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**Evolution Through the Minskian Regimes**

by

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**Abstract**

The influence of inflation on a Minskian framework of financial crisis is the focus of this paper. It begins by presenting an update of the framework presented at the 2003 AHE, discussing changes in method and new empirical applications. It then discusses the influence of inflation on the interpretation of an economy's shift through the Minskian regimes. This influence is exposed through (1) the decomposition of the real rate of return and (2) the decomposition of the framework into non-financial and financial sectors. The framework demonstrates that policymakers face a difficult choice if an economy is assessed as financially fragile. The stark choice faced by policymakers is either to permit a financial crisis, which would likely increase unemployment, or to inject liquidity into the system in order to abort a financial crisis, which would likely ignite inflation. Implications are then drawn for the monetary policy recommendations of the current consensus view in macroeconomics. An important result is that efforts to maintain the consensus, without recognizing that the economy is financially fragile, could trigger the onset of financial crisis. This result is discussed in the context of present U.S. economy.

JEL codes: E3, E5, F3, N1, O5, P1

Key words: Minsky, financial instability, monetary policy, inflation, new consensus

## **I. Introduction**

Much like business cycle theories, theories of international financial crisis have attributed crisis to either poor macroeconomic policies and/or external shocks. Neither strand, however, has had much success in explaining why crisis occurred in Thailand and other Asian economies as the macro-fundamentals of these economies appeared to signal healthy economies prior to the onset of the crisis in 1997. Contagion, or an external shock, may have played a role in crises of some Asian economies, but does not explain why crisis occurred in the originating country, Thailand. As a result, explanations of financial crisis have begun to include a role for financial intermediaries (Krugman, 1998) or simply to turn away from theoretical constructions and empirically identify the determinants of currency and banking crises (Goldstein, Kaminsky and Reinhart, 2000).

There has been little recognition of a third approach which is that the internal dynamics of a capitalist economy could render the system vulnerable to financial crises. Minsky's Financial Instability Hypothesis would seem to be a natural starting point as it argues that the internal dynamics of a capitalist economy, through firms' investment and financing decisions, endogenously push the economy into a financially fragile position. Minsky's analysis was confined to a closed, fully developed capitalist system. There have been attempts to extend the scope to an open economy (Arestis and Glickman (1999), Dymski (1999), Foley (2003), Kregel (1998), and Schroeder (2004)). Towards this end, the goals of this paper are two-fold. First, it provides additional empirical support for the cash-flow accounting framework developed by Foley (2003) and Schroeder (2004). Section 2 reviews the extension of a Minskian framework to an

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open economy. Section 3 applies the framework to Thailand, Korea, and the United States, and Section 4 provides a summary of the findings. The second goal is to examine the U.S. in more detail, as it appears to have averted the transition into Ponzi, at least, temporarily. Section 5 examines the trends of the corporate, nonfinancial and financial sectors of the U.S. economy to compare the overall performance of the economy with the corporate sectors. Finally, Section 6 focuses on the role of inflation in interpreting the movements of the real rates of profit and interest. The framework demonstrates that policymakers face a difficult choice if an economy is assessed as financially fragile. The stark choice is either to generate a financial crisis, which would likely increase unemployment, or to inject liquidity into the system in order to abort a financial crisis, which would likely exacerbate inflation. Implications are then drawn for the monetary policy recommendations of the current consensus view in macroeconomics. An important result is that efforts to maintain the consensus, without recognizing that the economy is financially fragile, could trigger the onset of financial crisis.

## **II. Minskian framework**

Hyman Minsky's Financial Instability Hypothesis argues that over an extended tranquil period, in which the economy expands with only minor recessions, firms become less risk averse with the success of past investments. As a result, they gradually adjust their portfolios in such a way that the time series of future cash flows generated by assets become increasingly destined to fulfill the time series of debt service payments generated by liabilities. In other words, firms' "value of portfolio liquidity" declines when cash flows from operations are strong (Minsky, 1991, p. 162). Changes made to portfolios reflect the investment and financing decisions which firms make in order to survive and grow in a competitive environment.

Indebtedness not only increases, but it becomes more short-term. It becomes more short-term as

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the production of output tends to be of a short-term nature, and, so, requires short-term financing (Minsky, 1980, p. 506). In addition, agents think they have better knowledge about the short-term than they do for the long-term in a world filled with uncertainty. Subsequently, the interest rate on short-term debt is less than the interest rate on long-term debt in a tranquil period. Firms take advantage of a lower interest rate by introducing rollover financing to increase their bottom lines (Minsky, 1995, p. 203). Increased reliance on short-term debt means that the demand for financing becomes more inelastic with respect to the interest rates, gradually rendering the entire economy susceptible to interest rate increases and to weakening cash flows.

Using a cash flow accounting framework, Minsky (1991, 1995) classifies firms into three types: hedged, speculative, and Ponzi. Sources of funding for firms are internal (profit) and external (borrowing). Firms use funding to service debt (interest payment plus some fraction of the principal) and/or for new investment:

$$\textit{Sources} = \textit{Uses}$$

$$\textit{profit} + \textit{borrowing} = \textit{investment} + \textit{debt service} \quad (1)$$

A firm is classified as hedged when its profit is greater than the sum of investment and debt service payment, implying the firm is able to reduce its (net) debt burden. A speculative firm is one whose profit is greater than its debt service payment, but not quite enough to cover both debt service and all of investment. An implication is part of the firm's investment is paid for with new borrowing, so the debt burden is increasing. This is common behavior for a growing enterprise.

A Ponzi firm is one whose profit does not cover its required debt service payment. The firm must borrow in order to meet its debt service obligation; here, too, the firm's debt burden is increasing.

Foley (2003) formalizes the simple cash flow statement of a firm as:

$$R + D = I + V \quad (2)$$

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where  $R$  is profit,  $V$  is debt service payment,  $I$  is investment, and  $D$  is new borrowing. A firm's debt contract is simply the finance it receives in exchange for debt service (the stream of interest and principal payments). Bankruptcy occurs if a debt service payment is missed. The path of a firm's financial health, and solvency, can be described by the growth and profit rates of its assets and by the interest rate by dividing  $I$  and  $R$  by the firm's assets ( $A$ ), and dividing  $V$  by the firm's stock of debt ( $B$ ):

$$D = (g-r)A + iB \quad (3)$$

where  $r$  is the profit rate ( $R/A$ ),  $i$  is the interest rate ( $V/B$ ), and  $g$  is the rate of growth of firm's assets ( $I/A$ ).

In his work Minsky progressed to the macro-level by visualizing firms as being distributed along a line or spectrum with a situation of financial robustness at one end and a state of financial fragility at the other. The position of a firm in this spectrum depends on the relationship between its debt service and cash flow – i.e., its classification. A hedged firm is considered to be financially robust, and a Ponzi firm is considered to be financially fragile. At the start of an upswing firms are generally classified as hedged, and, so, the economy, as a whole, is viewed as financially robust. As the boom proceeds, firms increase borrowing to pay for new investment and/or to increase their bottom lines by taking advantage of low interest on short-term debt. Consequently, the liability structures of firms become increasingly speculative or Ponzi, and the distribution of firms shifts along the line away from robust towards the fragile end. This shift in the distribution of firms gradually leads the economy into increasing financial vulnerability (Minsky, 1995, pp. 200-201). For our purposes, it is more expedient to conceptualize the economy in terms of a representative firm.<sup>1</sup> If capital stock ( $K$ ) replaces assets ( $A$ ) as the denominator for  $r$  and  $g$  and if the current account deficit is taken to be new external borrowing ( $D$ ), then equation (3) can be used to trace the financial fragility of the economy along a path using the combination of the rates

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of interest ( $i$ ), profit ( $r$ ) and growth ( $g$ ). (Recall, if the balance of payments is to equal zero, then the current account is the negative of the capital account.)

The Minskian classifications for an economy's financial state, as per the Foley framework, are:

- (1) "hedged" when the rate of profit ( $r$ ) is greater than the rate of accumulation ( $g$ ) and the rate of interest ( $i$ ):  $r > g > i$  or  $r > i > g$ . Under these conditions, debt service is paid out of profit and new investment is covered by a combination of profit and borrowing.
- (2) "speculative" when the rate of accumulation is greater than the profit rate:  $g > r > i$ . If the interest rate increases, debt service payments can still be made, as long as they do not exhaust profit obtained from productive investments.
- (3) "Ponzi" when  $i > r$ . In this state, the economy is vulnerable to financial crisis or it can be described as being financially fragile. Solvency is now entirely dependent upon creditors' confidence in the economy's ability to generate revenue. (Foley, 2003, pp. 158-160).

According to Minsky, then, the simple act of borrowing to finance accumulation is a primary determinant of instability in a capitalist system (Minsky, 1980, p. 520). As the proportion of debt service payments rises relative to firms' cash flows, financial institutions become increasingly exposed to failures in asset performance (nonperforming loans). When cash flows into financial intermediaries fall, they become more risk averse and cut exposure by decreasing loans for consumption and investment (Minsky, 1995, p. 198). The decline in granting new loans and in refinancing old ones means the supply of finance drops, and, so, investment drops. As investment drops, profit falls, further diminishing the cash flows of firms and increasing the proportion of debt service paid out of cash flows. The interest rate rises as the supply of financing falls and the (increasingly inelastic) demand for financing increases, worsening the liquidity situation of firms and the terms on which any new financing is made. Eventually, firms resort to selling assets to acquire cash to make debt payments. As prices of assets and stocks decline, consumption and investment fall, worsening cash flow problems of firms and banks (and a debt-deflation process ensues). Exactly how a financial crisis unfolds depends upon the institutional characteristics of

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the economy and how, and if, its policymakers intervene. The above description of the evolution of financial fragility suggests that monitoring the trends in  $g$ ,  $r$ , and  $i$ , and the relationships between the trends, could assist the assessment of a country's vulnerability to financial crisis. For instance, the transition from the hedged regime to the speculative regime suggests that rate of profit is falling relative to the rate of accumulation, enabling the switch from  $r > g$  to  $g > r$ . Likewise, the shift from the speculative regime to the Ponzi regime suggests that the rate of profit is falling relative to the interest rate, enabling the shift from  $r > i$  to  $i > r$ . This alternative perspective of how financial fragility is generated offers a more tangible method of anticipating financial crisis than explanations based upon poor macroeconomic policies and/or external shock.

If one recognizes that the investment flows are driven by the short-term, or incremental, rate of return on new investment, a different picture emerges. According to Shaikh (1996), the near-term rate of return is what firms use to make decisions about undertaking new investment projects, because in a world of uncertainty the incremental return is a better guide than the average rate to what firms can expect to receive on the investment of new funds, given the prevailing market conditions. The incremental profit rate, thus, acts, as a signal which directs capital flows. This rate will then influence the pace of capital accumulation. For instance, if the incremental rate of return starts to decline, and remains declining over time, then one can expect the pace of capital accumulation to decline as well, with some time lag. The incremental rate of profit ( $r'$ ) is defined, as per Shaikh, as the change in profit divided by the change in capital stock (prior period investment):  $r' = \Delta R / \Delta K = \Delta R / I_{t-1}$ , where  $\Delta R = R_t - R_{t-1}$ ,  $\Delta K = K_t - K_{t-1} = I_{t-1}$ . The incremental profit rate tends to be more volatile than the average rate as it reflects cyclical, short-term changes in aggregate demand. Likewise, the incremental capital accumulation ( $g'$ ) is defined as  $\Delta I / \Delta K = \Delta I / I_{t-1} = \% \Delta I$ , where  $\Delta I = I_t - I_{t-1}$ ,  $\Delta K = K_t - K_{t-1} = I_{t-1}$ , and incremental interest ( $i'$ ) as  $\Delta V / \Delta B = \Delta V / D_{t-1}$ , where  $\Delta V = V_t - V_{t-1}$ ,  $\Delta B = B_t - B_{t-1} = D_{t-1}$ . The incremental rates could supplement, if

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not anticipate, the trends in the average rates.

A role for speculative investment can be incorporated by noting that as a boom progresses the rate of profit on productive investment has a natural tendency to fall and to become more uncertain.<sup>2</sup> In an attempt to offset this tendency, firms divert capital from away from productive investment towards speculative investment in real estate and in the stock market. Speculative investment may offer higher expected returns which seem more secure due to the short-term nature of speculative investment. This diversion tends to inflate asset prices which capital inflows then exacerbate. Increased speculative investment, relative to productive, enhances the system's vulnerability to financial crisis as it relies on investors' confidence, which can shift quickly.

### **III. Evolution through the Minskian Regimes**

The framework presented in the previous section is applied to: Thailand, Korea, and the United States. For Thailand and Korea, the period 1980-1999 was used. The year 1980 was selected as a starting point because of the limitations of data availability, and the year 1999 marks the end of the turmoil associated with their crisis periods. The onset of crisis in these economies was in mid-1997 (Thailand) and in late 1997-early 1998 (Korea). For the United States the period 1980-2004 was selected.

Annual data was used for these cases. Interested readers are referred to the Appendix for data sources and details on the construction of the figures. For each case a set of three graphs is presented. The first graph illustrates the average rates used in Foley (2003). The profit/capital stock definition of the rate of profit is the rate of return on existing capital stock. Similarly, capital accumulation, defined as investment relative to capital stock, is an average increase in capital stock. The ratio of external debt service to external debt stock is the average debt service payment

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per dollar of debt (adjusted for inflation). The second graph illustrates the incremental rates of profit, growth, interest (minimum lending or prime rate), and the speculative rate of return. The stock market rate of return is used as a proxy for the speculative rate of return. The Hodrick Prescott filter ( $\lambda = 30$ ) was applied to the incremental series in order to ascertain the trends in these short-term, volatile rates. The result is contained in the third graph.

### ***Thailand***

The figures for annual average rates of profit, growth, and interest (debt service-debt stock ratio) are illustrated in graph 1. The series begin in 1983 because of the manner in which the capital stock series is constructed from the investment series. According to the figures, the economy is in the hedged regime ( $r > g$ ) in 1983, the Ponzi regime (debt ratio  $> r$ ) from 1984 to 1985, in the speculative regime ( $g > r$ ) from 1986 to 1996, and shifts into the hedged regime in 1997 and 1998 before turning Ponzi in 1999. Profit experiences a boost after the Plaza Accord and does not exhibit a downturn until the onset of crisis in 1997. The accumulation rate also experiences a boost after 1985 and falls off sharply in 1997. The debt service-debt stock ratio declines from 1986, although it increases during a mild recession in 1990-1992. The ratio hits a pre-crisis low in 1995, turns negative in 1998 and increases sharply in 1999. The fact that the average rates indicate that the Thai economy was in the hedged regime during its crisis would seem to be perverse. Why didn't the average rate of profit fall below the rate of interest (as proxied by the debt service-debt stock ratio)?

graph 1 (Minsky series: average rates) here

Part of the answer to this question lies the history of Thailand's use of long-term and short-term debt. According to data from the World Bank's *Global Development Finance*

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database, stocks of long-term and short-term debt increase rapidly from 1992-1997. Between 1990 and 1996, it took an average of just under 4 years for Thailand's stock of debt to double, and it did so twice. Further, short-term term debt increased relative to long term. The stocks of both maturities begins to decline in 1996, probably reflecting banks' hesitance to grant new loans or to rollover existing ones. Towards the end of the crisis, the stock of long-term debt remained at near peak levels, whereas the the stock of short-term debt was halved. Through 1996 debt service increased, but not as quickly as the rate at which the debt stock was growing. Hence, the average rate of interest declined, until the banks began to restrict new credit about the same time that the repayment of accumulated short-term debt fell due.

Replacing the average rates with the incremental rates yields graph 2. The Thai economy was in the hedged regime during 1986 and 1987. The incremental rate of profit ( $r'$ ) is greater than the percentage change in investment ( $g'$ ), which, in turn, is greater than the (real) long-term market interest rate  $i(\text{MLR})$ :  $r' > g' > i(\text{MLR})$ . From 1988 to 1990 the Thai economy is in the speculative regime. The percentage change in investment is greater than the incremental rate of profit, which, in turn is greater than the interest rate:  $g' > r' > i(\text{MLR})$ . From 1991 to 1996, the figures indicate the Thai economy is borderline speculative-Ponzi. (Recall, 1990-96 is a period in which the short-term debt of Thailand grew rapidly.) In 1997 and 1998 the economy is clearly in the Ponzi regime as the market interest rate is greater than the incremental rate of profit:  $i(\text{MLR}) > r'$ . The Thai economy snaps back into the hedged regime in 1999. This can be attributed to productive investment contracting to such an extent that the change in profit relative to prior period investment, the definition of the incremental rate of profit, simply yields a higher rate of profit.

Graph 2 (incremental Minsky series) here

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In 1997 the rate of profit turns negative, and the pace of capital accumulation slows more rapidly. For the Thai economy, then, financial crisis arrives about the time that the rate of profit on productive investment turned negative.

The volatility in the incremental rates and remaining imprecisions in which the data categories have been constructed to fit theoretical concepts of the data series makes it difficult to pinpoint precisely the transitions between the regimes. To help validate the transition, the Hodrick-Prescott filter was applied (using a parameter of 30) to both sets of incremental rates. The results are exhibited in graph 3.

Graph 3 (HP incremental Minsky series) here

According to figures in graph 3 the Thai economy emerges from Ponzi in early 1987, and graduates from the speculative regime to the hedged regime in mid-1991. The economy enters into the Ponzi regime about 1995. The productive rate of return turns negative in 1996, and the speculative rate of return turns negative about the same time as Ponzi is entered.

With respect to speculative activity, according to the smoothed incremental version, the first thing to note is that during the speculative regime the incremental rate of return on productive investment hits its high at some point in 1990 and then begins to decline. The speculative rate of return reaches its peak in 1988. It is just prior to entry into the Ponzi regime that the stock market rate of return turns negative. During the early Ponzi and crisis periods the stock market rate of return remains negative.

Finally, if one compares the figures in graphs 3 and 1 one see two similar pictures. According to the average rates the economy emerges from Ponzi into the speculative position in

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1987, makes an attempt at hedged in 1994-1996, enters into hedged in 1997-1998 and into Ponzi in 1999. The trends in the incremental rates indicate the economy emerges from Ponzi into speculative in 1987, emerges from speculative into hedged in 1991, and back into Ponzi in 1995. It appears the average figures lag the filtered incremental rates. It's possible that additional work on matching theoretical concepts with data categories may reduce the lag. In the meantime, the smoothed incremental rates lend strong empirical support of the transition of this economy through the Minskian regimes.

### ***South Korea***

The Korean figures for annual average rates of profit, interest, and growth are illustrated in graph 4. Like Thailand, the series begin in 1983 because of the method for constructing a capital stock series. According to the average rates, the Korean system is hedged from 1983-1988, with the exception of 1987. It makes the transition to speculative in 1988 remains in the speculative state until 1999 when it turns Ponzi.

graph 4 (average Minsky series: Korea) here

The history of Korea's use of long-term and short-term debt helps to explain why the system does not progress into Ponzi prior to crisis. According to *Global Development Finance* statistics, South Korea's stock of long-term and short-term debt were not at historical highs until 1994. Up to that point, levels were consistent with the level exhibited in the mid-1980s. However, in 1994, both stocks of debt began to increase rapidly, especially short-term debt. Between 1993 and 1994, South Korea's stock of short-term debt more than doubles. Further, the stock of short-term debt surpasses the level of long-term debt in both 1995 and 1996. The long-term debt stock actually decreases slightly between 1994 and 1995, before increasing again in

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1996 and 1997. Like Thailand, the stock of short-term debt drops off in 1997, and even more dramatically in 1998. Long-term debt increases dramatically in 1998, before contracting slightly in 1999. Both Korean and Thai series appear to indicate willingness of banks to lend long-term during the crisis, but not so for the short-term. Debt service increased to debt stock prior to the crisis, which partly explains why the average rate of interest was declining right through the start of the crisis in Korea. For almost all years, the nominal debt ratio in Korea was higher than in Thailand.

Replacing the average profit rate with the incremental rates yields graph 5. The incremental rates reveal that the Korean economy was hedged in 1984-1986, where the incremental rate of profit ( $r'$ ) is greater than the percentage change in investment ( $g'$ ), which, in turn, is greater than the (real) long-term market interest rate  $i(\text{MLR})$ :  $r' > g' > i(\text{MLR})$ . The Korea economy then shifts to the speculative position ( $r' < g'$ ) from hedged in 1987. It was borderline speculative-Ponzi in 1989-1995, and made the transition to Ponzi in 1996 where it remained until 1999. (Recall, the stock of Korean debt began to grow rapidly in 1994.) As with Thailand, the shift back to hedged position in 1999 is attributed to a contraction of productive investment.

graph 5 (incremental Minsky series) here

As with Thailand, the volatility in the incremental rates makes it difficult to pinpoint precisely the transitions between the regimes. The Hodrick-Prescott filter was applied to both sets of incremental rates (using a parameter of 30). The results are illustrated in graph 6.

graph 6 (HP incremental Minsky series) here

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According to the smoothed incremental rates the Korean economy shifts to speculative from hedged in mid-1985, and it remains in speculative until the end of 1992. The Ponzi regime is entered in late 1992, 5 years prior to the eruption of crisis. The productive and speculative rates of return turn negative within a year of each other, mid-1994 and mid-1995, respectively; the productive rate of return turned negative prior to the speculative rate of return doing so.

With respect to speculative activity, the first thing to note, using the smoothed figures, is that during the hedged regime the incremental rate of return on productive investment exhibits its high right at the start (1983) and has a consistent downward trend. The annual real stock market rate of return (stock mkt r) reaches its peak about 1987. The speculative rate of return turns negative after the entry into Ponzi, and after the productive rate of return becomes negative. During the early Ponzi and crisis periods the stock market rate of return remains negative.

Finally, if one compares graphs 4 and 6, one finds that message of the smoothed incremental rates is very similar to the message of the average rates. As per the average rates, Korea shifts into the speculative regime in 1989, whereas the shift is mid-1985 to mid-1986 with the trended rates. According to the average rates, Korea remains in the speculative state until 1999 when it turns Ponzi, whereas for the smoothed figures the transition to Ponzi is earlier (late 1992 to late 1995). So, like Thailand, it seems the set of average figures that use a Minskian definition of profit lag the trended incremental rates. All three sets of rates lend empirical support to the transition of Korea through the Minskian regimes.

### ***United States***

The figures for the U.S. annual average rates of profit, interest, and growth are illustrated in graph 7. The graph reveals the U.S. was in the Ponzi regime from 1981-1992, the speculative

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regime from 1993 –1997, and then flirted with the Ponzi regime 1998 and in 2000. In 2001, the U.S. economy reverted back speculative and into hedged for 2002 and 2003. The average rates appear to move according to Minskian vision of the evolution of financial fragility. However, experience suggests that it is doubtful that the U.S. was not in the hedged regime at some point in the 1980s or 1990s.

graph 7 (average Minsky series: U.S.) here

Again, part of the explanation as to why the average rates do not move as one would expect lies with the history of United States' use of long-term and short-term debt. As per data from the Federal Reserve and Bureau of Economic Analysis, external debt stocks of the U.S. have been increasing throughout the 1980's and 1990's, each year setting a new historic high. The use of short-term debt has increased rapidly since the mid-1990's. However, the composition of the external debt stock remains predominantly long-term. Debt service, too, has been setting historic highs each year starting in 1980. (Note, the debt service series for the U.S. does not exclude principal payments; the U.S. Treasury is just now starting to construct a series containing both the interest and principal payments). Debt service on short-term debt remained under \$140 billion per year until 1994, when it began to increase. This explains why the debt service-debt stock ratio declined until 1994 when it, too, began to increase.

Replacing the average profit rate with the incremental rates yields graph 8. The figures confirm that the American economy was in the Ponzi regime from 1981 to 1991. There is a brief period (1992-1993) when the U.S. enters the hedged regime. From 1994-2000, the economy alternates between the speculative and Ponzi regimes. The system shifts into the hedged regime in 2001 where it has remained until recently, returning to the speculative regime in 2004. Part of the

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explanation is that investment contracted during 2002 and 2003 (which pushes the incremental profit rate upward).

graph 8 (incremental Minsky rates) here

The filtered versions of the charts help to clarify the story underlying the incremental rates. Again, the Hodrick-Prescott filter was applied (with a parameter of 30) to the incremental rates. The results are illustrated in graph 9.

Graph 9 (HP incremental Minsky chart) here

The figures in graph 9 also confirm that the U.S. was in the Ponzi position through most of the 1980s (1981-89). It shifts into the hedged regime during 1989 and remain there until 1994 when it progresses into speculative. The system nearly progresses into Ponzi during 1996-1998, but it avoids doing so. In fact, it returns strongly to the hedged phase in 1999 where it has remained.

With respect to speculative activity, the smoothed figures reveal two bubbles during this period. The first occurs during the 1980s and the second during the 1990s. The first bubble began in 1983 and deflated in the late 1980s. It was accompanied by low rates of capital accumulation and low, though increasing, rate of profit. The second bubble began in 1992-1993, as the U.S. emerged from a mild recession. The second bubble was accompanied by improved rates of growth in investment, but a falling rate of return on productive investment. The smoothed speculative rate of return fell rapidly after 1998 with onset of the deflation in the stock market.

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Finally, if one compares the average and trended incremental Minsky series, one sees, again, that the smoothed incremental rates assist with the definition of the regimes and the timing of their transitions and that the average version reflect the trends in the incremental rates with a lag. According to the average rates, the U.S. emerges from Ponzi in 1993, whereas the trended incremental rates show the emergence in 1989. The U.S. progressed into the hedged regime 2001 as per the average rates, but the smoothed rates indicate the progression into hedged regime occurred in 1999. According to both sets of rates, the U.S. is in the speculative regime from 1993-1998, give or take a year.

#### **IV. Summary of Results**

The applications provide empirical support that economies, developed and developing, do evolve through the Minskian regimes. The most important discovery is that the Ponzi regime arrives prior to financial crisis. According to the trends in the incremental rates Thailand entered the Ponzi phase in early 1995, over two years prior to the devaluation of the Thai baht. In Korea, Ponzi was entered in late 1992, about five years prior to the devaluation of the won. The arrival of Ponzi prior to financial crisis would support the idea that the Ponzi regime has two phases - the phase prior to crisis and the crisis phase itself. The first phase can last any number of years, e.g., approximately two years in Thailand, four years in Korea, and possibly longer for a developed country such as the U.S. The length could be attributed to the depth and complexity of a country's financial markets.

Two other interesting results are related to when the rates of return on speculative and productive investment turn negative. The rate of return on speculative investment turns negative about the time that economy shifts into Ponzi. In Thailand the (filtered) speculative rate of return turned negative in mid-1994, shortly before the entry into Ponzi. In Korea, the speculative rate of

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return turned negative in early 1995, about two years after entry into Ponzi. In the U.S., the speculative rate of return turned negative in mid-2003.

The rate of return on productive investment turns negative near the onset of crisis. In Thailand, the smoothed incremental rate of profit investment turned negative in early 1995, about one year after the speculative return turned negative, and two years prior to the devaluation of the Thai baht. In Korea, the productive rate of return turned negative in late 1994, just prior to the speculative rate of return turning negative, and three years prior to devaluation. The productive rate of return for the U.S. is declining, but has yet to turn negative.

Another feature is the relationship between the speculative rate of return and the interest rate. It seems that speculative rate of return falls below the interest rate at some point near the onset of Ponzi. For Thailand, this occurs in 1993; for Korea, this occurred in late 1994, and in early 2002 in the U.S. The speculative rate of return falling below the interest rate may signal to investors that higher rates of return may be had simply by placing money in bank accounts rather than investing, say, in the stock market, adding downward pressure on shares.

Finally, it is important to note that the series and trends are very sensitive to how the data is constructed to fit the theoretical concepts. The confusing results from the average rates indicate that it is possible that what we see is an imperfect fit between theoretical concepts and the data categories. It is also possible that the complexity of its financial system is problematic to capture within this simple framework. Data construction by government agencies as well is problematic in that, especially for the U.S., the NIPA constructions include imputed transactions and do not capture ways that firms can massage their accounts.

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## **V. The Corporate Financial and Nonfinancial Sectors of the United States**

According to the smoothed incremental rates, the American system nearly shifts into Ponzi during 1996-1998. It has recently exhibited features found in Thailand and Korea with respect to the transition into Ponzi. For instance, the speculative rate of return turned negative in 2003. The speculative rate of return fell below the interest rate in 2002. However, the U.S. has avoided entry into Ponzi as it returned strongly into the hedged regime in 1999 where it has remained. Again, part of the answer to this shift is due to the rapid rise of the rate of profit caused by a contraction in investment in 2002 and 2003. Recall, the incremental rate of profit is defined as a change in profit relative to prior period investment. If investment contracts, then by definition, the incremental rate of profit increases. So, it could be that the U.S. is on the cusp of a crisis, as this scenario is one experienced by both Thailand and Korea with the onset of their financial crises.

This is not the whole story, though. The trend in capital accumulation for the U.S. has increased, boosted by a falling real interest rate. This section analyzes the sectors of the U.S. economy in order to determine how much of the incremental rate of profit is driven by non-corporate business (sole proprietorships and partnerships) and corporate sectors and where the increase in investment is occurring.

Using data from the Bureau of Economic Analysis (NIPA tables 1.13 & 1.14) graphs 10 and 11 provide a picture of the forms of organization within U.S. domestic business. Graph 10 illustrates the shares of the forms of domestic business in the U.S. from 1980 to 2003. Corporations have held the largest share, although there is some deterioration in their share due to strong growth of sole proprietorships and partnerships. Graph 11 shows the breakdown of the corporate sector into nonfinancial and financial firms. Nonfinancial corporations have, by far, the

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largest share of this sector. However, financial corporations have also exhibited strong growth since 1980, increasing its share from about 10% to nearly 18% of the corporate sector.

Graph 10 (Forms of U.S. domestic business)

Graph 11 (U.S. Corporation: Nonfinancial vs. Financial)

By defining the incremental rates of profit and capital accumulation on the three sectors, and performing the Hodrick- Prescott filter on the rates, graphs 12, 13, and 14 were obtained. The graphs focus on the period 1988 to 2004 (to 2003 for noncorporate sector). The figures show that both the corporate financial and nonfinancial sectors were in the Ponzi regime until 1993. In 1994, the financial sector emerges into the hedged regime, where it has remained since. The last few years, however, its rate of return appears to have peaked and is now deteriorating, along with a negative trend in capital accumulation. The nonfinancial corporate sector emerges from Ponzi into the speculative regime in 1993. It returns to Ponzi in 1996 and remains until 2001. From 2001 to present, this sector has been hedged, although, it, too, exhibits a negative trend in capital accumulation. The noncorporate sector has been in hedged regime since 1998. However, the rate of profit has been falling since 1997 and capital accumulation is near zero.

In sum, the incremental profit rate has been the highest for the non-corporate and financial corporate sectors, but the rates are now deteriorating. Even though the nonfinancial corporate sector, the largest segment of U.S. domestic business, has a relatively low rate of profit, it has been steady and increasing lately. Again, the movements in the incremental rate of profit must be interpreted with caution due to the influence of negative rates of capital accumulation, as per the unsmoothed incremental rates, in 2002 and 2003.

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What has been driving the U.S. economy? Part of the answer to this question may lie with a decomposition of fixed investment. Graph 15 contrasts the filtered incremental rates of capital accumulation for fixed residential and non-residential investment (structures vs. equipment). The form of investment with the quickest rate of increase is private, residential fixed investment, which validates the perception of a housing bubble in the U.S. The housing bubble, buoyed by low interest rate policy of the Federal Reserve, could be prompting investment in related sectors, helping to keep the U.S. economy from progressing into Ponzi. Investment in nonresidential equipment is also growing, but investment in nonresidential structures has negative trend in its rate of growth.

#### **VI. The Influence of Inflation on a Minskian Framework of Financial Instability: Implications for Monetary Policy?**

Another aspect of the U.S.'s veer away from Ponzi and back into the hedged position of the interest rates, due to active management of the Federal Reserve Bank to stimulate the economy. After the burst of the stock market bubble in 2000, the Federal Reserve began to lower interest rates in an attempt to engineer a soft landing for the economy by stimulating investment. Initially, investment in fixed, nonresidential structures and equipment did not pick up. However, the reduction of the interest rates appears to have supported another bubble in the housing market. Spending in this market, and spending on the war in Iraq, not to mention the increase in oil prices associated with the war, have contributed to the formation of inflation. As inflation increases the real interest rate and productive rate of return are tempered. However, if the Federal Reserve decides to offset inflation with increases in the interest rate, adhering to the "current consensus," the real interest rate could actually increase and be driven towards the incremental rate of profit. In other words, Federal Reserve policy may force the economy into the Ponzi regime. In other words, it may speed the process towards financial instability and crisis, which would likely

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involve further devaluation of the dollar, deflation of U.S. dollar-denominated assets, a reversal of the recent surge in investment, and, ultimately, higher unemployment. On the other hand, the Federal Reserve could do nothing and permit a bout of inflation of which no one is certain how fast or severe it will evolve. This would lower the rates of return on U.S. assets for foreign investors, lowering their confidence, triggering capital flight and the devaluation of the dollar. This scenario is precisely that discussed by Krugman (New York Times, Op-Ed, 18/04/05). The tradeoff for the Federal Reserve is the cost of crisis now versus the cost of crisis later. Politically, it may be more advantageous for crisis to occur later, which perhaps is why the Federal Reserve is now willing to put its measured interest rate increases on hold rather than make an attempt to keep inflation within a 2-3 percent threshold.

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## **VII. ENDNOTES**

1. Dumenil and Levy (1990), footnote 3, may provide a defense of the use of the representative firm in that, like their analysis, the purpose here is to work with the vintages of capital stock as they are and monitor their evolution, not to provide an explanation of changes in technology, as embodied in changes in the composition of capital stock, due to changes in prices and technical change. “In doing so, we avoid the thorny issue of aggregation (of individual production functions).” Parentheses added.

2. Many economists attribute this tendency to exogenous factors (e.g., overcapacity in export markets in Wolfson (2000)) or as being the result of policy (e.g., poor investment coordination in Chang, Park and Yoo (1998)).

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### **VIII. References**

Arestis, P. and M. Glickman. 1999. Financial crisis in South East Asia: dispelling illusion the Minsky way. University of East London, Department of Economics, Working Paper No. 22

Chang, H.J., H.J. Park, and C. G. Yoo. 1998. Interpreting the Korean crisis: financial liberalization, industrial policy, and corporate governance. *Cambridge Journal of Economics*, vol. 22, 735-46

Dumenil, G. and D. Levy. 1990. Post Depression trends in the economic rate of return for U.S. manufacturing. *Review of Economics and Statistics*, vol. 72, 406-13

Dymski, G. A. 1999. Asset bubbles and Minsky crises in East Asia: a spatialized Minsky approach. University of California, Riverside, Department of Economics, Research Paper

Foley, D. K. 2003. Financial fragility in developing economies, pp. 157-168 in Dutt, A. and Ros, J. (eds), *Development Economics and Structuralist Macroeconomics: Essays in Honour of Lance Taylor*. Cheltenham, England: Edward Elgar

Goldstein, M., G. L. Kaminsky, and C. M. Reinhart. 2000. *Assessing Financial Vulnerability: An Early Warning System for Emerging Markets*. Washington, D.C.: Institute for International Economics

Kregel, J. A. 1998. Yes, 'it' did happen again – a Minsky crisis happened in Asia. Jerome Levy Economics Institute Working Paper No. 234

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Krugman, P. 1998. What happened to Asia? <http://web.mit.edu/krugman/www.DISINTER.html>

Krugman, P. 2005. A Whiff of Stagflation. Op-Ed column (4/18/05), *The New York Times*, New York: The New York Times Company.

Marquetti, A. 1997. How to use the World data set. <http://cepa.newschol.edu/~epwt/DataDoc.html>

Minsky, H. P. June 1980. Capitalist financial processes and the instability of capitalism. *Journal of Economic Issues*, vol. 14, 505-23

Minsky, H. P. 1995. Financial factors in the economics of capitalism. *Journal of Financial Services Research*, vol. 9, 197-208

Minsky, H. P. 1991. The financial instability hypothesis: a clarification, pp. 158-66 in Feldstein, M. (ed), *The Risk of Economic Crisis*, A Bureau of Economic Research Conference report. Chicago: University of Chicago Press

Schroeder, S. K. 2004. 'Political Economic Forecasting of Financial Crises', PhD Thesis, New School for Social Research, New York

Shaikh, A. M. 1996. The stock market and the corporate sector: a profit-based approach. Jerome Levy Economics Institute Working Papers No. 146

Wolfson, M. H. 2000. Neoliberalism and international financial stability. *Review of Radical Political Economy*, vol. 32, 369-78

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## **APPENDIX - Notes on Data Sources & Constructions**

Capital accumulation (rate of) – Annual series for capital accumulation was obtained by dividing annual real, gross private investment relative to annual, real private capital stock (base year 1988).

The result was then multiplied by 100 for an expression in terms of a percent.

Korea: no additional notes.

Thailand: no additional notes.

United States: no additional notes.

Capital stock (real) – When a capital stock series was unavailable, or incomplete, one can use data series for annual, real gross fixed capital formation (I) for private construction (C) and equipment (E) to construct an annual, real capital stock (K) series, base year 1988. Annual, net capital stock was computed using the formula:

$$K(t) = \sum_{j=0}^N I(t-j) * (1-dep)^j$$

where the depreciation rate was determined using the Hulton & Wycoff's PIM procedure, as described by Aldamir Marquetti (1997). This procedure defines depreciation as BAL/T, where BAL is the degree of declining balance due to depreciation and T is average lifetime of an asset.

Korea: The Thai figures for T, BAL were used for Korea. The annual capital stock series begins in 1983. Figures are in billions of won.

Thailand: T was assumed to be 14. BAL is defined as  $((0.91)(C/I)+(1.65)(E/I))$ , 1.65 is equipment's degree of declining balance due to depreciation and 0.91 is structure's degree of declining balance due to depreciation. The depreciation rate (dep) is 9.45%. The annual capital stock series begins in 1983 and the quarterly series begins fourth

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quarter 1983. Figures are in millions of baht.

United States: Annual capital stock series was obtained by deflating the sum of current cost net stock of private fixed assets (line 1 of NIPA table 6.1) and current cost of depreciation of private fixed assets (line 1 of NIPA table 6.4) by implicit price deflator for gross fixed private investment. The annual capital stock series begins in 1980. Figures are in billions of dollars.

Compensation of employees (nominal) - Wages plus other non-wage compensation.

Korea: Annual data were obtained from the website of the Bank of Korea, ([www.bok.kr](http://www.bok.kr)), National Accounts page. The series code is HLGC10105. The observations are in billions of won.

Thailand: Compensation consists of wages & salaries, pay to members of armed forces, and employers' contributions to social security. This and other components of national income can be located in Summary table 9, "Distribution of the National Income at Current Market Prices," of National Economic and Social Development Board's publication "Executive Summary: Capital Stock of Thailand, 1980-1996," and updates at its website, National Income table 10, by the same name. The observations are in millions of baht.

United States: Annual series is located in line 2 (compensation of employees) in NIPA Table 1.12 -National Income by Type of Income. The table is located at the Bureau of Economic Analysis (BEA) website ([www.bea.gov](http://www.bea.gov)). Compensation consists of wages and salary accruals (including to government workers), supplements such as employer

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contributions to pension funds (employee and government) and insurance funds. The observations are in billion of dollars.

Corporate transfer payments (nominal) - Payments to persons and the rest of the work by private business. Payments to person include liability payments and gifts to non-profit institutions.

Payments to the rest of the world consists of taxes paid to foreign governments.

Korea: An annual series was obtained from the website of the Bank of Korea ([www.bok.kr](http://www.bok.kr)), National Accounts page. The series is the sum of corresponding observations for nonfinancial and financial corporations, codes HLGH111244 and HLGH212440. The observations are in billions of won.

Thailand: Annual data were obtained from the Main Accounts Table 2, "National Income at Current Market Prices," of the National Economic and Social Development Board's publication "Executive Summary: Capital Stock of Thailand, 1980-1996," and updates at its National Income webpage ([www.nesdb.go.th](http://www.nesdb.go.th)) in a table by the same name. The observations are in millions of baht.

United States: Payments to persons include liability payments and gifts to non-profit institutions. Payments to the rest of the world consists of taxes paid to foreign governments. Annual series are located in line 21 (business current transfer payments) in NIPA Table 1.12 -National Income by Type of Income. The table is located at the Bureau of Economic Analysis (BEA) website ([www.bea.gov](http://www.bea.gov)). The observations are in billion of dollars.

Debt service-debt stock ratio (real): Ratio of external debt service payments relative to the stock

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of external debt, with inflation  $[(p_t - p_{t-1})/p_{t-1}]$  deducted to convert the nominal ratio to real, and  
times 100 to create a percentage. (Implicit price deflators for investment were used to create  
inflation figures.)

Korea: no additional notes.

Thailand: no additional notes.

United States: no additional notes.

Direct taxes on corporations (nominal) - Taxes on corporate income.

Korea: Annual series was obtained from the website of the Bank of Korea  
([www.bok.kr](http://www.bok.kr)), National Accounts page. The series code is HLGH11121 for nonfinancial  
corporations and HLGH12121 for financial corporations. The observations are in billions  
of won.

Thailand: Annual nominal series is located in Table 58 - General Government Current  
Revenue found in National Economic and Social Development Board's "Executive  
Summary, Capital Stock of Thailand in 1970-1996" and in Table 10 - Distribution of the  
National Income at Current Market Prices at the NESDB website ([www.nesdb.go.th](http://www.nesdb.go.th)).  
The observations are in millions of Thai baht.

United States: Annual series is located in line 14 of NIPA Table 1.12 -National Income  
by Type of Income at the BEA website ([www.bea.gov](http://www.bea.gov)). The observations are in billion  
of dollars.

External debt service (nominal) -

Korea: Annual series were obtained from the World Bank's Global Development Finance

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database. It was formed by adding the series for debt service (interest and principal) on long term external debt with the series for debt service (interest only) on short-term external debt. The observations are in millions of U.S. dollars.

Thailand: Annual series were obtained from the World Bank's Global Development Finance database. It was formed by adding the series for debt service (interest and principal) on long term external debt with the series for debt service (interest only) on short-term external debt. The observations are in millions of U.S. dollars.

United States: Annual data are located in lines 32 and 33, Income payments on foreign owned assets (public and private) in the U.S., of Table 1 - U.S. International Transactions. The table can be found at the BEA website ([www.bea.gov](http://www.bea.gov)). The observations are in billions of U.S. dollars.

External debt stock, total (nominal) -

Korea: Annual series were obtained from the World Bank's Global Development Finance database. It is series called Total Debt Stocks (EDT). It consists of long-term debt (LDOD), use of IMF credit, and short-term debt. The observations are in millions of U.S. dollars.

Thailand: Annual series were obtained from the World Bank's Global Development Finance database. It is series called Total Debt Stocks (EDT). It consists of long-term debt (LDOD), use of IMF credit, and short-term debt. The observations are in millions of U.S. dollars.

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United States: Annual data are located in line 6, Credit Market Instruments, of Flow of Funds Account Table L.107 - Rest of World, Amounts Outstanding. The table can be found at the website for the U.S. Federal Reserve ([www.federalreserve.gov](http://www.federalreserve.gov)). Credit market instruments consist of open market paper (short-term debt), U.S. government securities, U.S. corporate bonds, and loans to U.S. corporate business. The observations are in billions of U.S. dollars.

Government income from property -

Korea: Annual series is located at the Bank of Korea's website ([www.bok.or.kr](http://www.bok.or.kr)), National Accounts page. The series code is HLGH1321510 for interest and HLCH13216 for rent. The observations are in billions of won.

Thailand: Annual series, government income from property and entrepreneurship from interest and rent, were located in Main Accounts Table 58, "General Government Current Revenue," of Thailand's National Economic and Social Development Board's publication "Executive Summary: Capital Stock of Thailand, 1980-1996." Updates were obtained at the NESDB's National Income webpage ([www.nesdb.go.th](http://www.nesdb.go.th)) in National Account Table 2. The observations are in millions of baht.

United States: Annual data was obtained in line 9 (Income receipts on assets - interest) and line (rent) of BEA Table 3.1 - Government Current Receipts and Expenditures. The table is available at the BEA website ([www.bea.gov](http://www.bea.gov)). Observations are in billions of dollars.

Gross domestic product (GDP), (nominal)-

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Korea: Annual data were obtained at the Bank of Korea's website ([www.bok.go.kr](http://www.bok.go.kr)). The series name is HLGB10106. The observations are in billions of won.

Thailand: Annual figures for 1993 to present were obtained from Table 1 at the "Gross Domestic Product" webpage at the National Economic and Social Development Board's website ([www.nesdb.go.th](http://www.nesdb.go.th)). Historical annual data for nominal GDP, through 1992, were obtained in the Summary Table 1, "Balance Sheet of National Income and Expenditures at Current Market Prices," located in NESDB's "Executive Summary, Capital Stock of Thailand in 1970-1996". The observations are in millions of baht.

United States: Annual series are located in line 1 (gross domestic product) in NIPA Table 1.1.5 - Gross Domestic Product, which can be found at the BEA website ([www.bea.gov](http://www.bea.gov)). The observations are in billion of dollars.

Incremental profit rate (real) - the difference between current and prior period real profit relative to prior period real investment, times 100 to obtain a percentage.

Korea: no additional notes.

Thailand: no additional notes.

United States: no additional notes.

Indirect taxes (nominal) - excise, customs taxes, and other taxes on production.

Korea: Annual series was obtained from the website of the Bank of Korea, National Accounts page. The series code is HLGB10104. The observations are in billions of won.

Thailand: Annual series was obtained from Table 58 - General Government Current

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Revenue of the National Economic and Social Development Board's "Executive Summary, Capital Stock of Thailand in 1970-1996" and in Table 10 - Distribution of the National Income at Current Market Prices at the NESDB website ([www.nesdb.go.th](http://www.nesdb.go.th)). The observations are in millions of baht.

United States: Annual series consisted of line 4 (taxes on production and imports) in NIPA Table 3.1 - Government Current Receipts and Expenditure - located at the BEA website ([www.bea.gov](http://www.bea.gov)). The observations are in billion of dollars.

Interest payments on debts (public and consumer) -

Korea: Annual data was obtained at the Bank of Korea website ([www.bok.or.kr](http://www.bok.or.kr)). Interest payments on consumer debt is series code HLGH1411511, and interest payments on public debt is series code HLGH131151. The observations are in billions of won.

Thailand: Annual data for both interest payments on consumer debt was obtained from the National Economic and Social Development Board's webpage ([www.nesdb.go.th](http://www.nesdb.go.th)) and Account 2 - National Income table of the NESDB's "Executive Summary and Capital Stock of Thailand in 1970-1996." The observations are in millions of baht.

United States: Annual data was obtained at the BEA website ([www.bea.gov](http://www.bea.gov)). Interest payments on public debt is located in line 22 of Table 3.1 - Government Current Receipts and Expenditures. Interest payments on consumer debt is located in line 29 of Table 2.1 - Personal Income and Its Disposition. The observations are in billions of dollars.

Investment deflator – Base year 1988 (1988 = 100).

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Korea: Gross fixed capital formation (GFCF) deflator series for 1995 was shifted to 1988 base by multiplying the 1995 series by the factor  $(1/(1988_{1995 \text{ base}}))$ .

Thailand: Annual GFCF deflator series was obtained by dividing nominal GFCF observations by corresponding real GFCF observations.

United States: Gross fixed private investment (GFPI) price deflator series for 1996 was shifted to 1988 base by multiplying the 1996 series by the factor  $(1/(1988_{1996 \text{ base}}))$ .

Investment (real) - gross fixed capital formation (private) or gross private fixed investment.

Korea: Annual observations for fixed investment (construction and machinery & equipment) for the private sector, 1995 base year, were obtained at the Bank of Korea's website ([www.bok.or.kr](http://www.bok.or.kr)) and then shifted to base year 1988 by multiplying the series by the factor  $(1/IPD(1988 \text{ observation})_{1995 \text{ base}})$ . The series code for construction is HLHH10102. The series code for machinery and equipment is HLHH10105. The observations are in billions of won.

Thailand: Annual observations for gross capital formation (construction & equipment) for the private sector, base year 1988, was obtained at the National Economic and Social Development Board website, Summary Table 9 - Gross Capital Formation at 1988 Prices, and its publication "Executive Summary: Capital Stock of Thailand, 1980-1996," summary table 8 (same name). Please note that as annual investment observations are available starting 1980, observations for 1970-79 were constructed assuming an average growth rate per annum of 4% and the definition:  $I(1980-j) = (I(1980)/\exp(0.04*j))$ . The observations are in millions of Thai baht.

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United States: Annual nominal series are located in line of Table 1.1.5 - Gross Domestic Product, line 7 - gross private investment fixed investment which can be found at the BEA website ([www.bea.gov](http://www.bea.gov)). The series was deflated using the implicit price deflator for investment (base year 1988). The observations are in billions of dollars.

Long-term lending rates - The minimum lending or interest rate (MLR) charged by commercial banks to its prime customers for a loan.

Korea: Annual observations were obtained from the IMF's International Financial Statistics database.

Thailand: Annual observations were obtained from the IMF's International Financial Statistics database.

United States: Annual data were obtained at the website for the Federal Reserve ([www.federalreserve.gov](http://www.federalreserve.gov)), table H.15 - Selected Interest Rates. The series name is "bank prime loan."

Personal income from property - Income in the forms of rent and interest that are received by households and non-profit institutions serving households.

Korea: Data observations came from the Bank of Korea website ([www.bok.or.kr](http://www.bok.or.kr)). The code for the interest rate series is HLGH142151; the code for the dividend series is HLGH142131; and the code for the rent series is HLGH14216. The observations are in billions of won.

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Thailand: Annual series was obtained from the National Economic and Social Development Board website ([www.nesdb.go.th](http://www.nesdb.go.th)) and from Summary Table 54 - Income from Property Received by Households and Private Non-Profit Institutions in the “Executive Summary, Capital Stock of Thailand in 1970-1996.” The observations are in millions of baht.

United States: Data observations came from the BEA website ([www.bea.gov](http://www.bea.gov)). The series for the rental income of persons (without capital consumption adjustment) is located in line 40 of NIPA Table 1.12 - National Income by Type of Income. The interest series is located in line 14 of Table 2.1 - Personal Income and Its Disposition. The observations are in billions of dollars.

Profit (nominal) – Nominal GDP minus compensation of employees, indirect and direct taxes, personal income from property (rent and interest), government income from property, corporate transfer payments, and interest on debt (public and consumer).

For developing countries, an additional component was subtracted from nominal GDP. This component was a series to account for income of peasants. The series was calculated from two series made available by the International Labor Organization at its website ([www.ilo.org](http://www.ilo.org)). The first series, Division 1 workers (workers employed in agriculture, hunting, forestry, and fishing), is found in Table 2B - Total Employment by Activity. The number of workers is in the thousands. The second series, wages of agricultural workers, is one-half of wages paid to non-Division 1 workers (wage series for Division 1 workers is not available for many developing countries). As the ILO wage series is monthly, the resulting series was multiplied by 12 for an estimate of the

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annual wages paid to an agricultural worker, a peasant. Total wages of peasants was determined by multiplying each component of the wage series with corresponding component of the number of workers employed as a Division 1 worker.

Korea: The observations are in billions of won.

Thailand: The observations are in millions of baht.

United States: The observations are in billions of dollars.

Profit (real) - The nominal profit series deflated by the GFCF deflator (base year 1988).

Korea: The observations are in billions of won.

Thailand: The observations are in millions of baht.

United States: The observations are in billions of dollars.

Profit rate (real) – real profit divided by the corresponding observation for real capital, times 100.

This is the “actual” rate of profit.

Korea: no additional notes.

Thailand: no additional notes.

United States: no additional notes.

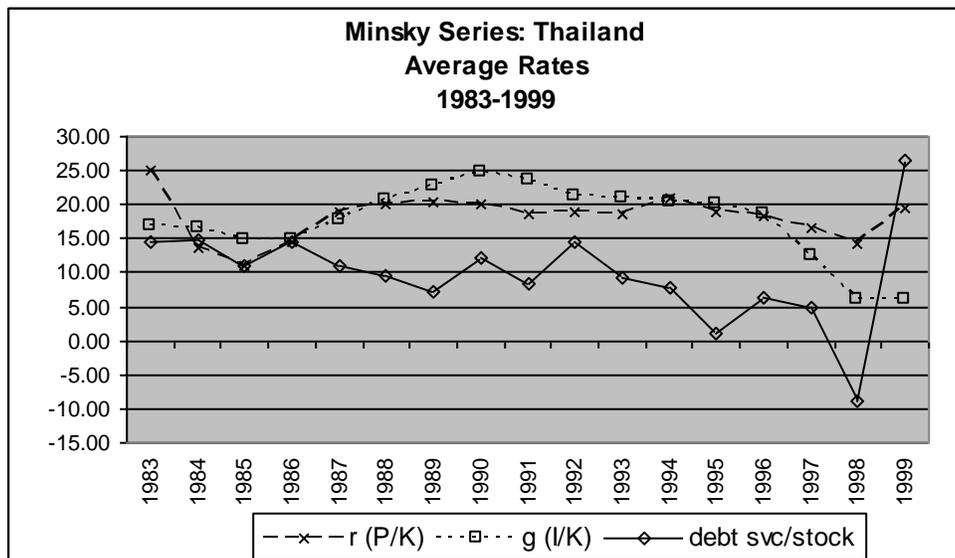
Speculative (stock market) rate of return (real) – the sum of real capital gain (difference between consecutive observations of price index) and real dividend per share (current period), divided by real price index of prior period. The real price index and real dividend per share series were generated by deflating the corresponding nominal series with the investment (GFCF) deflator (base year 1988). Nominal data for the stock market price index was obtained at Datastream; the series name is PI . The observations were daily, so an annual observation is simple average of the observations for the year. Similarly, nominal data for dividend yield was obtain at Datastream;

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 the series name is DY.

Korea: The Korean Stock Exchange (KOSPI) was used. Please note that there is no corresponding dividend yield series for the KOSPI. The yield on Korean corporate bonds was used instead, as it is thought that arbitrage will force these rates towards equality. Observations for this series is available through the website of the Bank of Korea. The series code used for years 1987-1999 was BEEA472 (3-YR, AA-), 1980-1986 observations were drawn from code BEEA471, which combines the AA- and BBB- grade corporate bonds. The observations are based upon the won.

Thailand: The Stock Exchange of Thailand (SET) was used. The observations are based upon the baht.

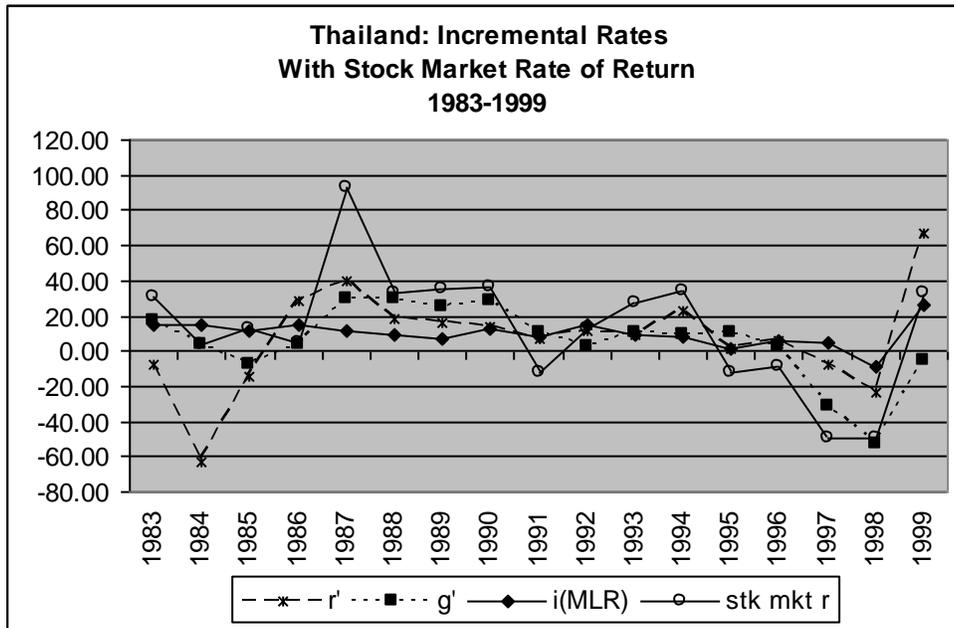
United States: The S&P500 was used. The observations are based upon the dollar.



Graph 1

Source: Author's calculations

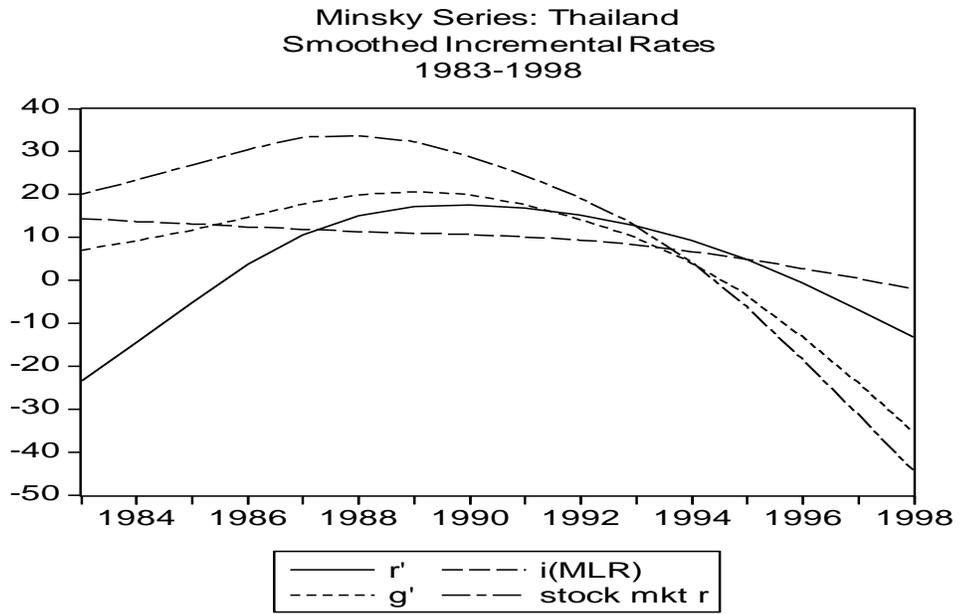
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Graph 2

Source: Author's calculations

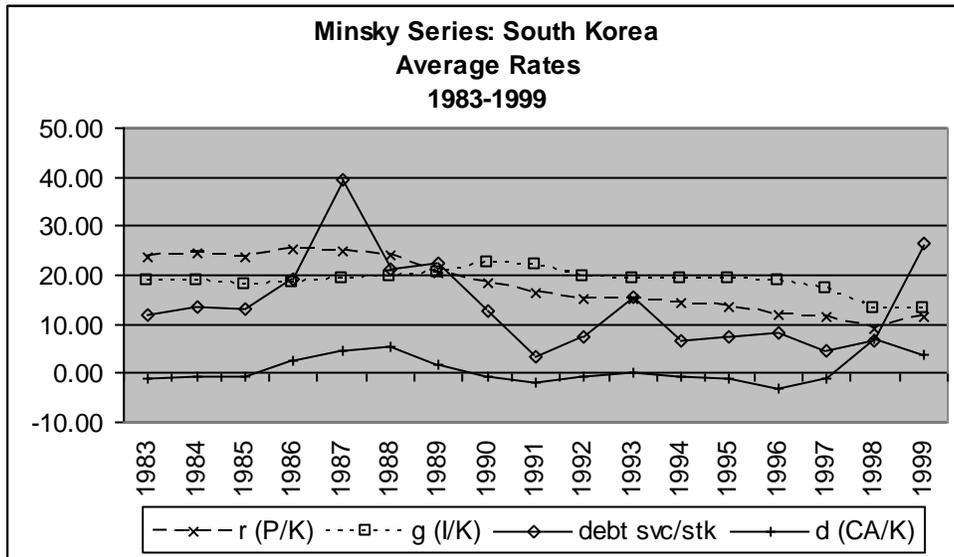
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Graph 3

Source: Author's calculations

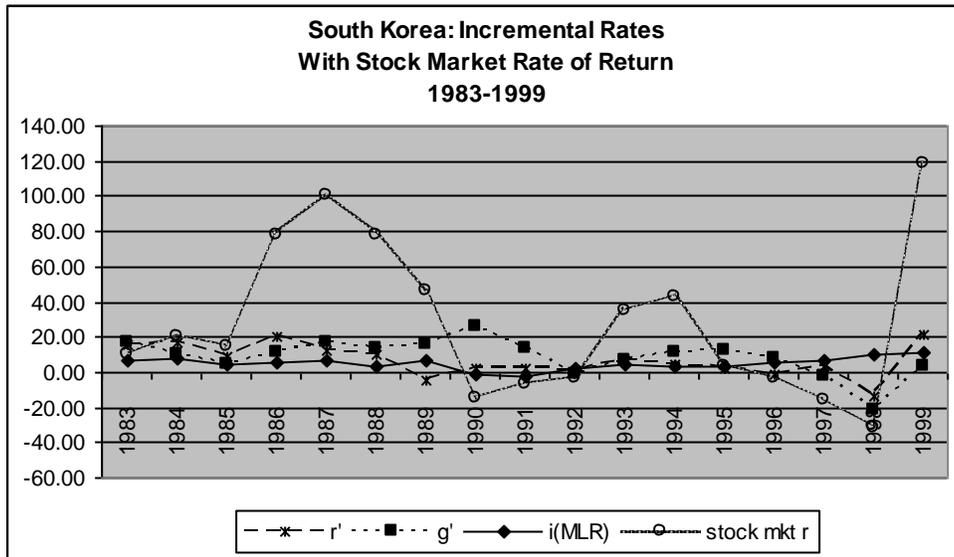
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Graph 4

Source: Author's calculations

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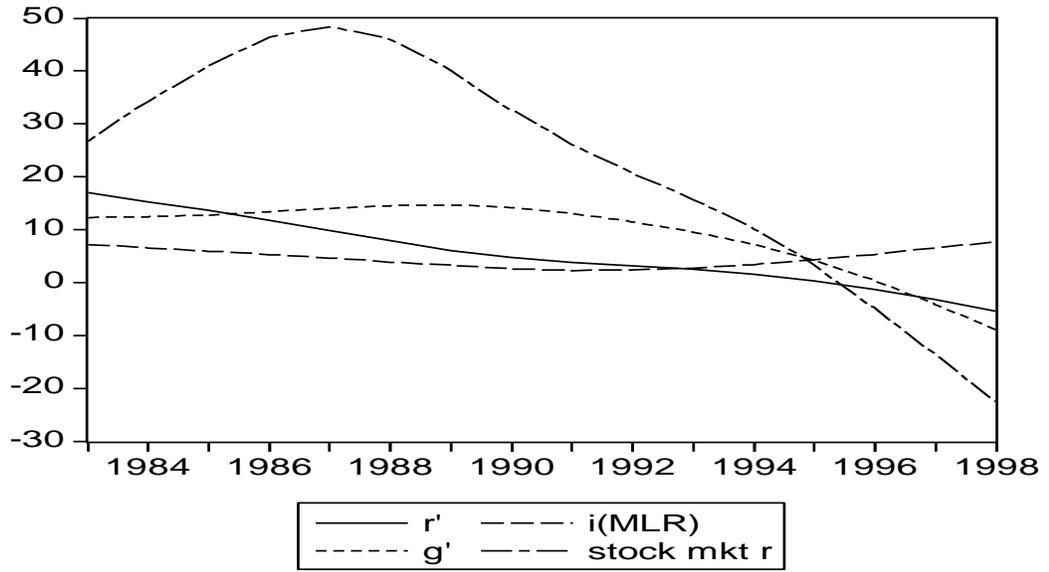


Graph 5

Source: Author's calculations

Minskian evolution,  
S. Schroeder, 12/14/2019

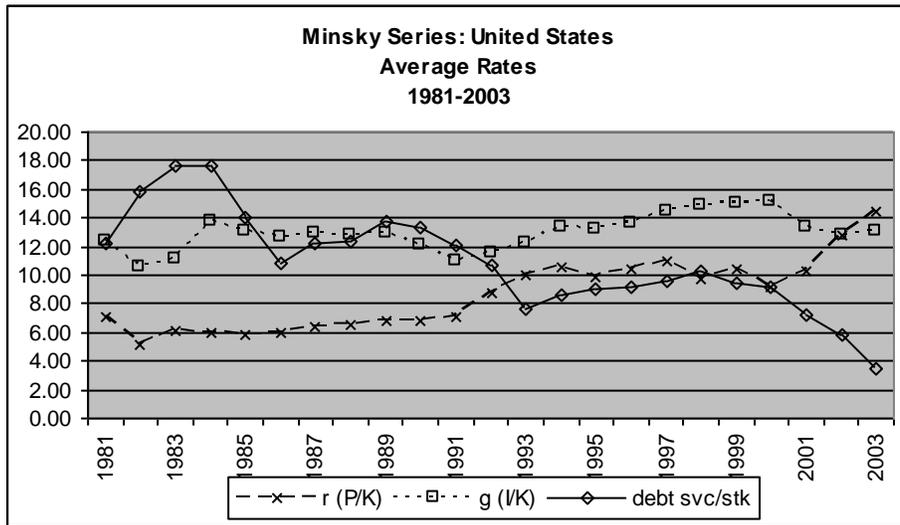
Minsky Series: South Korea  
Smooth Incremental Rates  
1983-1998



Graph 6

Source: Author's calculations

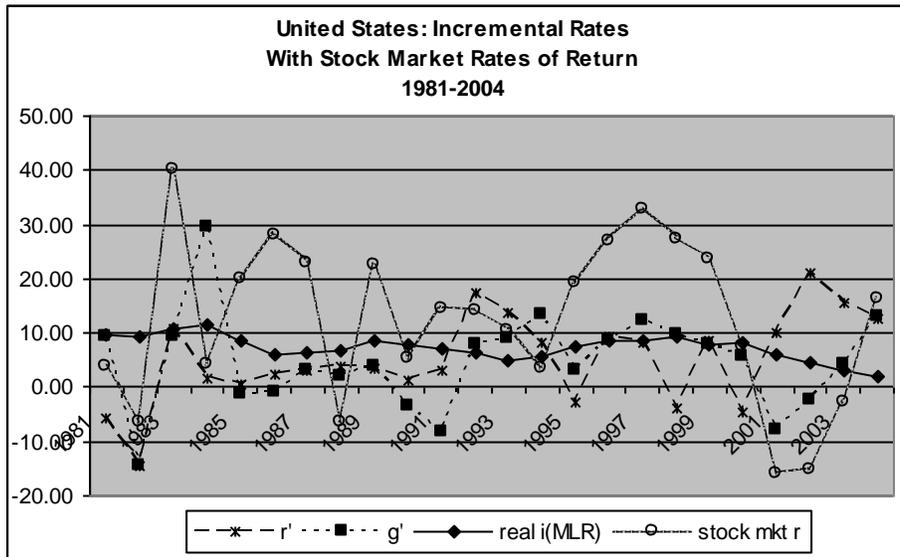
Minskian evolution,  
S. Schroeder, 12/14/2019



Graph 7

Source: Author's calculations

Minskian evolution,  
S. Schroeder, 12/14/2019

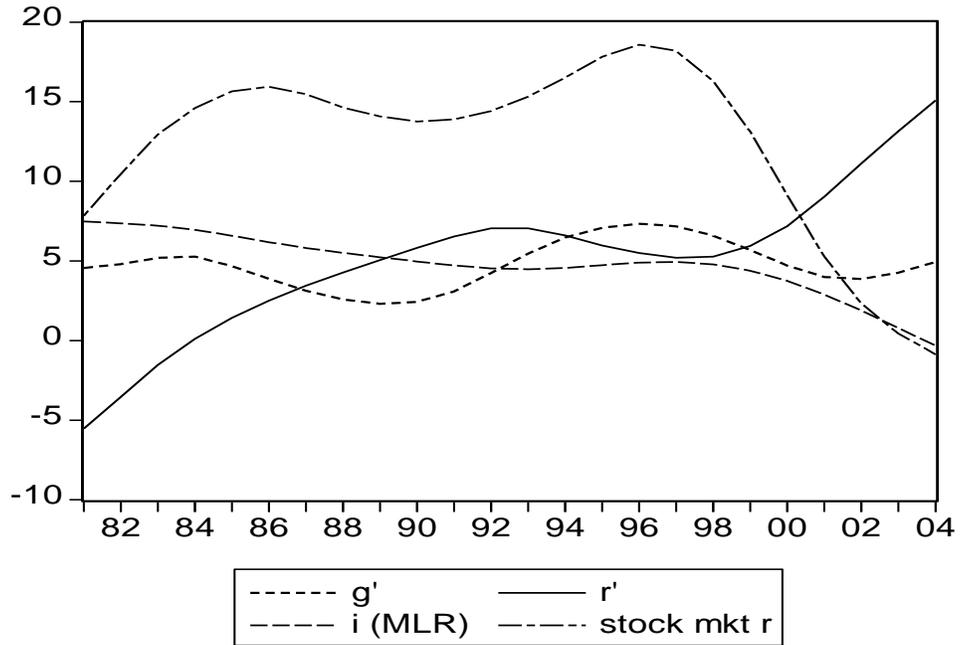


Graph 8

Source: Author's calculations

Minskian evolution,  
S. Schroeder, 12/14/2019

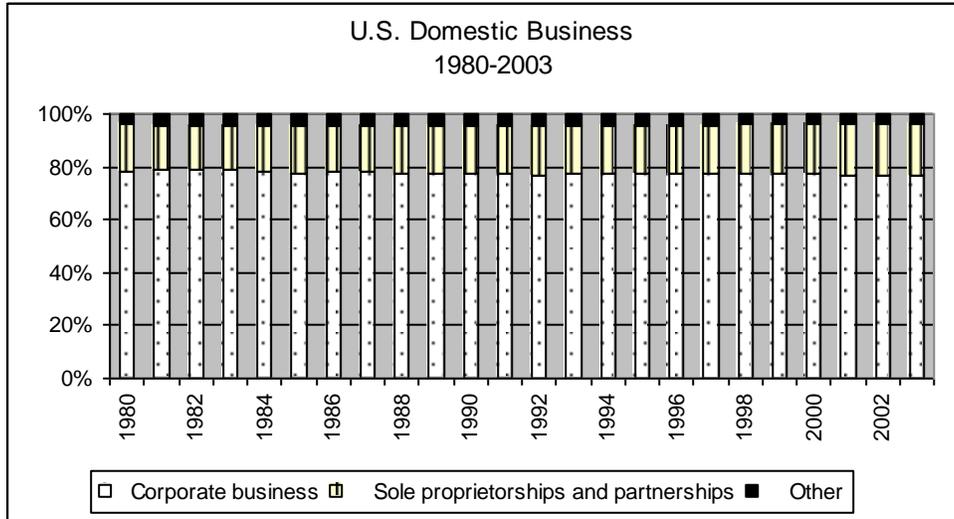
Minsky Series: U.S.  
Smoothed Incremental Rates  
1981-2004



Graph 9

Source: Author's calculations

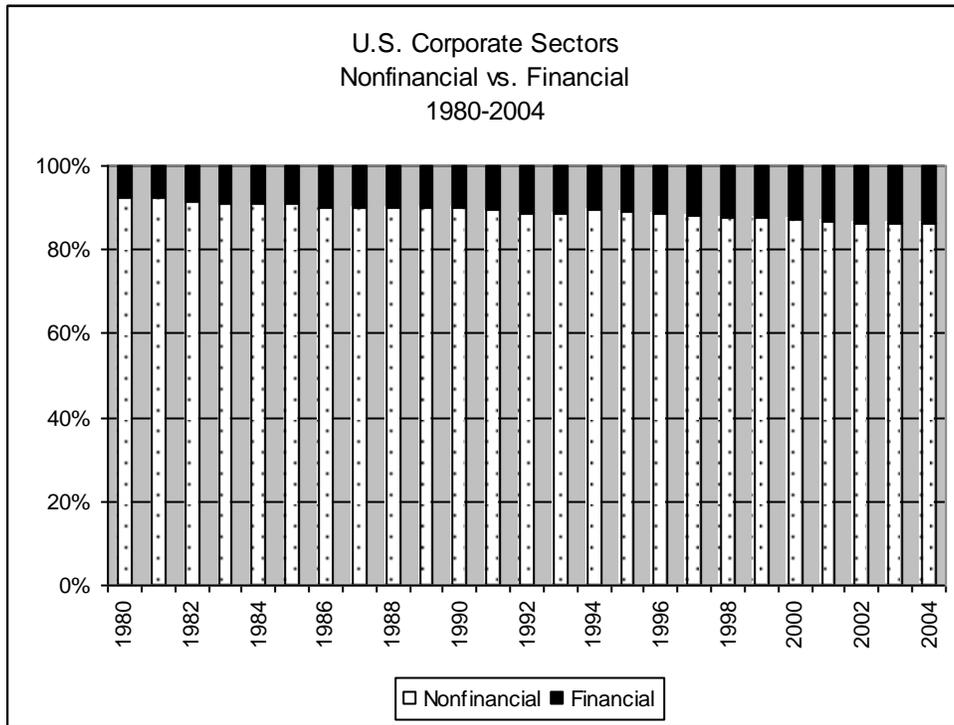
Minskian evolution,  
S. Schroeder, 12/14/2019



Graph 10

Source: Bureau of Economic Analysis, U.S. Department of Commerce, August 2004

Minskian evolution,  
S. Schroeder, 12/14/2019

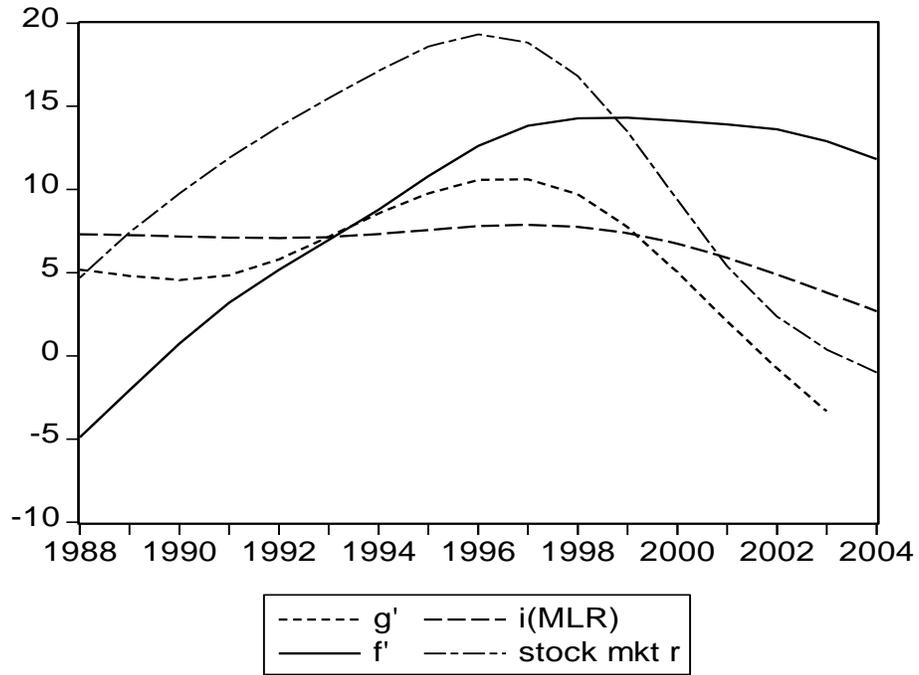


Graph 11

Source: Bureau of Economic Analysis, U.S. Department of Commerce, March 2005

Minskian evolution,  
S. Schroeder, 12/14/2019

U.S. Financial Corporate Sector  
Smoothed Incremental Rates  
1988-2004

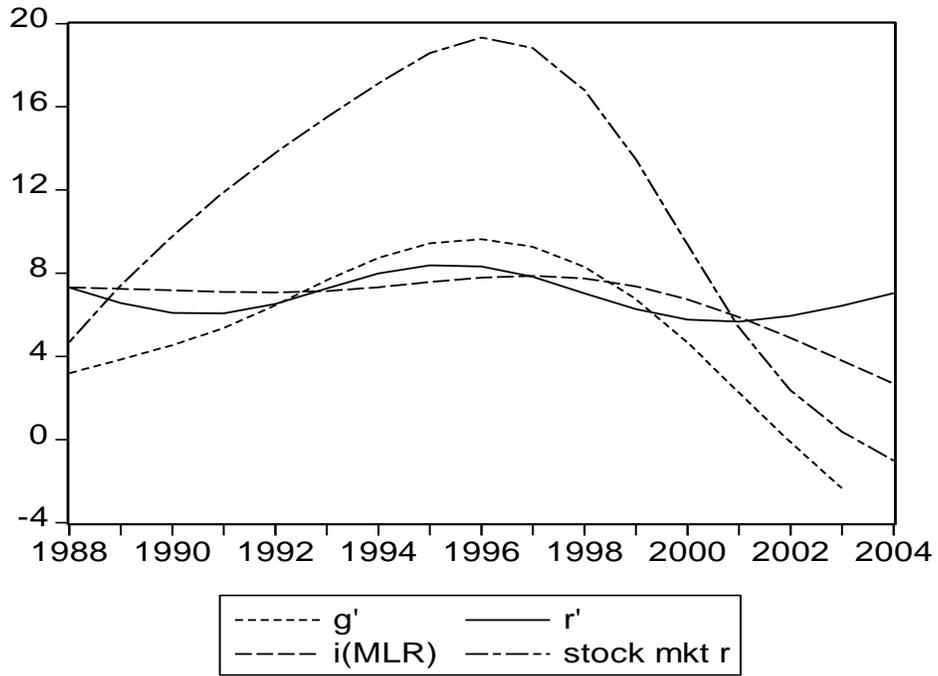


Graph 12

Source: Author's calculations

Minskian evolution,  
S. Schroeder, 12/14/2019

U.S. Nonfinancial Corporate Sector  
Smoothed Incremental Rates  
1988-2004

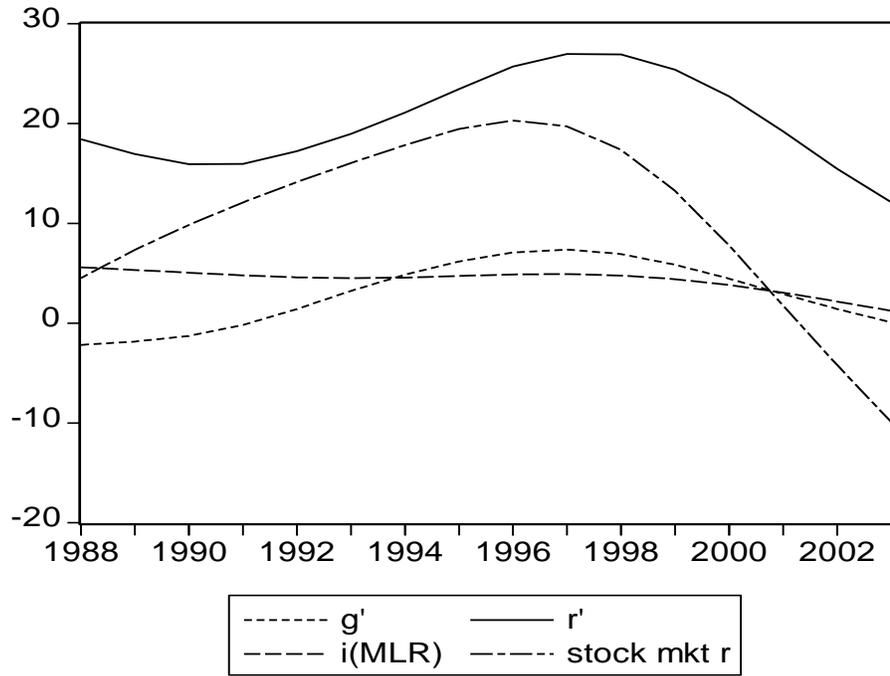


Graph 13

Source: Author's calculations

Minskian evolution,  
S. Schroeder, 12/14/2019

### U.S. Sole Proprietorships & Partnerships Smoothed Incremental Rates 1988-2004

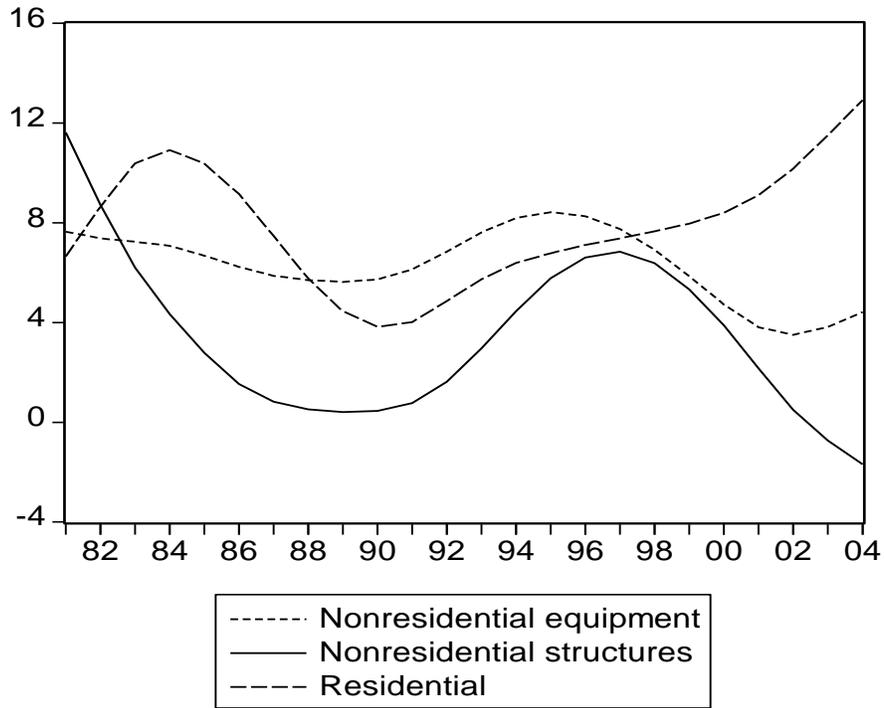


Graph 14

Source: Author's calculations

Minskian evolution,  
S. Schroeder, 12/14/2019

U.S.: Investment Decomposition  
Smoothed Incremental Rates  
1981-2004



Graph 15

Source: Author's calculations