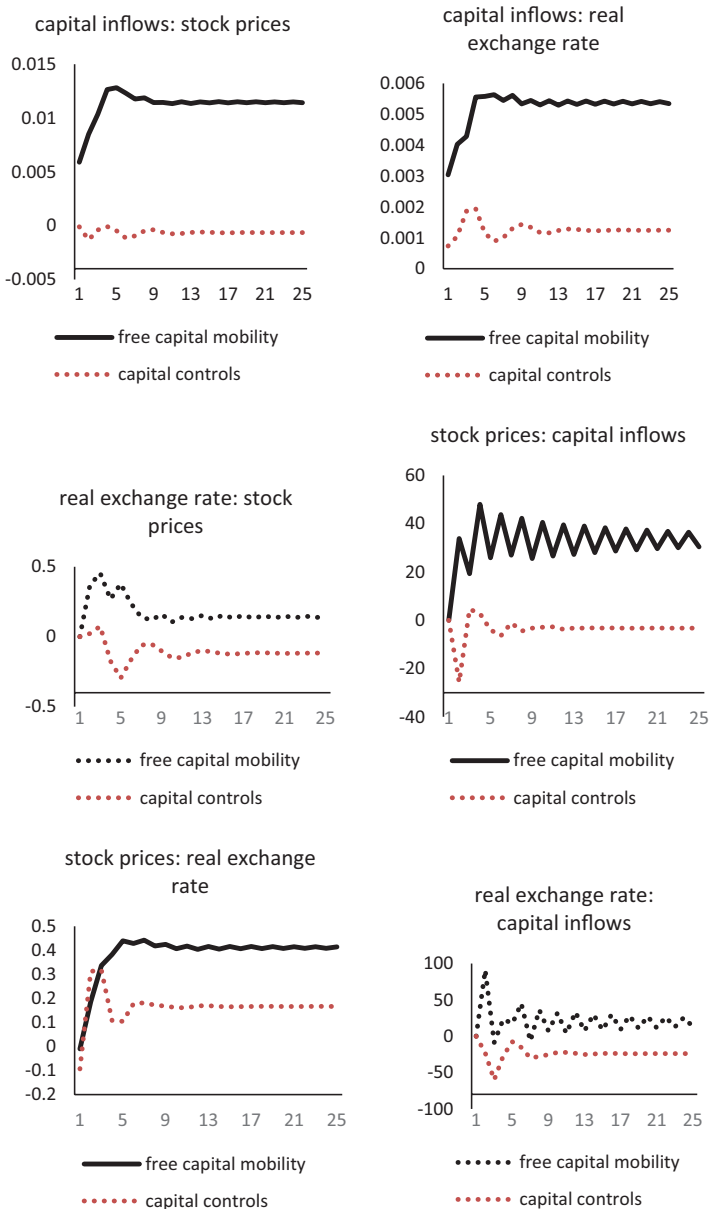
Fig. 10.4 Cumulative impulse responses for different regimes (*Note* The solid indicates that the shock is significant whereas dotted line indicates that the shock is insignficant using 90% confidence bands)

Conclusion

We have found that the capital inflows may have caused the appreciation of the real exchange rate as well as the stock market boom. Iceland's newly privatized bank's access to international capital flows may have made them choose riskier behaviour as discussed in the chapter by Michael Dooley in this volume. In essence, the risky asset choice could be leveraged in the international capital market by attracting capital from an unlimited pool of bond issuers and depositors. Our empirical results are also consistent with the thesis of Robert Aliber in another chapter of the volume that current account surpluses in other countries may create capital outflows that cause inflows into small open economies. These inflows then generate a credit-driven boom and a subsequent bust when the inflows come to a sudden stop.

The policy implications of our results are clear. A country should try to limit the volume of PFI by foreign investors, especially investments in the market for government bonds, corporate bonds and bank deposits. Such carry trade can, as we have shown, have large destabilizing effects on asset prices and economic activity of the recipient country. This has been the policy of Iceland's central bank since the summer of 2016 when a reserve requirement was imposed on the portfolio investment (defined as investment in listed bonds and deposits) of foreign residents. This policy requires investors to put a fraction of the amount invested (currently 20%) into an interest-free account at the central bank for one year. The policy has been very effective and helped preserve monetary policy independence and also maintain current account surpluses in spite of interest rates being higher than in the large economies.

The system of floating exchange rates and perfect capital mobility has shown itself, again and again, to be unstable. However, wave after wave of financial crises have not convinced international organizations, such as the IMF, and policy makers at the country level to adopt policies aimed at limiting speculative capital flows. Financial crises did not occur during the Bretton Woods period while economic growth was impressive. There is a need for reforming the international monetary system (if it can be called a system), meanwhile each country has to fend for itself.
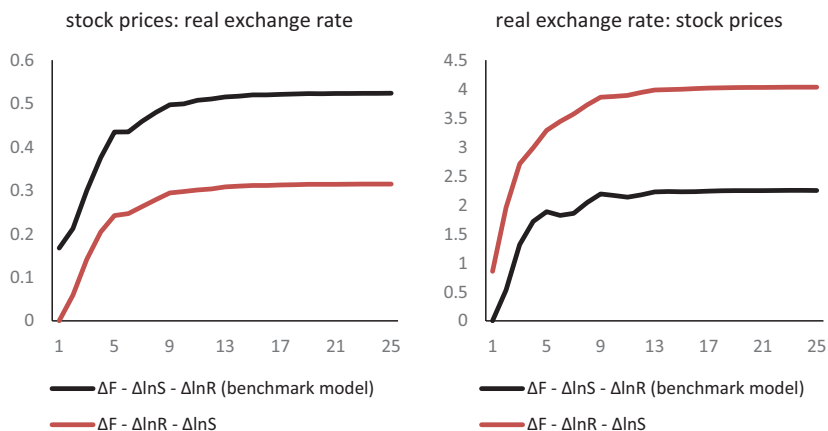
Appendix

stock prices: real exchange rate

real exchange rate: stock prices

Fig. 10.5   Impulse responses from different ordering

References

Aggarwal, R. (1981). Exchange Rates and Stock Prices: A Study of the U.S. Capital Markets Under Floating Exchange Rates. *Akron Business and Economic Review, 12,* 7–12.

Benediktsdottir, S., Danielsson, J., & Zoega, G. (2011). Lessons from a Collapse of a Financial System. *Economic Policy, 26,* 186–235.

Branson, W. H. (1983). Macroeconomic Determinants of Real Exchange Rate Risk. In R. J. Herring (Ed.), *Managing Foreign Exchange Rate Risk.* Cambridge, MA: Cambridge University Press.

Diamandis, P. F., & Drakos, A. A. (2011). Financial Liberalization, Exchange Rates and Stock Prices: Exogenous Shocks in Four Latin America Countries. *Journal of Policy Modeling, 33*(3), 381–394.

Dornbusch, R., & Fischer, S. (1980). Exchange Rates and the Current Account. *The American Economic Review, 70*(5), 960–971.

Frankel, J. A. (1983). Monetary and Portfolio-Balance Models of Exchange Rate Determination. In J. S. Bhandari & B. H. Putnam (Eds.), *Economic Interdependence and Flexible Exchange Rates.* Cambridge, MA: MIT Press.

Goodwin, T. H., Farsio, F., & Willett, T. D. (1992). The Dollar and the Dow. *Rivista Internazionale di Scienze Economiche e Commerciali, 39,* 899–906.

Granger, C. W. J., Huang, B. N., & Yang, C. W. (2000). A Bivariate Causality Between Stock Prices and Exchange Rates: Evidence from Recent Asian Flu. *The Quarterly Review of Economics and Finance, 40,* 337–354.

Orhangazi, Ö. (2008). Financialisation and Capital Accumulation in the Non-financial Corporate Sector: A Theoretical and Empirical Investigation on the US Economy: 1973–2003. *Cambridge Journal of Economics, 32*(6), 863–886.

Pan, M.-S., Fok, R., & Liu, Y. (2007). Dynamic Linkages Between Exchange Rates and Stock Prices: Evidence from East Asian Markets. *International Review of Economics and Finance, 16,* 503–520.

Soenen, L. A., & Hennigar, E. S. (1988). An Analysis of Exchange Rate and Stock Prices—The U.S. Experience Between 1980 and 1986. *Akron Business and Economic Review, 19,* 7–16.

Van Treeck, T. (2008). A Synthetic, Stock–Flow Consistent Macroeconomic Model of Financialisation. *Cambridge Journal of Economics, 33*(3), 467–493.