

The Three Faces of The 1997 Crisis: The Lessons to Learn

Henry Wan, Jr.

Cornell University

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1. Introduction

Crisis 1997 – the third and last of the 1990 crises – is intriguing for: (a) its *abrupt* onset, (b) its *peripatetic* reach and (c) its *virulence* against apparently vigorous victims. To prevent its recurrence, one needs a firm understanding of the menace. On account of the complexities, we do not look for a single model but address here three aspects in turn.

2. The Political Economy of the Crisis

Crisis 1997 is unnerving because its debilitating effects on economies enjoying sustained, rapid growth, and supposedly sound macro-economic fundamentals. Korea was a new entrant of OECD, and a showcase for development for 'getting interventions right' (Rodrik, 1995). Malaysia had won praises from the IMF right up to the eve of the crisis¹. Thailand was singled out to be praised for its macro-economic management (Christenson et al., 1993). If these economies were not immune, it appears doubtful how any developing economy can be made safe.

Offhand, Crisis 1997 is an anomaly. In East and Southeast Asia, troubles arose from private foreign borrowing, not sovereign debt. As shown in Table 2.1, global crises might arise from delinquent government in developing economies, or delinquent private firms in developed economies, but less likely from private bad debt in the developing world. Borrowers with dubious prospect can hardly contract massive loans to cause transcontinental consequences. Business to business deals are supposedly based upon rational calculations, and risk management is the first principle in finance.

Table 2.1 International Financial Crises and Nature of Borrowing – The Common View

<u>Borrowing Economies</u>	<u>Borrowing Party</u>	
	<u>Government</u>	<u>Private Firm</u>
Developed	Not likely	Likely

¹ As Mahathir (pp. 53-4, 1999) has reminded us.

Less Developed

Likely

Not likely

In Crisis 1997, not all victims were Asian² and not all Asian victims had a debt crisis³. Yet Asian debts made Crisis 1997 into what it was. These were debts with a difference. To finance rapid growth, they could easily exceed in amount those which covered the Latin American deficits. Backed by overt or tacit government support, such loans would appear as credit-worthy as government bonds to foreign creditors. However, an Asian 'developmental State' was often motivated by non-economic objectives.

Thus, the civil aircraft industry appealed to Indonesia under Suharto, presumably because it was a market the Japanese hesitated to enter. To keep the per capita GDP above the magic figure of 10,000 U. S. dollars, Kim Young Sam's Korea approved short term foreign borrowing rather than a devaluation⁴; to raise national pride, Mahathir built the Petronas towers⁵, bought Britain's Lotus Engineering to launch high-performance cars and constructed the world's largest flag. Even behind Thailand's futile attempt to defend the baht and the successful but costly decision to peg the Hong Kong dollar to the U. S. dollar and not a currency basket of one's trading partners, politics were involved.

If in search for rapid growth, one invokes the State against market failure, the economy may be prone to government failure, in a time of financial crises. If the power to rule can be won through economic nationalism, then inevitable market shocks will be resisted vainly, to the last extremities, making the adjustment costly and very abrupt. In the final analysis, when bread and circus were enough to trade for allegiance, the Roman public would only get the governments they deserved. *Caveat emptor!*

3. Connectedness over Disjoint Subsystems

Crisis 1997 affected many economies. The major victims of the financial storm came in the following chronological order: The Czechlands, Thailand, Malaysia, Indonesia, Korea, Brazil, and Russia. This is often explained with some theory of contagion⁶, where by logic, any pair of afflicted entities must be connected by at least one 'path of contagion', made up exclusively with afflicted entities only, within some

² E.g., Russia and Brazil.

³ E.g., Hong Kong.

⁴ Chang (p.227, 1998).

⁵ These are the highest buildings in the world.

⁶ See for example, Allen and Gale (2000).

financing (or trading) network. For institutional reform, the implication is, future crises can best be contained with 'firewalls' for compartmentalization.

However, how can this explanation fit Crisis 1997 is less than clear. The time path is highly peripatetic. Linking some pair of victims, say, Brazil and Russia, any chain of transactions is likely to pass through some advanced economies, say, America, Japan or some European economies, none of these were ever seriously affected in the Crisis.

As an alternative, the 'inductance hypothesis', may be illustrated below (Wan and Wong, 2000). Consider a world of two disjoint 'credit chains'. The 'Latin' (or respectively, the 'Greek') chain consists of a debtor d (or respectively, δ) borrowing funds from a creditor c (or respectively, γ), who in turn owes loans from a banker b (or respectively, β), while one of the banker also has an additional investment in A . Who has invested in A is known to A and the bankers, but not necessarily to others. All the loans are in short term, but used to finance some long term projects, so that periodic extensions are relied upon to keep the systems afloat. Concurrent applications for extension of all loan are presently under simultaneous review. To save oneself, any banker suffering a loss in investment must reject credit extension to the creditor, any creditor who approves credit extension to the debtor but gets rejected by one's own banker will then become insolvent. A debtor goes bankrupt if the creditor denies the loan extension. Denoting a real (conjectured) relation with double lines, (single line), Chart 3.1 shows that when A defaults, the equilibrium outcome is a subsystem crisis, under complete information, but possibly a 'world-wide crisis', under incomplete information.

Chart 3.1 Crisis under Alternative Information Structures

<u>Information Structure</u>	Complete <u>Information</u>	Incomplete <u>Information</u>
Additional Investment	A //	A // \
Banker	b 	β b β
Creditor	c 	γ c γ

Debtor (italicized if bankrupt) d δ d δ

The implication of this exercise is that 'system transparency' is desirable. If it is common knowledge that a particular bank is not affected by any failure in its investment, then those borrowing from it have no cause to tighten the credit and cause the crisis to decimate the particular local system.

Crisis 1997 is like a wildfire. It ignites with lightning, it spreads by wind, yet it happens only to forests which are tinder-dry. The State-backed private foreign debt supplies the spark. The lack of financial transparency facilitates the panic. What remains to be explained is international economic situation, which is crisis - prone. It has already happened before. It may wait to haunt us again. That is to be examined next.

4. The Growing Uncertainty

To a large extent, Crisis 1997 is a debt crisis, arising from international loans. Analytically, international loans are hard to study. The market is incomplete. Further, unlike goods sold in markets approximating the Walrasian scenario of price-taking agents, real-life loans are project-specific. A loan is granted not only at particular interest rates, but also for a definite amount, over a given duration, to a specific borrower, and often with a designated use. Loans granted to produce for export are not to be diverted to purchase real estates⁷. In principle, the equilibrium terms of the loan may also depend upon the magnitude of its volume, so that in industries enjoying scale economy, a project may be viable only when it exceeds a minimum size. In such cases, multiple equilibrium may emerge. But this is a complexity we try to do without, for now.

By Feldstein and Horioka (1980), international capital movement is usually dominated in volume by domestic saving and investment. For simplicity, we focus here on the equilibrium terms of loans of infinitesimal size, so that our attention is directed to the real exchange rate, where by Uchupalanun (1999), two results may be established:

- (A) multiple equilibrium terms of loans are possible, and
- (B) the likelihood of multiplicity may increase, as the poor in the world catches up with the rich.

We offer some intuitive discussion below by means of,

⁷ Given the same odds, if bankruptcy is a possibility, the borrower prefers a larger stake, which brings a larger gain in success, but bankruptcy equalizes all losses in failure. This a view the lender never shares.

A Simplified Example

In a four-good Ricardian world there are two symmetric economies. In each country, the representative individual has a fixed labor endowment of 1 unit, and a homothetic preference representable as a constant elasticity of substitution function over two traded goods and a local, non-traded good, say, housing⁸. This elasticity is $\sigma \in (0, 1)$, between any pair of goods consumed. Everyone treats both traded goods equally. If the price ratio is one to one, identical amounts will be consumed. Due to environmental differences, each economy enjoys overwhelming comparative advantage in one particular traded good. Under all possible equilibrium conditions, each economy always exports one traded good and imports the other. One might regard then the unit labor productivity to be one for the natural export and zero for the import. By selecting units, the labor productivity for local housing will be normalized as unity also. With the cost ratio being always one-to-one between housing and the exportable good, one may assume the spending ratio between housing and the exportable good is always $A - 1$, with $A > 1$. Identify the degree of effectiveness in utilizing labor (e. g., training, organization, etc.) as human capital, which operates like a labor-augmenting index. We shall start with the case that in both economies, labor efficiency is at its maximal attainable level, which is set at unity. An entire family of examples can be parameterized by the pair of parameters, (A, σ) .

The Excess Demand Function

In this model, any real exchange rate is identical to the wage ratio, or the double factorial terms of trade. Let the domestic labor be the numeraire, so that the domestic wage is $w \equiv 1 \equiv p$, the unit price for both the tradable product and housing for the home country, attention may be focused to the foreign wage rate, $w^* \equiv p^*$, the unit price for both the tradable product and housing for the foreign country. Under our assumption of symmetry, there is always a benchmark equilibrium: $w^* = 1$. Denote h , t and τ respectively as housing, tradable product consumed and tradable product exported for the

⁸ More generally, one may assume a two – level utility index. In the lower level, the consumed exportable product and the home good serve as arguments for a sub-utility index which is homogeneous of the first degree. This sub-utility and the imports are arguments in a constant elasticity of substitution utility index.

home country and h^* , t^* and τ^* for the corresponding magnitudes of the foreign country, then all these six magnitudes are functions of the single variable w^* .

The full employment conditions for home labor L and foreign labor, L^* are:

$$(4.1) \quad h + t + \tau - 1 = 0 = h^* + t^* + \tau^* - 1.$$

Balance of trade calls for:

$$(4.2) \quad b = \tau^* - \tau/w^* = 0.$$

At the benchmark equilibrium, clearly,

$$(4.3) \quad h = (A-1)/(A+1) = h^*, \quad t = \tau^* = 1/(A+1) = t^* = \tau,$$

also, the consumption ratios by factor content are:

$$(4.4) \quad (h + t)/\tau^* = A = (h^* + t^*)/\tau.$$

Now by the definition of a constant elasticity of substitution function, one can integrate between the benchmark value and any alternative value of w^* to obtain,

$$(4.5) \quad \log[(h + t)/\tau^*] - \log A = \sigma(\log w^* - \log 1) = \log A - \log[(h^* + t^*)/\tau],$$

or, equivalently,

$$(4.6) \quad (h + t)/A\tau^* = (w^*)^\sigma = A\tau/(h^* + t^*).$$

By (4.1),

$$(4.7) \quad (1 - \tau)/A\tau^* = (w^*)^\sigma = A\tau/(1 - \tau^*),$$

or, equivalently,

$$\begin{aligned} \tau + A(w^*)^\sigma \tau^* &= 1 \\ A\tau + (w^*)^\sigma \tau^* &= (w^*)^\sigma. \end{aligned}$$

Thus, here are two equations to solve both τ and τ^* in terms of w^* ,

$$(4.8) \quad \tau = [1 - A(w^*)^\sigma] (w^*)^\sigma / \Delta, \quad \tau^* = [(w^*)^\sigma - A] / \Delta, \quad \Delta = (1 - A^2) (w^*)^\sigma.$$

With these, we transform (4.2) into a function $b(w^*)$, the excess demand for the foreign balance:

$$(4.9) \quad b = \{[(w^*)^\sigma - A] - [1 - A(w^*)^\sigma] (w^*)^{\sigma-1}\} / (1 - A^2) (w^*)^\sigma.$$

The Marshall – Lerner Test and a Direct Analysis

At the benchmark equilibrium where:

$$(4.10) \quad b(w^*) = 0 \quad \text{for } w^* = 1,$$

the crucial criterion form is:

$$(4.11) \quad b'(1).$$

Whenever this expression is positive then the excess demand schedule: $\{(b(w^*), w^*)\}$ would take the form of an horizontally flipped letter 'S', with the benchmark equilibrium located along the middle range. One can easily determine two more equilibria, w^*_+ and w^*_- , straddling the benchmark equilibrium. This establishes Result (A) and shown in Figure 4.1.

One can also gain much insight by a 'direct analysis' of (4.9-4.10) as follows. The equilibrium condition, $b = 0$, can be show as equivalent to:

$$(4.12) \quad A = \sinh(\omega/2) / \sinh [(1- 2\sigma)(\omega/2)] \\ = A(\sigma, \omega),$$

say, where,

$$\omega = \log w^*, \quad \sinh z = (e^z - e^{-z})/2.$$

Since the hyperbolic sine function \sinh , is an *odd function* ($\sinh z = -\sinh (-z)$), which is strictly increasing, we can conclude that,

1. For all (A, σ) , $w^* = 1$ is a solution (the benchmark equilibrium),
2. Given any $\sigma \in (0, 1/2)$, there is some value $A = A(\sigma, \omega) > 1$, such that for the model parameterized by $[A(\sigma, \omega), \sigma]$, both $w^* = e^\omega$ and $1/w^* = e^{-\omega}$ are equilibrium values of foreign wage rates, in addition to $w^* = 1$. Figures 4.3 and 4.4 display the $A(\sigma, \omega)$ graphs for $\sigma = 1/4$ and $2/5$, respectively.

For a pair of values A and σ , one can read off the pair of equilibrium values of ω . This can be done by constructing a horizontal line of A to intersect the graph of $A(\sigma, \omega)$ at such equilibrium values of ω .

Intuitively, the presence of multiple equilibrium real exchange rates is highly destabilizing. The real exchange rate can stay at one equilibrium position for an arbitrarily long period and then shifts itself to another equilibrium position, without warning. Moreover, there is no economic theory which allows us to make any probabilistic statement concerning the likelihood of which equilibrium will prevail at any particular moment. The debt of an agent in the home country which is denominated in foreign currency can be a time bomb, with a fuse of unknowable length. What is negotiated at one equilibrium exchange rate may bankrupt the borrower, should a devaluation carry the economy into another equilibrium position. The situation is more

exacerbated when the government tries to win political legitimacy through various manifestations of economic prosperity. As we argued in Section 2, such non-economic objectives may cause a government to delay an inevitable adjustment and usher in an economic crisis.

It is time to discuss the relationship between what we have discussed here and the in the current literature of international finance⁹, where multiple equilibria emerge mainly because of the presence of money, and the 'soundness of fundamentals' is an issue relevant for the macro-economic concerns of individual economies, considered one at a time. To be sure, what is in the literature are important questions. What we have shown is, there is no guarantee that the world economy is crisis – free, even when there is nothing to worry about from these standard aspects. Inherent instability can still arise from how individual economies interact, and such difficulties can develop even if trade takes place exclusively by barter¹⁰.

The instabilities treated in the standard literature and in our analysis are like a frosted windshield and a dense fog in the air. Both diminish the visibility for driving. Each poses a similar, but separate and independent problem. An effective defogging system is crucially important to the driver's safety. So is the weather forecast. No defogging system, however effective, can clear a heavy fog.

Since the questions raised here have not received much notice before, does that imply that, they have been considered unimportant by conventional wisdom, and therefore they are not to be taken seriously? We think not. The world economy may be evolving into a 'turbulence zone' of multiple equilibrium real exchange rates. The reasons are sketched below with a

Modified Example.

In the previous example, assume now that in period $n \geq 0$, the labor-augmenting efficiency index of the home country is $x_n \in (0, 1)$ where 1 is the constant value of that index for the foreign country. Assume further that due to the North – South technology spill – over, the dynamics for x_n is as follows:

$$(4.) \quad x_{n+1} = x_n + c x_n (1 - x_n), \quad x_0 \text{ given,} \quad c \in (0, 1) \text{ is a parameter for imitation.}$$

⁹ For an authoritative survey see Obstfeld and Rogoff (1996).

¹⁰ So that money-related difficulties are ruled out along side with any circulating money.

This implies the series $\{x_n\}$ evolves by a Logistic Law, and approaches monotonically to its asymptotic value of unity, that is, the gradual completion of the catching up process.

For this model, we now study the absence or presence of multiple equilibrium real exchange rates over time. For very small values of x_n , the complete specialization result may break down, since in autarky, the foreign country will produce both goods, even though the foreign country is not very productive for its natural import. This is the consequence of the constant elasticity of substitution utility function for a value of σ less than 1. Every indifference curve is bounded away from the axes by an loglinear contour tangential to it at a single point. Therefore, a modicum of that natural import will be consumed, hence produced, even if the foreign country is highly inefficient for that good, and the value of A is so large, that only a very small part of the foreign labor is allocated there. For simplicity, we shall next assume that x_0 is just slightly larger than some minimum value that assures complete specialization in both countries for all period n , $n \geq 0$. Our analysis takes two steps.

Step 1. Under complete specialization, and with all individuals sharing the same preference, the foreign country under autarky can only have a single equilibrium price for each good. By construction, the value of x_0 is so selected that initially, the complete displacement of that small portion of foreign labor from producing its natural import does not give rise to any multiple equilibrium for the value of w^* . This is shown in Figure 4.2.

Step 2. With x_0 approaching 1, we are returning to the previous example, and multiple equilibria reappear.

This scenario suggests that in a real world, including a developed North and a developing South, when economies like Japan, the Newly Industrialized Economies, China, and so on grow richer by industrialization, the world economy is conceivably more prone to develop multiple equilibria, hence inherent instability.

An Assessment of Realism

In our models, multiple equilibria appear because of both a sufficiently low elasticity of substitution (certainly below $1/2$), and a sufficiently high value of A (certainly above 1). In real life, the low elasticity of substitution is a fact beyond dispute, at least for some products. In Asia, the need of the Newly Industrialized Economies for imported 'key components' from Japan has caused their perennial trade deficit to Japan.

The high value of A is known from the 'home good bias', documented by Armington (1969), and caused such differences in the 'marginal propensities to import' which underlie the secondary burden in the transfer problem (the Keynes case). It manifests in the real estate booms when any economy becomes prosperous. The exchange rate fluctuation is also well known, say between the dollar and the yen, currencies of the largest two economies in today's world.

5. A Concluding Remark

There are many different aspects one can explore about Crisis 1997. We focus on aspects not yet quite adequately addressed in the literature. The last chapter is certainly not yet written. At the present, regarding policy concerns, the words of caution in Bhagwati (1998) deserve as much attention as we can devote to.

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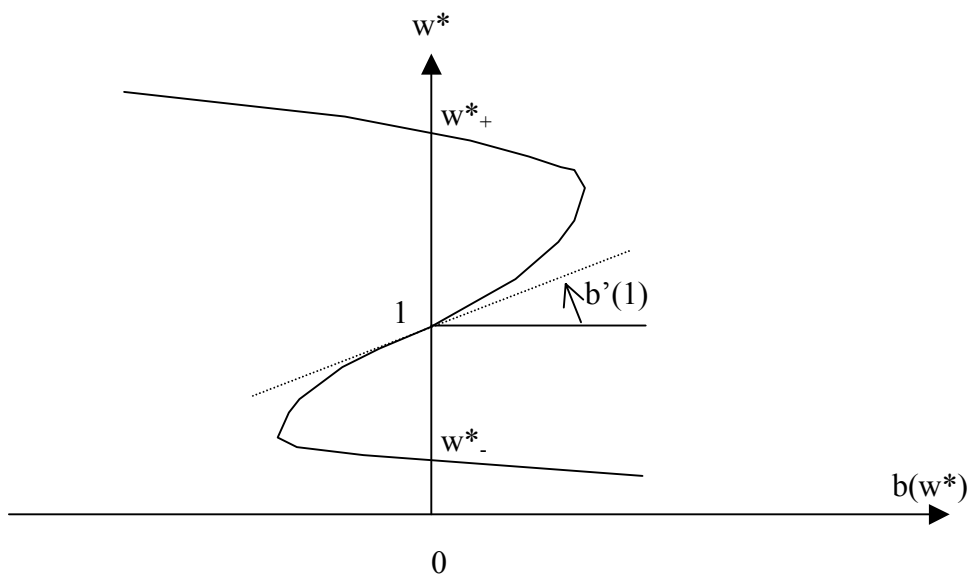


Figure 4.1 Balance of Trade: Multiple Equilibria

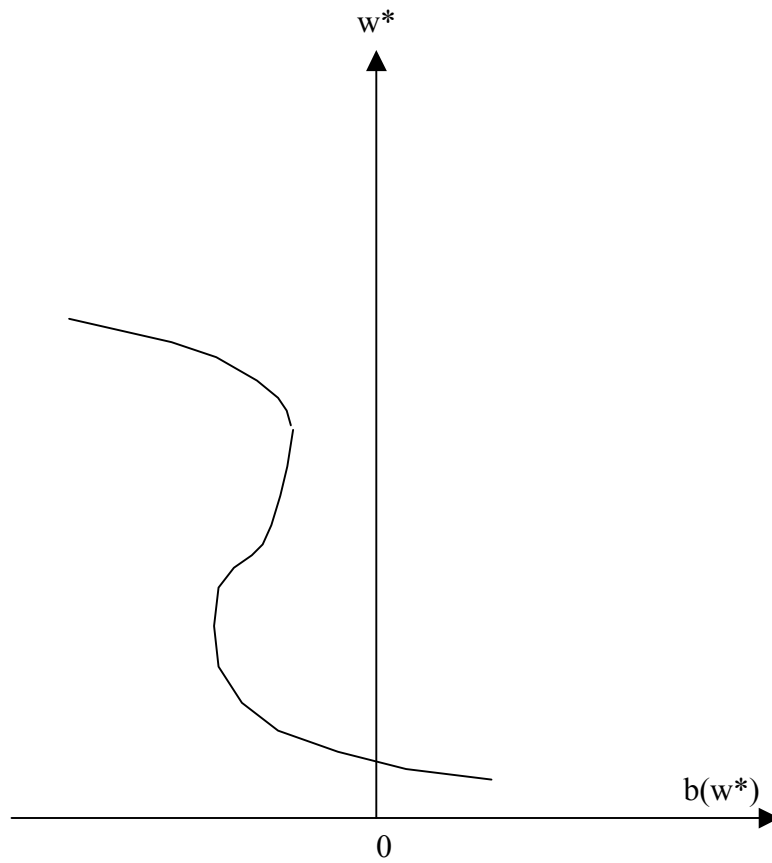


Figure 4.2 Balance of Trade: Single Equilibrium

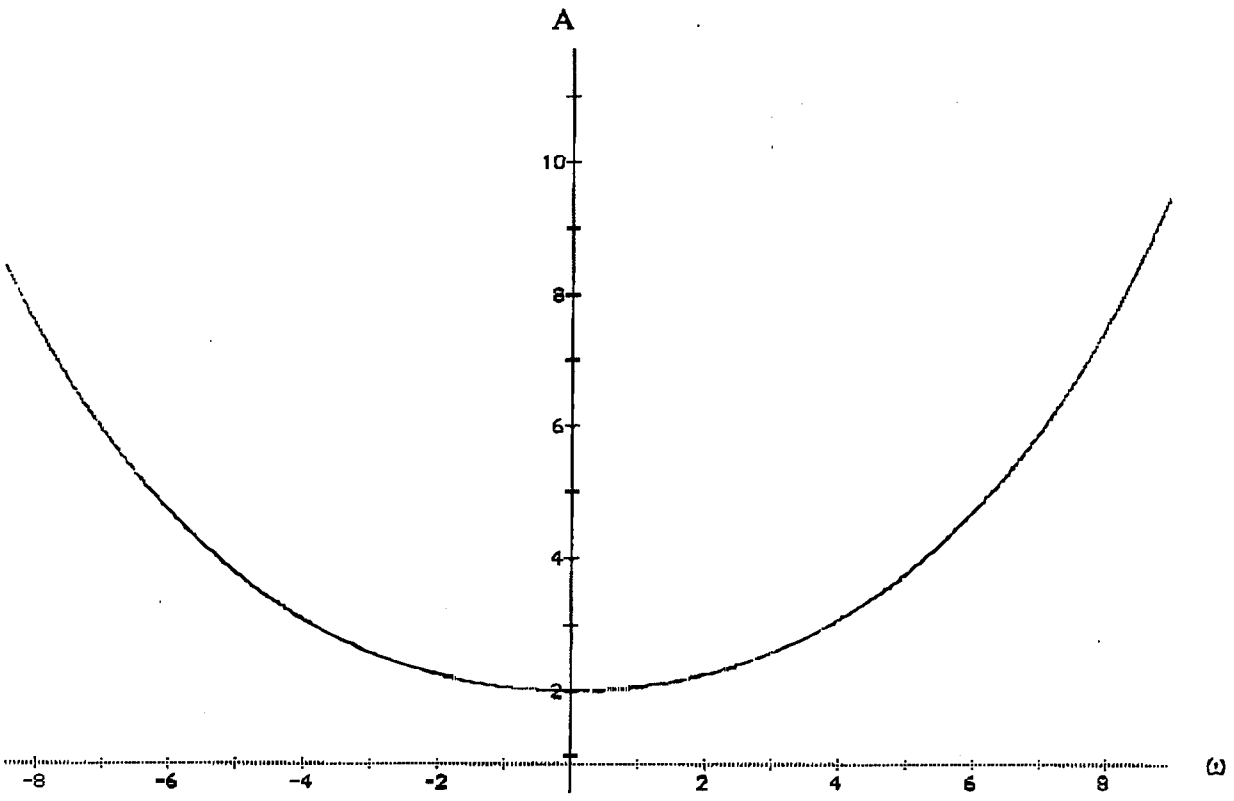


Figure 4.3 Graph of $A(\sigma, \omega)$: $\sigma = 1/4$

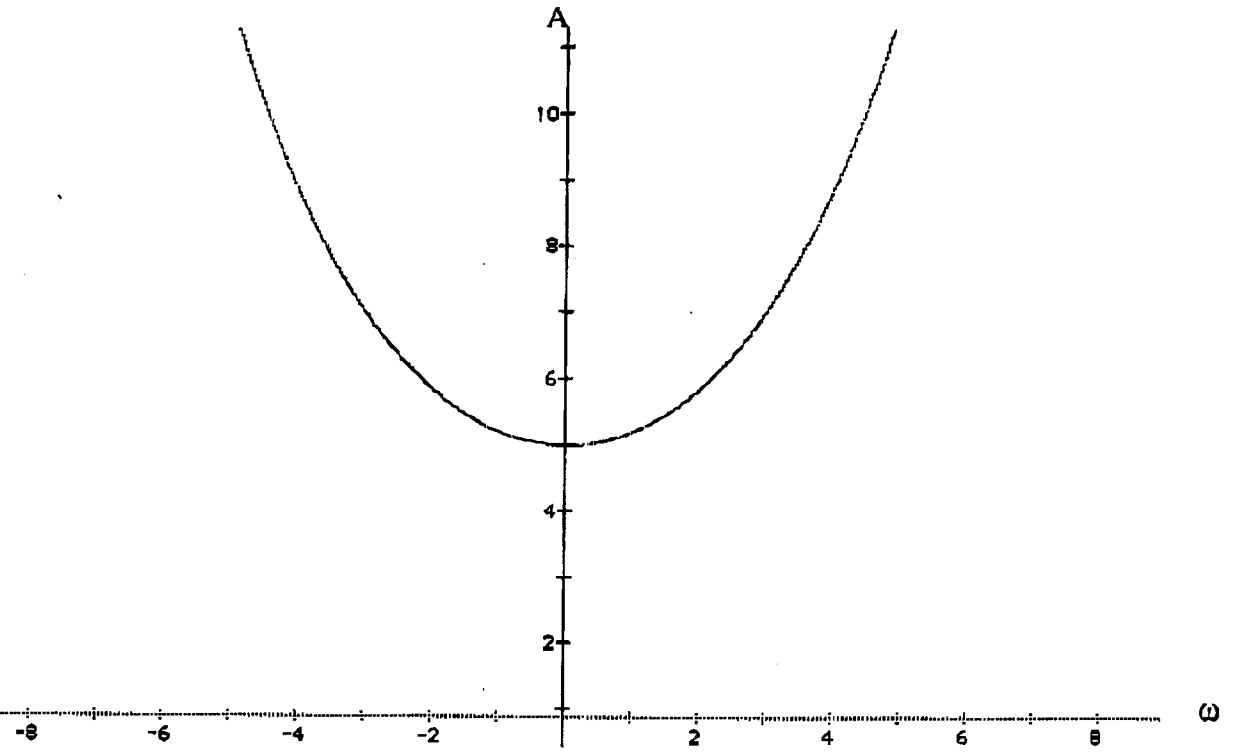


Figure 4.4 Graph of $A(\sigma, \omega)$: $\sigma = 2/5$