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# “Ideal” Financial Development and Financial Overaccumulation

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**JEL codes:** G1, O4, C6

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## Abstract

In this paper, we examine whether there is an “ideal” level of financial development, somewhere between financial capital overaccumulation and financial capital underaccumulation. We construct indexes of non-bank or speculative financial development, financial (bank) deepening, and production. We find that financial deepening does support what we dub the “speculative spread,” that is, the difference between non-bank or speculative finance and real production. As financial deepening grows, the speculative spread may grow in step. Where the speculative spread exceeds deepening, financial instability may occur. Hence financial deepening may promote or constrain economic development.

## Introduction

The literature on the relationship between finance and growth has asked several important questions over the decades: first and foremost, it has asked whether financial development is important for growth. Second, it has asked whether the type of financial structure matters for economic growth and development. Third, it has asked whether the magnitude of financial investment is important to growth. Fourth, it has asked how the order of financial development affects economic growth.

For the most part, there has been a consensus that financial development at the macroeconomic level is important for growth, and, at the other end, many economists, particularly those who study financial crises, believe that financial *liberalization* at an early level of economic development can arrest growth<sup>2</sup>. However, an important question remains: what is the *optimal* level of financial development for economic growth, in both developed and developing countries? The study of speculative bubbles has shown that finance can arrest growth, creating a crisis when the bubble bursts, but it has not been shown outside of the literature on speculative finance and that on capital overaccumulation that financial development can become “too” large for the level of economic growth. In this paper, we test the hypothesis that there is an “ideal” level of financial development for the level of economic development that is best for stable economic growth.

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<sup>2</sup> Klein and Olivei (1999) find, in an empirical test, that financial liberalization between 1986 and 1995 resulted in financial deepening for developed countries, but did not result in increased financial deepening for developing countries.

The paper is structured as follows: Section One examines existing literature on the relationship between finance and growth. Section Two critically reviews a variety of theoretical precursors: Marx's overaccumulation of capital theory, the Harrod-Domar model, the "golden age" growth model of Phelps and others, and the overlapping generations model. Section Three operationalizes our hypothesis that non-bank financial development and financial deepening (measured largely through bank activity) are intricately connected through the productive capacity of the economy. Section Four tests the hypothesis and discusses the significance of our findings. Section Five concludes.

## **Section One. Literature on finance, development, and overaccumulation**

### ***Finance and development***

Financial deepening has mainly been defined in the literature in terms of development of the private banking sector. Goldsmith (1969), McKinnon (1973), and Shaw (1973) initiated the literature on financial deepening and its role in economic development. Goldsmith, studying 35 countries, found that on average periods of economic growth over time were accompanied by financial development. McKinnon viewed finance as easing constraints to production, as a bridge between entrepreneurship or productivity and growth. Finance would increase the efficiency of capital and reduce fragmentation, in which profit rates varied greatly throughout the economy.

The financial deepening literature has evolved over time. The literature inspired by McKinnon and Shaw is labeled "supply-leading" financial deepening theory, in which financial deepening produces economic development, while that illustrated by Ireland (1994) is called "demand-leading," in which economic development creates financial deepening. The argument in demand-leading theory was that as an economy grows and expands technologically, productive processes require additional financial resources. Financial development follows productivity. McKinnon, however, argued that in developing countries, traditional technology businesses often coexist with more modern businesses, making an allocation of financial subsidies to an industry as a whole inappropriate for efficient allocation of capital, since the traditional or the modern business may in fact be more productive. In his mind, economic development did not necessarily drive financial development at lower levels of production. And in fact, most scholars take the supply-leading view (Fritz 1984). Importantly, Gurley and Shaw (1960) state "...net output capacity depends only partly on the level of investment. It depends also on the efficient allocation of investment among alternative capital projects."

Levine (1997) provides an extensive literature review on the empirical relationship between finance and growth, and asserts a positive and first-order relationship between the two. Levine writes that the level of financial development likely influences not only the present level of economic growth, but also future economic growth and capital accumulation. Financial markets reduce market frictions such as information and transactions costs, and mobilize and allocate financial resources in an economy. Economic growth also affects financial development by expanding the introduction and advancement of financial institutions, but most literature has examined the effect of financial development on growth.

King and Levine (1993a, 1993b, 1993c), examining 80 countries between 1960 and 1989, finding that there is a strong positive relationship between financial development and growth. Financial

development indicators include the size of financial intermediaries, the degree to which the central bank versus commercial banks allocate credit, the percentage of credit allocated that is private, and the ratio of credit to private enterprises to GDP. Growth indicators include real per capita GDP growth, capital accumulation, and productivity growth. Financial depth in 1960, the authors find, is significantly correlated to each of the averaged growth indicators. King and Levine (1993c) also show that financial systems that allow for risk diversification accelerate technological change and economic growth.

Bencivenga and Smith (1992) write of the “optimal” level of financial repression in the context of an economy that must monetize its deficit, modeling the optimal level of repression through high reserve requirements or deposit interest rate ceilings using an overlapping generations model. The paper formalizes McKinnon’s (1982) discussion regarding the importance of the order of financial liberalization, emphasizing the necessity of changing fiscal policy before financial liberalization takes place. Roubini and Sala-i-Martin (1992) also model financial repression and long term growth, showing that governments that repress the financial sector in order to deliver inflationary revenues from an increased demand for money affect growth negatively.

Financial stability, as a general concept, has also been regarded as an important precursor to economic growth. Bernanke and Gertler (1990) construct a model in which financial instability creates high agency costs, resulting in low and inefficient investment. Bernanke and Gertler define financial instability at the micro level, occurring when a borrower can contribute less of his own funding to an investment project while holding more information about the project than the lender. The interests of borrower and lender diverge, creating agency costs. This leads to poor investment performance and hence to poor economic performance.

Unlike most of the financial deepening literature, Arestis and Demetriades (1997) include indicators of stock market development. By contrast to King and Levine (1993a, 1993b, 1993c), Arestis and Demetriades (1997) use time-series regression analysis to find that the relationship between financial development and economic growth is quite variable by country; the relationship cannot be generalized. The authors believe their results are better substantiated than cross-country regressions since time-series analysis captures more robustly the relationship between contemporaneous or lagged indicators and the dependent variable. Arestis and Demetriades find that the relationship between contemporaneous financial development and economic growth is much stronger than that between lagged financial development and economic growth, contradicting King and Levine’s finding, in their cross country regression, that financial development leads economic growth<sup>3</sup>.

But it could very well be that Arestis and Demetriades’ (1997) results are different because they include indicators of stock market development, which behaves quite differently than but in conjunction with bank development. In this paper, we find that bank financial development aids the development of non-bank (including stock market) financial development as it relates to production, which we refer to

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<sup>3</sup> The debate continued with Levine, Loyaza, and Beck (2000) and Beck, Levine, and Loyaza (2000), who take into account the issue of simultaneity of regressors. Christopoulos and Tsionas (2004) attempt to resolve technical issues by accounting for both issues of simultaneity of regressors and issues of integration and cointegration of the data, finding that indeed, financial deepening does impact economic growth in the long run.

as the 'speculative wedge.' We argue that a divergence of non-bank financial development as it relates to production from bank financial development results in overaccumulation of financial capital.

### ***Overaccumulation of capital***

The concept of capital overaccumulation, or divergence from a stable growth path, was first put forth by Marx, who described overaccumulation as a situation in which capitalists incorporate so much capital into the production process that the workers cannot purchase the goods produced. Later, Keynes also noted that the economy did not necessarily tend toward equilibrium in which neither overaccumulation nor underaccumulation of capital occurs. Refuting Say's Law, in which supply creates its own demand, Keynes found that crises of effective demand were real phenomena.

Overaccumulation of capital was considered in models that followed Keynes. Stability in economic growth was much more limited in these models, which assumed the economy could move away from "steady state" growth. This group of models includes the Harrod-Domar model and the "golden age" growth model of Phelps and others, including Robinson. The overlapping generations model, although neoclassical rather than Keynesian in methodology, also assumes the possibility of overaccumulation.

In the Harrod-Domar model, a particular level of investment was required for long-run capital outlay, and it was possible for the actual long run growth rate to diverge from stability. Besomi (2001) stresses that Harrod's original model was nonlinear, and based on changes in the business cycle, which also translated into long-run growth. But no matter; the fact was that the actual growth rate might diverge from the warranted growth rate, and the economy could become trapped in a cycle that required continuing further investment.

The "golden age" growth model was drawn up separately by several economists, here represented by Edmund Phelps. Phelps (1961) writes:

If there exists a golden-age growth path on which the social net rate of return to investment equals the rate of growth (hence, in one class of models, the fraction of output saved equals the capital elasticity of output)-or, in market terms, a golden-age path on which the competitive interest rate equals the growth rate and hence gross investment equals the gross competitive earnings of capital-then this golden age produces a path of consumption which is uniformly higher than the consumption path associated with any other golden age.

The "golden age growth path" is the most efficient growth path the economy may take (Phelps 1965). Phelps (1962) writes that the elasticity of the maximum path of growth to the investment ratio depends only on the capital elasticity of output.

Another type of ideal capital accumulation model is the neoclassical overlapping generations model, which is based on household and firm decisions which determine the size of the capital stock. The models were developed by Ramsey (1928), Cass (1965), and Koopmans (1965), who assumed that individuals live two periods, and by Diamond (1965), who assumed that new households could

continually enter the economy (Romer 2001). Overlapping generations models also make use of the “golden rule” of capital accumulation, such that the amount of capital in the next period is some function of the current level of capital.

Later neoclassical growth models did not allow for instability based on an ideal level of capital accumulation. In both exogenous and endogenous models, overaccumulation of capital resulted simply in the return to equilibrium. For example, in the Solow model, both capital and output in their steady state were determined endogenously at the equilibrium level. Exogenous neoclassical models have been critiqued by Garegnani (1984) and Harris (1970) for attributing inefficiencies to market inefficiencies, since the marginal product of capital equals the profit rate, both of which face decreasing returns. Hence persistent problems of unemployment, due to Keynesian shortage of effective demand, or problems of obtaining surplus value in the Marxist vein, have been increasingly neglected since the advent of the Solow model in 1956. Kaldor (1977) also sharply criticized the exogenous neoclassical model for implying that increasing the capital to labor ratio would increase the capital to output ratio, when he mainly attributed economic growth to increasing returns found in larger economies.

Endogenous growth models, introduced by Lucas (1988) and Romer (1986), among others, set out to address some of these issues<sup>4</sup>. Endogenous growth models, which allow the marginal product of capital to increase over time, face their own shortcomings; these models continue to preserve some of the basic assumptions of neoclassical economics that were criticized for their lack of realism in the exogenous models that preceded them. Long run growth is independent of the structural characteristics of the economy (Aghion and Howitt 1998), and capital overaccumulation is not possible.

McKinnon (1973), a founder of financial deepening theory, was not persuaded by the golden rule of growth, noting that in this type of model, “the life of monetary authorities is indeed idyllic (and perhaps a bit dull) with only a little more effort required on the fiscal side to keep the rate of aggregate investment properly adjusted. The banking-monetary system has no particular role to play in the process of capital accumulation, even though bankers and their public relations officers may have persuaded people otherwise.” The neoclassical model overall, he writes, leaves out proper consideration of the monetary system, and leads one to conclude that monetary policy is independent of the private savings rate and that money demand cannot be determined.

Although the work on capital overaccumulation inspired our current thesis, prior growth models focused on physical capital overaccumulation, while we focus on financial capital overaccumulation. Some work on financial capital overaccumulation has been done, but not much. Bello (2006) writes about financial overaccumulation in the sense that profitability of the financial sector rises far above the real (not stock inflated) profitability of the manufacturing and industrial sector. Investment may be incorporated into physical capital or goods, but if it is not used, where there is a lack of demand, profitability fails to result. Therefore, finance has created what Bello calls “superficial boom[s]” in the developed world.

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<sup>4</sup> Additional growth models, such as that by Grossman and Helpman (1991), included invention in the growth process.

Financial capital overaccumulation is possible when production cannot absorb finance in a sustainable fashion. This is demonstrated by speculative bubbles and capital inefficiencies. One way to state this is that if the profit rate of finance is larger than the profit rate of industry, instability will arise since finance is overleveraged.

To some degree, this type of thinking is illustrated in the work of Hyman Minsky, who wrote that finance can move from a hedge state, to a speculative state, to Ponzi financing. Although in reality hedge financing can coexist alongside speculative or Ponzi financing, thus making it unclear when one state dominates, Minsky provides a vein of thinking similar to that which we emphasize. Finance is tied to the business cycle, with credit expansion being procyclical (Minsky 1991). As production increases, finance moves from hedge to speculative, and a sharp decline in production is associated with Ponzi financing.

We write in a similar vein. While logically, an excess creation of machines (physical capital) is possible, since the labor supply that can use the machines or purchase their output is limited, an excess of financial capital has not been discussed in the literature. In fact, most economists, both orthodox and heterodox, would ask whether it is at all possible to have “too much” financial capital. We believe financial capital can be excessive, and when excessive, pernicious. But unlike Bello (2006), we do not think that the relationship between financial capital and the real sector is direct. Rather, the real sector as it relates to non-bank financial capital is supported by bank financial capital.

Some models have pursued speculative finance, which is one pathway toward overaccumulation. For example, Caballero, Farhi and Hammour (1994) create a model in which speculative finance, a case in which interest rates exceed the growth rate of the economy, can continue to create booming investment, but when a speculative growth path crashes, the bubble may also crash.

### **Section Three. Operationalization of hypothesis**

We posit that for any level of economic development, if the growth of finance is less than or equal to the growth of production, an increase in financial deepening is necessary. Conversely, if the growth of finance is greater than the growth of production, a decrease in financial deepening is necessary. This is not easy to operationalize, since both financial deepening and production are heterogeneous; there is no average representation of either. We can start with a general hypothesis as follows.

For any  $E$ :

Where  $F - P < kD$ ,  $F - P$  must increase;

where  $F - P > kD$ ,  $F - P$  must decrease (for high income countries) or  $D$  must increase (for low income countries).

where  $F$  is the index of finance,  $P$  is the index of production,  $D$  is the index of financial deepening,  $E$  is the level of economic development, and  $k$  is a positive parameter.

We first construct indices for non-bank financial development, production, and financial deepening. We use two equally weighted variables in the financial deepening index  $D$ . The variables representing

financial deepening have been used in prior work by King and Levine (1993b ) and include measures of liquid liabilities to GDP (DEPTH)<sup>5</sup> and gross claims on the private sector to GDP (PRIVY)<sup>6</sup>, normalizing on the smallest data point, Peru in 1990.

We use our own index to measure non-bank financial development  $F$ , including equal weights of the ratio of other financial institutions to GDP (OTHER) and stock market capitalization to GDP (STOCK)<sup>7</sup>, normalizing by the smallest data, in this case Uruguay in 1995.

We also use our own index to measure production  $P$ , including equal weights of the Industrial Production Index<sup>8</sup> and the Agricultural Output Index<sup>9,10</sup>. Since these production index components have already been normalized (indexed), we use the composite production index  $P$  directly. We compare indices of finance and production to construct a binary variable indicating whether non-bank financial development is greater than production. We note that the correlation between production and non-bank financial development is negligible, at 32 percent, while the correlation between non-bank financial development and financial deepening is moderate, at 48 percent.

We then examine the relationship between the difference between non-bank financial development and production (the 'speculative wedge,' versus financial deepening. In order to do this, we subtract the production index from the non-bank financial development index, and regress this on the financial deepening index upon this index as well as other control variables. Importantly, we note that correlation between the speculative wedge and the financial deepening index is low to moderate, not high.

The relationship between the speculative wedge (transformed by adding 200 to make it positive, and take the natural log) and the financial deepening index is as follows:

**Figure. Financial Deepening Index versus Speculative Wedge Transformation**

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<sup>5</sup> Data from Beck and Demirgüç-Kunt (2009).

<sup>6</sup> PRIVY calculated from IFS 32d/GDP. We do not use Levine's measure PRIVATE, which is calculated from IFS 32d/(32a through 32f, excluding 32e), since there are numerous gaps in the data, limiting the number of observations.

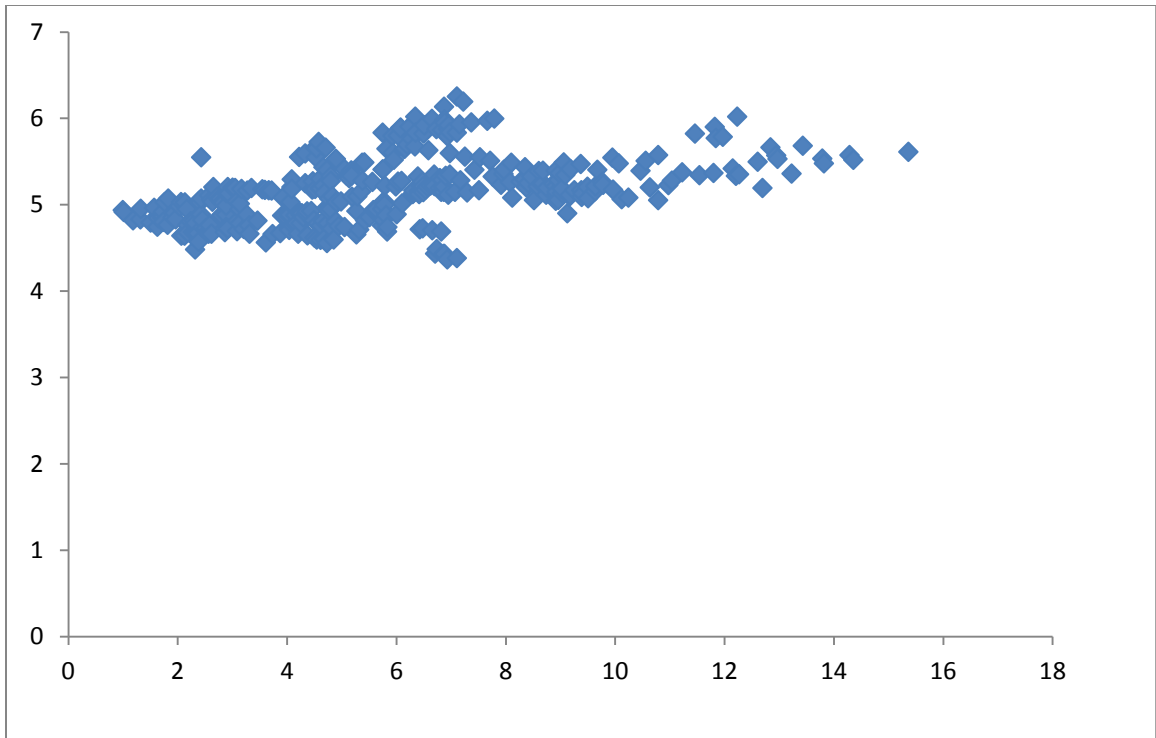
<sup>7</sup> All data for  $F$  index from Beck and Demirgüç-Kunt (2009). We had, and removed, the indicators public bond market capitalization to GDP and bank returns on assets because they were not significant in determining the level of economic development (GDP per capita).

<sup>8</sup> Laspeyres' index number of total value-added in all industrial production, where value added is the value of output less the values of both intermediate consumption and consumption of fixed capital. (United Nations, annual, Series P).

<sup>9</sup> Based on the sum of price-weighted quantities of different agricultural commodities produced after deductions of quantities used as seed and feed weighted in a similar manner. All the indices at the country, regional, and world levels are calculated by the Laspeyres formula. Production quantities of each commodity are weighted by average international commodity prices in the base period and summed for each year. To obtain the index, the aggregate for a given year is divided by the average aggregate for the base period. The commodities covered in the computation of indices of agricultural production are all crops and livestock products originating in each country. Practically all products are covered, with the main exception of fodder crops.

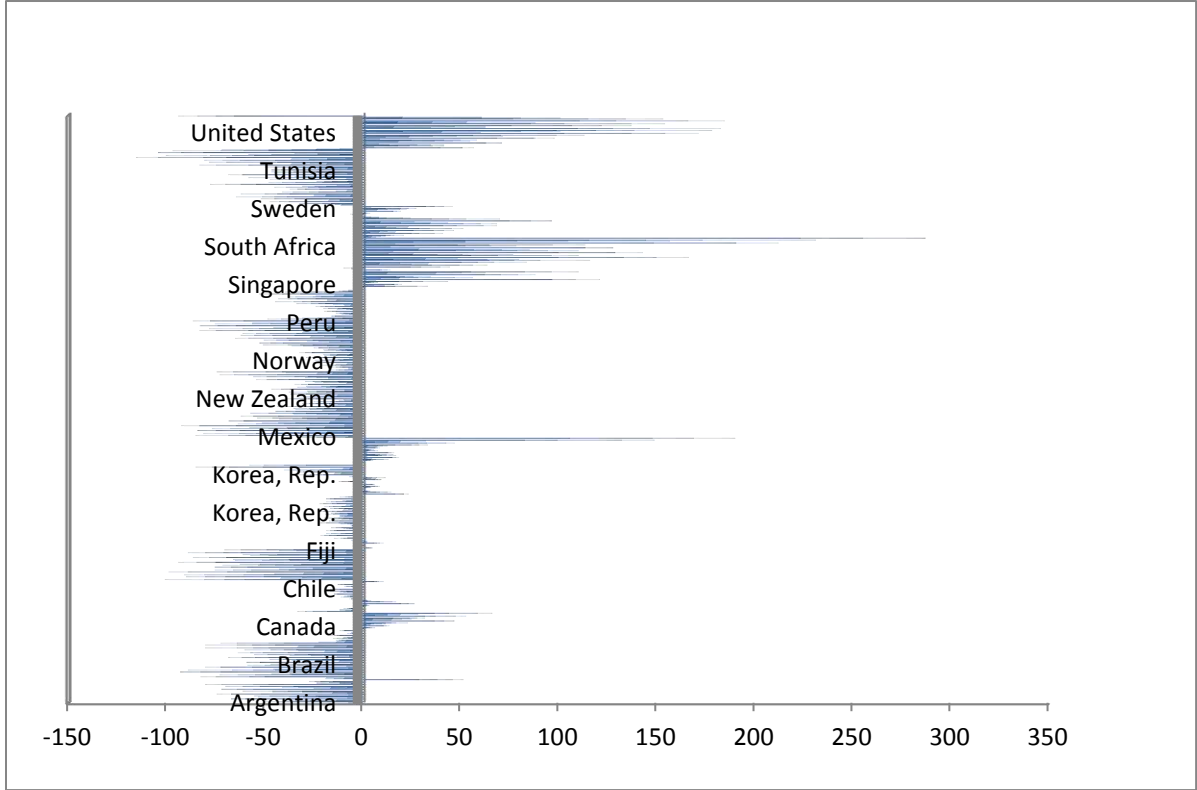
<sup>10</sup> Both the IPI and API are taken from Eurostat.





The speculative wedge, by country is as follows:

Figure. Speculative Wedge by Country



The regression equations we use are as follows:

**Constant Coefficients Model**

The constant coefficients model is as follows:

$$FIN\_PROD_{it} = \alpha_1 + \beta_1 DEEP\_IND_{1it} + \beta_2 GDPPERCAP_{2it} + e_{it}$$

**Time Fixed Effects Model**

$$FIN\_PROD_{it} = \alpha_1 + \lambda_2 Year1977 + \lambda_3 Year1978 + \dots \lambda_{32} Year2008 + \beta_1 DEEP\_IND_{1it} + \beta_2 GDPPERCAP_{2it} + e_{it}$$

The individual year effects are insignificant. If we group according to 2 or 3 groupings by years (1977-93, 1994-2008 or 1977-88, 1989-1999, 2000-2008), one grouping (1977-1988) is significant at the 5% level, but on the whole these yearly categorizations are not statistically justified using cluster analysis. If we set up an indicator that denotes whether the observation is between 1990 and 1999, when speculative markets grew rapidly, the category is significant and justified by cluster analysis. The regression equation looks like this:

$$FIN\_PROD_{it} = \alpha_1 + \lambda_2 YearNineties + \beta_1 DEEP\_IND_{1it} + \beta_2 GDPPERCAP_{2it} + e_{it}$$

**Time and Country Fixed Effects Model**

$$FIN\_PROD_{it} = \alpha_0 + \alpha_1 country + \alpha_2 country + \dots \lambda_0 + \lambda_1 Year1977 + \lambda_2 Year1978 + \dots \lambda_{31} Year2008 + \beta_1 DEEP\_IND_{1it} + \beta_2 GDPPERCAP_{2it} + e_{it}$$

Individual country effects are significant but not meaningful. We are interested in the differences in financial deepening effects of the speculative spread between groups of countries. Therefore, we divide countries into OECD and non-OECD countries. These categories are statistically justified through cluster analysis. We again use the year classification ‘Nineties.’ Therefore, we arrive at the following regression equation:

$$FIN\_PROD_{it} = \alpha_0 + \alpha_1 OECD + \lambda_2 YearNineties + \beta_1 DEEP\_IND_{1it} + \beta_2 GDPPERCAP_{2it} + e_{it}$$

**Section Four. Findings**

We first look at the regression results, then turn to country case studies to test the hypothesis.

**Constant Coefficients Model**

$$FIN\_PROD_{it} = \alpha_1 + \beta_1 DEEP\_IND_{1it} + \beta_2 GDPPERCAP_{2it} + e_{it}$$

	Parameter Estimate	T Value	P Value
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Intercept	-83.55606	-11.03	<.0001
GDP Per Capita	0.00234	6.89	<.0001
Financial Deepening Index	8.18343	6.51	<.0001
N	370		
R <sup>2</sup>	29%		
Adjusted R <sup>2</sup>	29%		
F Value	75.26		
Pr > F	<.0001		

The financial deepening index and GDP per capita are both significant, with the financial deepening index having a much greater impact on the speculative index FIN\_PROD.

### Time Fixed Effects Model

The time fixed effects model looks as follows:

$$FIN\_PROD_{it} = a_1 + \lambda_2 YearNineties + \beta_1 DEEP\_IND_{1it} + \beta_2 GDPPERCAP_{2it} + e_{it}$$

	Parameter Estimate	T Value	P Value
Intercept	-70.32386	-7.10	<.0001
GDP Per Capita	0.00253	7.21	<.0001
Financial Deepening Index	8.12124	6.48	<.0001
Nineties (1=1990-1999)	-18.06534	-2.06	0.0401
N	370		
R <sup>2</sup>	30%		
Adjusted R <sup>2</sup>	29%		
F Value	52.03		
Pr > F	<.0001		

The financial deepening index and GDP per capita continue to be significant, as was the decade of the nineties. The impact of GDP per capita was again low but still significant.

### Time and Country Fixed Effects Model

The equation for the time and country fixed effects was as follows:

$$FIN\_PROD_{it} = a_0 + a_1 OECD + \lambda_2 YearNineties + \beta_1 DEEP\_IND_{1it} + \beta_2 GDPPERCAP_{2it} + e_{it}$$

Therefore, we have:

	Parameter	T Value	P Value
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	Estimate		
Intercept	-69.39916	-6.88	<.0001
GDP Per Capita	0.00266	6.02	<.0001
Financial Deepening Index	8.08247	6.43	<.0001
Nineties (1=1990-1999)	-18.38728	-2.09	0.0374
OECD (1=OECD)	-4.47935	-0.50	0.6149
N	370		
R <sup>2</sup>	30%		
Adjusted R <sup>2</sup>	29%		
F Value	29.01		
Pr > F	<.0001		

OECD is not significant, while the financial deepening index, GDP per capita, and the nineties period continue to be significant. The impact of GDP per capita on the speculative spread is again low.

But this analysis is not the whole story. Our hypothesis was as follows:

For any  $E$ :

Where  $F - P < kD$ ,  $F - P$  must increase;

where  $F - P > kD$ ,  $F - P$  must decrease (for high income countries) or  $D$  must increase (for low income countries).

where  $F$  is the index of finance,  $P$  is the index of production,  $D$  is the index of financial deepening,  $E$  is the level of economic development, and  $k$  is a positive parameter.

We have found that there is a close relationship between financial deepening (banking development) and the speculative wedge (non-bank financial development over and beyond production). In addition, economic development as measured by GDP per capita is important, but the impact of GDP per capita on the speculative wedge (the regression coefficient) is close to zero. The nineties time period, but not the country grouping (OECD) matters as a control variable.

Have we arrived at the conclusion of our hypothesis? Not yet. We incorporate a crisis indicator to identify crisis countries and years. We found this to be insignificant in our regression. Speculation may really occur just before a crisis, but even looking at this indicator we find it to be insignificant in regression analysis.

Hence we use a more primitive method of analysis to look at patterns in the data. Using a rough estimate of the financial deepening coefficient per the regression analysis (close to 8), and subtracting the intercept from the dependent variable, we examine numbers that demonstrate the trends of the speculative wedge and the financial deepening index\*8.

First, we divide the countries into low, middle, and high income countries by the most recent World Bank categorization (based on GDP per capita in recent years).

Representing low income countries is Nigeria. Lower middle income countries include Jordan, Peru, Philippines, and Tunisia, while upper middle income countries include Brazil, Fiji, Mexico, Argentina, Chile, Malaysia and South Africa. High income countries include Norway, Canada, Korea, Singapore, Sweden, Trinidad and Tobago, and the United States. Graphs of the financial deepening and speculative wedge indices are shown in the Appendix.

Of the countries listed below, the following countries have been through financial crises: Philippines (mild participation in Asian Crisis 1997-99), Brazil (eighties debt crisis 1982-89, Asian financial crisis 1998), Mexico (eighties debt crisis starting 1982, 1994 peso crisis), Norway (banking crisis 1988-93), Korea (Asian crisis 1997-99), Argentina (eighties debt crisis 1982-89, Argentine crisis 2000-1), Chile (eighties debt crisis 1982-89), Malaysia (Asian crisis 1997-99), Singapore (mild participation in Asian Crisis 1997-99), Sweden (banking crisis 1991-93), and the United States (2008 to present).

Country	Years covered	Excess speculation years	Crisis years	Average excess speculation, over all years covered	Average excess speculation during excess spec. years	Average excess speculation during two years preceding crises
Argentina	1988-2008	1988, 1990-91, 2000-03	1982-89, 2000-01	-1	28	-18
Brazil	1992-2007	2007	1982-89, 1998	-15	3.78	-9
Canada	1989-2006	Entire covered period	None	37	37	N/A
Chile	1989-2008	Entire covered period	1982-89	40	40	Insufficient data
Fiji	1995-2008	None	None	-35	None	N/A
Jordan	1979-2000	1979-91, 1993-94, 1996-99	None	16	50	N/A
Korea	1977-2005	1977-2000	1997-99	38	48	53
Malaysia	1978-1994	Entire covered period	1997-99	65	65	221 (in 1994)
Mexico	1998-2008	None	1982-89, 1994	-20	None	Insufficient data
Nigeria	1978-1992	1978-1990	None	17	21	N/A
Norway	1989-2003	Entire covered period	1988-93	17	17	Insufficient data

Peru	1990-2008	1990-96, 2008	None	-4	13	N/A
Philippines	1977-1995	Entire covered period	1997-99	35	35	50
Singapore	1995-2008	1995-2007	1997-99	74	82	78
South Africa	1989-2008	Entire covered period	None	201	201	N/A
Sweden	1989-2008	Entire covered period	1991-93	90	90	72
Trinidad and Tobago	1989-2008	1989-91, 1997-99, 2004-05, 2007	None	2	14	N/A
Tunisia	1993-2008	None	None	-46	None	N/A
United States	1989-2008	Entire covered period	2008	182	182	227

We find that for crisis countries, pre-crisis data in which the excess speculation index is higher than the average excess speculation is often telling, and sometimes not. The analysis works in the cases of Brazil, Korea, Malaysia, Philippines, Singapore, and the United States, but does not work in the cases of Argentina and Sweden. The case for application of this index is greatest in countries in which the pre-crisis excess speculation index is greater than the average for non-crisis excess speculation years, as in the cases of Korea, Malaysia, the Philippines, and the United States, but not for Argentina, Brazil, Singapore and Sweden. Hence, given our constrained data availability, the excess speculation spread can predict crisis about half of the time when crises occur. The excess speculation spread can be a warning signal during periods of excess speculation and no crisis—crisis may not occur but is possible. This has been true for all of the countries except Fiji, Mexico, and Tunisia. Thus the excess speculation spread is prone to alerting to false positives.

Finally, we ask, is this type of analysis useful? In its crude form, with a lack of data, the excess speculation index appears that it may be useful in predicting crises for countries when used with other indicators that can determine risk. However, simply avoiding crisis should be the weakest goal of economic policy; maintaining a strong, vibrant and stable economy should be the strongest. In the latter case, in our judgment the excess speculation index can serve as a guide in determining whether to curb speculative activity or to increase the level of financial deepening in order to maintain speculative activity. For when speculative activity crashes, it is the banking and monetary institutions that are forced to stabilize economic activity. Therefore financial deepening can be thought of as a base from which economic activity and speculative (riskier) financial activity can be built.

This latter analysis lacks elegance but in future research shall be refined. For now, we simply make the case that financial capital can lead to overaccumulation in the form of speculation, which creates the possibility that economic instability will occur. When the speculative wedge greatly exceeds the

financial deepening index, either speculation must be reduced, or financial (bank) deepening must occur in order to stabilize the economy.

### **Section Five. Conclusion**

We construct a model that states where there is excess speculation over production and financial deepening, policy must strive to decrease speculation or increase financial deepening. This represents financial capital overaccumulation. In the converse case, there is financial capital underaccumulation and there is more room for speculative activity in the form of non-bank financing. Future research shall refine the methodology used in this paper to streamline and make rigorous the argument for financial overaccumulation. However, we have put forth a case for financial overaccumulation that has been lacking in the literature.

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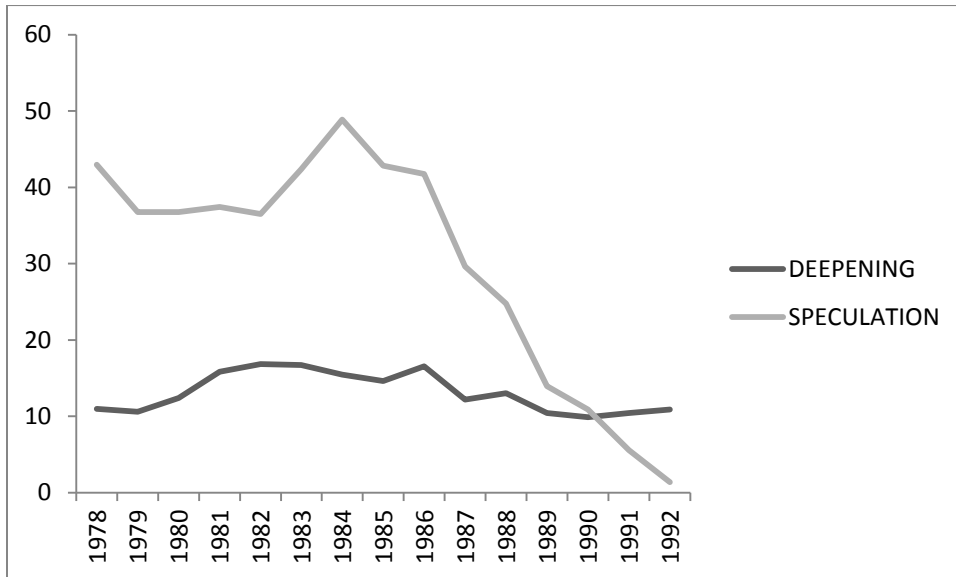
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## Appendix

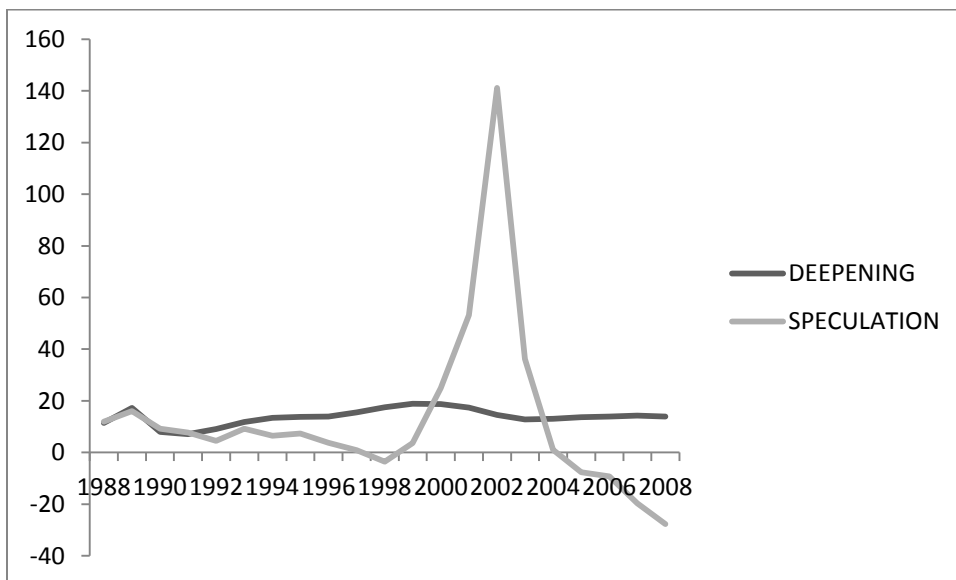
### WORLD BANK LOW INCOME COUNTRIES

Nigeria

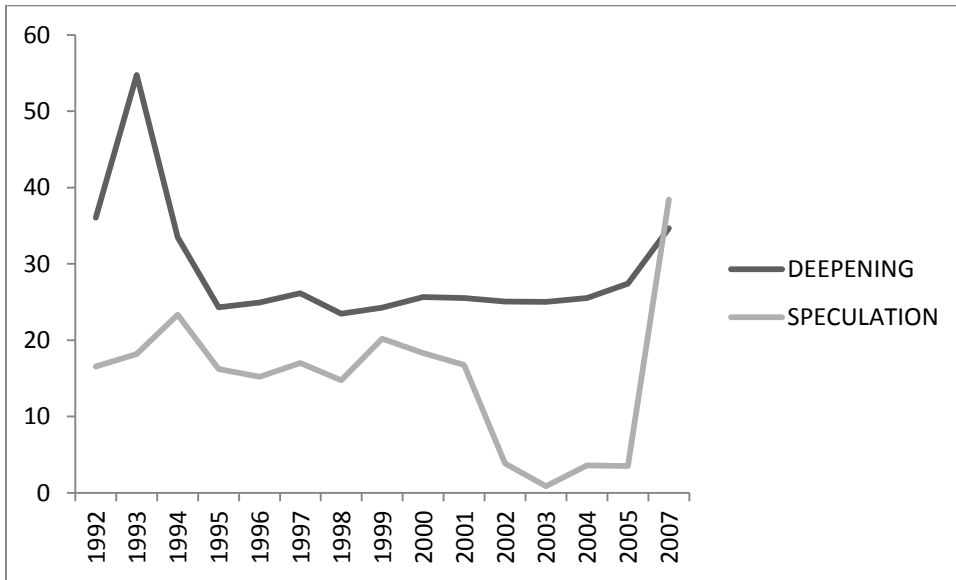


### WORLD BANK MIDDLE INCOME COUNTRIES

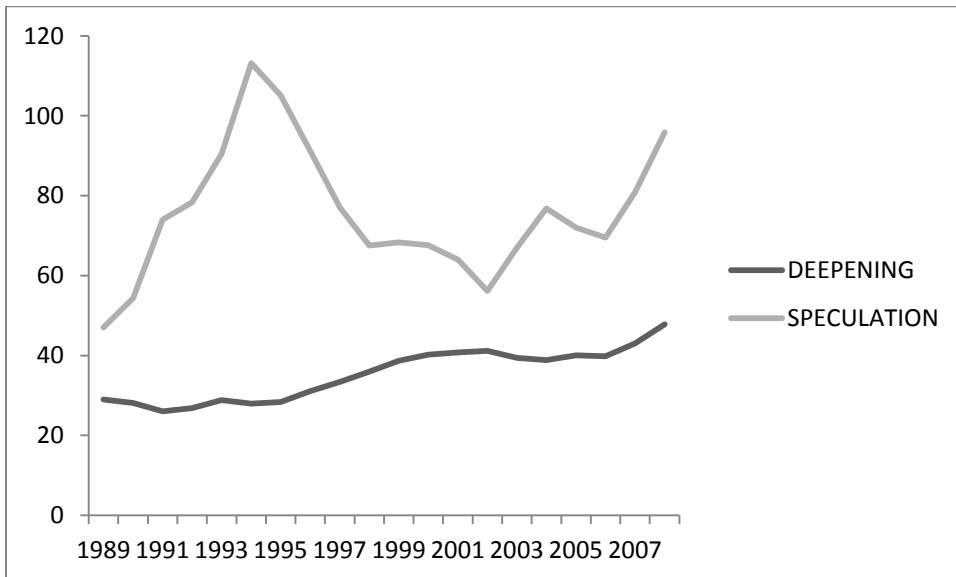
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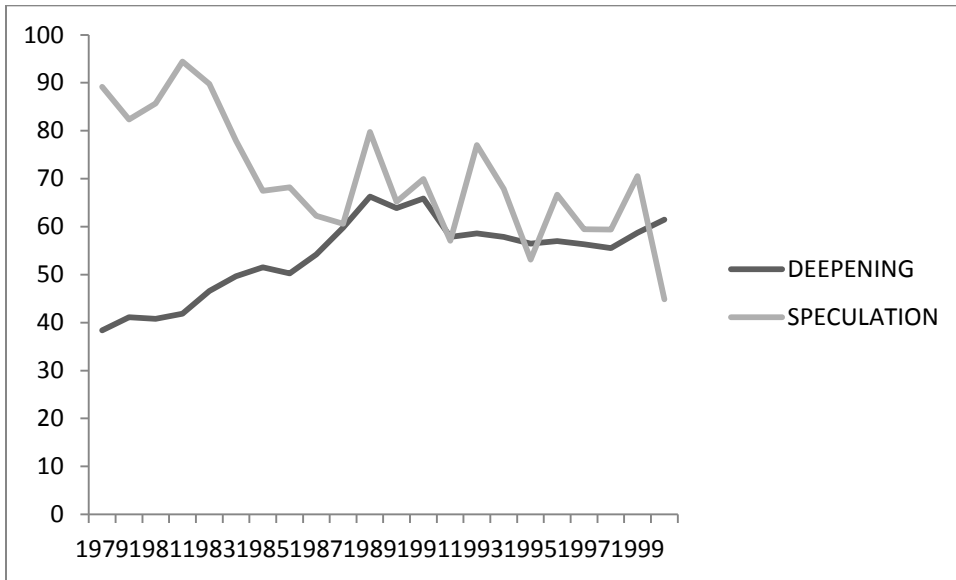
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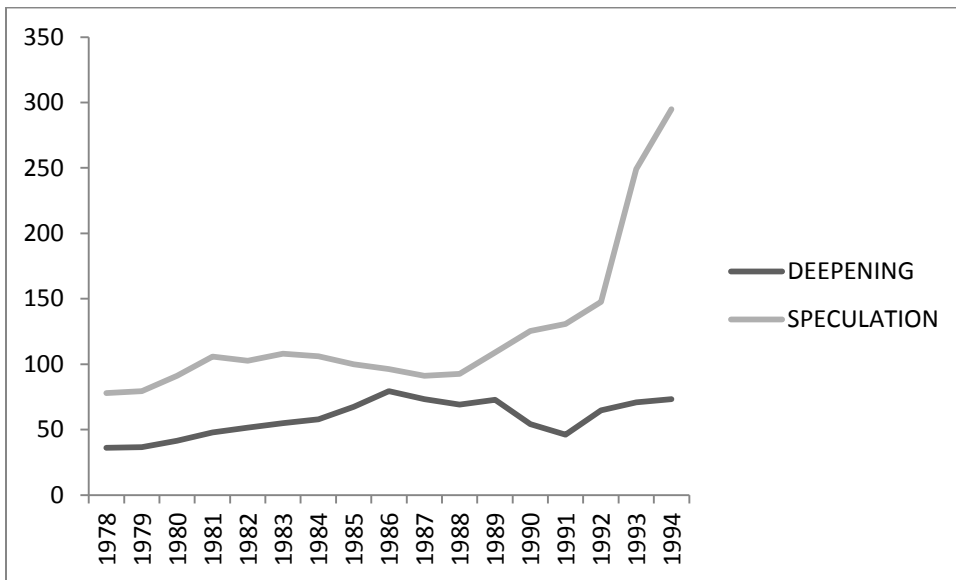
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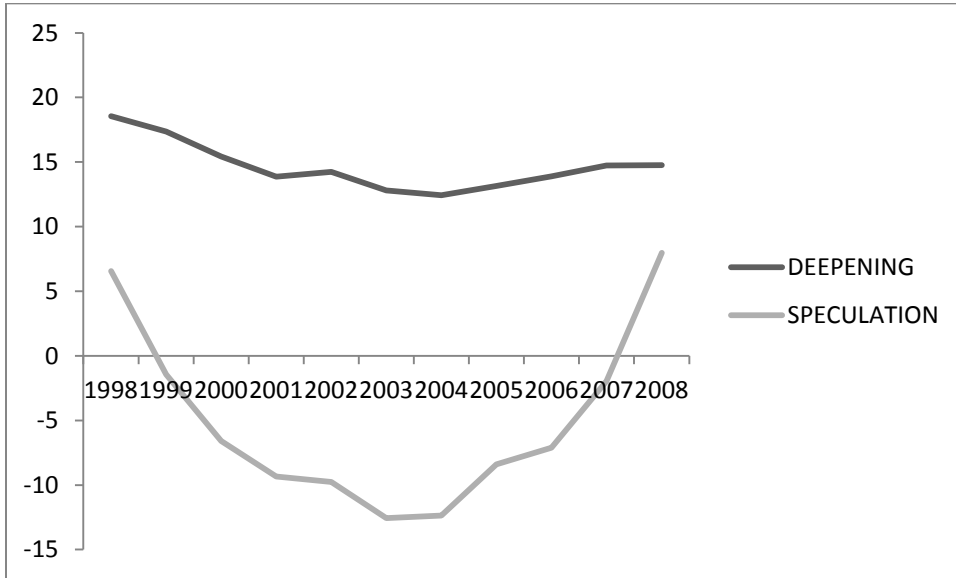
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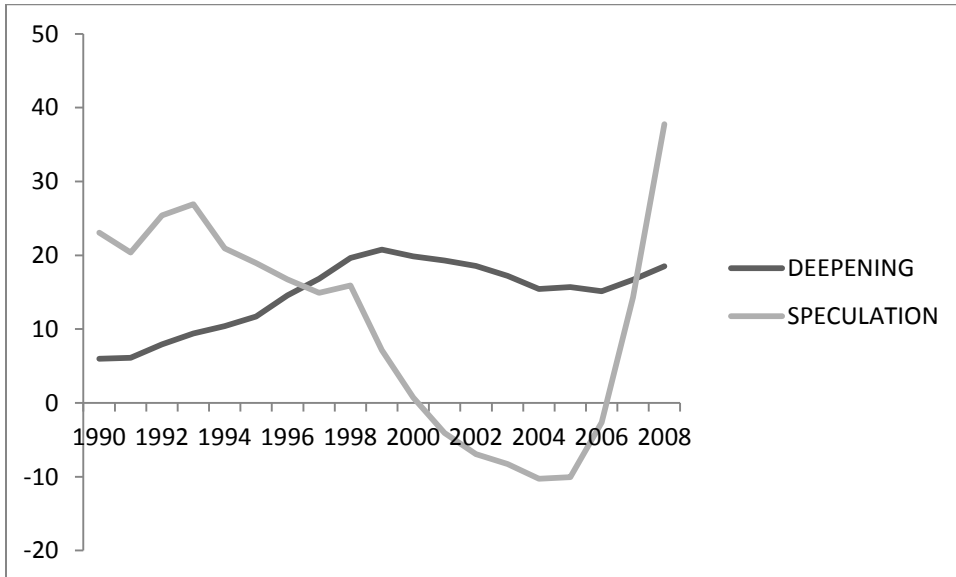
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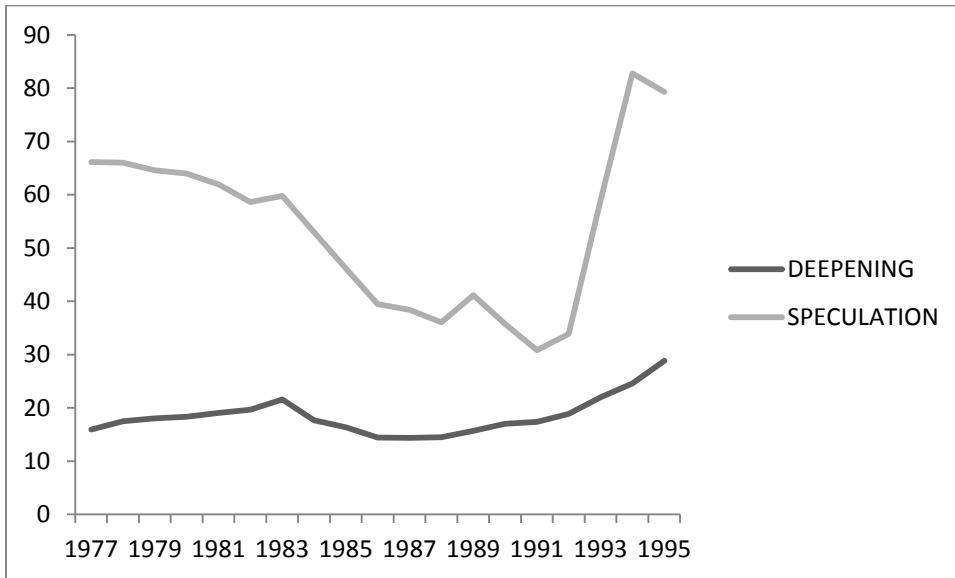
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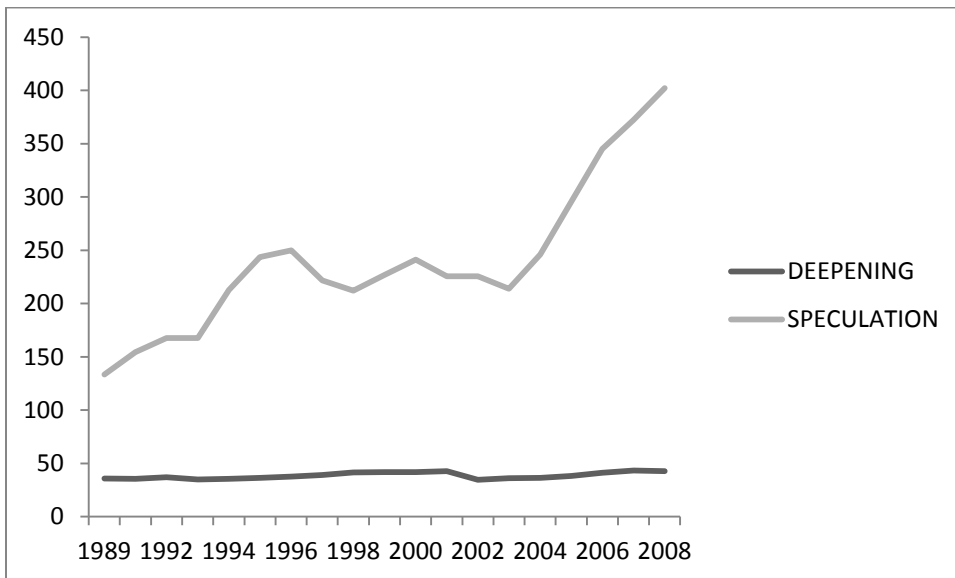
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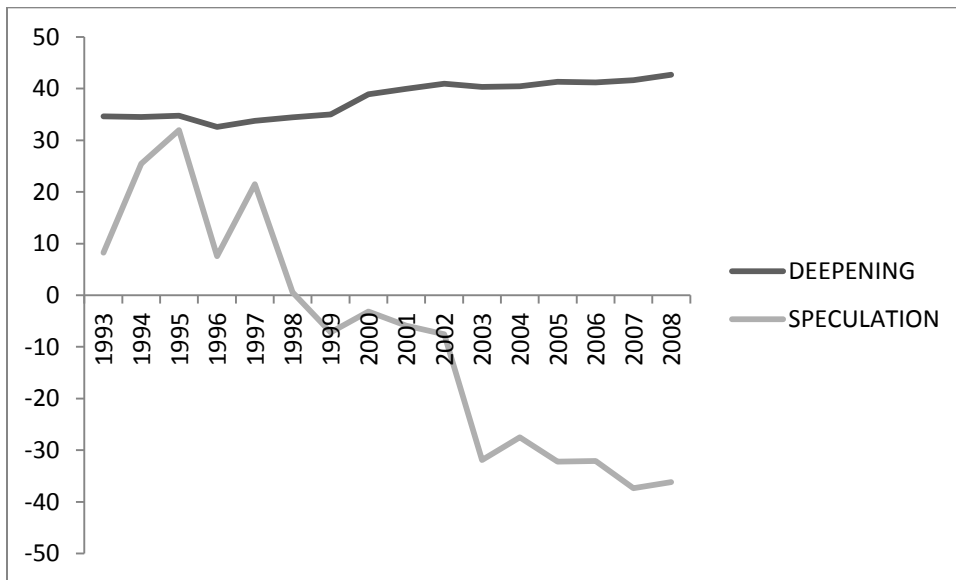
## Philippines



## South Africa

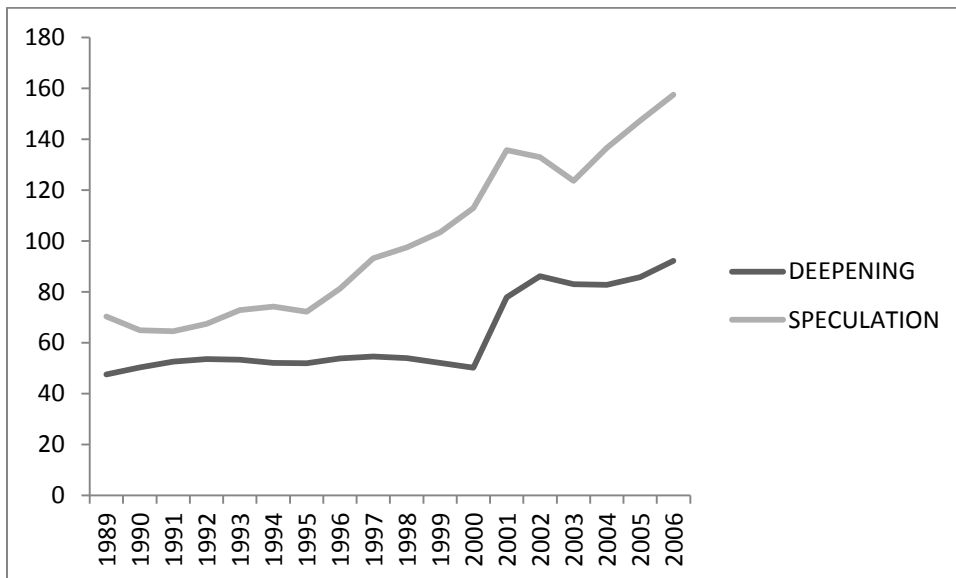


## Tunisia



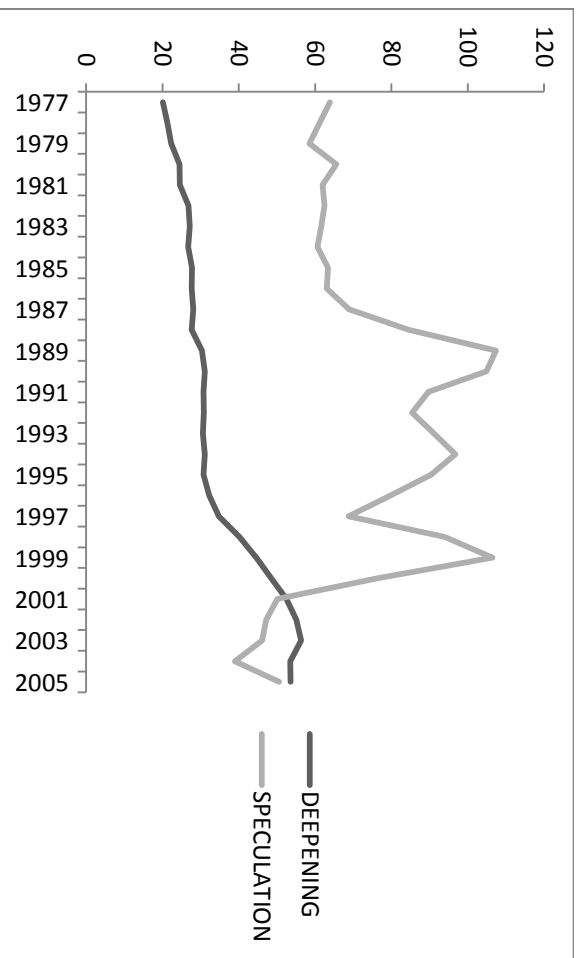
## WORLD BANK HIGH INCOME COUNTRIES

### Canada

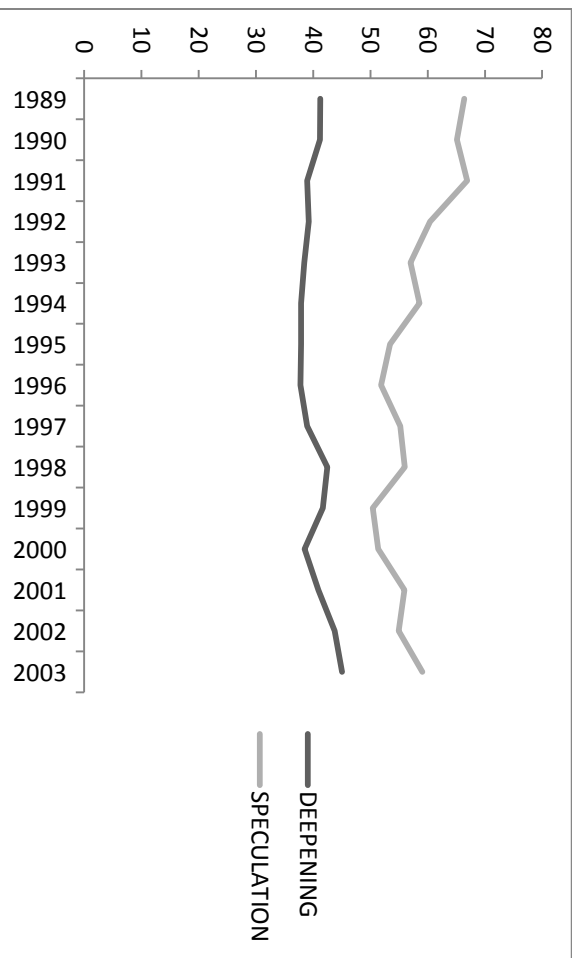




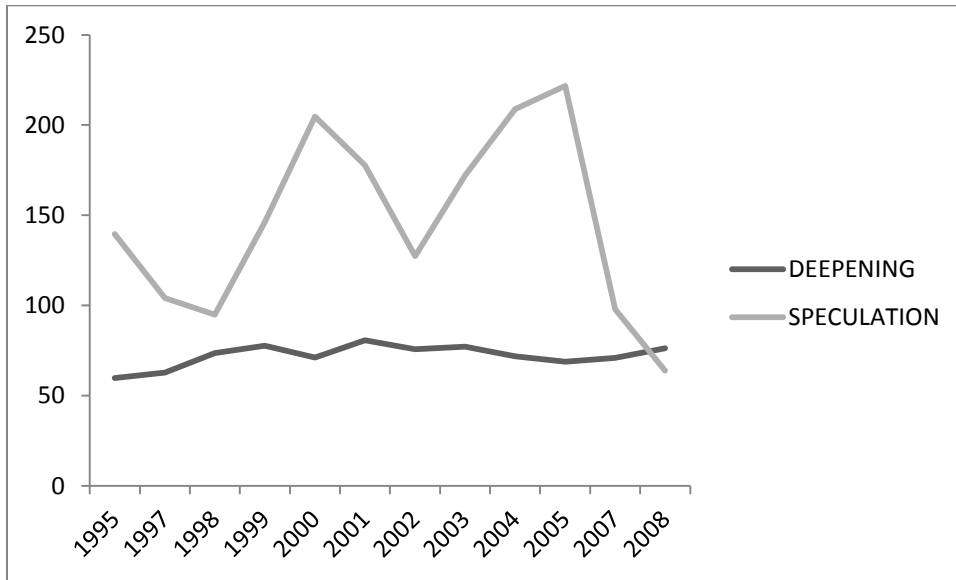
Korea



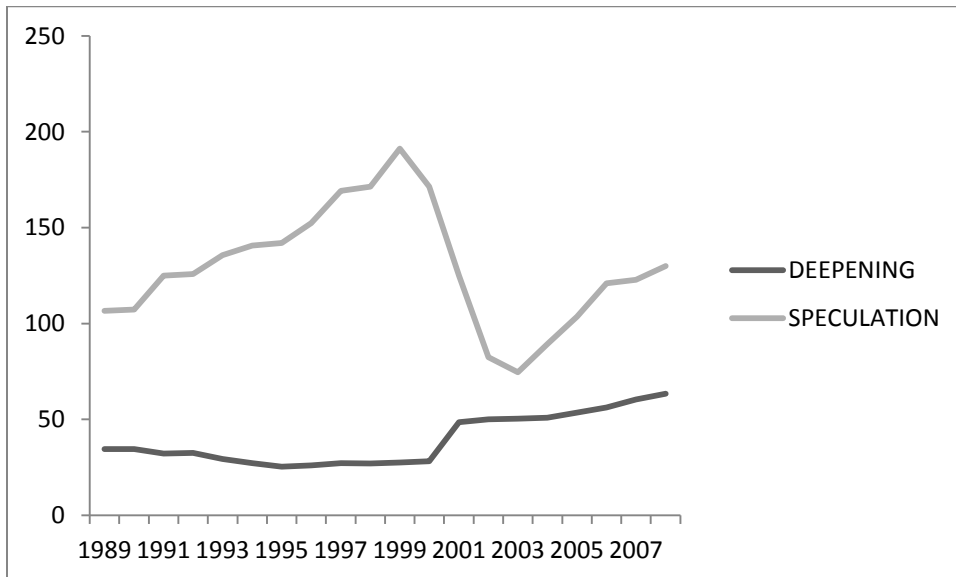
Norway



### Singapore



### Sweden



United States

