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Commodity Indexed Securitization and Infrastructural Change: Turkey's Role in Emerging Economies

Som Dasgupta & Michael B. Brodsky***

I. INTRODUCTION

Recent changes in the structure of central European and Eurasian states present the international financial markets with a unique set of opportunities and some formidable dilemmas.¹ In the newly emerging economies of Azerbaijan, Bulgaria, Kazakhstan, Turkmenistan, and others there are high interest rates, and currencies which are usually non-convertible or at best partially convertible. Turkey is viewed as central in this setting. Since the economic decline of Beirut, Turkey has increasingly assumed the role of the regional financial center, providing access to such services as financial expertise, trading, and more generally providing an eastern gate to these markets for the industrialized nations of the West.

While high interest rates may be in keeping with high inflation and the necessity to attract capital for sovereign projects,² at the private level

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¹ See Anderson, Gilbert and Powell, Center for Economic Policy Research, London SW1Y6LA; article no. 295, April 1989. Among other factors these dilemmas include the risk of default that is invariably weighed against the likelihood of attractive interest payments, the decision on whether to purchase default insurance from a third party, which can significantly increase costs for the lender etc.

² Capital flows are usually directed towards regions with highest available returns, *ceteris paribus*. In recent years German interest rates have been maintained at high levels to attract international capital necessary to finance growth in Eastern Germany. When exchange rates are fixed, the

high inflation and non-convertibility compounded with domestic risk considerations translate into a severe paucity of funds. However Western sources of capital realize the potential, on a macroeconomic level, of these new markets.³

In view of these issues, this paper proposes an optimal approach to design and regulation of commodity contingent instruments for private enterprises. The design of these instruments is likely to significantly alleviate the capital constraints in emerging markets, particularly in Eurasia. A commodity contingent security usually consists of a combination of a traditional debt security (a bond) and several units of a financial instrument, the payoff of which is in some well-defined way linked to the price of a traded commodity. Although commodity contingent securitization can, in theory, be applied at both the national and the private level, the proposals in this paper are directed mainly toward private sector funding. Government plays an important and complementary role in determining the success of these instruments. Government should provide tax subsidies to external sources of private sector capital, design a regulatory framework that preserves the integrity and professional reputation of these infant markets, and, more generally, foster a social consensus for entrepreneurship and growth.

It is important to distinguish between the two sources of risk which international capital intermediaries (banks, for example) face. Sovereign risk arises from the possibility of default when funds are lent at the national level. The other sources of risk generally arise from the volatility of cash flows from the public sector projects funded by such loans. The poor service record on Less Developed Country (LDC) debt during the 1980's⁴ has had severe balance sheet related consequences for creditor banks. To an important extent this reflects the failure of banks to distin-

ability of monetary policy to influence the level of interest rates is limited. Eight European countries, including Germany belong to a subsystem called the European Monetary system, that maintains a fixed exchange rate between these countries, but freely fluctuates as a group against the U.S. dollar. Thus Germany's insistence on maintaining high interest rates had to be validated by the others in the system, often leading to difficult policy co-ordination between the respective European central banks. For an in depth treatment of these issues see Dornbusch and Frenkel (eds.) *International Economic Policy: Theory and Evidence*, Baltimore, Johns Hopkins, 1985.

³ In a recent study (*Journal of Portfolio Management* Vol. 19. No. 1 Fall 1992) BARRA, Inc. analysts, Divecha, Drach and Stefek have found that investing in Mutual funds of emerging markets can actually lower the risk and increase the return of internationally diversified portfolios. Specifically they find that "... Over the past five years, a global investor who put 20 percent in an emerging market index fund would have reduced overall annual portfolio risk from 18.3 percent to 17.5 percent while increasing annual return from 12.6 percent to 14.7 percent.

⁴ In the 1970's there was a surge in lending to Latin American nations by U.S. banks. Subsequent default on the part of these nations brought about a crisis in the U.S. banking community of massive proportions.

guish between sovereign default risk and other sources of risk. In situations in which private sector debtors default on contractual obligations, creditors have greater protection by securing assets or the potential for recourse through courts. Clearly such protection does not exist when the counterparty is a sovereign government. Thus servicing of public debt is largely a voluntary action, where the sovereign compares the costs and benefits of full default to the alternative of debt rescheduling or refinancing.

The sovereign risk problem has spillover effects on project specific and general obligation bank loans to private enterprises. Accordingly, a private sector loan, which by definition does not carry the sovereign risk, is incorrectly perceived to include a sovereign component. In reality investors and lending institutions are confused about illiquidity or non-convertibility of currency and linking this with the sovereign risk. Proposals to tackle the seemingly intractable problem of sovereign risk range from conventional ideas, such as third party insurance provided by an international agency such as the IMF, to stricter ones requiring the borrower to pledge collateral.

Two issues must be clearly understood in the context of misappraisal of sovereign risk. First, while sovereign risk does not exist for private enterprise loans, the diffusion of national level loans, if any exist, may cause foreign private capital to be more forthcoming. Second, the absence of sovereign risk does not imply that private enterprise loans are less risky than sovereign loans. In fact default risk in these loans may be significant,⁵ and may be easily hidden from the international investor due to informational asymmetries. High default probabilities arise when the contractual obligations are negatively related to the borrower's ability to pay. Commodity contingent securities can reverse this negative relationship and thereby minimize default risk. The pricing of this minimal default risk can be obtained from any of the well-known risk-pricing models,⁶ enabling the hybrid security to be traded on the open market. The problem of obtaining capital via hybrids is then reduced to proper packaging and marketing of these instruments.⁷

⁵ D. Anderson *Small Industries in Developing Countries: A Discussion of Issues in World Development* 10, no. 11: 913-948 finds default risks that range from 10 percent to 60 percent.

⁶ For example it is widely understood in finance, that a simple insurance, viewed as a put option, can be priced through the Black-Scholes option pricing model, or any other appropriate actuarial model. See, for example, R. Merton, *Continuous-Time Finance*, 424.

⁷ Developed capital markets of the West have witnessed a proliferation of hybrid instruments during the 1980s. For example a highly successful crude oil price contingent bond was issued by The Standard Oil Company of Ohio (SOHIO) in 1986. A good discussion of the SOHIO contract can be found in the article *Regulation of Commodity-Linked Debt and Depository Instruments* by Jordan,

The article is organized as follows. In Section II new markets are described and the typical problems that characterize these markets are analyzed. Section III examines the overall financial position of Turkey and why it is critically poised to assume a key role in the development of the Eurasian markets. Section IV introduces the reader to the design and basic tools of commodity contingent securities and provides some examples. It also discusses the potential of such instruments as risk management products in emerging markets and addresses the regulatory and institutional frameworks under which these securities are likely to succeed. Furthermore, the new version of Turkey's Capital Market Law and the provisions in this law that relate specifically to the development of commodity contingent instruments are examined. Section V provides overall conclusions and developments that are expected to follow in the wake of regulatory and economic reforms.

II. THE STRUCTURE OF NEW MARKETS

In the newly formed countries of Eurasia, formal capital markets in the Western sense do not exist. What does exist are informal sources of finance such as family, friends, local moneylenders, and curb markets. While finance of this type has been largely unsuccessful in fostering prosperity and growth, information accumulated by these traditional sources has proven to be invaluable in making a proper transition to capital driven economic growth. Authors such as Malcolm Harper⁸ have expressed a rather pessimistic view regarding the ability of capital markets to grow in developing countries. This is largely based on the notion that small scale entrepreneurs do not have the sophistication to distinguish between debt and equity, or long term and short term financing.

While the preceding viewpoint needs to be taken into consideration in making capital allocation decisions, it should be pointed out that recent experiences of countries such as Brazil, Chile, India, and Indonesia, have been uniformly the opposite. In these countries, capital constraints arise primarily due to informational asymmetries between the SSE (small scale enterprises) and the lending institution. There also exist certain types of market imperfections, such as natural monopolies and cartels, imperfect foresight, and an incomplete set of financial instruments. Other imperfections arise due to state intervention in controlling interest rates, rationing and directed loan allocation in favor of or against small

Mackay and Moriarty in *The Handbook of Financial Engineering*, Smith & Smithson (Eds.), Publisher: Harper & Row, page: 554-557.

⁸ M. Harper, *Small Businesses in the Third World* (1984).

and medium scale enterprises, taxation of dividends, and regulatory limits on expansion and new product development.

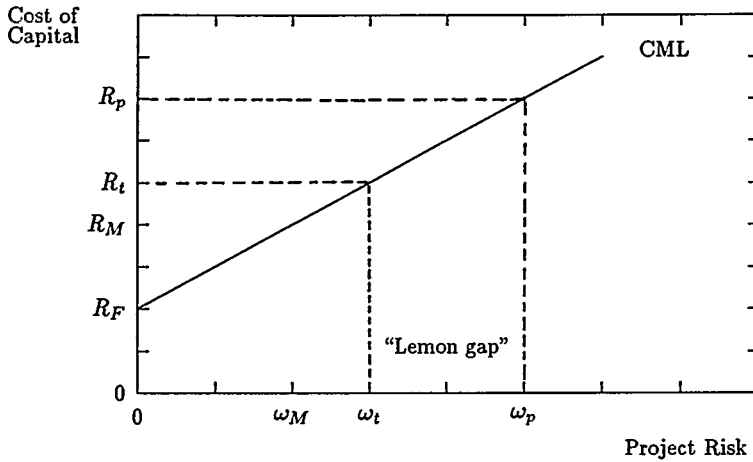


Figure 1: True Risk and Perceived Risk of SSE

A. Perceived Risks

One imperfection related problem that arises due to asymmetric information between the capital intermediary and the SSE is that of transactions costs. Often the costs of investigating the risk inherent in a particular loan are disproportional to the size of the loan. This means that at the warranted rate of interest (cost of capital), the expected net present value of cash flows are insufficient to support the project to fruition. This disproportionality may be eliminated if collateral is available; however such is rarely the case for SSEs, especially start ups.

Akerlof⁹ discusses a systematic bias that frequently arises in the financing of SSEs. According to Akerlof's theory, given the high cost of loan investigation, the high risk nature of SSEs, and the common perception that SSEs are high risk, a uniformly high level of risk is assessed on all loans sought by individual SSEs. Figure 1 exhibits the situation associated with the so-called "lemon gap." The true risk of a representative SSE is given by ω_t , whereas the perceived risk is ω_p . Given the overall market risk and the rates of return on the market and the risk-free rate

⁹ Akerlof, The Market for Lemons: Quality of Uncertainty and the Market Mechanism. Quarterly Journal of Economics 84 (1970).

(W_M , R_M and R_F respectively), the Capital Asset Pricing Model¹⁰ projects a fair cost of capital for the SSE at R_t . However, due to the incorrectly assigned across-the-board level of risk, the actual cost of capital to the SSE is R_p . As a result the lowest common denominator (the riskiest SSE) forces the better projects out of the market. This exaggerated risk usually does not arise with local moneylenders who possess better information on the borrower's activities. In this respect, informal capital markets are much closer to the full-information model than the formal institution based structure.

B. Venture Capital Funds

The provision of venture capital funds can prove to be of great advantage in emerging markets for many reasons. One immediately obvious reason is the elimination of the lemon gap. Since venture capitalists are significantly closer to the small business borrower than an ordinary corporate lending institution, their information set is much more precise. This more precise information will lead to the proper allocation of resources, although transactions costs will increase since only a fraction of all applications will be accepted. One significant problem that arises with the traditional system, however, is that while venture capital funds may be successfully used in funding business start-ups and smaller working capital requirements when the business has established some ground, they are woefully inadequate when larger amounts of capital need to be infused for the purpose of expansion and long term planning.

It is precisely for such large scale expansionary activity, leading to export oriented operations, that commodity contingent securities (CCSs) are proposed. Specialized funds consisting of CCSs can provide much needed capital; these funds can then be traded on second tier markets,

¹⁰ The Capital Asset Pricing Model (CAPM), was developed independently by John Lintner (1965), Jan Mossin (1966) and William Sharpe (1964). Their respective versions are different only in terms of some initial assumptions but lead to the same conclusion: market prices of portfolios containing assets with uncertain cash flows must bear a consistent relationship with the overall risk-return characteristics of the "market portfolio." The overall market portfolio is typically proxied by the S&P 500 index. This consistent relationship is quantified to arrive at an equation called the Capital Market Line which provides the market warranted return for all securities, given their total "amounts" of risk. This risk measure is the "beta" of the asset and is equal to the ratio of the covariance of the asset return with the market's and the variance of the market's return. The CAPM, or some version of it, has been used to project the fair cost of capital for a firm. To gain a detailed understanding of the CAPM see for example William Sharpe's original article *Capital Asset Prices: A Theory of Market Equilibrium* in *Journal of Finance* 1964. This theory and the other related and unrelated research contributed to William Sharpe co-receiving (with Harry Markowitz and Merton Miller) the Nobel Prize in Economic Science in 1991.

and thereby obtain a market valuation of the firm's capital structure. In this regard the debt to equity ratio of the firm plays a pivotal role.

The Modigliani-Miller theorem notwithstanding,¹¹ a higher debt/equity ratio, *ceteris paribus*, increases the risk of the firm. It has been argued that once investment policy (i.e. investment projects) is identified, the risk of cash flows is known. Thus fixed interest payments against such cash flows should not cause any unanticipated risk. However, increasing leverage also increases expected bankruptcy costs, leading to the conclusion that there is an optimal level of debt, one that minimizes expected bankruptcy costs. A generalization may be made at this juncture. The higher the risk of an enterprise the lower its leverage should be, making equity investments the natural choice. However outright equity investment may not be forthcoming when risks are high, suggesting the use of equity derivatives, convertible debt, debt issued with commodity calls, and a whole gamut of other possibilities.

Limits on the level of the debt/equity ratio that lenders are usually willing to tolerate vary from 1:1 in countries like Bulgaria and Ukraine to 2:1 in Azerbaijan, Turkmenistan, Kazakhstan, Baku, and others of the former Soviet republic. Table I shows incentives available in some selected countries for investments in venture capital funds. In the United States incentives for venture capital investment appear only as a part of government funds allocated to R & D expenditures. Certain countries, such as Japan, do not have any incentives for venture capital investment. Under its new policies, Turkey offers significant opportunities for both domestic and international venture capital.

III. TURKEY: MARKET REFORMS AND THE NEW ECONOMIC POLICY

The purpose of this section is to provide an overview of the Turkish economy, with specific emphasis on its financial sector. The last decade witnessed an era of stabilization and structural change in Turkey. Economic programs, evolving in accordance with the agreements and financial support of the World Bank and the IMF, have had far-reaching impacts domestically and on neighboring economies. This is underscored by Turkey's increasing consolidation of the role of the regional financial center.

The broad objectives of Turkey's stabilization program consisted of

¹¹ The Modigliani-Miller theorem finds that under perfect capital market conditions, the debt to equity ratio of the firm is irrelevant in determining the value of the firm. The original article titled "The Cost of Capital, Corporation Finance and the Theory of Investment," appears in *The American Economic Review* 48 (1958).

TABLE I: VENTURE CAPITAL FUND INCENTIVES

Country	Incentives	Capital Markets
U.S.A.	Finance tied to govt. R&D policy	NASDAQ
U.K.	BES (Business Expansion Schemes) tax subsidies to individuals	Unlisted Securities Markets
West Germany	None	None
Japan	None	OTC Market
Canada	Tax concessions on dividends, capital gains	None
France	Tax concessions to start-ups and VCFs; guarantees to investors in risky enterprises	Second Marché
Turkey	Tax exemptions to VCFs; tax concessions on dividends, capital gains; international tax treaties; transactions costs minimizing trading systems.	Proposed Istanbul second tier market; New approved Commodities and Futures markets

Sources: *Financial Times* supplement "Venture Capital," December 1987; and the Capital Market Board of Turkey.

restoring economic growth with low inflation levels, promoting the reliance of the economy on market forces, and reducing the role of the public sector. To achieve these objectives the following policies and reforms were utilized:

1. Liberalization of exchange rate policies and payments systems to achieve a fully convertible traded currency;
2. Interest rate deregulation and financial sector reform;
3. Foreign trade and investment regime reform; and
4. Public sector reform by converting SEEs (State Economic Enterprises) to private businesses.

In 1980 the IMF approved a three-year standby arrangement for Special Drawing Rights¹² (SDR) of 1,250 million. In 1983, an additional one year arrangement was approved for SDR of 225 million to be followed by another SDR of 225 million in 1984. These arrangements contained quantitative performance criteria, including limits on the net domestic assets of the Central Bank and Central Bank credit to the public sector and annual limits on short term debt. In addition, the World Bank extended sizable project lending and five consecutive Structural Adjustment Loans totaling \$1.6 billion.

¹² Special Drawing Rights are available only to approved members of the International Monetary Fund. These members may draw loans denominated in a mixture of international currencies.

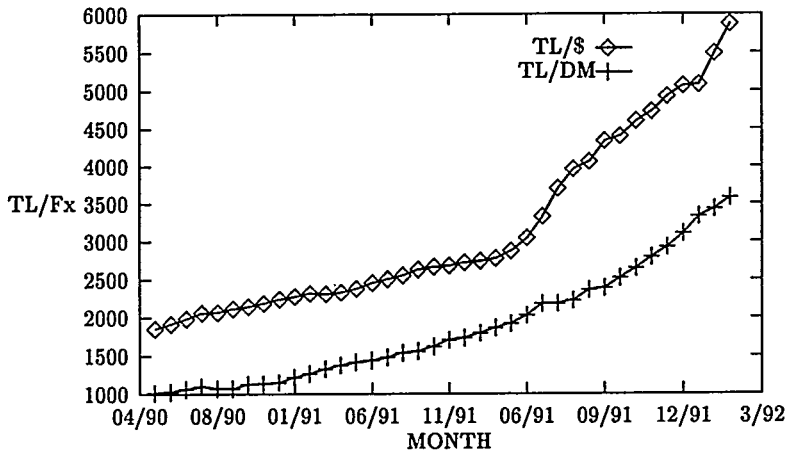


Figure 2: Exchange Rate Movements

A. Main features of the Adjustment Program

1. *Exchange Rate and Payments Regime.* Figure 2 exhibits exchange rate movements of the Turkish Lira (TL) against the U.S. dollar and the Deutsche Mark (DM). The fundamentally different new regime evolved in three stages. First, the currency was devalued by 33% in January, 1980, and subsequently small adjustments were made in increasing frequency. In May, 1981, the authorities began adjusting the exchange rate on a daily basis. Starting in 1988, the exchange rate was determined in the open market with Central Bank participation. Multiple exchange rate practices were phased out and the payment system was liberalized. The new regime allows banks to open foreign currency accounts and trade freely in the currency market.

2. *Financial Markets Reforms.* Financial reform began with interest rate deregulation and later extended to capital markets. In 1982 the Capital Market Board was established as the regulatory body for the securities markets. A treasury securities market was established in 1985 and an interbank money market was introduced in 1986. The Istanbul Stock Exchange was reopened in the same year. The Central Bank opened the Gold Market in 1989. The process of securitization and innovation led to the introduction of active markets on T-bills, commercial paper, and mutual fund certificates.

3. *Foreign Trade and Investment Regime.* Import liberalization started in 1984. The new system eliminated quantitative restrictions and reduced tariff rates. The main tool for export promotion was the exchange

rate policy which maintained and increased the competitiveness of the economy. In addition, the government provided tax rebates for exporters, preferential export credits, and foreign currency retention. Following trade account liberalization, the government also liberalized capital account transactions in 1988 and 1989.

4. *Public Sector Reform.* The authorities first arranged tax brackets, unified corporate tax rates across industries, introduced the value added tax system, and improved the tax collection mechanism. A comprehensive Privatization program aimed at converting State Economic Enterprises to private enterprises was launched in 1986.

B. Financial Markets

The Turkish financial markets are dominated by treasury issues and corporate equity, both held primarily by the commercial banking sector. Although trends indicate that small investors are participating increasingly in the stock market, the gold market has recently undergone a decentralizing change. Accordingly, the Central Bank is no longer the sole authority for gold bullion or certificate transactions.

The expansionary phase of economic activity which began in 1989 continued in 1990 and 1991. In 1990 the total public sector securities issued in the primary market increased 26 percent to a value of TL 21.5 trillion.¹³ Private sector permits for issuing securities increased 174 percent to TL 6.3 trillion. This upward trend continued through 1991. In the following sections each of the markets is examined in some detail.

1. *The Primary Securities Markets*

These markets are essentially dominated by treasury issues, both short term and long term. Government bonds and treasury bills have grown in correspondence with the increase of the budget deficit. In 1991, the amount of government bonds available in Turkey stood at TL 16.5 trillion, while treasury bills were at TL 10.2 trillion. In 1990, the market value of permits for private sector securities stood at TL 6.3 trillion. Stocks accounted for TL 4.1 trillion and the rest was broadly classified as corporate debt. During 1991 the average increase of private sector securities was 10 percent over the previous year's value. Of these securities, mutual fund certificates accounted for the largest increase.

2. *The Secondary Securities Markets*

In 1990 the value of securities traded in the secondary markets

¹³ The Central Bank of the Republic of Turkey, Annual reports 1990, 1991 1st. 2 quarters.

stood at TL 116.3 trillion. In 1991 the market rose to TL 272.5 trillion. In both years an average of 14 percent of total transactions occurred in the stock market and 86 percent was attributable to the markets for private sector bonds, government bonds, treasury bills, bank bills, commer-

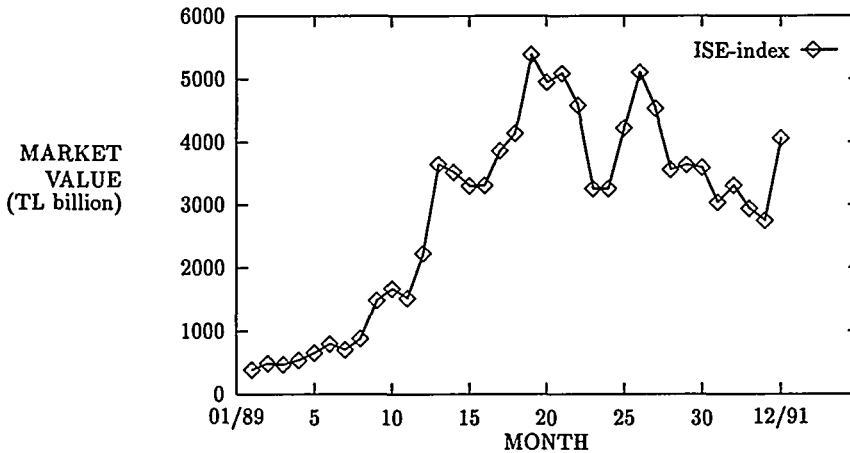


Figure 3: Istanbul Stock Exchange Overall Trading Value

cial papers, revenue sharing certificates, and foreign currency indexed bonds. Both quoted and unquoted systems were in effect starting June 11, 1990. Figure 3 shows the fluctuations in the market value of the Istanbul Stock Exchange index, which is a value weighted average of 50 industrial and commercial stocks. It is clear that the market is actively traded and undergoes large swings in volatility. It may also be noted that the foreign and non-resident purchases of the ISE index and other stocks have seen significant increases in the last fiscal year.

3. The Gold Market

The gold market serves a unique function in Turkey and its surrounding regions. Traditionally, gold has been a store of value in Eastern societies. The Turkish gold market occupies the central distribution position for gold transactions for a majority of Middle Eastern and South Asian countries, such as the Emirates, Pakistan, Saudi Arabia, and Qatar. Recently independent countries of the former Soviet Union have looked to Turkey for capital and technology flows as well as vehicles to mitigate risks in their new commercial ventures. Frequently, due to the unavailability of convertible currencies, these countries prefer transactions in gold or gold related securities. This has necessitated the development of a fully integrated spot as well as futures market in gold. Until

March of 1992, the Central Bank has been the sole authority in the gold transactions market. Gold prices moved accordingly (see Figure 4). With the dissolution of the Central Bank monopoly, the need for standardized gold markets has become increasingly clear.

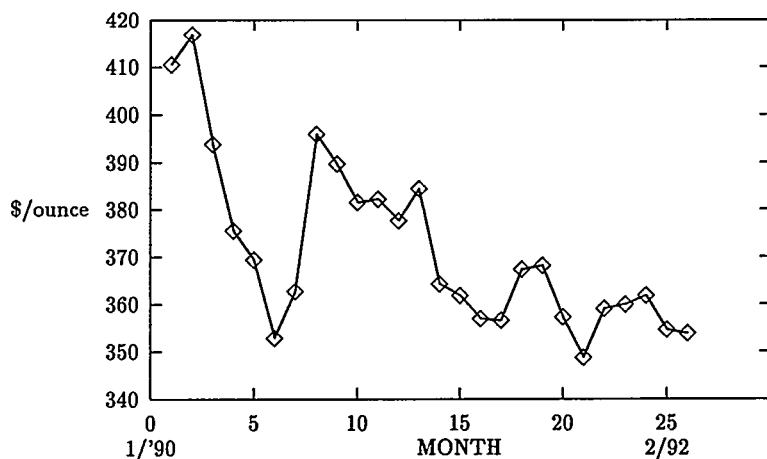


Figure 4: Central Bank Gold Auction Prices

4. *Derivative Securities and Legislation*

The general category of derivative securities includes the traditional equity contingent claims (calls and puts) and the proposed commodity contingent instruments. Prior to the passage of the new Capital Market Law (1992), no provisions were available for the issuance of contingent claims of any sort. As a result, forwards and related types of contracts based primarily on interest rates and agricultural commodities, occupied an undefined section of the market. Concurrently there was no degree of standardization of these contracts. Furthermore taxation and balance sheet treatment of the same were undefined, or, at best, vaguely understood. Article 13 of the Capital Market Law, which dealt previously with only the issuance of bonds, has been much expanded in scope. Specifically, Article 13-A¹⁴ authorizes:

Asset Backed Securities collateralized by the receivables and fixed assets can be issued. The issuer institutions of these securities, issuing require-

¹⁴ The Law Concerning The Capital Market, Law No. 2499, Date of approval 7.28.1981, is the precursor of the current version of the Capital Market Law. In the original version Article 13 deals with the issuance of bonds by stock corporations, and provides guidelines and limits on the total amount issuable under the law. Specifically, such amounts were not to exceed the residual amount, which is yielded after deducting the losses (if any) from the total sum of the issued capital shown on

ments, issue limits, eligible receivables and assets, the principles and essentials of evaluation and qualifications shall be regulated by communiques to be prepared by the Board.

The limits stated in Article 13 shall not be applied to the issuance of asset backed securities.

The implications of this article are far-reaching. The Article lays the foundation for the design of a variety of asset contingent securities, which shall fall under the regulatory oversight of the Capital Market Board, comprehensively reducing the Board's search costs and other costs related to quality, delivery, and related provisions. The Board maintains considerable latitude in evaluating the qualifications needed for the approval of a specific instrument. This degree of latitude allows for speedy approval of instruments which under more restrictive statutes would lead to inevitable bottlenecks between the capital needs of the issuer and the timing of issuance.

The limits set for bonds in Article 13 state that:

The total value of bonds and other borrowing instruments qualified as capital market instruments issued by publicly held joint stock corporations may not exceed the residual amount which is yielded after deducting the losses, if any, from the total sum of the issued or paid up capital stated on the latest financial statement which is audited independently and sent to the Board and the reserve money and the reevaluation fund stated on the latest financial statement approved by the general assembly.

The exemption of asset contingent securities from the limits set by Article 13 implies that such securities are likely to be treated as off balance sheet items. This aspect of accounting treatment of certain types of derivative securities has been criticized on grounds that it may potentially understate the actual leverage of the firm. However the advantages of this practice in terms of firm restructuring and future divestiture of venture capitalists are also recognized. In any event, accounting for the inclusion of these items must be carefully evaluated. In the United States and Britain, for example, hedge accounting, which relates to derivative positions that offset price movements of the primary security, as opposed to speculative positions in the same, poses some challenging issues in accounting principles.

Foreign currency and precious metal exchanges are covered under

the latest balance sheet approved by the General Assembly, or the total sum of paid-up capital and the reserve money indicated on the balance sheet.

The Recent Amendments to the Capital Market Law were approved on 10.14.1992, and specifically expanded in scope through Article 13A. to include the issuance of Asset Backed securities, such as stock and bond options, commodity options and other categories such as may be deemed to be asset backed. The Article specifies the nature of institutions that can issue such securities, issuing limits, eligible receivables and assets, the principles and essentials of evaluation and qualifications that shall be regulated by communiques from the The Capital Market Board.

Article 40-A¹⁵ of the Capital Market Law. According to this article, the Ministry of Finance has the authority to establish the related exchanges. This article is essentially the culmination of the several steps taken during the last decade to make the currency fully convertible and thereby obtain a market-oriented valuation of the Turkish Lira.

A set of significant changes to the restriction of commercial banks related to the funding of investment indeces (which may contain asset-backed securities) has been abolished in the new version of the Law. Accordingly Articles 41 through 44 have been eliminated. These Articles set subjective and quantitative limits on the participation of banks in the portfolio of the fund, and vice versa. For example, Article 41-c required that:

The managing bank may not include in its portfolio the securities of corporations, where its shareholders, Chairman and Members of its Board of Directors, its general manager and assistant general managers own jointly or individually more than 25 percent of the capital. . . .

The abolition of these requirements implies that banks or any other institutions that will initiate venture capital funds will in no sense be restricted to directly participate, manage, and expand the operations of any firm that participates in such funds. In this respect banking and other similar capital intermediary operations are most likely to resemble those of the continental European finance houses, such as the legendary French *Credit Mobilier*, or the German banks, rather than the British or American counterparts which deal solely in providing loans and have historically avoided equity commitments.

IV. COMMODITY CONTINGENT SECURITIZATION

A commodity contingent security is understood to be a financial obligation whose terms and payoffs are standardized¹⁶ in order that the holders of such securities are treated equally. The main distinction from a traditional debt security lies in the feature that a part of the total cash flows of the commodity contingent security is directly linked to the price of some (possibly) internationally traded commodity which the issuing enterprise is engaged in producing. Secondary markets in these securities are likely to be active, implying high liquidity. This is precisely the attraction behind having a secondary market, which would otherwise be costly in terms of issuance and other expenses. Furthermore, secondary

¹⁵ The Capital Market Law (with Recent Amendments) 3-28 (1992).

¹⁶ Standardization refers to the specification of all fiduciary and legal features of the security such as the face value, term to maturity, conditions of delivery etc. The sole variable that remains is the market price of the security, which is the basis of negotiation between the two counterparties.

market trading would establish a market valuation of the debt, in contrast to a debt which appears only on the books of the bank, and thus any change in the value of the debt due to marketwide conditions is not reported except in cases of default.

For the actual design of CCS one simple criterion should be the guiding principle. Securities with different payoff possibilities will generally lead to different default probabilities, and accordingly, different premia charged on them. It is then required that the security design minimize this default risk premium subject to the constraint that the risk-adjusted value of securities is at least equal to the amount of finance necessary. In theory, if the penalty of default, which includes both cash payments and the future restriction to the capital markets, is known, then design is straightforward. However this penalty function may not be well-known. In light of this possibility, tying up debt service with the value of the CCS directly linked with the export earnings from the borrower presents a direct and appealing solution. That is, payments on borrowings are directly linked to the export revenues of the issuer. A possible problem which could possibly arise under this framework involves the possibility of the issuer manipulating his output and stock decisions to bias his export earnings. This can be tackled by employing standard methods of minimum deductibles and tying export revenues to international prices of the traded commodities.

Commodity contingency can be obtained when facing the prospect of commodity price uncertainty by hedging in the forward markets if they are available. In such an arrangement the straight debt is combined with the sale of the appropriate commodity forward contract. The effect of this for payments can be written as:

$$P(S(m)) = P_0 + S(M) - F \quad (1)$$

where $P(S(m))$ is the payment to be made if the state of the world, m , arises.¹⁷ P_0 is the amount to be paid that is independent of the state dependent commodity price, $S(m)$, and F is the forwards price. This implies a constant cash-flow to the issuer of $C(s) = F - P_0$.

There are some caveats to introducing commodity contingency through the use of forward contracts. Clearly the separate forward contract initiates an additional source of credit risk. Thus, when the commodity price is low, the issuer may have the incentive to deliver on the forward sale while at the same time defaulting on the debt payment, if the low commodity prices depress the value of future access to capital

¹⁷ State of the world is understood in the probabilistic sense, i.e., what type of market price for the commodity emerges. The number of such possible states are $m = 1, 2, \dots M$.

markets and the cash penalty is insignificant. This scenario can be avoided if the forward contract is held as collateral against the debt or if the debt plus forward is combined into a single security, which is the commodity contingent bond.

Although the CCS will necessarily alleviate the problem of multiple sources of credit risk, it will not necessarily guarantee that the scheduled payments on the borrowings are less than or equal to the sum of cash penalties, access to capital markets, and other costs to the creditor. For example, when the commodity prices are high and perhaps rising, the incentive to default may also rise if the cash penalty and access value do not rise at the same rate as the commodity price. Thus the producer may retain the profits of the commodity price boom and, beyond a certain range of high commodity prices, the value of access to capital markets may actually fall. It is with such circumstances in mind that we suggest that the CCS be designed to include a simultaneous purchase of a commodity call option, with an exercise price greater than the price of the forward contract:

$$P(m) = P_0 + S(m) - F p \text{Max}(0, S(m) - K) \quad (2)$$

The Max function of the above equation represents the payoff from the commodity call option (see Figure 5). This structure allows for the possibility of zero or negative payments if in certain states the commodity price falls to a level such that $S(m) < F - P_0$. This possibility is obviously unattractive to potential investors. To circumvent this problem the instrument can be packaged to contain in addition to the instruments specified above, a written call option with a lower exercise price, such that the payments are:

$$P(m) = P_0 + \text{Max}(0, S(m) p K_1) - \text{Max}(0, S(m) - K_2) \quad (3)$$

where the second part of the payoff is the premium of the written call with the exercise price $K_1 < K_2$. This security, containing two calls on the same underlying commodity, obtains a guaranteed minimum payment, $P(m) = P_0$, has a range of commodity prices for which the payments rise, and has a maximum payment of $P(m) = P_0 + K_2 - K_1$. When the commodity price goes to a level lower than K_1 , the penalties of non-payment will also fall and the instrument will deliver a larger insurance premium. This will, of course, be more attractive to the investors and lead to greater amounts of forthcoming capital. In the next section two examples of CCS design are considered. The first one combines a straight debt with a call option on the price of the underlying commodity (i.e. only a cash settlement is allowed with no physical delivery of the

commodity), and the second one adds an additional option to the first design.

A. An Example

Consider a security that could be issued by a cotton producing and processing company. It is comprised of:

- L units of a standard coupon paying bond, paying a fixed coupon of \$A semiannually, until maturity which is T years hence;
- N units of a zero coupon note, which at maturity would pay an amount equal to q times the excess of the price of cotton over \$K per bale capped at \$X per bale.

Figure 5 presents the payoff at maturity of this security as it varies with the price of the underlying commodity (measured along the horizontal axis) and consists of the net accrued value of the coupon payments from the coupon bearing bonds and the amount from the commodity-indexed part. This can be written as:

$$\text{Net Payoff} = \sum_{i=1}^{T-1} A(1+r)^{T-i} + \{N \times \text{Max}[0, P_T - \$K]\} \quad P_T \leq \$X \quad (4)$$

Here P_T stands for the international market price for cotton per bale at the maturity date T. L and N are the number of units of each type of the constituent securities, and q is a positive constant which is taken to be 1 in the figures. The second part is isomorphous to a call option on the commodity.¹⁸

Suppose the maturity of this instrument is two years ($T=2$), and the price of the underlying commodity at maturity is $P_T = \$20$. The fixed coupon on each of the $L = 10$ units of the straight debt $A = \$100$, paid semiannually, the rate of interest reflecting the risk of the straight debt $r = 0.1$ annually, and if $N = 100$ are the values of the parameters, then the net payoff of the CCS is \$5525.63. The percentage holding period return would depend on the initial investment on the straight debt and the commodity call option. Note that the maximum value that this CCS can have is determined by the cap on the option part. Suppose that the cap is set at \$30, then the maximum value of the option is \$20 and the maximum value of the security is also obtained at the same time. It is possible, of course, that the commodity price could be below the exercise price at maturity. In that case the value

¹⁸ Isomorphous implies that the payoff is exactly similar to the payoff of a general call option that is traded on an exchange. A call option is a contract that provides the holder the right but not the obligation to purchase an underlying security such as a stock, at a pre-specified price within a pre-specified period of time.

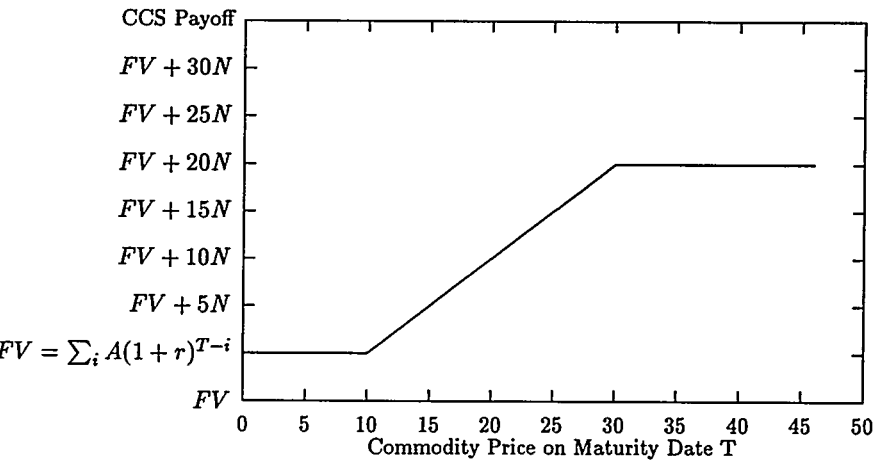


Figure 5: Payoff for Debt Hybrid with Commodity Call

of the option part is zero, and consequently the accrued payoff from the debt may not be sufficient to ensure a fair rate of return. To accommodate this possibility, the face value of the debt may be adjusted accordingly to reflect a discount, par, or premium with respect to the price of the bond.

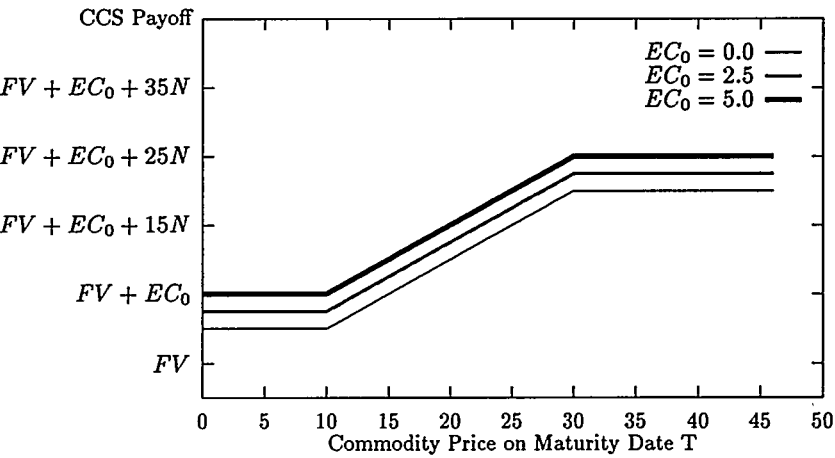


Figure 6: Payoff for Debt Hybrid with Commodity Call and Equity Calls

It may be desirable to provide an equity ownership option to the investors, who at any time prior to or at maturity may find it attractive to participate in residual revenues of the enterprise. This can be achieved quite

simply by adding equity call option EC to the CCS package. This case is presented in Figure 6. Now the value of EC will depend on the valuation of the stock of the firm, which, in the case of SMEs, is in all likelihood not trading publicly. Furthermore, its value will surely be positively correlated with the price of the traded commodity, if the firm is a one-product firm. These are important valuation issues for the CCS and pose some challenging structures for multi-factor derivatives pricing. As the equity call gains value the payoff to the lender increases. Figure 6 shows three increasing values of the equity call at maturity, that lead to higher payoffs for all values of the commodity price at maturity.

One aspect of commodity contingent design that arises is related to the jurisdiction of regulatory agencies over these securities. In the presence of multiple authorities, such as exists in the United States with the Securities Exchange Commission (SEC) and the Commodity Futures Trading Commission (CFTC), each authority competes for the regulation of these securities, which clearly straddle the line separating non-commodity and commodity based instruments. To this issue, it is possible to refer to the commodity independent yield criteria. Thus, if the security has a possible payoff which is primarily (according to a legislated amount) composed of the commodity part, then it falls under the purview of the CFTC or an equivalent body. Conversely, if it is primarily a traditional debt or equity instrument, it should fall under the jurisdiction of the SEC. Fortunately, this complication does not arise in Turkey, since the Capital Market Board is the sole authority over both commodities and traditional securities (with the exception of currency based instruments, which are the responsibility of the Finance Ministry).

V. CONCLUSIONS

We have argued that commodity contingent securities are likely to be successful in raising capital for enterprises in the emerging nations of Central Asia and some former Soviet Republics. To this end we find that the Republic of Turkey, with its democratic framework and experienced capital markets, has the potential to perform a crucial service to its neighboring nations that have not been served sufficiently by Western financial institutions. Additionally, we have found that, for reasons related to standardization and moral hazard, contingency based on non-manipulable, internationally traded commodity prices provide the most desirable CCS design. Furthermore, we have examined the regulatory structure of Turkey as it applies to these potential markets. We find that The Capital Market Law in its current version allows for flexibility of CCS design while providing for required regulatory oversight. It would

not be gross speculation, therefore, to believe that under such promising conditions the market for CCS would perform much like the equities of private commodity producers. Consequently, in combining futures and forwards, ample vehicles for hedging and arbitrage can lead to a high degree of liquidity in commodity contingent securities.