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# The Wharton Financial Institutions Center

## *Universal Banking, Intertemporal Risk Smoothing and European Financial Integration*

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# **Universal Banking, Intertemporal Risk Smoothing and European Financial Integration**

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**Abstract:** How should countries' financial systems be reformed? This question is of particular importance for the European Union as it moves toward a single unified system. Traditional theory suggests that market-based systems are desirable. This paper argues that this view is too simplistic. Comparing financial systems is a complex issue with many different facets. For example, if markets are incomplete they will be able to provide optimal risk sharing and intermediaries may be able to do better. It is suggested that while U.S.-style market-based systems provide good opportunities for cross-sectional risk sharing, they do not allow intertemporal smoothing. In contrast, for German-style intermediated systems with universal banks the reverse is true.

## 1. Introduction

Cross-country differences in financial systems are striking. In Germany we find a universal banking system, where banks undertake a wide range of activities including both banking and securities activities. They dominate the financial system, which has relatively underdeveloped financial markets. In the U.S., on the other hand, the Glass-Steagall act has prevented banks from freely engaging in both commercial banking and securities activities and financial markets have played a much more important role.

As international financial systems become increasingly integrated, the need to reform each country's system has become clear. How to reform those systems is a hotly debated policy issue. Much of this debate has centered on universal banking and the relationship between banks and financial markets. These issues have particular importance for the European Union. The stated goal of creating a single European financial system, without any barriers between member countries, implies a movement toward a single kind of financial system.<sup>1</sup> One possibility is to move towards a German-style intermediated system. Another is to adopt a U.S.-style, market-based system, by fostering easy access to the sophisticated financial markets in the City of London and encouraging the development of other countries' markets. In fact, a number of countries within the European Union, such as France and Spain, have already moved away from an intermediated system towards a market system. Should a market system be the goal or would a German-style system be more desirable?

The theories that have been invoked to justify many of the moves to market-based systems are based on traditional neoclassical models. Competition is thought to be desirable because it leads to increased efficiency. Opening up new financial markets is thought to be desirable because it offers increased risk-sharing opportunities. An illustration of

this line of reasoning is provided by Melitz's (1990) description of France's move to a market-based system in the mid 1980's:

As one contemplates the panoply of measures that took effect in France from late 1984 to the end of 1986, there is no doubt that the changes were inspired by a general vision. This was no mere lifting of controls: new instruments were created; new markets were added, including markets in futures; and the importance of permitting every individual agent to hedge his risks was clearly recognized. The whole program smacks of a close acquaintance with the principles of the theory of finance.

In Allen and Gale (1995a), we argue that the comparison of financial systems is complex and a whole host of factors are involved in determining the welfare costs and benefits of each system. Using as a benchmark an idealized, intermediary-based system, which we term the "German" model, and an idealized, market-based system, which we term the "U.S." model, we suggest that each type of system has advantages and disadvantages in overcoming market failures. Prescriptions such as "increased competition improves efficiency" or "allowing access to a greater range of financial markets improves risk sharing" are too simplistic. From a theoretical perspective, one can make a case for both systems. If we lived in an Arrow-Debreu-McKenzie world with complete markets, there would be no need for intermediaries, except perhaps as a means of reducing transaction costs. On the other hand, in the presence of moral hazard and adverse selection, one can argue that intermediaries must have an advantage, since they can replicate anything that markets can do and in addition they have the ability to write long-term incentive contracts to reduce agency costs. In the real world, which falls somewhere between these two extremes, markets are incomplete and intermediaries pose incentive problems of their own. Designing an optimal financial system involves a detailed weighing of the offsetting costs and benefits and will likely require a mixture of markets

and intermediaries.

In Allen and Gale (1995b) we focus on the risk-sharing differences between the two benchmark German- and U.S. style systems. One difference is that in a market-based system, asset values are continuously marked to market, which implies that individual investors bear a substantial amount of risk from fluctuations in market prices. An illustration of this difference is provided by the German and American experiences of the 1970's and 1980's. In the U.S., the real value of the stock market approximately halved after the "oil shock" in the early 1970's and stayed at this level for the rest of the decade as shown in Figure 1. Households that had provided for retirement by investing in the stock market and needed to liquidate shares in order to pay for consumption were forced to reduce their standard of living substantially. By contrast, in the 1980's the stock market approximately doubled in real value and the process was reversed; households whose savings were invested in the stock market were able to increase their consumption substantially. The important point is that these U.S. households bore substantial consumption risk over the two decades.

The U.S. experience can be contrasted with that of Germany over the same period. As stressed in Allen and Gale (1995a), German households save for retirement and other purposes primarily in various forms of bank accounts and other debt-like instruments, such as insurance policies. Although Germany also experienced an "oil shock", the value of these savings was not halved. German investors were able to consume the amount they had planned as banks drew on reserves to maintain payouts. In the 1980's there was a sustained boom in Germany as in the U.S. During this period the value of households' savings did not increase, since they were held in the form of fixed claims on the intermediaries. The intermediaries, however, were able to build up reserves. In contrast to the U.S. case, we could argue,

households did not bear as much risk from their savings because of the depletion and addition to reserves by intermediaries.

The "oil shock" and boom of the 1980's are examples of what are usually termed non-diversifiable risks. They are risks which affect the whole economy and cannot be diversified away by holding a large portfolio containing many stocks. Standard financial theory has little to say about the hedging of non-diversifiable risks. It assumes that the set of assets is given and focuses on the efficient sharing of these risks through exchange. We term this kind of risk sharing cross-sectional risk sharing. It is discussed in Section 2. Financial markets are well suited for providing this kind of risk sharing.

Allen and Gale (1995b) departs from the traditional approach by focusing on how non-diversifiable risk can be reduced by a financial system. We term this intertemporal smoothing. It is argued that financial markets cannot provide this kind of risk reduction, whereas intermediated financial systems can do so. This is discussed further in Section 3.

The example of intertemporal risk smoothing is an illustration of the general failure of incomplete markets to provide optimal risk sharing. Risk sharing is a kind of insurance and any form of insurance lends itself to problems of adverse selection and arbitrage. Intermediaries may be able to do better than markets precisely because their assets are not freely traded and are not marked to market. In Section 4 we offer some other examples of this general phenomenon.

The purpose of this paper is to develop the implications of some of these ideas for the policy issue of European financial integration. Much of the financial reform that has occurred in countries such as France and Spain has been concerned with moving away from a German-style intermediated system and allowing access to global financial markets. In doing this they gain the

advantages of cross-sectional risk sharing. However, they may be losing the advantages of intertemporal smoothing and other forms of risk sharing. It may be that this change is desirable, but it is important that the trade-off be properly understood before moving in this direction. This is particularly true for Germany, where the potential already exists for a system of intertemporal smoothing. Once the move to a market-based system has been made, it is much more difficult to regain the advantages of an intermediated system.

An obvious question is whether universal banks can extend the activities they undertake to simultaneously obtain cross-sectional risk sharing and intertemporal risk smoothing. This possibility is discussed in Section 5. Section 6 contains some concluding remarks.

## 2. Cross-Sectional Risk Sharing

It has long been recognized that one of the major functions of financial markets is to provide opportunities for risk sharing (Arrow (1964)). Markets allow individuals to diversify portfolios, hedge idiosyncratic risks, and adjust the riskiness of portfolios to suit their risk tolerances. We call this cross-sectional risk sharing, because different individuals are exchanging risks at a given point in time.

One of the salient characteristics of market-based financial systems such as those in the U.S. and U.K. is the enormous variety of financial products available to the average investor. The diversity of instruments and markets does provide many opportunities for cross-sectional risk sharing.

In Germany, the possibilities for cross-sectional risk sharing are more limited. Relatively few stocks are quoted on the stock exchanges and there are few mutual funds or other intermediaries which can provide direct ownership of stocks without high transaction costs. Trading futures and

options is not a practical possibility for most investors. In short, investors have restricted opportunities to share risk cross-sectionally through markets. Most save in bank accounts which do not provide opportunities for hedging.

From the point of view of cross-sectional risk sharing, the U.S. model appears to offer a much richer menu of choices than the German model and it is tempting to conclude that a market-based system provides superior risk sharing opportunities to an intermediary-based system. However, markets have their own limitations and if markets are incomplete or if participation in financial markets is incomplete, intermediaries may have some advantages in providing risk sharing by smoothing returns over time.

### 3. Intertemporal Risk Smoothing

If markets were complete in the Arrow-Debreu-McKenzie sense, there would be no difficulty in obtaining insurance against all risks. But in the real world, participation is incomplete (not everyone is able to trade at a fictional initial date) and the markets available are incomplete (even if all securities can be synthesized by continuous trading, the costs of doing so make this impractical as a method of optimal risk sharing). Intermediaries can do better by setting up a risk sharing mechanism for the participants, but the sense in which they can do better is subtle and the way they achieve it involves some important qualifications.

There are two forms of intertemporal risk sharing which are not likely to be available in a market-based system. One is what we call intergenerational risk sharing. Here risks can be smoothed over time by "passing" them from one generation to another.<sup>2</sup> In order for one generation to liquidate its holdings of assets, another generation must be willing to buy. The price at which this exchange takes place may be volatile, because

of fluctuations in interest rates, for example. This price variation may introduce substantial consumption risk. An intermediary can provide insurance against these swings in asset prices by averaging gains and losses over time. But without some institution to bridge the gap between successive generations, the market does not provide any mechanism for sharing this risk. In a market-based system, different generations participate in the market at different points in time (this is an example of incomplete participation) and individuals have an opportunity to avoid the downside risks of such a scheme by "opting out" when the returns are unfavorable (this is an example of arbitrage unraveling an insurance scheme). These two factors combine to prevent the market from providing optimal risk sharing.

Another means by which intermediaries can achieve intertemporal smoothing is asset accumulation. A formal model is provided by Allen and Gale (1995b). We contrast a market economy, in which individuals invest directly in a safe asset and a risky asset, with an intermediated economy, in which a long-lived intermediary holds all the assets and offers deposit contracts to each generation. Because of the overlapping generations structure of the model, the price of the risky asset in the market economy is always low enough that its return dominates the safe asset, which is never held. As a result, each generation bears the full dividend risk on the risky asset. In the intermediated economy, on the other hand, intertemporal smoothing is provided to individual investors, who do better according to almost all welfare indicators, by accumulating reserves in the form of the safe asset. In fact, in a long-run-average sense, the intermediary can eliminate risk altogether. This is a form of intertemporal risk pooling, analogous to the risk pooling that markets perform when they allow investors to diversify risks across many assets. However, unlike the cross-sectional risk sharing allowed by markets, intertemporal risk pooling requires the

are extremely imperfect.<sup>4</sup>

The analysis in Allen and Gale (1995b) focuses on one particular market failure, namely incomplete market participation. This is meant to be a paradigm for other types of incomplete markets. We would argue that there are many market failures which limit the ability of markets to smooth risk intertemporally. Examples are the problems of writing individualized contracts, transaction costs, moral hazard and adverse selection. In many cases, such market failures do not impede the ability of an intermediary-based system to smooth returns over time by building up and

governments in a number of countries have reduced their direct investment and have privatised their existing holdings of assets. If there are government failures which limit the effectiveness of governments in investing directly, intermediaries may be able to smooth risk more effectively.

Other methods of alleviating risk available to governments are social security schemes and budget deficits. Pay-as-you-go social security schemes and budget deficits are concerned with reallocations at a given point in time. They are methods of sharing risks between and within generations; they do not achieve intertemporal smoothing through asset accumulation. Funded social security systems can provide intertemporal smoothing through asset accumulation, but only if the fund is invested in real assets rather than paper claims such as government debt. The government may play an important role in this respect, if it is interested in the long-run welfare of its citizens. Similar considerations apply to occupational pension schemes provided by industrial groups or large employers, if they take a longer term view than individuals.

#### 4. European Financial Integration and Disintermediation

One of the major issues in moving towards a fully integrated financial system in Europe is how to manage the transition. One alternative is simply to remove barriers and allow all investors, firms and financial institutions access to markets in every country. For example, investors in Germany would have easy access to the international capital markets in London and would be able to invest in the wide array of funds and assets available there.

We started by considering a financial system with intermediaries and without markets. One might expect that a larger set of alternatives, markets plus financial intermediaries, would make individuals better off than markets

or intermediaries alone. One could use markets to achieve optimal cross-sectional risk sharing and use intermediaries for other forms of risk sharing. But this argument relies on a very broad ceteris paribus assumption and overlooks the fact that many other things will be different in the two economies.

In Allen and Gale (1995b) we formally model what happens if a relatively small intermediated financial system is opened to competition from global financial markets. It is shown that there is a significant problem of disintermediation which undermines the ability of an intermediated financial system to provide intertemporal smoothing. The reason is that risk sharing of the type discussed in the previous section always implies some form of arbitrage opportunity. Taking advantage of arbitrage opportunities is rational for the individual, but it can lead to an equilibrium in which everyone is worse off. This is why market-based financial systems cannot provide intertemporal risk smoothing of the type described, even if a wide variety of financial instruments is available.

The effect of competition from financial markets is modeled by assuming that the intermediated financial system is small by comparison to the financial markets, so the market equilibrium is unaffected by the presence of the intermediary. Each generation has a choice of whether to participate in the intermediary's risk-sharing mechanism or to make use of the financial markets. To simplify, we suppose that an agent has to choose one or the other; allowing partial participation would make the threat of disintermediation greater and would strengthen our result. Then in order to persuade agents to participate in the risk-sharing mechanism ex post, it must offer a higher expected utility than the market, conditional on the information available to the agent at the moment he makes his decision. In fact, we show that subject to this disintermediation constraint, the

intermediary can do no better than the market, i.e., no generation can be made better off, even in an ex ante sense.

This result does not depend on the fact that the early generations are almost certainly going to lose out because they will be required to contribute to the reserves more than they can hope to gain from risk sharing. The result continues to hold if we give the risk-sharing mechanism a "head start" in the form of an arbitrarily large but finite initial reserve. Eventually there will come a time when the reserves are depleted. If the return on assets is below average, the risk-sharing mechanism will not have the reserves to subsidize the return. However, if the return is above average the risk-sharing mechanism will tax the return in order to replenish its reserves. Thus, the return offered by the risk-sharing mechanism is dominated by the market return and investors will therefore opt out of the intermediated system. Anticipating this, preceding generations will also opt out and the whole scheme unravels.

This parable suggests that simply opening up the German financial system to competition from the global capital markets in London may cause difficulties for German financial institutions. The banks will no longer be able to smooth away non-diversifiable risks and, if they try, they face the threat of disintermediation and the instability which this might cause. Although cross-sectional risk sharing will be significantly improved, this may not be enough to compensate for the elimination of intertemporal smoothing or the risk of financial instability. Moreover, once disintermediation has occurred it will not be easy to reestablish an intermediated system, because the early generations would be called upon to accept a lower expected return from the intermediated system than is available in the market system in order to build up reserves.

The trade-off between cross-sectional risk sharing and intertemporal

risk smoothing depends on the degree of heterogeneity within each generation in terms of risk sharing capacity. If there are wide differences then improving cross-sectional risk sharing possibilities is desirable. On the other hand, if each generation is fairly homogeneous, so there is not much scope for cross-sectional risk sharing, then intertemporal risk smoothing will allow a larger improvement in welfare.

The direction that the European Union should move in when establishing a single financial system depends on a complex array of factors. The analysis described above suggests that market-based systems have limitations. We would argue that this is an example of a more general weakness of markets. In an Arrow-Debreu-McKenzie world with complete markets, complete participation, and no transaction costs, efficient risk sharing can be achieved, but these conditions are not satisfied in practice. So societies have developed a number of institutions that provide insurance that financial markets do not provide. Governments provide unemployment insurance and social security benefits. Companies provide health insurance and occupational pension plans. Banks and insurance companies provide claims that are not subject to fluctuations in market prices. The problem is that all these schemes for providing insurance against non-diversifiable risks involve some form of intertemporal risk sharing, since non-diversifiable risks can only be averaged over time, and the intertemporal aspect of these insurance arrangements leads to arbitrage possibilities. If, at any time, agents can find a better investment, they will take it. Governments can compel participation, but other institutions cannot. So the existence of markets tends to undermine private intertemporal insurance arrangements of all kinds, precisely because there will be times at which the current market return will be more attractive than the smoothed return offered by the institution. So an insurance company which tries to smooth the returns on

its annuity policies will find a lot of takers when market returns are low and few when they are high, but it cannot stay in business this way, at least, not in a competitive environment. But in a financial system dominated by a few, large institutions which have all chosen to smooth returns and in which financial markets do not exist to provide competition, this situation may be quite stable.

The possibility of intertemporal smoothing does not by itself tell us whether European financial integration is a good thing or a bad thing, but it does suggest that the idea that competition and markets are a panacea for all of Europe's financial problems is too simplistic. There are, too, other theoretical reasons why competition may be undesirable: it can create a barrier to exploiting economies of scale, it can reduce incentives for innovation by making rents harder to capture, it can offer too much choice in a market where information is costly, and it can lead to instability. Taken together, these ideas suggest that a more searching analysis of the costs and benefits of different financial systems may be required.

##### 5. Can Universal Banks Achieve the Best of Both Worlds?

An interesting issue is whether it is possible to have a financial system which simultaneously obtains the benefits of cross-sectional risk sharing and intertemporal risk smoothing. One problem has already been alluded to: there is a fundamental tension between intertemporal risk smoothing and the existence of financial markets. This suggests that if cross-sectional risk sharing and intertemporal risk smoothing are to be achieved simultaneously, it does not seem likely that this can be done by a combination of traditional bank accounts and financial markets. One possibility is to create a universal superbank, which offers a menu of bank accounts with different risk characteristics, combining the best features of

both the market and traditional intermediaries.

One barrier to implementing universal superbanking is the problem of maintaining liquidity, without undermining intertemporal smoothing. One of the chief rationales for having a variety of products is that customers can use their private information (about risk preferences, liquidity needs and so forth) to construct tailor-made portfolios. Since new information is continually arriving, the customer will want to rearrange his affairs as time goes on. The only practicable means of allowing customers to make use of this information is to offer them the opportunity of reallocating their wealth among the different funds. But this threatens to wreck whatever intertemporal smoothing schemes the bank has managed to set up.

Another barrier arises from the difficulty of finding variables to which the returns of the various accounts could be indexed. Ideally, these variables should be observable, verifiable and non-manipulable. One possibility is to have the bank set up a mutual fund, the assets of which are owned by shareholders and held by a trustee, so that the returns to each investor's account are tied to the performance of the fund's portfolio. But once this is done, it effectively rules out the possibility of intertemporal risk smoothing. The depositors are the legal owners of the fund and the bank cannot infringe their ownership rights by making transfers into and out of the fund. On the other hand, if the deposits are invested in the general assets of the bank, it is not clear how the rate of return will be determined. Because the bank's assets are not marked-to-market, any measure that one might choose is manipulable. In fact, to the extent that intertemporal smoothing is offered by the bank, we want the return to be manipulable rather than being tied to an index that is beyond the bank's control. Deposit contracts do not suffer from this problem, because they either specify a fixed rate of return or allow the rate of return to be set

at the discretion of the bank.

For all these reasons, it may be difficult to improve on the range of products that German universal banks offer without undermining the potential for intertemporal smoothing. There is thus a trade-off in deciding on the structure of a financial system. If investors are fairly homogeneous there is little advantage to cross-sectional risk sharing and little cost to adopting the German model which allows intertemporal risk smoothing. On the other hand, if there is enough heterogeneity that the benefits from cross-sectional risk sharing outweigh the benefits from intertemporal risk smoothing, a market based system may be preferable.

## 6. Concluding Remarks

In this paper we have identified two types of financial system. A market-based system promotes cross-sectional risk sharing. An intermediary-based system promotes intertemporal risk smoothing. Which system is best in a particular situation depends on the degree of homogeneity in each generation. According to this view, it is not immediately clear that a move towards a single European financial system will lead to an improvement in welfare. The parts of the European Union which currently have intermediary-based financial systems such as Germany may well be made worse off because there may will be disintermediation and possibilities for intertemporal smoothing may be eliminated.

The European Union is not the only place where the issue of financial integration is an important one. The Clinton administration has made it a priority to encourage the Japanese to open their financial system and allow foreign competition. Just as the analysis above suggests the German financial system might be damaged by the move towards a single market in the European Union, the effectiveness of the Japanese financial system might also

be reduced by such a change. Similarly, with NAFTA and the extension of this free trade zone to the rest of the Americas, it is again not immediately clear that moving towards a single financial market will benefit all countries.

# NYSE Index

constant dollars, 1966=100

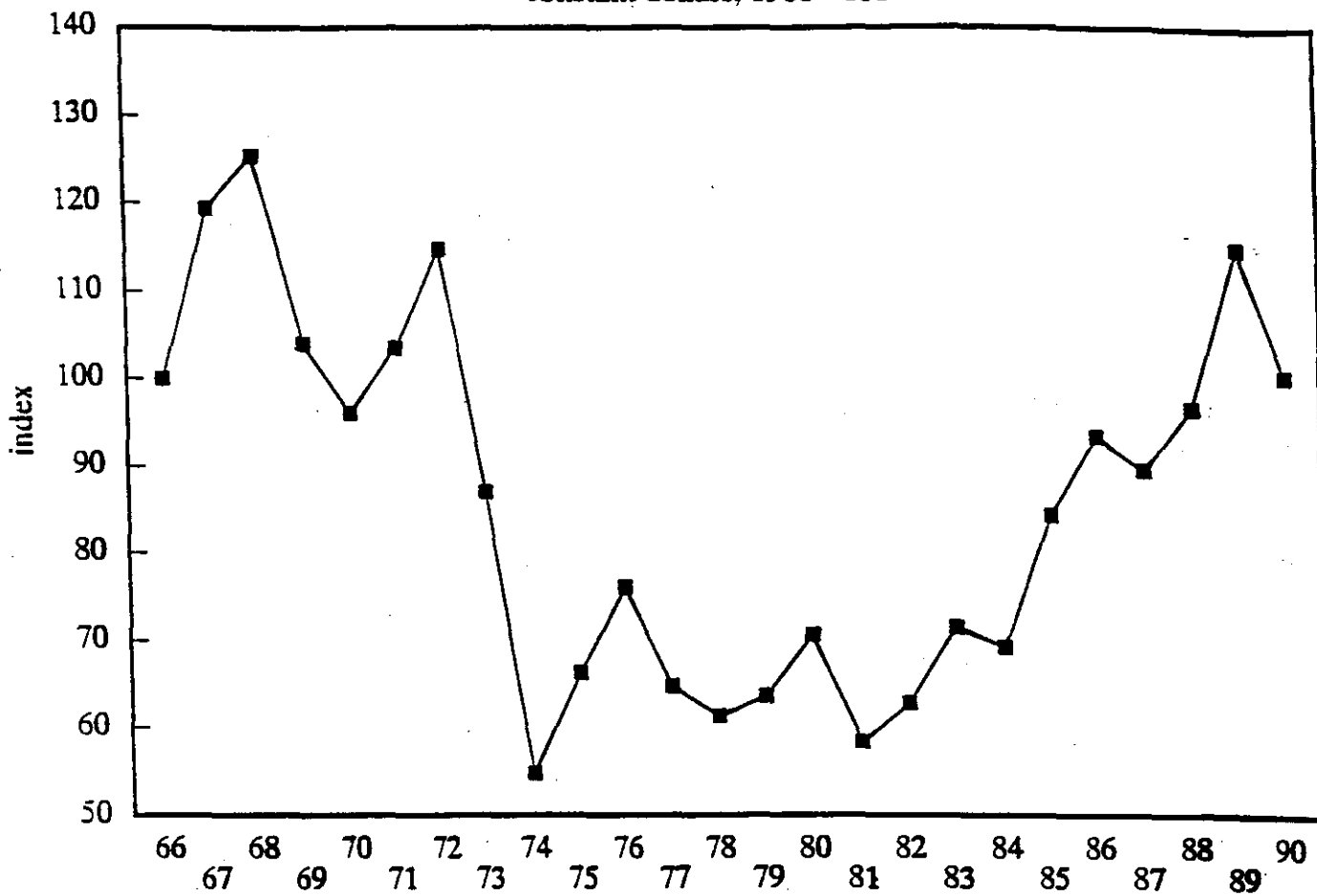


Figure 1

The variation of real U.S. stock prices 1966-1990

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## Notes

<sup>1</sup> See Saunders and Walter (1994) pp. 119-124 for an outline of the history and plans for European financial integration and Institute of International Bankers (1994) for recent developments.

<sup>2</sup> For a further discussion of the issues involved in intergenerational risk sharing, the reader is referred to Gale (1994) and the references cited therein. A model of intermediation in which liquidity risk is shared between generations is provided by Qi (1994) who extends the Diamond-Dybvig model to an intertemporal setting. In Qi's model there is no aggregate uncertainty and hence no scope for intertemporal risk smoothing.

<sup>3</sup> Fulghieri and Rovelli (1994) and Bhattacharya and Padilla (1994) also compare the performance of markets and intermediaries in achieving efficient intertemporal allocation of resources but they assume there is no aggregate uncertainty in consumption.

<sup>4</sup> See Altonji, Hayashi and Kotlikoff (1992) and the references cited therein.