Development and Finance: Insights from the New Paradigm of Monetary Economics

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It is a real pleasure to be here to celebrate Sir Arthur Lewis. I got to know Sir Arthur while I was at Princeton. It is impossible for anybody who knew Sir Arthur to turn down an invitation to give a lecture in his memory. He was a true gentleman and a scholar, one of the few persons for whom those epithets are truly deserved. More than that, he was a devoted public servant. He earned the respect and affection of everyone who encountered him. But even before I got to know Sir Arthur when I was at Princeton, I felt in a way that I knew him, as all economists interested in development come to know him, because we had been his students, not direct students but students of his ideas. His ideas were probably the most influential in development economics in the twentieth century. He wanted to understand what explained the lack of development of so many countries. He wanted to understand why, in the process of development, wages remained low and what might be done to bring about development in the countries that remained poor for so long.

I have spent a lot of time in recent years studying the process of globalisation and observing how today international agreements often suppress industrialisation, though perhaps more subtly than the colonial powers did. For instance, while average tariffs are very low, tariffs on processed agricultural foods are very high; the whole strategy, the whole structure of the tariffs (which are four times higher on developing countries than they are on developed countries) are intended to stop industrialisation, thwarting the development of the developing countries. The issue on which Lewis focused, the problem of labour surplus economies, will be an issue that will be with us in a very vivid way in the coming decades, as globalisation integrates into the global economy 2.5 billion individuals, workers in India and China, and elsewhere in Asia. There is a dramatic change going on in the global economy which has not been fully appreciated: the workers in the economies of China and in India, which have for so long been excluded from the global economy, are finally becoming integrated into it. We don't have a fair rule of law, but we are beginning to have a rule of law, and it is going to make a difference. If there were ever a period of a true global surplus of labour (or at least a very large supply of labour), we are about to enter into such an era; we are seeing already even in the US and Europe some of the effects. The fact is that wages in the US have been stagnant over the last five years while GDP has been growing, and the real income of the median household in the US has actually been declining. While the country on the whole is getting richer, the representative individuals are actually getting poorer, and this is the kind of scenario that Sir Arthur Lewis would have predicted using his model.

The subject of globalisation is one that I dealt with at great length in my book, *Globalisation and its Discontents*, and I am in the process of writing a sequel to that, called *Making Globalisation Work*. I want today to spend my time talking about a rather different topic. Having been invited by the Central Bank to give a talk, I can't help but talk about my book *Towards a New Paradigm in Monetary Economics*. It is not very often that I can talk about the subject with a captive audience, so I beg your indulgence and I will try to make this somewhat understandable. But I think it is, I believe, an extremely important topic for anyone committed to improving growth and the well-being of those in the developing world.

I begin by asking the question, Why do we need a new theory? What was wrong with the old theory? After I try to explain the answer to that, I will explain what the new theory is, and then finally I will talk about some of the implications, including the implications for a development strategy. There are three reasons that a new theory is needed. First, the old theory is basically implausible; it makes no sense, even though it's taught in graduate schools around the world. Second, policies based on the old theory have often not worked, and in some cases have worked disastrously, and I will give you a couple of examples. Finally, even when they have worked, the old theories haven't explained why they have worked. They have left a puzzle, which I hope to resolve.

The failure of the old paradigm: unresolved puzzles and failed policies

Let me begin with the last because in a way it's the easiest to understand. The US was in a recession that began around 1989, and it emerged from that recession in 1993/94. The policies that the Clinton Administration (of which I was a part) instituted are widely believed to have helped the economy revive. Robert Rubin, Treasury Secretary, who was the spokesperson in economics for the Administration, always talked about deficit reduction: he said that deficit reduction helped revive the American economy. It was a very nice story, and it had a certain aura of probity around it. Nobody likes deficits, especially as our current Administration keeps getting the deficits larger and larger. It is becoming an increasing source of concern not only to the US but for the stability of the whole global economy, and rightly so. It is a source of worry.

But there is a puzzle. For 70 years economists have preached that when you have an economic downturn, what you need to get out of the economic downturn is deficit spending. Keynes talked about the use of stimulatory fiscal policy; even President Bush has talked about the role of stimulatory fiscal policy, although by stimulation he means tax cuts for the very rich. Seventy years ago there was a lively debate in the US about what to do about the Great Depression. The followers of Keynes said you needed to have more deficit spending, and the Secretary of the Treasury at the time (the policy positions of the Secretary of the Treasury seemed to be consistent over decades) said no, you have to get rid of the deficit. When the economy goes down tax revenues go down and deficits grow, and he said what you need to do is restore confidence in the economy by getting rid of the deficit. Fortunately President Hoover was defeated, and his Secretary of the Treasury went with him, and his successor, President Roosevelt, followed the advice of Keynes.

But the ideas of Andrew Mellon are still seemingly influential, for instance, within the international financial community and at the International Monetary Fund (IMF). The IMF has given the world a large number of new experiments, testing Keynes' ideas. Argentina had an economic downturn, with a resulting fiscal deficit, and the IMF said, get rid of your deficit and raise your taxes. If you do that, your economy will recover. They followed the IMF’s advice, and, as Keynes would have predicted, the economic downturn worsened: they had a really bad crisis. The same happened in Korea, Indonesia, and Thailand. All around the world there have been an enormous number of experiments. Now, for economists this is great news, because our theories have been verified, but for the people in the countries it has been a disaster. The good news is we do not have to rewrite our text books: Keynesian economics is right.

But there is a puzzle. The American economy seemed to recover in 1993, even though there was deficit reduction, and the question is why. Standard monetary theory and standard Keynesian economics do not provide an explanation.

To understand the full nature of the puzzle, and to see the answer to it, we have to go back in history. Alan Greenspan is about to leave office as one of the most respected central bank governors in all history. One of the wonderful things when you have success like he's had is that people forget your mistakes. The one I have in mind in particular concerned the recession of 1991-92. One of the good things in the US is that we have a central bank that is accountable; it has to testify before the Congress and explain what it is doing, so we got to see what was going through his mind, assuming that he was honest. And from Greenspan's Congressional testimony, it is very clear that he did not understand what was going on. He successfully lowered interest rates, and in the standard model that he was using, the lowering of interest rates in the way that the Fed had should have stimulated the economy. However, it did not work, and it was clear from his testimony that he did not fully understand why; it was (at least at the time) a puzzle. Interestingly, the vice chairman of the Federal Bank at the time, David Mullins, who was actually a contributor to this new paradigm of monetary economics, that focuses on information economics and credit (and which I will talk about in a few minutes), recognised what the problem was and advocated an alternative set of policies. But one of the unfortunate things is that if you are the vice chairman, you have much less power than the chairman. They did not listen to him, and the economy went into a prolonged recession and slowdown. I suppose that every cloud has a silver lining. The silver lining of that recession was that President Clinton got elected.

Thus, the old Paradigm not only leaves unanswered the puzzle for why the American economy recovered in 1993; but more importantly, had the old paradigm been correct, the economy would never have faced the protracted slowdown: Greenspan's interest rate reductions would have led to a quick recovery. The new paradigm explains both why the interest rate reductions did not work in 1991, and why the economy recovered in 1993. But before describing the new paradigm and showing how it provides answers to these longstanding puzzles, I need to describe further the grounds for dissatisfaction with the old paradigm.

The implausibility of the old paradigm

The underlying problem is simply that the theory is implausible, and I beg your forgiveness as I take a few minutes to talk a little about the standard theory of interest rate determination and the role of the central banks. The focus is on demand and supply of money. Central banks control the supply of money, and there is a demand for money which is based on income and nominal interest rates. You need money to engage in transactions, and the higher your income is the more money you need. If you increase the cost of holding money, you reduce the demand. Since money does not bear interest, you could hold your assets in the form that yielded a return, but because you are holding money, you lose that return. This is the cost of holding money (the opportunity cost). When the central bank increases the supply of money, for the demand for money to equal the supply of money, interest rates must fall, and that lowering of interest rates stimulates the economy. That is the basic framework in which monetary policy works. The problem with this theory is that none of the hypotheses make sense in a modern economy. Take the first hypothesis: Do you need money to engage in transactions? The answer is no: in an economy like the US, most of the time things are bought with credit cards. You need credit, but you do not need money. Quite often I will go visit a number of countries without ever using money; I just use my American Express card or my Visa card. (This is not an advertisement for either; it is simply a description of the modern economy.) The fact that I can use a credit card of one form or another shows that you really do not need money.

Moreover, most transactions are not income generating; most transactions are exchanges of assets. The relationship between income generating transactions and transactions that are an exchange of assets are variable over the business cycle. This means that if money were needed for transactions, the demand for money would not be closely linked with income (as hypothesised by the standard theory.)

Furthermore, most money as we define it is not the little pieces of paper that you have (dollar bills and coins) but demand deposit which we keep in the bank that is interesting bearing. In fact, most money today is (or could be) held in forms like cash management accounts or brokerage accounts, for which the interest rate differs little from the T-bill rate. There is really no opportunity cost for holding money, or it is insignificant and unrelated to the business cycle. What then is the mechanism by which monetary policy works?

The story of the demand and supply of money has been extremely influential, even though it has not provided a good description of the monetary sector of the American economy and of most advanced industrial countries for a very long time. Interestingly, 75 years ago in Cambridge there was an alternative to the theory of Keynes, and that was of Robertson. He talked about the demand and supply for loanable funds. (He focused on the funds that are available for investment.) He did not have a good theory of credit, and that is the essential difference between the theories that I am talking about today and these older theories.

Theory of loanable funds

There was a very heated debate 75 years ago, and as so often happens in the war of ideas, one theory won, and that was Keynes' theory. It is hard for people to understand how intense the warfare was between these two groups. I was in Cambridge as a graduate student, and the remnants of that war were still going on. The two sides, Keynes' and Robertson's disciples, had their own seminars, and they would not invite those who belonged to the other side to their seminars. The seminars of Keynes' disciples were called "secret seminars" because they did not want the others to attend. But of course it was not a secret that they were a secret; everybody knew about it. It was not until 1970 that the secret seminars finally came to an end.

The new paradigm

The new paradigm that I have been developing is really an offshoot of the general theory of information. What you need for transactions, as I said before, is credit. Firms who want to buy a machine or make an investment have to get credit. What determines the supply of credit? Here is the key role of banks in most economies around the world, with a few exceptions. Banks are the economic institutions in society that determine credit worthiness; they determine who should get credit and in fact allocate credit.

Now, actually lending money is not difficult, but the real problem is getting it back again. And the business of banks is to figure out if they give money to someone, will they get it back. That is what we mean by credit worthiness: trying to figure out which of the people who come to your door will give it back. The task of banking institutions is to assess not only the credit worthiness of the individual but also the viability of the projects for which credit is being asked. It is not just a question of intentions but ability to repay, because if you invest money poorly you are not going to be able to repay it. What are good projects that will yield enough returns that the loan can be repaid?

What then determines the level of economic activity? The level of economic activity is the availability of credit. Then the question is, what determines the availability of credit? There are many factors that affect the availability of credit, but many of them have to do with the net worth of the banking institutions and their perceptions of risk, as well as the economic environment in which they operate, including the T-bill interest rates, the interest rates they may have to pay depositors, and the regulatory environment (for instance restrictions on lending, capital adequacy standards, and the whole variety of regulations that are imposed on banks.)

The recession of 1991 and the new paradigm

From this perspective it becomes more understandable what happened in the US in 1990. What happened was the working out of a set of events that actually goes back more than a decade. It is useful to see how actions in one day have consequences for later dates, and it may take 10-15 years for the full consequences to be seen. The economic consequences of the mistakes that President Bush is making in the US today will not be fully realized potentially for a number of years into the future.

For instance, a critical point in the story was when the governor of the Fed that preceded Greenspan raised interest rates to unprecedented levels in an attempt to fight inflation. This had disastrous effects on the countries of this region. In Latin America, one country after another went into default. They had borrowed money during the 1970s to get them through the difficulties posed by high oil prices, and at reasonable interest rates their debt was not unmanageable. But suddenly the rules of the game were changed: interest rates rose to levels that were unprecedented, and the Latin American countries could not repay their debt.

One of the members of the Federal Reserve Board warned the Board that if you raise interest rates to those levels and tightened the availability of money in the way that was proposed, it would have disastrous effects on Latin America. The reply was that under its charter, the obligation of the Fed is to the American economy.

This is an important lesson about the world of globalisation. The US pursued a monetary policy to fight inflation in its own country but with absolutely devastating effects in Latin America. It resulted in the lost decade of the 1980s during which income stagnated or even declined. But even though America's policies have enormous effects on others, its policies are centred on their impact on the American economy. Interestingly, the high interest rates also had a devastating effect on the US, but it was less apparent, and it would take years before the full effects would be realised. The high interest rates meant that the value of mortgages went way down. Mortgages are long-term loans at fixed interest rates, and when the interest rates go up, their value decreases. A mortgage paying 7 per cent interest rate will not be worth much, when new loans are yielding 10 or 15 per cent. What does that mean? It means the savings and loans institutions, an important part of the American banking system, effectively went bankrupt. They had to pay high interest rates to the depositors, but the value of their portfolio went way down. So, their assets decreased in value, but not their liabilities, what they owed to their depositors. They were effectively bankrupt, but accounting kept them alive.

In the 1990s we all learned that the private sector did some really bad accounting. There is a long tradition of using accounting deceptively. President Reagan did not want the S&Ls to go belly up under his watch, so he changed the regulations and allowed firms to treat as an asset their goodwill. Effectively, a new asset was created overnight to add to the balance sheet. That all of a sudden kept them out of bankruptcy. One of my friends used a word for these banks who, but for this goodwill would have been bankrupt: zombies. Why did he call them zombies? Because they were dead, but they were still among the living. And these zombie banks gambled on resurrection. They gambled that if they took some big, high risks and they won, they would get out of their indebtedness. And they could not really lose because they were already dead. If their gamble did not pay off, they were, in a sense, more dead (that is, their liabilities would have exceeded their assets by even more), but if you are dead, being more dead makes no difference.

The gamble did not pay off. Reagan's phoney accounting only postponed the day of reckoning. When they went from being dead to more dead, the US government bailed them out, in the long tradition of corporate welfare. We do not have enough money, not even a few million dollars for our poorer Americans, as you saw so vividly in New Orleans[1], but we had hundreds of billions of dollars to bail out the corporations, including the banks. At the time people did not know how much it was going to cost. It was estimated to be between $100-500 billion; fortunately because the economy did recover, the cost was at the lower end of that range.

What determines the ability of banks to lend and their willingness to generate credit? One of the things is their net worth, and their net worth had been diminished by this action that the Fed had undertaken at the beginning of the 1980s.

But one more critical thing happened that would help bring on the recession of 1991. In 1989 there was the bail out of the banks, but accompanying the bailouts was the view that we should not let this happen again. And so they tightened regulatory standards. And then what did the banks do? Not surprisingly, they reduced lending. And what happens when large numbers of banks reduce lending? If one bank does it, it does not make a big difference, but when large numbers of banks do it, the supply of credit goes down. And when the supply of credit goes down, the level of economic activity goes down, and the American economy went into a recession.

The standard model did not understand this at all; it was talking about the demand of money and the supply of money. But what was going on involved the supply of credit. Lowering interest rates did not lead to (much of) an increase in the supply of credit. It was a credit crunch, and it was only by doing something about the supply of credit that eventually we were able to get out of the doldrums.

This analysis also provides an understanding for why the 1993 deficit reduction package worked in helping the economy recover. Another mistake was made in 1989, and the years immediately after the bail-out. As I noted, we were worried about banks going bankrupt after having this terrible experience, so we imposed what they call capital adequacy requirements, where you have to have a certain amount of capital. The amount of capital you need is related to how risky your loan portfolio is. If you are investing in a loan that is very risky, you need more capital than if you are investing very safely.

The question is, what was risky capital? What were risky loans or risky investments? The critical issue was, were long term government bonds risky? For an economist, the answer is unambiguously yes, they are. It is not that the government is going to default. It isn't the worry about default but about long term bonds: if interest rates rise, the value of long term bonds fall, and they can fall enormously. What you worry about is the value of your portfolio and your assets. It is exactly what happened in the early 1980s when the value of assets declined as the long term interest rates rose. There was the danger that if you bought a long term government bond, even if it did not default, the bonds could go down in value if interest rates rise, and the result is that the banks could go bankrupt. But Greenspan decided that they were going to be treated as if they were safe. There were no economics behind this; there was a big debate between the chairman of the Council of Economic Advisors and the Federal Bank on this issue. The chairman, Mike Boskin, took the right view that these long term bonds were risky and ought to be treated as risky. The result of this was again bad accounting, where it looked like the banks were doing quite well. Why was that? At this period, the short rate was relatively low, about 4 per cent or so, and the long rate was relatively high, at 7 or 8 per cent. You could borrow short, take depositors' short term deposits, pay 4 per cent interest, invest it in a long term bond, and get 8 per cent. It looked like you were making money. But why was there a difference between the 8 per cent and the 4 per cent? The answer is that they were worried that those long term bonds might lose value. Any good accounting would have recognized the risk in the decrease in the value of the bonds, but we did not want to have good accounting because that would make clear what was going on. So they got to book the income as if these banks were getting richer and richer, even though they were in this very risky position.

It is not always the case that when you do the wrong thing you get punished, and this is one of those instances where the Fed did the wrong thing and it worked out well. In 1992 it looked like the deficits were going through the roof, and at the end of 1992 deficits were almost 5 per cent of GDP with no clear view about what was going to happen. It could even get worse. If the deficits continue to grow, with an increase in government borrowing, demand and supply says long term interest rates would start to rise. What happens if long term interest rates start to rise? The value of these long term bonds would start to fall, the banks would all be in bad trouble, just as they had been in the middle of the 1980s, and there would be a need for another major government bail out. It was an extremely risky strategy. But this is where the deficit reduction strategy paid off. Because of the way it was done, it had a certain degree of credibility. As people saw the deficits going down, they saw the balance of demand and supply of funds was going in the right way. As long term interest rates started to decline, the value of long term bonds increased. In effect, there was a certain degree of re-capitalisation of the banking system. The banking system, because of the increase in the value of their long term bonds and in their net worth, was able to start lending more. At the same time, one of the things we did in the Clinton

Administration was to reduce some of the overly stringent regulations that were intended to discourage lending, or at least bad lending. It was a very hard call: we did not want to loosen them too much (lest banks get back in the gambling syndrome), but just enough to help revive the economy.

Lessons from the new paradigm

There are a number of lessons that come out of this new paradigm and differences from the older theory. One of them is that the level of economic activity is affected not just by standard macroeconomic variables but also by microeconomics. Banking regulation intended to ensure the safety and soundness of financial institutions is typically separated off from macroeconomic monetary policy (open market operations). But regulations can have just as important an effect on the level of aggregate economic activity as standard macroeconomic interventions. Secondly, it emphasised the intertwining of demand and supply. One of the things affecting the economy was the supply of credit. Shocks to the economy on the demand side affect the profitability of firms and lead to defaults, which undermine the net worth of banks and lead to a reduction in the supply of credit. Shocks on either the supply side or the demand side can thus affect both aggregate demand and aggregate supply. The two are much more closely interlinked than is depicted in standard economic theory.

This is especially important in small open economies. In the standard theory of small open economies, slight adjustments in the exchange rate can have very big effects on increasing aggregate demand. And yet quite often, it does not work out that way. In the case of East Asia, they had a dramatic lowering of their exchange rate, but in fact the balance sheet effects of that were enormous. Rather than the economies being resuscitated by the decline in the exchange rate, they were actually hurt.

Broader implications of the new paradigm

I want to finally turn to some of the broader policy implications of this new paradigm. I have already hinted at one of them, which is the importance of regulatory policy as it affects the aggregate level of economic activity.

A second important aspect is that it focuses attention not only on the interest rates but also on the availability of credit. I gave a version of this talk at the Bank of England, which has long been under the influence of what's called the availability doctrine. To them, this is all old news. The new paradigm helped explain to them what they already believed. But in many circles this emphasis on the availability of credit has not been taken seriously. In fact, in some circles there is no such thing as credit rationing. I tell my students who have doubts about credit rationing to go down to the bank and try to get some credit. Tell the bank you will have a high income when you graduate, and ask the banker to lend you money on the basis of your future prospects. Any of them that have tried have come back empty handed.

The new paradigm also emphasises the importance of the lending rate in determining economic activity. It is not the T-bill rate, as most of us cannot borrow at the T-bill rate, even though we would like too. What matters is the rate at which firms can borrow, and the spread between the T-bill rate and the lending rate is a variable in itself that can change with economic circumstances.

An example of how the failure to recognise and focus on this can have important consequences occurred in November of 2000, when there was some worry about an increase in the rate of inflation in the US. Central bankers are always worried about incipient inflation; it seems to be something that is imprinted on them. When the Fed saw inflation starting to rise, it got very worried and raised interest rates. The timing could not have been worse. The economy was already beginning to slowdown, and the raising of the interest rates in November contributed to the recession that officially began in March. Just like most of the post-war recessions have been caused by over zealous central banks stepping on the brakes too hard, here was another instance in which clearly it contributed to the economic downturn. But if the Fed had focused on the lending rate, it would have recognised that there were already forces at play to slow down the economy. In April of that year, we had the tech bubble burst, which increased risks. The result was that the spread between the T-bill rate and the lending rate increased, so borrowers were already paying a higher interest rate. This was working to slow down the economy. The Fed, by not recognising and not focusing on the lending rate, raised the T-bill rate, which then led to an increase in the lending rate even more and contributed to the economy going into a recession.

Insights for development

I want to turn now to the final topic of this evening, and that is the insights that this general theory provides for development and finance. It begins with the observation that in many ways the financial institutions are the brains of the economy; for all you bankers, that must make you feel good. The most important function in any economy, or at least one of the most important functions, is deciding who gets scarce capital. This is especially true in developing economies, where, almost by definition, capital is very scarce. You want to make sure that it gets the best use. The process of determining credit worthiness and ascertaining what are the best projects is one of the key responsibilities of banking institutions. When they do it well, the economy grows strongly. The success of East Asia in part was a result of the fact that over a 35 year period, by and large, with some mistakes, they allocated their capital enormously well. Around the world there have been cases where there have been high levels of savings that have not been allocated very well, and the result is the growth has not been very strong. For instance, many of the oil rich countries have been able to save but have not been able to allocate or invest that savings well. But in East Asia, not only did they have high levels of savings but also they were able to earn good returns on those savings. That had at least partly to do with the efficiency of their banking and other financial institutions.

The problem is that around the world in many countries banks really are not performing the social functions which they are supposed to perform. In many countries around the world, the main thing that banks do is lend money to the government. This is a particular problem because in many countries around the world, IMF policies have driven interest rates up to 10, 15, 20 and in some cases even 30 per cent. If they can lend to the government at a 30 per cent interest rate, they do not have to worry about finding good private borrowers, since they are not going to do much better than that. It is very hard to find a factory that yields that kind of return.

The fact is that unfortunately in too many parts of the world, not only are banks not performing the functions which they are supposed to perform, neither are central banks. One of these important functions is examining whether the financial institutions are working well, in the sense that they are providing a flow of funds to each of the parts of the economy that need money; in other words, the central bank should ensure that the financial system provides funds not only to big businesses but also to small and medium enterprises, to the agricultural sector, to micro credit, to small farmers, to exporters, and for housing. Each of these parts of the economy needs a different kind of financial institution. The Prime Minister in his remarks this evening talked about housing, but an important part of housing is having financial institutions, such as mortgage markets, to provide money for housing.

Even in a well functioning market economy, quite often the private financial markets do not do as well as they should. In the US in recent years, for instance, as much as 25 per cent of the credit has been either through government sponsored agencies or with government guarantees. The government has played a pivotal role in providing and ensuring the availability of credit to a whole variety of sectors of the economy that otherwise would not have had it. It has done this in one of the most well performing private sector economies in the world. Still, there is a very important role for government action. I will list a few examples. The Small Business Administration provides vital money for start ups of small businesses. One example I often cite is that Federal Express got a small business loan. When I mention this, a lot of people start worrying about incompetence or corruption. Why did FedEx, a giant firm, get a small business loan? But an important lesson is that every large business starts as a small business. FedEx was a small business, and when it was a small business, it got a small business loan. It would not have been able to start had it not had a small business loan from the government. There are many other examples such as housing. America has one of the highest levels of private home ownership of any country in the world. Part of it has to do with tax deductions, but a large part of it also has to do with the availability of credit. Again, Fannie Mae, originally created by the

Federal Government, and a whole variety of other governmental institutions and institutions originally created by the government have played a vital role. Now, having created these effective institutions, the government can in fact step away, and the private sector is able to undertake the task of providing housing finance on its own. But the government played an absolutely critical catalytic role in enhancing this vital sector of the economy.

The US government also provides credit for exports. The Export-Import Bank is an important source of credit to exporters.

The lesson that I want to draw from this is that financial markets often do not work well on their own. There is an important role for government, and there is a very important role for the central bank to make sure that the financial markets are functioning well. They can identify where financial markets are not working well and work to create new institutions to provide the credit that is so necessary for long term economic growth and well-being.

This brings us back to Sir Arthur Lewis, because in his work he emphasised the importance of investment for the growth of the economy. He focused on savings. But savings has to be translated into investment. You can have savings, but if savings is going abroad or savings is going into government bonds, it will not be supporting investment. This is the critical role that financial institutions have to play in the process of development.

Concluding remarks

I have tried to describe in these few minutes this set of ideas called, *The New Paradigm in Monetary Economics*, an application of the ideas of information economics to which I alluded in the beginning.

One of the most important ideas in economics is Adam Smith's invisible hand, which is the idea that individuals in the pursuit of their self interest lead to economic efficiency and the well being of society more generally. One of the important results of my research and the research in economics information more generally is that it explained why the invisible hand often seems invisible: because it is not there. And it is particularly not there in areas of finance. There is an important role for government in improving the performance of the economy.

I hope I have highlighted the important roles that an active central bank and an active government can play in helping to promote development by making sure that resources are allocated well, and that those who have the potential to use those investments have access to the credit that will allow them and the economy to grow, creating jobs and increasing the prosperity and the well being of all the peoples of the developing world.

Sir Arthur devoted his life to the improvement of the well-being of those in the developing world. He believed that economic science was a powerful tool towards that end. My remarks this evening show the strength of his enduring legacy.