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ENDOWING CITIZENS WITH A PORTFOLIO OF STATE-SPONSORED ENTERPRISES FOR EFFICIENT AND EQUITABLE PRIVATIZATION

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Endowing Citizens with a Portfolio of State-Sponsored Enterprises for Efficient and Equitable Privatization

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1 Introduction

Privatization is “the transfer from government to private parties of the ownership of firms”.¹ This paper proposes a *portfolio endowment policy* as an alternative to conventional privatization policies. The portfolio endowment policy is designed to be efficient and transparently fair, to encourage essential public support. It is also adaptable to a broad range of challenging circumstances, including developing and transition economies. The paper concludes (pp. 104-118) by describing an application acutely relevant to international peace and security, the Israeli / Palestinian situation, as just one example of how the proposed policy has applications beyond classical privatization.

The basic idea of the portfolio endowment policy is to endow each citizen with a financial instrument representing a portfolio of state-sponsored enterprises.

- In the case of state-owned enterprises, they are restructured as necessary and a percentage to be immediately privatized is decided.
- A financial instrument is created: it represents a portfolio which includes a citizen’s share in each enterprise: citizens are endowed with it automatically.
- A nationwide marketplace is established to appropriately and effectively manage this asset, including trades involving constituent shares.

While the question whether or not to privatize at all is not the topic of this paper, a positive answer could be reinforced by a privatization method which can avoid some of the problems associated with conventional privatization - such as rising inequality and public opposition. Besides addressing those problems, the portfolio endowment policy is able to facilitate fast, efficient and fair privatization.

¹John Vickers, “Privatization” entry in “The New Palgrave Dictionary of Economics and the Law” (Peter Newman ed., 1998)

Speed arises in several ways. Public support should increase as the electorate perceives it will be a genuine beneficiary of transparently fair privatization. Government policy makers should be more willing to privatize if they can avoid the need for initial public offerings (IPOs), whose valuations can be subject to attack as either: 1) too low, e.g., the Thatcherite IPOs in England by the erstwhile Tory government (the IPOs were sold off at a significant discount to market value) or the Irish parastatal Telcom Eireann, or 2) too high, e.g., recent third generation telcom (3GL) licenses, or, still again, (!) Telcom Eireann (see pp. 15-16). The portfolio endowment policy can even achieve real results prior to actual privatization, in that citizens can be immediately endowed with a hypothecable, alienable financial asset representing their shares in enterprises which will be privatized according to some definite criteria such as time period.

Efficiency also comes in several forms. Operationally, automatic endowments avoid the need for expensive IPO procedures and the printing, distribution and eventual “dematerialization” of vouchers after non-transparent auctions for conventional mass privatization. Any taxes relating to citizen equity portfolios could be efficiently levied directly against accounts on a national marketplace, assuring compliance. State retention of a suitable minority share in lieu of corporate taxation would be essentially equivalent to privatization simultaneous with the once-and-for-all capital levy / lump sum tax called for by optimal taxation theory (although this option is also available to other privatization policies). Financial efficiency can take several forms, including the pricing efficiency and transaction costs² which would be optimized by the economies of scale of the nationwide marketplace. Another important form of financial efficiency relates to dominance of one combination of risk and return by another according to some preference relation. This issue is

²See “Capital Markets: Institutions and Instruments 2ed.”, Frank Fabozzi and Franco Modigliani (1996), pp. 154-55.

complex, and answers are subject to the precise formulation of the question. In general, the diversification inherent in the portfolio endowment policy can be an important advantage,³ although it is possible in principle that social welfare could be improved by matching riskier enterprises with less risk averse citizens. This issue will be explored in more detail later, by contrasting the portfolio endowment policy and a single enterprise endowment policy.

Fairness of the citizen equity portfolios results from the equality of treatment of all citizens.⁴ The issue of fairness is best explored by contrasting the implications for income inequality of the portfolio endowment policy and its (in a sense) polar opposite - the Thatcherite IPO policy. A case study modelling those contrasting implications for South Africa (see pp. 62ff.) suggests that the portfolio endowment policy has important potential advantages with respect to fairness.

³See, e.g., “Investments” 4ed., William Sharpe, Gordon Alexander (1990): “[D]iversification generally leads to risk reduction...” (p. 162). For a careful exposition of several related theorems, see Paul A. Samuelson, “General Proof that Diversification Pays”, *Journal of Financial and Quantitative Analysis* 2, 1-13 (1967).

⁴“Suppose that you were given some goods to divide fairly among n equally deserving people. How would you do it? It is probably safe to say that in this problem most people would divide the goods equally among the n agents. Given that they are by hypothesis equally deserving, what else could you do?” Excerpted from “Intermediate Microeconomics 5th ed”, Hal R. Varian, p. 564. Varian goes on to explain that an equal division is not necessarily Pareto efficient; this issue is addressed later under the topic of financial efficiency.

As could be expected, there are a number of possible objections:

1. Privatization policy doesn't matter any more, since it's all over.
2. If there are remaining state enterprises, why not keep them that way?
3. Does the privatization technique matter? Won't people trade to their optimal choices one way or another?
4. Why not choose a conventional policy such as Thatcherite IPOs or conventional mass privatization?
5. State enterprises should be sold, so as to provide government revenues, since a) it needs them, or b) it can use them more effectively than individual citizens could.
6. The citizen equity portfolio endowment policy is impractical because:
 - a) you can't assume that all citizens are sufficiently sophisticated,
 - b) a marketplace with x million participants isn't feasible, or
 - c) you can't do effective corporate governance with x million shareholders.
7. The portfolio endowment policy is redistributive, which is inherently suspect and economically inefficient.
8. The portfolio endowment policy will never be implemented, because nobody would be able to find a way to steal from it.

To provide a context for responses, the portfolio endowment policy will first be explained and conventional alternatives discussed, after which the objections will be revisited.

2 The Portfolio Endowment Policy Explained

2.1 What and How

Once again, the basic idea of the portfolio endowment policy is to endow each citizen with a financial instrument representing a portfolio of state-sponsored enterprises.⁵ The steps are taken by the government, enterprise managements and the citizenry, with the government initiative coming first.

The government's first steps are to: decide on the set of state-sponsored enterprises includable in the portfolio endowment, specify the preconditions to be met prior to privatization, and establish post-privatization corporate governance objectives. Privatization preconditions could include general restructuring, developing accounting systems appropriate to a private enterprise, and where monopoly power is an issue appropriate spinoffs. It then installs management teams, with a negotiated compensation package largely comprised of shares (rather than options) representing a fixed, small percentage of outstanding shares of the enterprise and its spinoffs.⁶ Compensation earned in one year should include a stream of shares a number of years (e.g., seven) into the future, but vesting can be contingent not only on actual privatization, but also on fulfilling additional, specified demonopolization targets.

As managements work to prepare their respective enterprises for privatization, the government makes a number of policy choices:

- the percentage of enterprise shares with which to endow citizens (the remainder being retained by the government for: transitional leverage over corporate governance, in lieu of enterprise taxation, as a fund to endow citi-

⁵“Social Welfare and the Privatization of Large State Enterprises in Newly Democratic Nations”, William J. Hartnett (MIT Technology and Policy Program, 1993).

⁶Id.

- zens who might be missed, or for other purposes);
- the portfolio fixing date (so that enterprises privatized by that date are included in the portfolio, and otherwise are eligible for inclusion in a subsequent portfolio cycle);
 - the eligibility criteria (e.g., all citizens born by the portfolio fixing date, and then including new citizens into the indefinite future);
 - criteria for polled shareholder voting on important corporate resolutions;
 - the allocation of citizen endowments into citizen portfolios with different restrictions, e.g., a discretionary portfolio with no restrictions, an investment portfolio available for education or microentrepreneurship, and a social security portfolio representing one component of the social safety net investable only in the initial endowment (fully diversified over the privatized enterprises), government debt or annuities, and with withdrawals limited to basic unmet needs for health, food or housing;
 - for the nationwide market which supports portfolio adjustments: the investment cycle period (e.g., annually), assets available (e.g., the diversified portfolio, individual company shares, individual company debt, government debt over a range of maturities,⁷ annuities), and transactions supported (e.g., buy and sell portions of the portfolio investment or the constituent shares, delegation of investment authority).

When enterprise management believes it has met the privatization preconditions, the government either approves and sets an effective privatization date

⁷Note that a nationwide marketplace where all citizens can conveniently invest in a range of government debt could have several important advantages: broadening the strategy set of individuals to include a presumably relatively safe domestic asset, and also broadening the investor base to deepen the market and potentially reduce borrowing costs to the government.

or specifies the remaining necessary actions.

The citizens themselves can execute transactions on the nationwide marketplace to adjust their portfolios. They can also use their portfolio endowment as collateral for approved purposes (e.g., microentrepreneurial investments). Note that while the ultimate actual makeup of the portfolio may be unsure up until the portfolio fixing date, citizens can be immediately endowed with the legal right to whatever portfolio is constituted, so that using it as collateral could begin immediately (presumably with appropriate allowance being made by the lender for any uncertainty, and with a central register with an appropriate (small) delay in approval to avoid multiple pledges of the same interest).⁸ Finally, the system is able to support citizens choosing to transfer part or all of their portfolio to private financial institutions, which promotes the growth and health of the financial sector with new capital and clients, while providing citizens more control over their portfolio and access to cash withdrawals able to provide macro-economic stimulus.

2.2 Conventional Alternatives

One taxonomy of conventional privatization is presented in Figure 1. Essentially, a policy maker chooses one (or more) entries from each column in Figure 1a (“process”, “amount of stake transferred”, “consideration”). Typical combinations of choices are presented in Figure 1b.

To date, there have been four main conventional approaches to privatization of large state enterprises, if ownership is transferred to the general citizenry:

⁸ This discussion of the specification and operation of the portfolio endowment policy is not intended to be comprehensive. For more detailed treatment of some of the issues and a more detailed exposition of one example of how to implement the nationwide marketplace, see “Privatization Marketplace”, William J. Hartnett (United States Patent 6,112,188, 2000).

Figure 1: A Taxonomy of Conventional Privatization

(a): The Conventional Privatization Policy "Menu"

"Process"	"Outcome"	
	Amount of Stake Transferred	Consideration
bidding	minority (of shares)	cash proceeds
negotiation	majority	other commitments
legislation	all	vouchers

(b): Typical Menu Choices for Conventional Privatization Policies

Policy	Process	Amount of Stake	Consideration
strategic partnership	negotiation	minority	cash / other commitments
private placements	negotiation	majority / all	cash / other commitments
auctions	bidding	majority / minority / all	cash
employee / management buyouts	negotiation / legislation	minority	cash (concessionary terms)
mass privatization	legislation	majority / all	vouchers

the British, Russian, Czechoslovak and Polish models.⁹ In the British model, large state enterprises which are embedded within a market economy are sold by means of initial public offerings. This approach is infeasible in some transition economies, where large state enterprises can far outvalue domestic savings, and there are no developed capital markets. In addition, even in well-developed western capital markets the "initial public offering discount" effectively transfers a large amount of wealth from the general citizenry to the initial bidders, who are presumably already among the wealthier citizens.

In Russia, citizens were issued privatization vouchers for a nominal fee, which could be used to bid at auctions for enterprises over a specified interval. Alternatively, vouchers could be sold for cash, or deposited with an investment

⁹The description of these conventional privatization models follows note 60.

fund. But so little information was available about enterprises, and expectations about future commercial and taxation policies were so unsettled, that bidding at auctions for individual enterprises was equivalent to a lottery in the popular sense. In fact, the enterprises to be privatized, their percentages available for purchase with vouchers, and even the time interval over which vouchers were valid, were repeatedly changed due to logistical difficulties and political pressures, greatly increasing the difficulty in formulating strategies. Those citizens reacting to the uncertainty by selling vouchers for cash were often fleeced, sometimes selling their patrimony for a few dollars. Nor did investment funds offer a secure alternative - one famous investment fund blowout managed even to shake the government. A final problem with voucher-type schemes is that they completely bypass citizens who don't take the initiative to participate, often representing some of the least advantaged members of society.

The Czechoslovak model endowed citizens with privatization booklets worth 1,000 points, for a nominal fee. The Center for Coupon Privatization then conducted a series of auctions, setting prices in points according to book value for the first round and by changing non-public algorithms for subsequent rounds. Companies oversubscribed by more than 25 percent were held over to the next round. Citizens could bid directly, or deposit their booklets with an Investment Privatization Fund. In the case of oversubscriptions less than 25 percent, the company was sold, with allocation priority given to individual bidders. In the case of undersubscription, all bids were filled. Several problems with this process stood out. The auctioneer's price-setting algorithms after the first round served to distort prices for political purposes, rather than facilitate price discovery.¹⁰ The investment funds took advantage of unsophisticated investors by essentially writing unfunded calls with their

¹⁰David Young, Pierre Hillion, "The Czechoslovak Privatization Auction: An Empirical Investigation" (INSEAD working paper 96/57/FIN/AC, 1996).

advertised guarantees of 10-fold and 15-fold returns backed only by corporate shells. And, as before, the severe dearth of reliable information increased the investment risks to bidders, whether individuals or funds.

According to the Polish model, each privatized enterprise had as a core investor one of a set of state-designated intermediaries known as National Investment Funds, endowed with 33 percent ownership. Another 27 percent was distributed equally to the remaining National Investment Funds, with the remainder distributed to employees or retained by the state. The government retained 30 percent, and distributed the remaining 10 percent to employees free of charge. In effect, one objective was to engineer corporate governance by means of a dominant shareholder. Each citizen had an opportunity to buy vouchers, which matured into shares in each of the Funds. One problem with this policy was the unreasonably high fees charged by the National Investment Funds, equivalent to more than 20% of the value of the shares. There is also a dual risk that the state-designated National Investment Funds will act like old-style state control boards, or else fail to reconcile the often conflicting responsibilities of corporate restructuring (with a commitment to remaining involved) and portfolio management (where the exit strategy is an important option). However, it is perhaps noteworthy that the Polish model has been the closest to the portfolio endowment policy, and also that Poland “has enjoyed just about the overall best growth record of all European and Central Asian transition countries”.¹¹

2.3 Answers to Objections

A number of possible objections were discussed in the introduction, which we are now in a better position to address:

¹¹John Nellis, “The World Bank, Privatization and Enterprise Reform in Transition Economies: A Retrospective Analysis” (OECD Background Paper, 2001).

1. Privatization still matters, because there remains a large amount of state enterprises in many countries. There also continue to arise new assets subject to state disposition, such as 3GL licenses or pollution permits, which can be packaged into one or more new, competing “state-sponsored” but private sector license-management companies.

2. Whether or not to privatize at all is an issue beyond the scope of this paper. But in general there is a good case that the private sector can be more efficient. Safeguards for stakeholders may still be appropriate, discussed later under the topic corporate governance. As to natural monopolies, privatization without effective regulation can cause real problems.

3. Perhaps in the limit of perfect efficiency, individuals would exchange endowments to achieve an optimum equilibrium independent of the privatization technique, so that the only significant policy issue would be the distribution of value. In fact, such efficiency doesn’t exist, and one of the strongest appeals of the portfolio endowment policy is that its initial allocation of a fully diversified portfolio is arguably the best initial condition, in combination with an efficient nationwide marketplace to support portfolio adjustments.

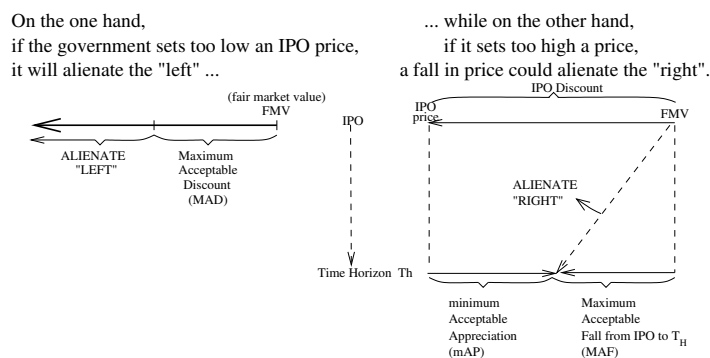
In particular, IPOs, private placements and strategic partnerships establish early prices during maximum uncertainty, typically at significant discounts.¹² In contrast, the portfolio endowment policy default corresponds to a long term buy and hold strategy in strong hands (with a psychological reference price of zero), fully diversified over the universe of privatized enterprises.

4. Conventional policies - IPOs and conventional mass privatization - have serious drawbacks. IPOs pose a risk if the public is sceptical or financially unsophisticated. English IPOs under Thatcher had an average IPO discount

¹²See note 60 for a discussion of this issue.

of 24% (about 1/4)¹³ and faced widespread opposition by the electorate.¹⁴ According to a Financial Times editorial, referring to private sector IPO discounts, “..if the first-day premium was sufficiently predictable ... to charge for access to it, it should surely have been eliminated by pricing the stock higher on issue...”¹⁵ Figure 2 shows the risk to government officials if they commit to Thatcherite IPOs. The stylized constituency on the “left” prefers fairness, dislikes high inequality, and tends not to participate in IPOs. On the other hand, the stylized constituency on the “right” prefers markets with minimal regulation, believes high inequality is not too high a price for more efficiency, and is wealthy enough to participate heavily in the IPOs.

Figure 2: Privatization via IPO: What Price is Right?



As Figure 2 shows, the first danger in trying to set an IPO price is that the

¹³‘Subscriber Returns, Underpricing, and Long-Term Performance of UK Privatisation Initial Public Offers’, K. Menyah, K. Paudyal, C. Inyangete, *Journal of Economics and Business* (1995) pp. 473-95.

¹⁴According to Peter Hutton, director of MORI and the foremost authority on attitudes toward privatization in Britain: “Privatisations have not generally been popular with the electorate. Polling evidence is sparse but the highest level of support I could find prior to any privatisation was for British Steel at 39% six months before it was privatised. The lowest level of support was for Water at just 10% one month before it was privatised[.] Perceptions of the benefits after the event have also generally been grudging.” In ‘Have the Goals of Privatisation been Achieved?’, MORI Research Papers (July 1994).

¹⁵‘IPO Tricks’, *Financial Times* (Jan. 23, 2002, p.14).

left will be alienated by setting the price too low, relative to “fair market value” assumed here to correspond roughly to the price at the end of the first day. The next danger is that if the future market price doesn’t stay comfortably above the IPO price, the right will be alienated.¹⁶ For example, it seems clear that the Tory government in England deeply alienated the left with its privatization program, due in considerable part to such deep IPO discounts. As another example, when Ireland privatized Telecom Eireann with a large IPO discount comparable to the track record in England, the government was criticized,¹⁷ and then was criticized yet again less than 30 months later when Telecom Eireann was taken private (under the new name of Eircom) at a valuation about $\frac{1}{3}$ less than the (discounted) flotation price.¹⁸

This demonstrates that there is no guarantee that a right price for a privatization IPO even exists, in the sense of not alienating a major portion of the electorate. Statesmanship may not always slavishly constrain itself by a litmus test of popular public approval. However, the alternative of the portfolio endowment policy exists where there is no IPO discount and its 100% participation should maximize public approval.¹⁹

In this case, it could be argued that pushing through unpopular privatization IPOs is not only undemocratic, but even anti-free market (because the

¹⁶The probability of alienating the right for a crude model which assumes normality is $\frac{1}{2}(1 - \text{erf}(\frac{1}{\sqrt{2}} \frac{MAF}{\sigma}))$, where MAF is the Maximum Acceptable Fall (= IPO Discount - minimum Acceptable Appreciation). As an example, for an IPO Discount of 24%, minimum Acceptable Appreciation of 5%, and an annual σ of 20% to 70%, the probability of alienating the right one year on would be roughly 20% to 40%.

¹⁷See, e.g., ‘They’re selling the family silver back to the people who owned it in the first place’, Pat Rabbitte, in ‘The Irish Times’ (July 8, 1999).

¹⁸‘And Then There Were None’ (i.e., no public shareholders), paraphrasing former director Paul Mackay as saying “The savage loss suffered by half a million ordinary investors should not have happened”. (The Sunday Times, December 9, 2001).

¹⁹Setting aside for the moment the separate issue of subsequent corporate behavior, such as redundancies or price hikes, more appropriately considered under the separate issue of corporate governance.

shares are not sold at a freely traded price, but at an artificial discount), and amounts to regressive redistribution on behalf of IPO participants at the expense of the citizenry as a whole. And a rejoinder that tax dollars would be spent to advertise the IPO to encourage widespread participation hardly addresses the issue that poor people may be unable to invest.

Conventional mass privatization has also suffered from many problems:²⁰

1) lack of participation by some of the most disadvantaged citizens, 2) citizen transactions taking place when uncertainty is maximum, 3) opaque auctions of shares for vouchers, 4) onerous management fees (in the Polish model fully comparable to the British IPO discounts), and 5) simple logistical inefficiency in the creation, distribution, utilization and final “dematerialization” of physical vouchers into shares.

In contrast, with the portfolio endowment policy: 1) participation is guaranteed to be 100% (even uncounted citizens on the fringe of society would retain their claim, against an escrow reserved for that and similar purposes); 2) citizen transactions determining the value to them of their shares will generally occur significantly after endowments and privatization: parts of the account can be segregated into compartments for social security, emergencies or hardship; a default do-nothing strategy implies holding the equity portfolio for the long term; and even borrowing against the account for tuition or micro-entrepreneurship only immediately frees part of the account value, as opposed to liquidating shares at the current price; 3) it is difficult to conceive a more transparent process than automatically endowing every citizen with an equity portfolio of state-sponsored enterprises; 4) the cost of the marketplace which enables citizens to execute transactions for their portfolio account should be the opposite of onerous; and 5) a straightforward endowment for all citizens is conceptually simple and logistically efficient.

²⁰See note 60 for a fuller discussion of these issues.

5. The argument that state enterprises should be sold in order to generate government revenue is weak. One of the typical reasons for privatization is to eliminate the government budget drain caused by a soft budget constraint of state enterprises, so that spinning off loss-making state enterprises already helps the government budget. While this can be appropriate, it is hard to defend using one-off sales of capital assets to balance or expand an on-going budget, heightening the risk in developing countries of future budget and currency crises if public spending is then maintained, and dangerous social unrest if it isn't. Finally, the claim that the government can use privatization proceeds more judiciously than individual citizens is inconsistent with the premise of private sector comparative efficiency used to justify privatization in the first place!

6. The issue of practicality of a privatization policy is very serious. The portfolio endowment policy has been specifically designed to be practical even in challenging circumstances such as transitional or less-developed societies. Even so, the degree of success is sure to be highly "implementation-sensitive", and it is highly desirable to arrange a meaningful amount of privatization agency discretion in resolving policy issues which arise during implementation. Corporate governance is feasible even with an entire citizenry of shareholders, by using appropriate executive compensation and polled shareholder voting. A national marketplace with even many millions of participants is feasible, even in less-developed societies, if transaction orders are cumulated for periodic execution, perhaps even annually. This is fully consistent with a highly desirable long-term investment outlook less susceptible to financial instability.

Concerning the issue that some citizens will be less sophisticated than others: a) constraints on alienability, such as segregated social security accounts, can restrict losses; b) integrating a market for supervised, non-custodial delegation of investment authority can make available transparent, fraud-resistant,

efficient expertise; c) to the extent the market efficiently discounts available information, all transactions will be at a fair price; d) owning portfolios should help people learn more about investment decisions; and e) perhaps most importantly, the default strategy, being endowed and doing nothing at all, corresponds to a fully diversified (over the state-sponsored enterprises) hold strategy, arguably a benchmark for sophisticated strategies.

7. While there is inherent ambiguity as to who “owns” state enterprises, the weakest interpretation is that the portfolio endowment policy represents “redistribution”. If the government serves as custodian and trustee of state enterprises, the trust must in some sense be on behalf of the entire citizenry.²¹ Therefore, a much stronger interpretation of the portfolio endowment policy is that it is logically analogous to Citigroup spinning off Travelers and distributing the bulk of the new shares directly to Citigroup shareholders. From this perspective, it is conventional Thatcherite IPOs with deep IPO discounts which are more appropriately viewed as amounting to *regressive* redistribution.²²

²¹ “[T]here is no definite theory of the firm under public ownership. In some sense the ultimate owners are the general public...” John Vickers, *supra* note 1.

²² See, e.g., ‘The Economist’ (March 11, 1995), ‘How to Privatize! What the Rest of the World Can Learn From the Unpopularity of Privatisation in Britain’, stating “[T]he government has been accused of selling something owned by the population as a whole to a self-selected group of well-educated, middle-income people, many of them natural Tory voters, at bargain prices.” Also in that issue, see the article ‘Disgusted’ stating “To say that privatisation is unpopular in Britain is an understatement. Every week brings fresh outrage at tales of bosses of privatised firms picking up huge pay rises while over-charging customers, sacking employees and cutting the pay of those who remain.” See also “The Changing Dynamics of Successful Privatisation: Attitudinal Factors”, Peter F. Hutton (Director of MORI, from the handout for a talk given around 1995, still referring to the paradigmatic Thatcherite IPOs): “1. Twenty years ago more people favoured further nationalisation than any privatisation, or de-nationalisation as it was then called. 2. It may come as a surprise to many people that the same is also true today. ... 23. But surely you could say the public have benefited as shareholders. Well certainly this is true of those 20% or so who have invested in privatised shares. Most have seen healthy growth in their share values and reasonable dividend performances. But that still leaves 80% who did not buy shares largely because they could not afford to.”

In fact, there is a genuine question whether privatizations accompanied by deep IPO discounts should be characterized as “givings” (the opposite of “takings”) in U.S. constitutional law, so that the deepness of the discount could be found to be unconstitutional. While U.S. law is not binding with respect to privatizations in other jurisdictions, it is so developed as to be worth consideration. A recent analysis of givings emphasizes that “[I]t is inequitable to bestow a benefit upon some people that, in all fairness and justice, should be given to the public as a whole.”²³ Perhaps the strongest defense would be that IPO discounts are an acceptable “prize” bestowed for the “socially beneficial activity” of purchasing the shares. However, “[w]here prizes are grossly excessive, the excessive portion should be treated as a chargeable giving...”²⁴

8. This is an argument made by an expert on former Soviet block economies in transition. I would like to think that the premise is about as strong as possible, but that the conclusion does not necessarily follow, especially in today’s post-Enron, post-WorldCom world. Rather, the transparency and legitimacy of the portfolio endowment policy, including its approach to corporate governance, should be considered attractive advantages which promote economic growth while reducing public opposition and political instability.²⁵

²³“Givings”, Abraham Bell, Gideon Parchomovsky, Harvard Law School Discussion Paper No. 320, p.4 (April 2001).

²⁴Id. at 31.

²⁵See Pak Hung Mo, “Corruption and Economic Growth”, *Journal of Comparative Economics* 29, 66-79 (2001).

3 Efficiency

3.1 Operational, Pricing, Transaction Costs

A nationwide marketplace able to provide a simple, basic set of investment choices to all citizens on a periodic batch basis has the inherent potential to be extremely efficient.²⁶ While collecting transaction orders over an investment cycle for periodic batch execution foregoes split-second, real-time, short-term trading, it could actually promote both stability of the financial markets and the effective pursuit of long term investment strategies.²⁷

With respect to operational efficiency, such a nationwide marketplace with period batch trade resolution maximizes the economies of scale and minimizes transaction costs. The depth of a nationwide periodic market should also promote pricing efficiency - by maximizing liquidity it is possible to minimize distortions associated with thin markets.²⁸

The highly liquid and efficient pricing to be expected in a periodic nationwide marketplace is in sharp contrast to initial public offerings which consistently experience deep discounts. There is also reason to believe that if a government seeks out a private placement or a strategic partnership, it should expect a significant discount due to hitting the bid in a thin market with a correspondingly wide bid-offer spread.²⁹ It should be emphasized, however,

²⁶The ideas of market efficiency in this section follow the exposition in ‘Capital Markets: Institutions and Investments (2 ed.)’, Frank J. Fabozzi, Franco Modigliani (1996).

²⁷Just the same, shorter term trading or other facilities could be available by transferring a portfolio to alternative financial institutions.

²⁸Stock market liquidity has also been linked with faster economic growth. See, e.g., Ross Levine, Sara Zervos, ‘Capital Control Liberalization and Stock Market Development’ (World Bank Research Working Paper 1622, 1996), and Ross Levine, Sara Zervos, ‘Stock Markets, Banks and Economic Growth’ (World Bank Research Working Paper 1690, 1996).

²⁹The small handful of potential bidders could seriously reduce the price received by the government, according to conventional auction theory. For example, for profit-maximizing,

that the management of the privatized enterprise would have ongoing future discretion to engage in private placements or strategic partnerships which advanced corporate strategy and actually enhanced shareholder value, and without the unavoidable political dimension when such decisions are taken by the government.

Still another pricing efficiency advantage of the nationwide marketplace is matching citizen buy/sell orders for the portfolio instrument or constituent stocks, with institutional investors making markets for any cumulative imbalances in orders. The net result is the potential to significantly reduce the effective bid-offer spread for citizen orders. In addition, it is possible to implicitly arbitrage between the portfolio and its constituents, deepening still further the market's liquidity while risklessly keeping the theoretical hedge valuation exact.

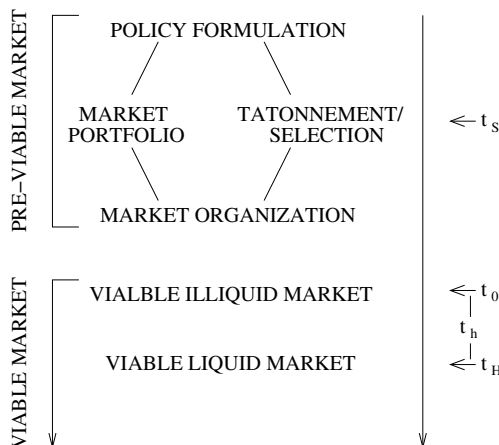
3.2 Financial Diversification

3.2.1 The Privatization Model

In this section on financial efficiency, we will compare the portfolio endowment policy with a voucher policy resulting in ownership of shares in a single enterprise, to explore the effects of diversification. Potential advantages of the portfolio endowment policy over conventional IPOs will be explored in the next section (on equity). Let us consider two distinct periods in the privatization process: *pre-viable market* and *viable market* (see Figure 3). The risk-neutral bidders with the same uniform distribution function of independent, private values bounded below by zero, in a first-price sealed bid auction each bidder bids $(N-1)/N$ times her true value, N being the number of bidders. For example, if the government were dealing with three bidders, there is a theoretical basis to expect them to bid $1/3$ less than their values. See R.R. McAfee, J. McMillan, "Auctions and Bidding", *Journal of Economic Literature* (June, 1987) pp 699-738.

“pre-viable market” period can be further divided into three intervals: “policy formulation”, “tatonnement/selection” (where applicable) and “market organization”. The *policy formulation* interval is the province of an idealized *social planner*, who demarcates enterprise boundaries within the state sector, decides which enterprises to privatize and the proportion of each to endow citizens with³⁰ and chooses whether to adopt a *portfolio endowment policy* (endow each of the N citizens with a financial instrument which includes $1/N$ th of the citizens’ share of each enterprise) or an *individual enterprise policy* (issue vouchers to each citizen and promulgate rules for a tatonnement process where each citizen selects an enterprise).

Figure 3: Privatization Time Line



For the case where the social planner adopted the individual enterprise policy, during the *tatonnement/selection* interval an idealized tatonnement process generates equilibrium prices for enterprise shares which perfectly reflect citizen preferences and beliefs about enterprise values. The start of the subsequent process when citizens select an enterprise (or, alternatively, are

³⁰The proportion of each enterprise not included in citizens’ endowment is privatized by other means (such as sales) or retained by the government.

endowed with the market portfolio) is designated as time “ t_s ”. The information set at time t_s is the information set which citizens would use to select an enterprise, and which the social planner uses to compare social welfare functions for the two policies. Since citizens are originally endowed with an equal amount of vouchers, which they can only use for a single enterprise, the amount which they obtain will be normalized to one share. Furthermore, for simplicity of exposition, the selection process will be characterized as the social planner dividing the enterprises into shares of that size and allotting them to the citizens who would have selected them.

The *market organization* interval reflects the legal, administrative, logistical and other delays which precede a viable market. During this interval, new information can develop - e.g., commercial laws are passed and (potentially new) enterprise management takes decisions such as restructuring - so that enterprise valuations may change. At the end of the market organization interval, a viable market arises.

The “viable market” period can be further divided into two intervals: the viable illiquid market and the viable liquid market. The *viable illiquid market* connotes a situation where real price discovery occurs, but mainly due to professional trading. Its beginning is designated by time “ t_0 ”, which is the earliest opportunity for citizens to adjust their portfolios and the shortest possible planning horizon “ t_h ” over which it is appropriate to evaluate alternative endowment policies. However, by assumption, illiquidity and high transaction costs inhibit any significant trading by the general citizenry, so that the choice of endowment policy continues to affect the social welfare function.

In contrast, at the start of the *viable liquid market*, the citizenry can engage in idealized frictionless trading with no transaction costs. Therefore, citizens will optimally adjust their portfolios, and any further effect of the

endowment policy on the social welfare function ceases. The beginning of the viable liquid market is designated by time “ t_H ”, which is the longest possible planning horizon over which it is appropriate to evaluate alternative endowment policies.

Our objective is to explore how the diversification inherent in the portfolio endowment policy can promote financial efficiency by modelling the difference in the social welfare function between it and a single enterprise endowment policy, where individuals choose an enterprise according to their individual utility function. This enables us to explore: a) whether it would be better to match riskier enterprises with less risk-averse citizens, and b) the critical issue (in some situations seemingly prevalent) of insider information. The idealized constraint that citizens only select a single enterprise is intended to reflect administrative logistics and a simplified choice process. Contrasting the two policy extremes of a market portfolio and a single enterprise provides insight into how the diversification of the market portfolio affects the social welfare function, especially since in practice individuals have tended to select one or very few enterprises during privatization, far fewer than the number needed for a well-diversified portfolio. Also note that this is a comparative evaluation of initial conditions for privatization, and the nationwide market-place is designed to efficiently support subsequent portfolio adjustments.

3.2.2 Utility and Social Welfare Functions

Consider a lottery with outcomes represented by certainty utilities u . It is only reasonable to believe that an individual could place a value on knowledge of the outcome, either due to intrinsic preference or because that knowledge could present opportunities or burdens.³¹ The lack of knowledge of the out-

³¹Typically, knowledge of the outcome would have a positive value, for example knowing which of two illnesses with promising, but different, treatments had been contracted. On

come would typically be particularly significant for lotteries whose resolution is less immediate, such as a privatization process. Indeed, the delay in privatization after a decision has been mooted has been found to be a highly significant determinant of privatization valuations.³² Because of the significance of these issues for privatization, we will develop a model of expected utility which explicitly incorporates lack of knowledge of the outcomes, discuss some of its implications as appropriate, and develop an approximation for its use to model alternative citizen choices. However, this analysis will not take into account a potentially significant advantage of the portfolio endowment policy: that it makes possible the immediate privatization of a future interest in state sponsored enterprises, capable of being used as collateral for tuition or micro-entrepreneurship right away.

To calculate an expected utility explicitly incorporating the lack of knowledge of the outcomes, we will assign values of uncertainty utility ω to realizations: combining the certainty utility u with an information component represented by a combination of the *amount* of the lack of knowledge with its *importance*. The most natural way to measure the amount of the lack of knowledge is with the information theory probabilistic “surprise” term $\log(\frac{1}{p})$, where the base of the logarithm determines the units of information (such as bits for base 2, or nats for base e). The expected value of the probabilistic surprise, in the discrete case $\sum p \log(\frac{1}{p})$, is called the information entropy.³³

In some cases, the probabilistic amount and economic importance of the lack of knowledge for a realization might be explicitly combined by a function

the other hand, a person might prefer to preserve uncertainty, for example over different negative outcomes which can’t be mitigated.

³²See, e.g., ‘Determinants of Privatization Prices’, Florencio Lopez-de-Silanes (NBER Working Paper 5494, 1996) for an econometric analysis of 361 Mexican state enterprises which found that delays during privatization significantly reduced valuations.

³³See Claude E. Shannon, ‘The Mathematical Theory of Communication’ (1948). For the continuous case, the analogous expression is now called differential entropy because it changes with transformations of the random variable.

representing the utility decrement due to opportunity cost “OC” or an intrinsic preference “IP” (for which the exercise of control over the outcome resulting in a certainty premium “CP”³⁴ might be separated out). Combining the certainty utility u of the realization with these influences yields the following expression for the realization uncertainty utility ω :

$$\omega = u - oc(s, u; u_R) - ip(s, u; u_R) + cp(s, u; u_R),$$

where $s = \log(\frac{1}{p})$, u_R corresponds to a suitable reference point, and oc , ip and cp are lower case to connote that they could in general be different functions over different subsets of realizations. However, normally,

$$\begin{aligned} s = 0 &\rightarrow oc = ip = 0, & s \neq 0 &\rightarrow cp = 0; \\ oc &\geq 0, & \frac{\partial oc}{\partial s} &\geq 0, & \frac{\partial oc}{\partial d(u, u_R)} &\geq 0; \\ & & \frac{\partial |ip|}{\partial d(u, u_R)} &\geq 0; \end{aligned}$$

where $d(u, u_R)$ is the distance between u and u_R according to some metric, and we are explicitly anticipating the possibility that the intrinsic preference toward the lack of knowledge of a realization could be positive or negative.

One particularly natural way to characterize the economic importance of the surprise is as the absolute deviation of the utility of the realization from its expected value: $|u - \langle u \rangle|$.³⁵ A particularly natural way to combine the economic importance and probabilistic amount of the surprise is by their product. Combining this new term with the certainty utility of the realization associated with u yields:

$$\omega = u - v \log \left(\frac{1}{p(u)} \right) |u - \langle u \rangle|,$$

³⁴With this certainty premium, complete *foreknowledge* of the outcome (certainty) is preferred even to complete *immediate* knowledge (instantly resolving the lottery).

³⁵In some circumstances, a more appropriate reference could correspond to the median or modal realization, or some other value significant to the context. Other functional forms than the absolute value of the deviation from the reference are also conceptually possible, although it is the most simple and so has considerable a priori appeal.

where v (upsilon) could be viewed as analogous to the marginal rate of substitution³⁶ between the experience of the outcome and the importance-weighted knowledge of it, e.g. between “having” and “knowing”. v will in general depend on both the preference characteristics of the individual and the precise specification of the lottery (i.e., the evolution of the individual’s information set relative to the actual realizations of the possible outcomes). The units of v are the reciprocal of information (e.g., bits⁻¹ or “perbits” for logarithms base 2, and nats⁻¹ or “pernats” for natural logarithms).

Consider a financial lottery with potentially many possible outcomes, and for which $v > 0$. It is easy to motivate the new term for u less than $\langle u \rangle$, since it involves a somewhat unexpected loss relative to $\langle u \rangle$. It is also possible to naturally motivate the new term for u greater than $\langle u \rangle$, for example as the opportunity cost of not being able to include the knowledge of the favorable outcome in making optimal current decisions.³⁷ This points out how v could vary for different realizations; in particular, it could be different for realizations below or above an appropriate reference.

The corresponding expected uncertainty utility W is then:

$$W = \langle \omega \rangle = \int \left(u - v \log \left(\frac{1}{p(u)} \right) |u - \langle u \rangle| \right) dP(u),$$

where $P(u)$ is the cumulative distribution function giving rise to the probability distribution function $p(u)$. For discrete and continuous distribution functions we have respectively:

$$W = \sum p(u) \left[u - v \log \left(\frac{1}{p(u)} \right) |u - \langle u \rangle| \right] ,$$

³⁶The term marginal rate of substitution might connote that the experience of the outcome and the knowledge of it should be considered separate “commodities”. However, the degree of knowledge is by definition inherent in the outcomes in a defined lottery.

³⁷Consider, e.g., Albert Ando, Franco Modigliani, “The ‘Life Cycle’ Hypothesis of Saving: Aggregate Implications and Tests”, American Economic Review, vol. 53 issue 1 (March, 1963) pp 55-84.

$$W = \int p(u) \left[u - v \log \left(\frac{1}{p(u)} \right) |u - \langle u \rangle| \right] du.$$

In the important case of the Bernoulli probability distribution, there are two outcomes with certainty utilities g and l (with $g > l$) and respective probabilities p and $q = 1 - p$. The expected uncertainty utility W for the Bernoulli distribution is then:

$$W = [p - vB(p)]g + [q + vB(p)]l = p^*g + q^*l, \text{ where}$$

$$B(p) = pq \left[\log \left(\frac{1}{p} \right) + \log \left(\frac{1}{q} \right) \right],$$

$$p^* = p - vB(p),$$

$$q^* = q + vB(p).$$

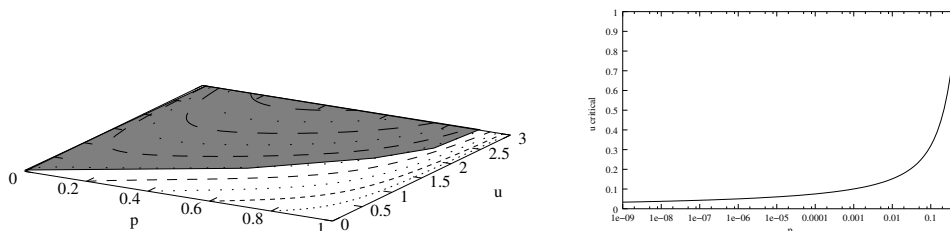
It is immediately apparent that, for $v > 0$ and $0 < p < 1$, the worse outcome will be *overweighted* relative to VNM expected utility theory, and that for fixed v this extra weight $vB(p)$ will be at a maximum for $p = \frac{1}{2}$.

It is also apparent that p^* and q^* sum to 1, looking like adjusted probabilities by which to calculate the expected value of the distribution. However, this glosses over the fact that the equation represents a combination of the effects of having and knowing. In fact, p^* and q^* could in principle violate the constraint that probabilities be in the range $[0,1]$:

$$\left(v > v_c = pB^{-1}(p) = \left[q \left(\log \left(\frac{1}{p} \right) + \log \left(\frac{1}{q} \right) \right) \right]^{-1} \right) \rightarrow (p^* < 0, q^* > 1),$$

where $(p = 0 \rightarrow v_c = 0)$, $(p = \frac{1}{2} \rightarrow v_c = 1 \text{ perbit})$ and $(p = 1 \rightarrow v_c \rightarrow \infty)$.³⁸ Therefore, at low probabilities p an individual's v could exceed v_c , leading to further anomalous choice behavior. Figure 4a portrays $p^*(p, v)$ with the

Figure 4: Bernoulli $p^*(p, v)$



critical region shaded, and Figure 4b shows $v_c(p)$ over the range $[1e-09, .5]$.

This critical region demonstrates that the uncertainty utility W is not contained within the Generic Utility Theory class of models. This is encouraging since that class seems to have been experimentally invalidated.³⁹ However, the counterintuitive possibility $\frac{\partial W(p,g,l)}{\partial g} < 0$ warrants explanation.

When confronted with a Bernoulli lottery, the individual normally values it by interpolating between l and g , albeit “over” weighting the worse outcome. Someone placing a high enough value on knowledge of the outcome ($v > v_c$) effectively *extrapolates* below l by a penalty expressible as a percentage of the range between l and g . Setting $l = 0$ and $g = 1$, the worst penalty occurs for $W'(p) = 0$, which implies $vB'(p) = 1$; several examples are presented below:

³⁸For Bernoulli lotteries, a natural choice to transform v into a dimensionless parameter v^* using v_c for a fifty-fifty lottery is the function $v^* : v \rightarrow \frac{v}{v_c(\frac{1}{2})}$. This normalization leaves the numerical magnitude unchanged when information is measured in bits.

³⁹See, e.g., ‘Is Generic Utility Theory a Suitable Theory of Choice Behavior for Gambles with Mixed Gains and Losses?’, Richard A. Chechile, Susan F. Butler, *Journal of Risk and Uncertainty* (20:2, 189-211 2000), which enumerates some of the models “captured” by Generic Utility Theory: (conventional) expected utility theory, subjective expected utility theory, additive and nonadditive subjective utility theories, cardinal utility, subjective weighted utility, prospect theory, dual bilinear model, rank-dependent model and expected value theory.

v	worst penalty (%)	for p
.2	-3	.011
.5	-6	.077
1	-23	.158

A lottery being valued lower than the certainty value of its worst outcome is natural if a sufficiently high value is placed on the knowledge of the outcomes. At the extreme, even a very good but very surprising outcome could be bad, as cardiologists know all too well.⁴⁰

If $v < 0$, for example someone seeks out a popular lottery and the excitement in *not* knowing the outcome is desirable, the situation is reversed.⁴¹ The better outcome g will be *overweighted* relative to the VNM valuation. And in the critical region $v < v_c^- = -qB^{-1}(p)$, the value will be an upside extrapolation. This is more prone to occur for low q (the probability of the worse outcome). For example, it may paradoxically be plausible for someone to value a sexual encounter even more highly if there is a small probability of a severe downside outcome such as AIDS. In the case of practices such as smoking, drugs or violent crime, while the probability of downside outcomes is not small, a strong enough aversion to knowing those outcomes in advance,

⁴⁰Other reasoning could also result in very small probabilities being “overweighted”. If an individual is first presented with a set of outcomes, and then told their probabilities (instead of prominently and immediately associating them), they may first subconsciously assign to an initial hypothesis, of a uniform distribution (“ud”) for the outcomes, some probability $p(\text{ud})$. If Bayesian inference is then used to update the probability of the hypothesis that the distribution is uniform, given the subsequent actual specification of probabilities (“spec”), we have $p(\text{ud} \mid \text{spec}) \propto p(\text{spec} \mid \text{ud})p(\text{ud})$. Presumably the actual specification of probabilities will imply $p(\text{spec} \mid \text{ud}) = 0$ exactly. But residual doubt, “analog” approximation, or just reluctance to completely abandon the default hypothesis of a uniform distribution, resulting in the individual using a $p(\text{spec} \mid \text{ud})$ at least on the order of the smallest probability of the lottery, will affect the choice process.

⁴¹Game shows where a contestant chooses between a known prize and a completely unknown one, particularly in the circumstance where the value of the known prize is the best estimate of the value of the unknown one, seem to be designed to isolate v and elicit its sign. Part of the appeal of such performances might rest in the audience identifying with the contestant and appreciating the significance of such a choice.

corresponding to a strongly negative v , might still overweight the “positive” realizations enough for upside extrapolation.

STDs, drugs, smoking, and violent crime represent some of the crises of our social system - a multiple loop nonlinear feedback system where flagrant symptoms often point to focally attractive but disappointingly insensitive control points.⁴² The model of uncertainty utility W suggests that v , viewed as an endogenous variable, might be a genuinely sensitive control point for such behavior. A promising information campaign to increase v for behavior patterns like those described above could not only point out the consequences of specific choices, but more especially focus precisely on the theme:

“because you want to know the consequences”.

Suppose when faced with a “moderate” Bernoulli lottery (with a midrange p) the individual uses the classical expected value as a reference. It may then be possible to associate their willingness to pay WTP (for more of an outcome) with their marginal utility for the realization above the reference, and their willingness to accept WTA with the lower realization, so that:

$$\left(\frac{WTP}{WTA} = \frac{p - vB(p)}{q + vB(p)} = \frac{p^*}{q^*} \right) \rightarrow \left(v = \frac{1}{B(p)} \frac{pWTA - qWTP}{WTA + WTP} \right)$$

For a fifty-fifty lottery, $v = \frac{WTA - WTP}{WTA + WTP}$ (perbits), or half the bid-offer spread divided by the price calculated by averaging WTA and WTP.

This “disentanglement”⁴³ of the contribution of having and knowing results in the violation of the Von-Neumann-Morgenstern axioms.⁴⁴

⁴²See Jay W. Forrester, ‘Counterintuitive Behavior of Social Systems’ in ‘Collected Papers of Jay W. Forrester’ (1975).

⁴³Using terminology alluded to in ‘Theory of Games and Economic Behavior’, John von Neumann, Oskar Morgenstern (1944).

⁴⁴Behavioral finance attempts to explain the consistent experimental deviations from VNM expected utility maximization. For a typical characterization of these deviations, see “Selling Company Shares to Reluctant Employees: France Telecom’s Experience”,

The substitution axiom, that mixing the same amount of a new lottery with two equally-preferred ones should result in two equally preferred ones, can be violated if $v > 0$. Consider a vacation lottery, where the resolution of the lottery and the experience of the outcome will occur next month. Assume an individual is indifferent between the two lotteries: a certain vacation in the mountains and a certain vacation at the sea shore. Now consider a fifty-fifty mix of those lotteries with the certain lottery of a vacation in the mountains. It is only natural to assume that the individual would not be indifferent between knowing for certain that he or she would vacation in the mountains and the alternative fifty-fifty mix. In this case, $v > 0$ could correspond to the value of foreknowledge in being able to suitably prepare. This example demonstrates the critical significance of the precise way that the individual's information set evolves and when the actual realization occurs, in the context of related issues such as opportunity costs.

The monotonicity axiom is also violable in the uncertainty utility formulation. According to that axiom, preferences among lotteries composed of two possible outcomes with utilities g and l , with $g > l$, are monotonic in the probability of the better outcome g . If a lottery with probability p_1 of g is preferred to a lottery with probability p_2 , then:

$$[p_1^- g + (1 - p_1^-)l] > [p_2^- g + (1 - p_2^-)l],$$

$$(p_1^- - p_2^-)(g - l) \geq 0 \rightarrow p_1^- \geq p_2^-, \text{ where:}$$

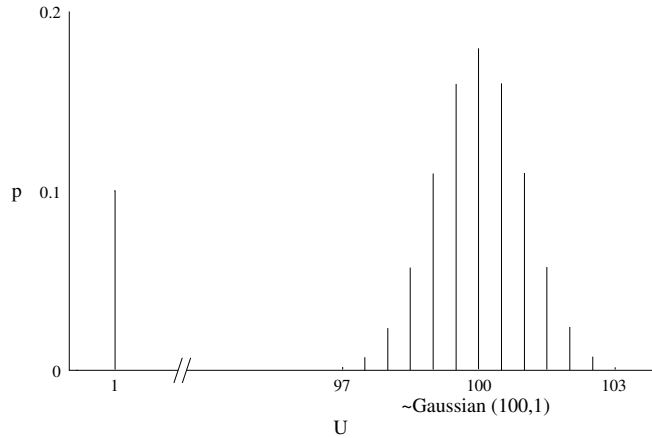
$$p_1^- = p_1 - vB(p_1), \quad p_2^- = p_2 - vB(p_2).$$

This can be true even if $p_1 < p_2$, when $B(p_2) > B(p_1)$, for $v > \frac{p_2 - p_1}{B(p_2) - B(p_1)}$.

F. DeGeorge, D. Jenter, A. Moel, P. Tufano (NBER Working Paper 7683, 2000): "In [behavioral finance] literature, individuals are not rational utility maximizers as in the neoclassical framework, but instead *suffer from mental biases and use simplifying heuristics* when making decisions". (Italics added to explanation/projection.) This interesting paper will also be referenced in the later discussion concerning treatment of employees. The characterization of the VNM axioms which we will use here follows Prajit K. Dutta, "Strategies and Games: Theory and Practice" p. 440 (1999).

The Von-Neumann-Morgenstern axiom that compound lotteries are equivalent to a simple lottery with the same distribution over final outcomes is particularly interesting. The uncertainty utility W will in general violate this axiom, as can be seen from Figure 5. By evaluating this lottery as a com-

Figure 5: Gaussian Lottery with Low-lier



pound lottery of the low outlier with the right-hand approximately Gaussian cluster taken as its own sub-lottery, the uncertainty utility is increased (in the case $v = .2$ by 6.3% even without sub-partitioning the cluster). This is because the sub-lottery for the right-hand cluster has reduced the excursions of its realizations from its own expected value, which is now introduced as an additional parameter in the calculation of overall uncertainty utility.

Not just any repartitioning of outcomes into a compound lottery tree of sub-lotteries will improve the uncertainty utility, because the $p \log(\frac{1}{p})$ cofactor, dominated by the term p , increases when outcomes are combined. For small v , corresponding perhaps to a professional experienced in a particular lottery, the optimal partition will reflect the “state of nature” by isolating outliers, but otherwise achieve a balance between the advantage and disadvantage of aggregating realizations (reducing excursions and increasing the $p \log(\frac{1}{p})$)

cofactor respectively) by using two or three intervals. At the other extreme of large v , corresponding perhaps to an amateur in a financial lottery for whom knowledge of a realization is just about as important as its occurrence, an interesting effect dominates. If high realizations are partitioned off, the *reduction in the value* of the sub-partitions due to the information component of the uncertainty utility is focused on the *lower realizations* because they are being clumped together, and this will increase the excursions at the top-level lottery. Conversely, if low realizations are partitioned off, that reduction is focused on higher realizations, decreasing excursions at the top-level lottery and resulting in a higher over-all expected uncertainty utility. The result is an “amateur” partition which separates out (“focuses on”) the lowest realizations, and with expected uncertainty utility insensitive to the value of the highest realizations.

For intermediate values of v , the optimal partition will reflect a combination of these influences of “nature” and “preference”. It is as if, to view a lottery in its “best” form, the individual perceives the probabilities and associated certainty utilities as refracted by the value which he or she places on the knowledge of the outcome relative to experiencing it.

When confronted with a distribution of outcomes, the first task of the individual is to evaluate the overall lottery to determine whether its valuation improves by re-interpreting it as a compound lottery, which could include a combination of discrete and continuous distributions. That an analysis of this sort occurs would seem unarguable in the degenerate case where identical outcomes are separately listed, so that a reasonable person would aggregate their probabilities before evaluating the lottery. The uncertainty utility W has not only the virtue of naturally incorporating this basic simplification, but also that of accommodating the case where a subset of outcomes are only negligibly distinct, resulting in an expected uncertainty utility only negligibly below the case with them exactly equal, an important principle of continuity.

The determination of the optimum member (meaning highest overall uncertainty utility) of the set of VNM-equivalent compound lotteries is an inversion problem, subject to enumeration for small numbers of outcomes and to non-linear programming for more complex situations. In the case of a lottery defined by frequencies which are only estimated by observation and therefore subject to noise, any prior knowledge of mass points or forms of distribution functions can be incorporated into a Bayesian inference. This evaluation process is clearly not costless, so that the heuristic “satisficing” of bounded rationality could naturally reflect the way people have adapted to this sort of problem. Since sub-lotteries could also be subject to optimization, it may be useful to view this inversion/inference problem as “the game of identifying nature’s game” (for small v) or “the game of identifying the best accommodation between preferences and nature” (for higher v), with sub-lotteries identified hierarchically downward and uncertainty utility W representing the continuation value calculated by “upward” induction.

With respect to game theory, if all the players are indifferent to knowledge of all intermediate and final outcomes, and for pure strategies not subjected to probabilistic interventions by “nature”, utility calculations and Nash equilibria should be unaffected, so that game theory using VNM utilities can be seen as a special case of the uncertainty utility W version. However, considering the violations of the VNM axioms by the uncertainty utility W model, it should not be surprising that for probabilistic aspects such as mixed strategies, utility calculations and Nash equilibria can change. As an example, how would the mixed strategy Nash equilibrium change for a simple game of chicken, such as could develop between a government and the union of an enterprise being considered for privatization over issues such as job security or concessionary shares?⁴⁵ Let players “lc” and “uc” choose probabilities of

⁴⁵Consider, for example, the recent facedown at Aer Lingus between the pilot’s union and the representative of the Irish government.

blinking (“b” and “B”) and, therefore, staring (“s”=1-b, “S”=1-B). Assume symmetry (so that in equilibrium $b = B$), and designate the payoffs as catastrophe (“C”, if both stare), lose or win (“L” or “W”, if one blinks but the other stares), and exit (“E”, if both blink), where $C < E, L < W$.

For the case $E > L$, it can be shown that at the mixed strategy equilibrium,

$$b - vB(b) = b_c > 0,$$

where $B(b)$ is (somewhat confusingly) the function defined earlier for the Bernoulli distribution with argument “b”, and b_c is the “classic” or “certainty” equilibrium value, positive as a result of the conditions on C, E, L and W. Under these conditions $B(b)$ is strictly positive, which, together with an assumption $v > 0$, implies $b > b_c$.

For the case $E < L$, interpretable as “gamesmanship” or a “voluntary status dominance arena” where each player would rather lose a “confrontation” (i.e., at least one stares) than avoid it, it can be shown that at the mixed strategy equilibrium,

$$b - vB(b) \frac{(W - C) - (L - E)}{(W - C) + (L - E)} = b_c > 0,$$

and that, for $v > 0$:

$$b^{E>L} > b^{E<L} > b_c > 0.$$

Therefore, according to the uncertainty utility W model, a VNM utility analysis generates an equilibrium strategy with a bias away from blinking and toward staring - increasing the probability of catastrophe. Considering that the development of game theory has been deeply associated with national security doctrine in the United States, and that important aspects of even complex confrontations such as the Cuban missile crisis, the broader US/USSR arms race or the recent Israeli/Palestinian situation can be modeled as a

game of chicken, such a bias could have significant negative consequences. Such a bias in strategy prescriptions, or even in the corresponding way of thinking, could degrade national security and jeopardize the pursuit of sustainable development which encompasses it.⁴⁶

Turning to continuous distributions, recall the expressions for the uncertainty utility, ω for the realizations and W for the entire distribution:

$$W = \int p(u)\omega(u)du, \text{ where}$$

$$\omega(u) = u - v \log \left(\frac{1}{p(u)} \right) |u- < u >|.$$

For the important Gaussian distribution $\sim N(\mu, \sigma^2)$ the integration yields:

$$W = \mu - v\sqrt{2/\pi} \left[\log \left(\sqrt{2\pi}e\sigma \right) \right] \sigma,$$

$$W = \mu - v\sqrt{2/\pi} (H + \log \sqrt{e}) \sigma,$$

$$W = \mu - \gamma\sigma,$$

where H is the differential information entropy of the Gaussian distribution. and the parameter $\gamma(\sigma) = v\sqrt{2/\pi} (H(\sigma) + \log \sqrt{e})$.

For $|v| > v_c = \frac{1}{\log \frac{1}{p_{max}}} = .75$ perbits (where $p_{max} = .399$, the Gaussian peak), the modal realization has a strictly extreme uncertainty utility ω ; e.g. for $v > v_c$ all other realizations (including higher ones) have strictly lower uncertainty utility ω , the surprise more than offsetting any gain. Therefore, a natural choice to transform v into a dimensionless parameter v^* is the function $v^* : v \rightarrow \frac{v}{v_c}$.

⁴⁶See infra note 128. Note that the same type of analysis is also applicable to avoid a downside bias in the weight of the precautionary principle with respect to international environmental law.

Figure 6: Gaussian Distribution: Information Component

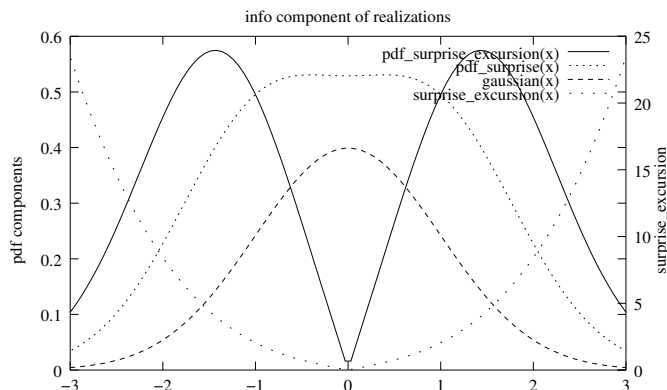


Figure 6 portrays the elements of the information component of uncertainty utility for a Gaussian distribution. The product of the familiar Gaussian distribution function and the probabilistic surprise of realizations, $\log \frac{1}{p(u)}$ (bits), has a central plateau with a shallow depression. The product of the probabilistic surprise and the excursion of the deviation, $|u - \langle u \rangle|$, is the bowl-shaped graph (using the scale on the right). The product of all three is the bimodal plot, $p(u) \log \frac{1}{p(u)} |u - \langle u \rangle|$. Figure 7 shows that bimodal function weighted by $-v$ and combined with $p(u)u$ to yield $p(u)\omega(u)$ for the cases $v=0, .15$ and $.75$ perbits.

Of perhaps particular interest is the graph of $\omega(u)$ itself, the uncertainty utility of the realizations, so that $W = \langle \omega(u) \rangle$. Figure 8 shows $\omega(u)$ for $v=0, .15$ and $.75$ perbits, with a decidedly quadratic appearance for large v .

To explore whether $W(\mu, \sigma)$ is approximately linear in σ , Figure 9 graphs $\sigma \log(\sqrt{2\pi}e\sigma)$. The plot is shown for $\sigma \in [1, 100]$, taking the natural unit for μ and σ in this information context as a just noticeable difference. From this perspective, the continuous Gaussian distribution is actually an approximation to the maximum entropy distribution given constraints on μ and σ ,

Figure 7: Gaussian Distribution: $p(u)\omega(u)$

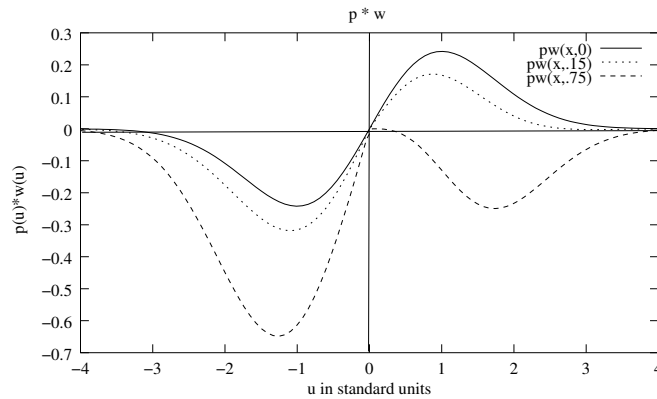
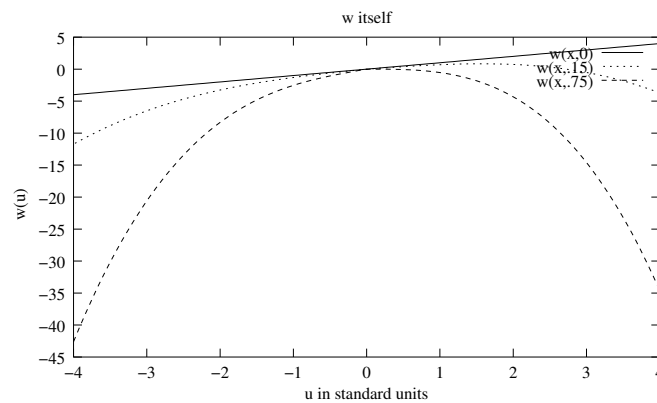


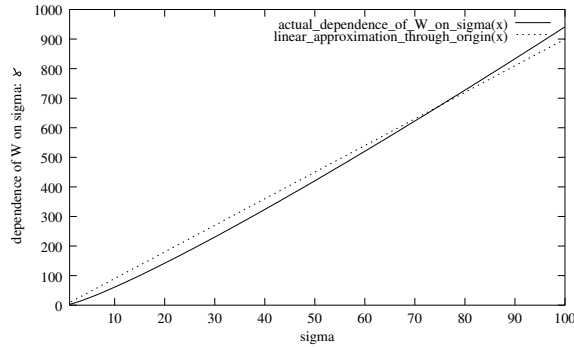
Figure 8: Gaussian Distribution: $\omega(u)$



and a uniform prior distribution over observably distinct discrete outcomes. Importantly for our purposes, a linear approximation appears quite reasonable, consistent with the fact that the second derivative, proportional to $\frac{1}{\sigma}$, approaches 0 as σ becomes unbounded, so that we can write: $W \approx \mu - \gamma\sigma$.

This linear approximation greatly simplifies the evaluation of the uncertainty utility for normal distributions, even where the distribution parameters are

Figure 9: $W = \mu - \gamma\sigma$: is γ approximately constant?



themselves uncertain (in the sense that μ and/or σ are only known as an expectation with associated variance). For example, in the case where σ is known and $\mu \sim N(\mu_\mu, \sigma_\mu)$, it can be shown that $W = \mu_\mu - \gamma(\sigma + \sigma_\mu)$. Another relevant compound is that of a routine normal distribution N and a mass point B (e.g., representing a bankruptcy event such as Enron). In that case, the result is an (adjusted) combination of expectations reduced by the standard deviation of the normal distribution by itself:

$$W = (p - vB(p))(\mu_N - \gamma\sigma_N) + (q + vB(p))\mu_B, \text{ or}$$

$$W = (p^*\mu_N + q^*\mu_B) - p^*\gamma\sigma_N.$$

We will assume that the value of a state-sponsored enterprise is lognormally distributed and that the certainty utility function is logarithmic. In that case, the individual's uncertainty utility $W \approx \mu_l - \gamma\sigma_l$, where μ and σ relate to the distribution of logarithms of values, hence the subscript l .⁴⁷

⁴⁷Our choice of individual utility function actually represents a censored version, in the sense of John Harsanyi, 'Rational Behavior and Bargaining Equilibrium in Games and Social Situations' (1977). However, the framework is powerful enough to incorporate

In the subsequent model, the individual will use their utility to choose between different enterprises, or a single enterprise and the overall portfolio. The objective of the social planner will be to choose between a fully diversified portfolio endowment policy and an individual enterprise policy by maximizing the social welfare function SWF given by

$$SWF = \sum_{\forall i} (\mu_v^i - \Gamma^i \sigma_v^i),$$

where here μ and σ relate to the distribution of values rather than logarithms (hence the subscript v), and Γ^i is a corresponding transformation of γ^i at a representative reference point.⁴⁸ The divergence between the SWF and individual utility function is appropriate, because it is the underlying value which is naturally additive for society and so a natural focus of attention for the social planner.⁴⁹ It should be emphasized that this social welfare function is meant to focus on financial efficiency (in the sense of risk relative to return), although later we will address the issue of inequality.

Before developing further this application of uncertainty utility W - that of a government policy maker evaluating alternative privatization strategies - it is important to place our utility function analysis so far into context. It was four years after the publication by John Von Neumann and Oskar Morgenstern of “Theory of Games and Economic Behavior” in 1944 that Claude Shannon published “The Mathematical Theory of Communication” in 1948. Despite

aspects such as status dominance, e.g. by adding to the realization utility an additional term $sd^-(u - u_R)$ for $u < u_R$, or $sd^+(u - u_R)$ for $u > u_R$, where normally $sd^- > sd^+ > 0$.

⁴⁸For example, $\Gamma = (\frac{\mu_{ref}}{\sigma_{ref}})\gamma$, where μ_{ref} and σ_{ref} correspond to a reference policy, e.g. the portfolio endowment policy. The subsequent analysis is insensitive to the precise transformation, our main interest being that $\Gamma(\gamma; \mu_{ref}, \sigma_{ref})$ is monotonically increasing.

⁴⁹This does not employ the conventional SWF of a weighted sum of individual utilities. However, the justification that varying such weights sweeps out Pareto optimal endowments is hardly dispositive, given the challenges of inter-personal utility comparisons and the absence of a market in utilities. To illustrate, if a social planner distributes firewood, need the SWF be a weighted function of sensations of warmth instead of a weighted function of firewood allotments?

the elegance and clarity of Shannon's foundation, information theory seems to have been considered an unintuitive subject.⁵⁰

One aspect in particular of information theory seems to have been insufficiently appreciated: that a conceptually well-defined analysis must specify the entire system of relevance, including most essentially the observer. To think about information without specifying an observer is like thinking about weight without specifying a gravitational field: it is meaningless, although some default is often taken for granted from the context.⁵¹ Indeed, the term information relates properly not to particular realizations, but rather to the process represented by the entire system. Shannon was a communications engineer, and he laid the foundations of information theory from the point of view of the designer of a communication channel, who represented the true observer in his analysis.⁵² From *this* observer's perspective, it was only natural to abstract away any meaning from the messages being transmitted. However, Shannon quite clearly stated that his analysis was not necessarily dispositive of applications in other fields: "the basic results of the subject are aimed in a very specific direction, a direction that is not necessarily relevant to such fields as psychology, economics, and other social sciences."⁵³

⁵⁰According to a widely recounted anecdote, Claude Shannon discussed his results with John Von Neumann, who suggested using the term entropy because the same concept was already in use in physics under that name, and that nobody would understand it so he would win all his arguments. Four years after Shannon's article, Paul Samuelson with characteristic insight stated: "From my own direct and indirect observations, I am satisfied that a large fraction of the sociology of gambling and risk taking will never significantly be discernible in terms of money prizes alone, as distinct from elements of suspense and gamesmanship." Paul A. Samuelson, "Probability, Utility, and the Independence Axiom", *Econometrica* 20/4 pp. 670-78 (Oct. 1952). However, Shannon's and Von Neumann's work remained unintegrated.

⁵¹The analogy more deeply would place the gravitational field and information into correspondence, since they provide the system context for the meaningfulness of thinking about the weight of an object or the observation by a conscious entity.

⁵²See E.T. Jaynes, 'Probability Theory: The Logic of Science' (manuscript, 1995).

⁵³Claude E. Shannon, 'The Bandwagon', *IEEE Transactions Information Theory*, vol. 2 (Mar 1956).

In the current analysis, the observer is the government policy maker who hypothetically places himself or herself into the position of members of the citizenry who experience, according to some appropriately censored utility function, realizations resulting from some privatization strategy. In this system, it is only natural to combine for a realization the probabilistic component of surprise ($\log \frac{1}{p}$) and the inherent importance of that surprise (e.g., $|u - \langle u \rangle|$) into the full surprise of a realization for the observer. The thesis being presented is that this conceptual framework, when applied naturally to situations such as individuals choosing among economic lotteries, represents an efficient combination of parsimony of expression and explanatory or predictive power. There remains the essential challenge of testing the validity of this thesis.⁵⁴

3.2.3 Common Preferences, Common Information

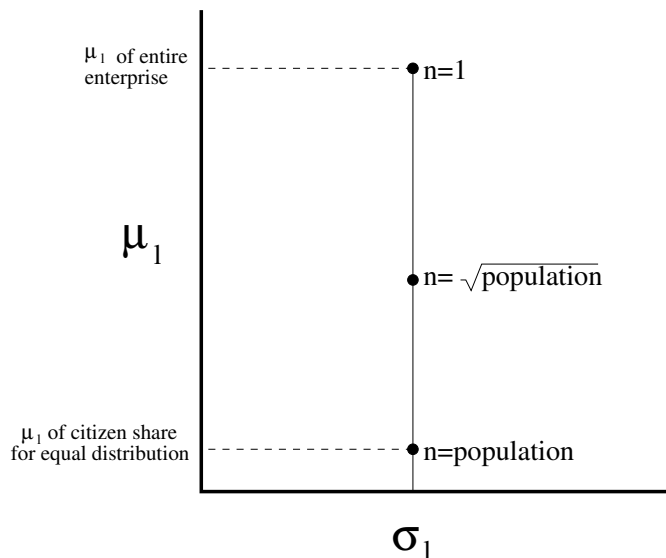
Assume that all citizens have common preferences of the form $W = \mu_l - \gamma\sigma_l$. Further assume that 1) each citizen knows his or her preference type (γ), 2) the social planner knows all the citizens' (common) preference type, and 3) all citizens and the social planner have common beliefs about μ_l and σ_l (which together determine the distribution of v) for all enterprises. For allotments of shares in individual enterprises, the social planner subdivides the enterprises into shares (see figure 10), subject to the following conditions:

- (1) the number of shares equals the number of citizens, $\sum_{\forall j} n_j = N$, where n_j is the number of shares for enterprise j , N is the number of citizens, and
- (2) each citizen is indifferent between all the shares.

⁵⁴In the words once again of Claude Shannon: "I personally believe that many of the concepts of information theory will prove useful in [psychology and economics] ... but the establishing of such applications is not a trivial matter of translating words to a new domain, but rather the slow tedious process of hypothesis and experimental verification." Id.

This is achieved by constructing successively higher or lower indifference curves until condition 1 is satisfied at the maximum utility (see Figure 11).⁵⁵

Figure 10: Division of an Enterprise into Shares in $\mu_l - \sigma_l$ Space



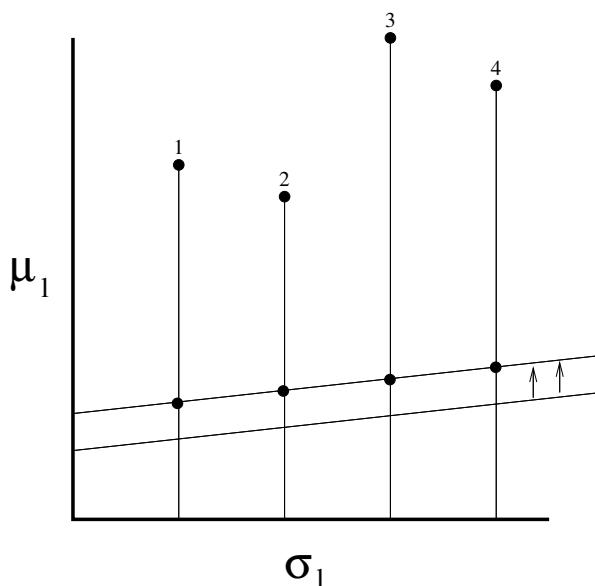
The intercept of the indifference curve on the μ_l axis, where $\sigma_l = 0$ so that the allotment is riskless, is the cash equivalent.

The social welfare function of the strategy which allots shares in individual enterprises (SWF_I) is then:

$$SWF_I = \sum_i (\mu_v^i - \Gamma \sigma_v^i).$$

⁵⁵We assume here that the number of citizens is much larger than the number of enterprises, in order to avoid leftover fractional shares. We further assume that the risk-adjusted total value of each enterprise is larger than the value of a single citizen's share, in order to avoid enterprises being shunned entirely. Note that if the social planner uses some mechanism which establishes an artificial floor on the nominal value of an enterprise which does not adequately incorporate perceived risk, it may be shunned anyway.

Figure 11: Division of Enterprises into Shares under Common Preferences



On the other hand, the social welfare function of the portfolio endowment policy (or “market portfolio policy”) which allots a portion of the market portfolio (SWF_M) is:

$$SWF_M = \sum_i (\mu_m - \Gamma \sigma_m),$$

where $\mu_m = \frac{\mu_M}{N}$, μ_M is the expected value of the entire market so that $\mu_M = \sum_j \mu_j$ where μ_j is defined to be μ_V for a share in enterprise j for notational convenience, and σ_m is the standard deviation of the value of one citizen’s share in the market portfolio.

It is immediately apparent that the summation of expected values will be the

same in this case,⁵⁶ and indeed in all other cases as well, since expectations of the value are additive and exactly all of the expected value will be allotted in the aggregate. Therefore, the difference of the two social welfare functions will be a function of only the risk components as follows:

$$\Delta SWF \equiv SWF_M - SWF_I = \sum_i \Gamma \sigma^i - \sum_i \Gamma \sigma_m = \Gamma \left[\sum_i \sigma^i - \sum_i \sigma_m \right]$$

As expected, the magnitude of the difference in the social welfare function is an increasing function of (indeed proportional to) the information preference parameter Γ . In order to sign ΔSWF , it is necessary to sign $(\sum_i \sigma^i - \sum_i \sigma_m)$. Note that when the total market portfolio with standard deviation σ_M is divided into N shares, each share has $\sigma_m = \frac{\sigma_M}{N}$. Likewise, when an enterprise j is divided into n_j shares, each share has standard deviation $\sigma_j = \frac{\sigma_{V_j}}{n_j}$. Note also that

$$\sum_i \sigma^i = \sum_j \sum_{i \in j} \sigma^i = \sum_j n_j \left(\frac{\sigma_{V_j}}{n_j} \right) = \sum_j \sigma_{V_j},$$

where $i \in j$ means citizen i is allotted a share in enterprise j , and we have made use of the fact that all shares of the same enterprise have the same standard deviation.

Therefore, to determine whether $\Delta SWF > 0$, it is only necessary to sign the expression:

$$\sum_j \sigma_{V_j} - \sigma_M,$$

which (since $\sigma_M, \forall \sigma_{V_j} \geq 0$) is equivalent to signing the quadratic form:

$$q = \left(\sum_j \sigma_{V_j} \right)^2 - (\sigma_M)^2.$$

⁵⁶

Formally: $\left[\mu_m \equiv \sum_j \left(\frac{\mu_{V_j}}{N} \right) \right] \Rightarrow \sum_i \mu_m = \sum_j \mu_{V_j} = \sum_j n_j \mu_j = \sum_i \mu_v^i.$

Expanding each term in turn we obtain:

$$\left(\sum_j \sigma_{V_j}\right)^2 = \sum_j \sigma_{V_j}^2 + 2 \sum_j \sum_{j' < j} \sigma_{V_j} \sigma_{V_{j'}},$$

and

$$\sigma_M^2 = \sum_j \sigma_{V_j}^2 + 2 \sum_j \sum_{j' < j} \rho_{jj'} \sigma_{V_j} \sigma_{V_{j'}},$$

where $\rho_{jj'} \in [-1, 1]$ is the correlation between V_j and $V_{j'}$.

Substituting these expressions into q , canceling the $\sum_j \sigma_{V_j}^2$ term, and combining the summation operators yields:

$$q = 2 \sum_j \sum_{j' < j} (1 - \rho_{jj'}) \sigma_{V_j} \sigma_{V_{j'}},$$

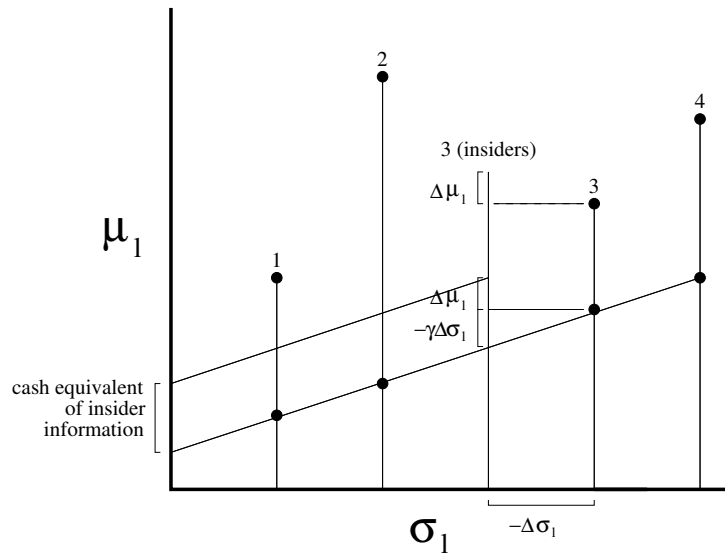
which must be positive since $\rho_{jj'} \leq 1$ for all j, j' , and we can assume that not all enterprise valuations are perfectly correlated, so that $\rho_{jj'} < 1$ for some j, j' . Therefore, in this case of common preferences, the relative advantage of the market portfolio policy is strictly positive.

3.2.4 Common Preferences, Inside Information

Now suppose the same common preferences and common information, except that a small number of insiders has private information about one of the enterprises, unbeknownst to the social planner and the other citizens.⁵⁷ For example, suppose they are better-informed about an enterprise ($\Delta\sigma_l < 0$), and in particular are aware of a valuable undisclosed asset ($\Delta\mu_l > 0$). This situation is depicted in Figure 12. In this case, the insiders would prefer a share of that enterprise to one of the others.

⁵⁷While insider information relates more to equity than efficiency, it is treated here to preserve the flow of reasoning.

Figure 12: Gain from Inside Information



As can be seen from the figure, this inside information results in an increase in cash equivalent utility to the insiders, at the expense of other citizens, of:

$$\Delta W = \Delta\mu_l - \gamma\Delta\sigma_l, \text{ where}$$

$$[\Delta\mu_l > 0; \Delta\sigma_l < 0] \Rightarrow [\Delta W > 0]$$

Clearly, no such gain from inside information would be possible under a market portfolio policy, which allots the same endowment to each citizen. Therefore, if the social welfare function were to negatively weight such transfers resulting from inside information as inequitable, then the relative advantage of the market portfolio policy increases in the context of inside information.

3.2.5 Heterogeneous Preferences

While the relative advantage of the market portfolio policy is strictly positive in the case of common preferences, what happens if we relax that assumption? Consider the case of two enterprises and two types of citizens. Assume that:

- 1) enterprise 1 (“the blue chip”) is less risky from the perspective of the citizens than enterprise 2 (“the flyer”), so that $\sigma_{l1} < \sigma_{l2}$;
- 2) citizens of type 1 (“the normals”) have a higher information preference parameter than citizens of type 2 (“the investors”), so that $\Gamma^1 > \Gamma^2$;
- 3) the “blue chip” and “flyer” are comparable in μ_V , while the “normals” greatly outnumber the “investors”, so that some of the “normals” will end up with allotments of the flyer.

Further, assume as before that:

- 1) each citizen knows their own preference type γ ,
- 2) the social planner knows all the citizens’ preference types, and
- 3) all citizens and the social planner have common beliefs about μ_v and $\sigma_{\log v}$, which determine the distribution of v , for both enterprises.

In the case of allotments of shares in individual enterprises, enterprises will be subdivided into shares such that:

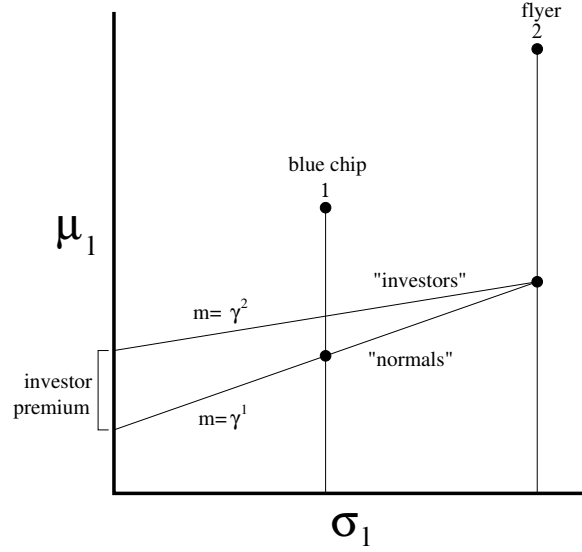
- 1) the number of shares equals the number of citizens: $n_1 + n_2 = N$, and
- 2) the “normals” are indifferent between the “blue chip” and the “flyer”:

$$\left(\frac{\mu_{l1}}{n_1} - \gamma^1 \sigma_{l1} \right) = \left(\frac{\mu_{l2}}{n_2} - \gamma^1 \sigma_{l2} \right).$$

Similar to the first case, this is achieved by the best indifference curve for the normals which satisfies $n_1 + n_2 = N$ (see Figure 13).

Note that while the normals are indifferent between the blue chip and the flyer, the investors strictly prefer their share of the flyer to a share of the blue

Figure 13: Divide Two Enterprises for Two Types of Citizens



chip and enjoy a cash-equivalent utility premium equal to the difference of the intercepts portrayed on Figure 13. This relative advantage of investors is presumably acceptable, since an attempt by the social planner to reduce it would penalize the investor for being less sensitive to risk.

As before, the difference in the social welfare function between the market portfolio policy (M) and the individual enterprise policy (I) is:

$$\Delta SWF = \left(\sum_i \Gamma^i \sigma^i \right)_I - \left(\sum_i \Gamma^i \sigma_m \right)_M .$$

The first term can be expanded as:

$$\left(\sum_i \Gamma^i \sigma^i \right)_I = \sum_{1 \in 1} \Gamma^1 \sigma_1 + \sum_{1 \in 2} \Gamma^1 \sigma_2 + \sum_2 \Gamma^2 \sigma_2,$$

where $\sum_{1 \in 2}$ denotes the summation over all citizens of type 1 allotted a share in enterprise 2, and \sum_2 denotes the summation over all citizens of type 2.

Noting that $\sum_{1 \in 1} \sigma_1 = \sigma_{V_1}$, ΔSWF then becomes:

$$\Delta SWF = (\Gamma^1 \sigma_{V_1} + p_{1\text{-of-}2} \Gamma^1 \sigma_{V_2} + p_{2\text{-of-}2} \Gamma^2 \sigma_{V_2}) - (p_1 \Gamma^1 \sigma_M + p_2 \Gamma^2 \sigma_M),$$

where $p_{1\text{-of-}2}$ is the proportion of enterprise 2 shares held by citizens of type 1, $p_{2\text{-of-}2}$ is the proportion of enterprise 2 shares held by citizens of type 2, p_1 is the proportion of type 1 citizens, and p_2 is the proportion of type 2 citizens. Next, we will turn to signing the ΔSWF and exploring its comparative statics.

Information-Indifferent Investors (I^3)

In the limit where Γ^2 approaches zero, so that investors become information indifferent, the relative social welfare function becomes:

$$\Delta SWF = (\sigma_{V_1} + p_{1\text{-of-}2} \sigma_{V_2} - p_1 \sigma_M) \Gamma^1.$$

Consider the extreme case where enterprise 1 is riskless, so that $\sigma_{V_1} = 0$, and where the normals hold an insignificant proportion of the shares of enterprise 2, so that $p_{1\text{-of-}2} = 0$. In this case, ΔSWF is strictly negative, because of the opportunity to segregate the risk of asset 2 in the holdings of the information-indifferent investors.

Few Investors

In the limit where there are few investors (relative both to total citizens and to number of shares in the flyer), $p_{2\text{-of-}2}$ and therefore p_2 approach zero and $p_{1\text{-of-}2}$ approaches one, so we can write:

$$\Delta SWF = \Gamma^1 \sigma_{V_1} + \Gamma^1 \sigma_{V_2} - \Gamma^1 \sigma_M = \Gamma^1 (\sigma_{V_1} + \sigma_{V_2} - \sigma_M)$$

This will be positive if $\sigma_{V_1} + \sigma_{V_2} > \sigma_M$, or equivalently if:

$$\sigma_{V_1}^2 + \sigma_{V_2}^2 + 2\sigma_{V_1}\sigma_{V_2} > \sigma_{V_1}^2 + \sigma_{V_2}^2 + 2\rho_{V_1, V_2}\sigma_{V_1}\sigma_{V_2},$$

which is true unless $\rho_{V_1, V_2} = 1$.

Therefore, if there are few enough investors (who are less sensitive to the riskiness of flyer shares and can therefore be allotted them without degrading the social welfare function as much), then the relative advantage of the market portfolio policy will be strictly positive, and proportional to the information preference parameter of the population.

Homogenization of Preferences

If the two enterprises have equal total variance (so that the flyer, which is riskier by construction, will have a smaller total expected value and fewer shares), then $\sigma_{V_1} = \sigma_{V_2} = \sigma_V$, and we can write:

$$\begin{aligned} \Delta SWF &= \sigma_V[(1 + p_{1-of-2})\Gamma^1 + p_{2-of-2}\Gamma^2] - \sigma_M[p_1\Gamma^1 + p_2\Gamma^2] \\ &= \left\{ \sigma_V \left[(1 + p_{1-of-2}) + p_{2-of-2} \left(\frac{\Gamma^2}{\Gamma^1} \right) \right] - \sigma_M \left[p_1 + p_2 \left(\frac{\Gamma^2}{\Gamma^1} \right) \right] \right\} \Gamma^1 \end{aligned}$$

We can then calculate the effect of increasing homogenization of preferences as follows:

$$\left(\frac{\partial(\Delta SWF)}{\partial \left(\frac{\Gamma^2}{\Gamma^1} \right)} \right) \Big|_{\sigma_{V_1}=\sigma_{V_2}} = (p_{2-of-2}\sigma_V - p_2\sigma_M) \Gamma^1,$$

which is proportional to the risk parameter of the normals, Γ^1 .

To sign this effect, consider the expression

$$\left(\frac{p_{2-of-2}}{p_2} - \frac{\sigma_M}{\sigma_V} \right).$$

Since enterprise 2 has less than half the shares we know $\frac{p_{2-of-2}}{p_2} > 2$. We also know that $\sigma_M \leq 2\sigma_V$ irrespective of the correlation ρ_{V_1, V_2} . Therefore, in the case where the two enterprises are of equal total standard deviation, homogenization of preferences improves the relative advantage of the market portfolio policy.

Diversification/Homogenization of Enterprise Risk

If citizens' preferences are nearly homogeneous, then $\Gamma^1 \approx \Gamma^2 = \Gamma$, and we can write:

$$\begin{aligned}
 \Delta SWF &\approx (\Gamma\sigma_{V_1} + p_{1\text{-of-}2}\Gamma\sigma_{V_2} + p_{2\text{-of-}2}\Gamma\sigma_{V_2}) - (p_1\Gamma\sigma_M + p_2\Gamma\sigma_M) \\
 &= [\sigma_{V_1} + (p_{1\text{-of-}2} + p_{2\text{-of-}2})\sigma_{V_2} - \sigma_M]\Gamma \\
 &= [(\sigma_{V_1} + \sigma_{V_2}) - \sigma_M]\Gamma \\
 &= \left[\frac{(\sigma_{V_1} + \sigma_{V_2})^2 - \sigma_M^2}{(\sigma_{V_1} + \sigma_{V_2}) + \sigma_M} \right] \Gamma \\
 &= \left[\frac{2\sigma_{V_1}\sigma_{V_2} - 2\rho_{V_1,V_2}\sigma_{V_1}\sigma_{V_2}}{(\sigma_{V_1} + \sigma_{V_2}) + \sigma_M} \right] \Gamma \\
 &= 2(1 - \rho_{V_1,V_2}) \left[\frac{\sigma_{V_1}\sigma_{V_2}}{(\sigma_{V_1} + \sigma_{V_2}) + \sigma_M} \right] \Gamma \\
 &= 2(1 - \rho_{V_1,V_2}) \left[\frac{\sigma_{V_2}}{1 + \frac{\sigma_M}{\sigma_{V_1}} + \frac{\sigma_{V_2}}{\sigma_{V_1}}} \right] \Gamma
 \end{aligned}$$

From this we can draw several conclusions under the assumption of nearly homogeneous citizen preferences:

- 1) The market portfolio strategy is strictly preferred (assuming $\rho_{V_1,V_2} < 1$), confirming our earlier finding.
- 2) The relative advantage of the market portfolio strategy increases proportional to $(1 - \rho_{V_1,V_2})$, i.e. as the signed correlation decreases (e.g. holding everything else constant this advantage would double if ρ_{V_1,V_2} changed from zero [or no correlation] to -1 [or perfect anti-correlation]). This effect is due to the increasing value of the diversification of the market portfolio as the signed correlation between the two enterprises decreases.

3) If the two enterprises have the same expected value, then by construction $\sigma_{V_2} > \sigma_{V_1}$. Then increasing enterprise homogeneity by increasing σ_{V_1} while holding σ_{V_2} constant increases the relative advantage of the market portfolio policy. This means that there is less diversity in enterprise risk to theoretically shift at a net gain in the social welfare function.

4) Finally, these effects increase in proportion to Γ . This means that the more sensitive the citizen is to risk, the greater is the relative advantage of the market portfolio policy.

Noise in Citizen Information

The market portfolio policy is immune to noise, in the sense that the allotment of ownership is independent of the accuracy of the beliefs (e.g., bias in the expected value, or excessively great variance, relative to the best available information) of the social planner or the citizens about the valuation distribution of any of the enterprises.

The individual enterprise policy is not immune to noise in that sense. Rather, the potential advantage of this policy arises from matching less certain enterprise shares with investors with smaller information preference parameters. This requires information about the relative riskiness of individual enterprise shares, in addition to some sort of mechanism to allot shares to citizens based on their information preference parameters.

Assume the social planner has the best available information about the distributional parameters of enterprise valuation. The effect of injecting a marginal amount of noise ϵ into citizens' information can be quantified by considering noise-induced switches of allotments. If a single normal (“ N ”) and investor (“ I ”) switch, when they should have been allotted shares of enterprises with standard deviation σ_l (lower risk) and σ_h (higher risk) respectively, the net

effect is:

$$\psi = (\Gamma^N \sigma_l + \Gamma^I \sigma_h) - (\Gamma^N \sigma_h + \Gamma^I \sigma_l),$$

where ψ is the change of the social welfare function due to one such switch.

This can be simplified as:

$$\psi = \Gamma^N(\sigma_l - \sigma_h) - \Gamma^I(\sigma_l - \sigma_h) = (\Gamma^N - \Gamma^I)(\sigma_l - \sigma_h).$$

Since $\Gamma^N - \Gamma^I > 0$, and $\sigma_l - \sigma_h < 0$, ψ is negative as expected, and is proportional in magnitude to the product of the difference of the information preference parameters of the two citizens, and the difference of the standard deviation of their planned allotments.

Summary

To summarize, we have shown (for the idealized two enterprise/two citizen type model) the selected conditions for signing ΔSWF and comparative statics shown in Table 1.

These comparative statics can be respectively interpreted as follows:

- 1) As the number of investors declines to zero relative to the number of citizens allotted shares in the riskier enterprise, the relative advantage of the market portfolio policy is strictly positive.

Table 1: Conditions for Signing ΔSWF and Comparative Statics

	Assumption	Inference
1.	$p_{2-of-2} \rightarrow 0$	$\Delta SWF > 0$
2.	$\Gamma^2 \rightarrow 0$; $\sigma_{V_1} = 0$ $p_{1-of-2} = 0$	$\Delta SWF < 0$
3.	$\Gamma^2 \rightarrow \Gamma^1$	$\frac{\partial(\Delta SWF)}{\partial(1-\rho_{v_1,v_2})} > 0$
4.	$\Gamma^2 \rightarrow \Gamma^1$, $\mu_{V_1} = \mu_{V_2}$ σ_{V_2} constant	$\frac{\partial(\Delta SWF)}{\partial\sigma_{V_1}} > 0$
5.	$\sigma_{V_1} = \sigma_{V_2}$	$\frac{\partial(\Delta SWF)}{\partial\left(\frac{\Gamma^2}{\Gamma^1}\right)} > 0$
6.	$\epsilon \rightarrow +$	$\frac{\partial(\Delta SWF)}{\partial\epsilon} > 0$
7.	$\Gamma^2 \rightarrow \Gamma^1$	$\Delta SWF > 0$

2) As investors become information indifferent, and the standard deviation of the risky enterprise becomes extremely high relative to the less risky enterprise, and the proportion of shares of the risky enterprise which the normals own becomes insignificant, the relative advantage of the market portfolio policy becomes strictly negative.

3) As citizen preferences approach homogeneity, the relative advantage of the market portfolio policy increases as the diversification potential between the enterprises increases.

4) As citizen preferences approach homogeneity, for enterprises of equal size (in expected value), the relative advantage of the market portfolio policy increases as enterprise risks become more homogeneous.

5) For enterprises of equal size (in standard deviation) the relative advantage of the market portfolio policy increases as citizen preferences become more

homogeneous.

6) If noise is injected into citizens' information about enterprise valuation which induces a switch in allotments, then the relative advantage of the market portfolio policy increases.

7) As citizen preferences approach homogeneity, the relative advantage of the market portfolio policy is strictly positive.

Furthermore, all these effects increase in magnitude with an increase in the information preference parameter of the normal citizens.

As a synopsis of these results, the possible advantage of a single enterprise policy would derive from an ability to allot less certain enterprises to citizens with smaller information preference parameters. Under the specified conditions, this potential advantage erodes, and the fully diversified market portfolio endowment policy becomes more advantageous, with:

- 1) increasing homogeneity of either enterprise risk or citizen preferences,
- 2) noise in citizens' information inducing allotment switching, and
- 3) an increasing effect of diversification between assets.

4 Equity

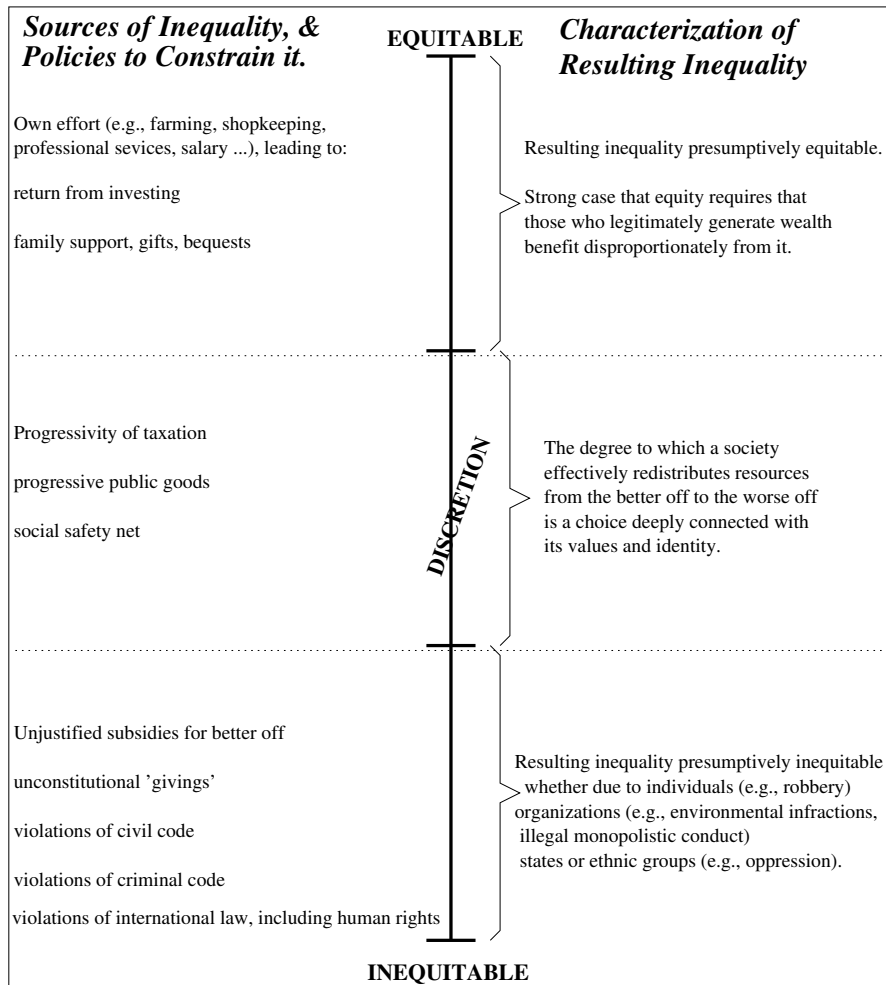
4.1 Inequality

According to conventional wisdom, there is often a trade-off between economic efficiency and social equity. However, the diversified portfolio endowment policy has the potential to both enhance efficiency and reduce inequality. We have already discussed the potential for relative financial efficiency due to diversification, and the potential to enhance equity by avoiding gains from inside information. Here, we discuss the effect of the portfolio endowment policy on inequality in the distribution of income or wealth.

It is worth discussing first the common belief that inequality corresponds to inequity. It is important to distinguish the origins of inequality: disproportionate benefits from one's own effort seem presumptively equitable; illegal conduct is the paradigmatic example of an inequitable source of inequality; and there are a number of policies affecting inequality which are best viewed as social choices (see Figure 14).

Right away it is apparent that it is too simple to characterize, say, a society with lower inequality as better than one with higher inequality. Taking the former Soviet Union as an example, and considering only the non-elite (e.g., non-Communist) population group, the pre-transition intra-group inequality was very low, but reflected an inequitable inhibition of individuals benefiting from their own effort. Conversely, at the other extreme, in a country such as Zaire under Mobutu, it is high inequality that would be presumptively inequitable. Perhaps, taking a Bayesian perspective, extremely high inequality could lead one to suspect inequitable origins, and extremely low inequality could lead one to suspect an inequitable suppression of individual property rights, while a broad middle ground is consistent with a range of responsi-

Figure 14: When Should Inequality be Characterized as Inequitable?



ble choices with respect to progressive fiscal policy and a social safety net. From this perspective, the evaluation of the equity of the level of inequality in a society is strongly path dependent. Therefore, in evaluating alternative policies, the prospective impact on inequality should be considered in the context of the current inequality structure, its path in getting there, and the

norms and mores of the society, which themselves also continue to adapt.

As an example of social values, there is a very strong American belief in the importance of equality of opportunity (as opposed to equality of outcome),⁵⁸ apparently shared in England.⁵⁹ A strong case can be made that the portfolio endowment policy - with automatic, equal endowments of privatized state-sponsored enterprises for all citizens - represents ultimate equality of opportunity.

With this background in mind, we will first analyze a situation where existing high levels of inequality have a prima facie inequitable source - South Africa, where the legacy of apartheid continues to permeate the economy. In this case, a policymaker would presumably view strongly negatively any increase in inequality due to privatization. Then, we will review some recent literature discussing the connection between inequality and economic growth.

4.1.1 Comparison with IPOs

One convenient, standard measure of inequality is the Gini coefficient:

$$G = \frac{\sum_i \sum_j |Y_i - Y_j|}{2n^2\bar{Y}}$$

⁵⁸See, e.g., Everett Carll Ladd, Karlyn H. Bowman, 'Attitudes toward Economic Inequality', American Enterprise Institute (1998): "Opportunity is the one prize a free society has to offer." quoting Oscar Handlin, 'The Idea of Opportunity', Public Opinion, vol. 5 No. 3 (1982) p.2, and "The American idea of equality - one that distinguishes it to this day from other nations (sic) - is rooted in the notion of equality of *opportunity*", quoting a 1993 poll showing that "A robust 84 percent [of Americans] favored the standard of equal opportunity, while only 12 percent favored equal outcomes".

⁵⁹"'Equality of opportunity' [...] has been widely accepted as a goal of government policy, and many writers treat it as of self-evident merit. Recently it has indeed been argued - at least in Britain - that equality of opportunity should be the sole principle of justice guiding social decisions." A.B. Atkinson, 'Social Justice and Public Policy' (1983).

where n is the number of citizens,
 Y_i is the income or wealth of citizen i ,
 \bar{Y} is the mean income or wealth, and
 $G \in [0, 1]$ (0 corresponding to complete equality, 1 corresponding to a single individual having everything).

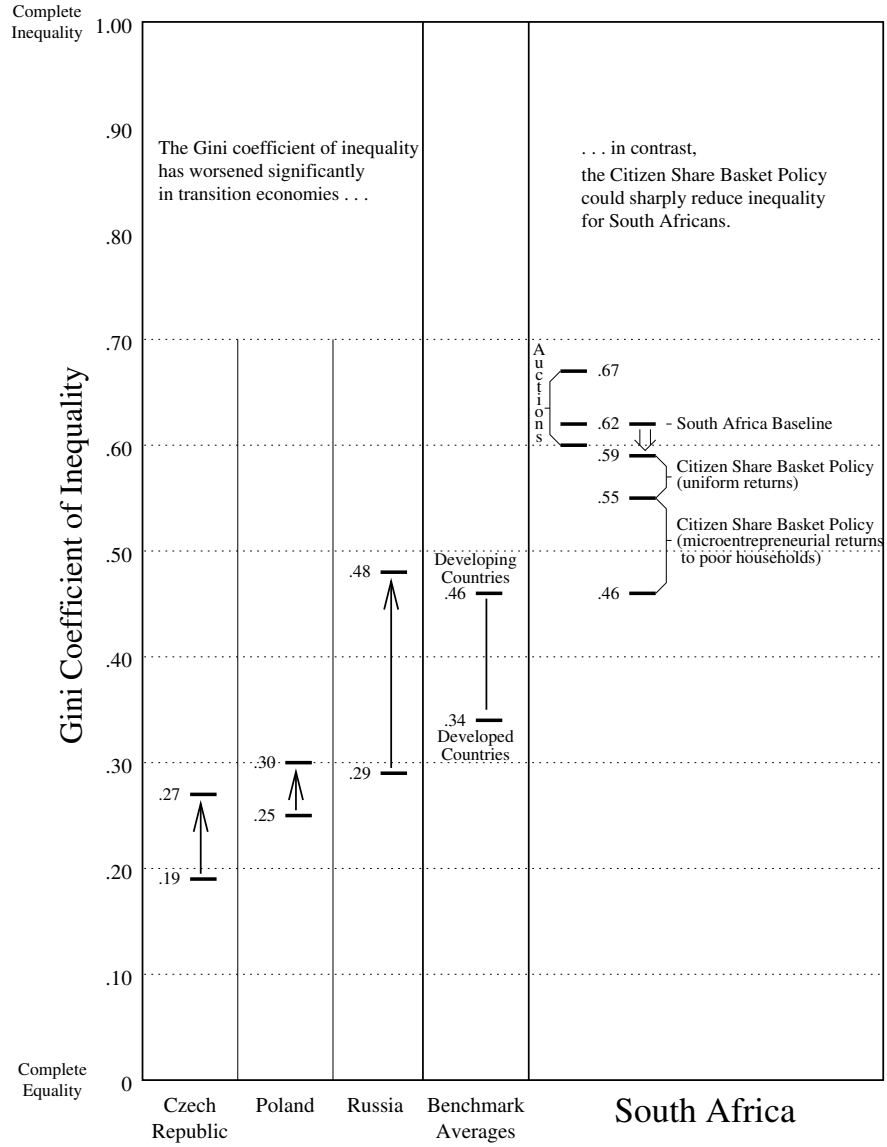
One study⁶⁰ compared projections for inequality for South Africa based on either IPOs or the portfolio endowment policy, using the South Africa Living Standards and Development Survey data set. It found that over a range of plausible assumptions, the Gini coefficient of household income inequality would not dramatically change due to an IPO policy, as the regressive effects (foreigners and richer locals benefiting from the IPO discount, and some of the proceeds reducing debt and future progressive taxes) approximately balanced the progressive effects (some of the proceeds invested in progressive redistribution). Projected impacts on inequality for the IPO policy were found to be insensitive to one-at-a-time changes in the underlying assumptions.

In contrast, projections for the portfolio endowment policy indicated the potential for a significant reduction in inequality. In addition, the projected reductions in inequality were very sensitive to assumptions for parastatal market value and elevated (e.g., micro-entrepreneurial) returns for the poorest stratum, especially in combination.⁶¹ Figure 15 summarizes those results, demonstrating that inequality in South Africa could potentially be reduced to the developing country average with a portfolio endowment policy, even as other societies in transition with conventional privatization policies have encountered worsening inequality.

⁶⁰“Shares for All: Options for Distributing Wealth through Privatisation”, William J. Hartnett (1997), Transition Series Research Report 54, Centre for Policy Studies, Johannesburg. This study also noted the potential connection between creating opportunity and reducing violent crime - a significant issue in South Africa and other countries.

⁶¹See id. for data sources, details of the analysis and qualifications on the conclusions.

Figure 15: Income Inequality in Transition, with Projections for South Africa



Perhaps as important as the decrease in inequality which the portfolio endowment policy can bring about, is the *prevention* of the sometimes severe *increases* in inequality associated with standard privatization policies over the last decade, as old (and new) elites have benefited disproportionately from both enterprise sales and voucher schemes.

In one highly provocative report,⁶² the Gini coefficient of individual income inequality of post-transition former Soviet block countries was found to have increased in all but one country (Slovakia), and sharply (from 5 to 29 Gini points, with Russia and Ukraine increasing 24 Gini points) except in four countries including Poland (with a slight increase of 2 Gini points, and a privatization policy closest to the portfolio endowment policy). That report also documents how Eastern Europe and the former Soviet Union suffered a depression beginning around the start of the transition, worse in Russia than even the Great Depression of the United States. The potential connection between severe output declines and worsening inequality associated with conventional privatization and other transition policies is a significant issue which we discuss next.

4.1.2 Implications for Growth

A recent meta-analysis of studies investigating the connection between inequality and growth finds that changes in inequality in either direction are associated with reduced future growth.⁶³ It proposes a political economy model in which bargaining between two groups (presumably “haves” and “have-nots”) over the distribution of growth from potential opportunities

⁶²Branko Milanovic, ‘Income, Inequality, and Poverty during the Transition from Planned to Market Economy’, (World Bank, 1998).

⁶³‘Inequality and Growth: What Can the Data Say?’, Abhijit Banerjee, Esther Duflo (NBER Working Paper 7793, July 2000).

delays and reduces that potential. This thesis is broadly consistent with the transition experience of former Soviet block countries, experiencing sharp increases in inequality and severe declines in output. Broadly interpreted, it is also consistent with the conventional wisdom that delays in implementing privatization, despite its expected opportunities for enhanced growth, are due in large part to various constituencies blocking it out of dissatisfaction with the prospective distribution not only of new efficiency gains, but also immediate transfer gains (e.g., sharply discounted or even free shares) and prospective losses (e.g., redundancies or price hikes in services).

The portfolio endowment policy, by virtue of its focal appeal as being equitable and transparent, could be a rare opportunity to accelerate economic reform by broadening its political support. In such a scenario, even significant reductions in inequality would be fully consistent with improved prospects for growth.

Another important recent paper, by Deininger and Olinto,⁶⁴ concluded that growth is hurt in particular by worsening *asset* inequality rather than income inequality. While most inequality data from the former Soviet block transition relates to income, there is every reason to believe that a corresponding or even more severe shift in wealth inequality has occurred - in significant part due to oligarchic appropriation of the value of privatized enterprises - with potentially serious consequences.⁶⁵ Deininger and Olinto point out that “well-designed measures to redistribute (sic) assets should, at least in theory,

⁶⁴‘Asset Distribution, Inequality, and Growth’, Klaus Deininger, Pedro Olinto (World Bank, 2001?).

⁶⁵ “[P]rivatization of state assets can, if not implemented carefully and accompanied by an appropriate regulatory framework, lead to large increases in the inequality of asset distribution. For example, fire-sales of assets without an adequate regulatory framework can, as in a number of Eastern European countries, lead to huge jumps in inequality in a relatively short period of time. Experience suggests that high levels of inequality are very difficult and costly to reverse.” Id. at 4.

allow countries to increase equity and efficiency at the same time”.⁶⁶

For a first order approximation of the effect of the portfolio endowment policy on the Gini coefficient of individual wealth inequality, if:

- 1) the same endowment for each citizen increases his or her wealth the same amount (not taking into account effects such as different returns - this understates the reduction in inequality if poorer people are able to generate microentrepreneurial returns, or even if their implied wealth enhancement is greater by virtue of being able to meet critical basic needs),
 - 2) the citizenry benefited equally from the enterprises under state control, and that benefit is considered the reference level, and
 - 3) privatization induces efficiency gains resulting in a positive value of each citizen’s endowment relative to the benefits under state control,
- then the immediate effect on the Gini coefficient is seen to be:

$$G_{new} = \left(\frac{\bar{Y}_{old}}{\bar{Y}_{new}} \right) G_{old}, \text{ where}$$
$$(\bar{Y}_{new} > \bar{Y}_{old}) \rightarrow (G_{new} < G_{old}),$$

so that inequality has decreased.

Therefore, the portfolio endowment policy has the potential to reduce wealth inequality, and in such a way - promoting efficiency, maximizing transparency and maintaining a social safety net - as to promote positive growth.

⁶⁶Id. at 17-18. Deininger and Olinto also note the importance of transparency and maintaining a safety net, both of which are strengths of the portfolio endowment policy.

4.2 Eligibility

4.2.1 Enterprise Employees

A major policy issue in privatization is whether enterprise employees should be given preferential treatment over the general citizenry.⁶⁷ After summarizing some arguments on both sides of this issue, any of which could prove persuasive in the right situation, a previously unconsidered policy alternative will be discussed: Even if enterprise employees were to be treated preferentially, under what circumstances would they prefer a portfolio endowment over an equal-valued allocation of shares in their own enterprise?⁶⁸

The strongest reason to avoid preferential treatment of enterprise employees relies on a fairness argument. Suppose the state sector is owned by the country as a whole, and that the government has operated it as a trustee for the general citizenry as the beneficiary. Suppose further that the employees of the state sector chose those jobs because they were paid a competitive combination of wages and benefits for their work on an ongoing basis. Then it would seem unfair to give employees an extra portion of their enterprise at the expense of the general citizenry. Why should citizens who were fortunate enough to have a job with a state enterprise be favored during privatization over fellow citizens who were unemployed or even destitute? This argument is considerably strengthened in the typical case where a soft budget constraint has resulted in the government covering enterprise losses on an ongoing basis,

⁶⁷So far, there seems little consensus on this issue, as actual practice in transition economies has varied extremely widely; e.g. in the former Soviet bloc, employee ownership of privatized firms has ranged from around 4% (in the Czech Republic) to around 95% (in Romania). Saul Estrin, 'Privatisation in Central and Eastern Europe' (March, 1996), citing J.S. Earle, S. Estrin, 'Employee Ownership in Transition' (1995).

⁶⁸This discussion focuses on whether to give employees more shares at privatization than the general citizenry, and if so whether a portfolio endowment would be better than shares in their own company. The next section, on corporate governance, will consider the distinct situation where employees are laid off after privatization has occurred.

plausibly due at least in part to a more-than-competitive combination of wages and benefits.

The argument against even-handed treatment of all citizens can be broken into four parts. First, if the process of privatization destroys a portion of the state enterprise social safety net which constitutes part of employees' total compensation, then it may be necessary to offset this with preferential treatment. Second, if privatization in other sectors of the economy such as land or housing preferentially favors the relevant "stakeholders" as part of some overall substituted social contract, then the case could be made that employees should be preferentially favored as stakeholders in their enterprise. Third, if the value of state enterprises is seen to be the product of the effort of the employees, and if they have not been fully compensated for their contribution to that value, then they could be entitled to a preferential allocation. Fourth, if the constituency of enterprise employees has an effective veto power over privatization, favoritism may be a necessary political precondition of privatization. Counterarguments to these ideas might include pointing out: 1) that broader segments of society than just employees can be impacted by privatization (e.g., beneficiaries of subsidized services); 2) the questionable feasibility of employee vetoes over privatization in the face of often severe unemployment pressures; and 3) the arbitrariness and inequity in using employment rolls at a single point in time.

These arguments and counterarguments must be resolved by the political process, perhaps in a sector-by-sector or even enterprise-by-enterprise fashion. In the rest of this section, we will hypothetically suppose that the political case were to be made for a certain level of preferential treatment of enterprise employees for a particular enterprise. Can we identify circumstances under which a conventional policy of awarding employees a percentage of their enterprise is Pareto inferior to an alternative policy which allocates the same expected value (over the appropriate planning horizon) of a market portfolio

of the state enterprises to be privatized?⁶⁹

In evaluating a policy which allocates a market portfolio rather than enterprise stock to employees, it is important to consider: 1) the normative dimension, 2) the interests of the general citizenry, and 3) the preferences of enterprise employees. *Normatively*, assume that any preferential allocation is based on a perception that the employees of the state enterprises to be privatized, as a class, have not been fully compensated for the value which they have added. Then on the one hand, if the initial prospects of different enterprises is best characterized as a luck of the draw determined by the legacy of state control, then a market portfolio supplement would be appropriate. On the other hand, if the initial valuations of different enterprises are predominantly the result of the initiative and effort of their respective employees, then the conventional policy of awarding them a percentage of their enterprise would be appropriate.

To analyze the preferences of the general citizenry and enterprise employees, the conventional stock-to-employees policy and a market portfolio supplement will be compared on the assumption that the enterprise shares and market portfolio have the same expected value (abstracting away the difficulty of valuation of enterprise shares relative to the market portfolio). This benchmark comparison has the virtue that the *general citizenry* is indifferent

⁶⁹The standard variant of concessionary pricing of shares for enterprise employees, which is equivalent to a bundled combination of free shares and fully priced shares, would be less desirable to employees than the unbundled free shares alone, which can be compared to an equal-valued market portfolio. In other words, this comparison of the equivalent unbundled free shares and the market portfolio award which costs society the same amount would understate the desirability to employees of the market portfolio award relative to a concessionary pricing scheme. Note that the following discussion will compare the two policies from a financial investment perspective, and abstract away issues of *incentives* which might support the conventional shares-to-employees policy (if you own part of the company, you have a greater interest in its profitability), and *corporate governance* which might support the market portfolio policy (employees as voting shareholders or even as non-voting shareholders with a major stake could entrench inefficient labor policies).

if the risk profile of the shares not awarded preferentially to enterprise employees is the same for the two policies. This assumption would hold in the limit if a single enterprise is either negligible in value relative to, or perfectly correlated to, the remaining set of state enterprises being privatized.

Enterprise employees' preferences between the conventional shares-to-employees policy and the market portfolio policy are of particular interest, and are the focus of the rest of this discussion. The over-all value to an employee of the shares-to-employees policy is:

$$V_{SEP} = V_E + V_W, \text{ where}$$

V_{SEP} = value of shares-to-employees policy;

V_E = value of enterprise stock, and

V_W = present value of the wage stream at time $t_{h'}$ (relative to arranging alternative employment).

In this context, we assume that the employee has a planning horizon $t_{h'}$, in the sense that V_E , V_W and therefore V_{SEP} are stochastic variables representing the respective values at time $t_{h'}$ in the future. Beliefs about the distributions are assumed to be common to all employees and market participants.

Likewise, the over-all value to an employee of the market portfolio policy is:

$$V_{MPP} = V_{MP} + V_W, \text{ where:}$$

V_{MPP} = value of market portfolio policy,

V_{MP} = value of market portfolio, and

V_W = value of wage stream as before.

The objective is to identify circumstances under which the conventional shares-to-employees policy is strictly Pareto inferior to the market portfolio policy. We shall restrict ourself to the case where the employee is only

sensitive to the over-all value of the equity endowment and wage stream, and is risk averse in the sense that a choice with a smaller standard deviation (or, in this case equivalently, variance) is preferred given equal expected values.

The objective is then to identify circumstances when the market portfolio policy is preferred:

$$(\mu_{V_{MPP}}, \sigma_{V_{MPP}}^2) \succ (\mu_{V_{SEP}}, \sigma_{V_{SEP}}^2), \text{ where:}$$

$$\begin{aligned} \mu_{V_{MPP}} &= \mu_{V_{MP}} + \mu_{V_W}, \\ \mu_{V_{SEP}} &= \mu_{V_E} + \mu_{V_W}, \\ \sigma_{V_{MPP}}^2 &= \sigma_{V_{MP}}^2 + \sigma_{V_W}^2 + 2\rho_{V_{MP}V_W} \sigma_{V_{MP}} \sigma_{V_W}, \\ \sigma_{V_{SEP}}^2 &= \sigma_{V_E}^2 + \sigma_{V_W}^2 + 2\rho_{V_EV_W} \sigma_{V_E} \sigma_{V_W}. \end{aligned}$$

By construction, the expected value of the market portfolio is equal to that of the benchmark portfolio, so that $\mu_{V_{MP}} = \mu_{V_E}$, (which can be different for employees of different enterprises), and $\mu_{V_{MPP}} = \mu_{V_{SEP}}$. Therefore, assuming that employees are risk averse, the market portfolio policy will be preferred if $\sigma_{V_{MPP}}^2 < \sigma_{V_{SEP}}^2$, or:

$$\sigma_{V_{MP}}^2 + 2\rho_{V_{MP}V_W} \sigma_{V_{MP}} \sigma_{V_W} < \sigma_{V_E}^2 + 2\rho_{V_EV_W} \sigma_{V_E} \sigma_{V_W}.$$

Under the conditions of the capital asset pricing model, i.e. risk averse utility maximizers, availability of a risk-free asset and short selling, we know that if the market portfolio represents the entire investment market, it is efficient. In that case, $\sigma_{V_{MP}}^2 < \sigma_{V_E}^2$ for any enterprise not perfectly correlated to the market. Under those assumptions, a sufficient but not necessary condition for the market portfolio policy to be preferred is then:

$$\rho_{V_{MP}V_W} < \left(\frac{\sigma_{V_E}}{\sigma_{V_{MP}}} \right) \rho_{V_EV_W}$$

Since these conditions assume that $\sigma_{V_{MP}}$ is less than σ_{V_E} , the market portfolio policy will be preferred, for example, if $\rho_{V_E V_W} > 0$ and the correlation between an employee's wage and the market portfolio ($\rho_{V_{MP} V_W}$) is less (in a signed sense) than the correlation between the employee's wage and enterprise shares ($\rho_{V_E V_W}$) (which could be particularly high if both react positively to corporate profits or favorable economic conditions). In this case, the diversification of the market portfolio makes it the policy alternative preferred by enterprise employees.

However, circumstances under which enterprise employees would prefer the conventional shares-to-employees policy can also be demonstrated, along with an intuitive explanation. Reversing the preference condition leads to:

$$\rho_{V_E V_W} < \rho_{V_{MP} V_W} \frac{\sigma_{V_{MP}}}{\sigma_{V_E}} - \left(1 - \frac{\sigma_{V_{MP}}}{\sigma_{V_E}}\right) \frac{\frac{1}{2}(\sigma_{V_{MP}} + \sigma_{V_E})}{\sigma_{V_W}}.$$

To interpret this condition for the preference of the benchmark enterprise portfolio, consider first the limiting case where $\sigma_{V_{MP}}$ approaches σ_{V_E} , so that the value of diversification becomes negligible. Then the condition will be true if $\rho_{V_E V_W} < \rho_{V_{MP} V_W}$: in other words, if the enterprise stock is less correlated (in a signed sense) and therefore a better hedge against the value of the wage stream. This might be true, for example, if there were a significant negative correlation between the value of the wage stream and the enterprise stock, such as might result from a process of layoffs and wage reductions increasing profits and stock prices.

Comparative statics show that this condition for the preference of the conventional shares-to-employees portfolio is harder to achieve: 1) as the *amount* of diversification increases (i.e., $\frac{\sigma_{V_{MP}}}{\sigma_{V_E}}$ decreases), and 2) as the average standard deviation of the market portfolio and enterprise stock increases relative to the standard deviation of the wage stream (i.e., $\frac{\frac{1}{2}(\sigma_{V_{MP}} + \sigma_{V_E})}{\sigma_{V_W}}$ increases), increasing the *effect* of the diversification. In the limit of very high diversi-

fication ($\frac{\sigma_{MP}}{\sigma_{VE}}$ approaches 0) and sufficiently high variability of stock price relative to variability in the wage stream ($\sigma_{VE} > 2\sigma_{VW}$), even a perfect anti-correlation between the enterprise stock and wage stream ($\rho_{VEVW} = -1$, so that enterprise stock is perfect insurance against variations in the value of the wage stream) is insufficient to offset the advantages of diversification of the market portfolio endowment policy. This risk to employees of “having all their eggs in one basket” has recently been highlighted by the collapse of Railtrack in England and Enron in the United States, with large numbers of employees facing disruption to their jobs and portfolios at the same time.

Finally, the degree of participation can be an issue. For example, during the privatization of France Telecom the participation rate in the employee share scheme was 63%, despite a flexible variety of offers with values up to triple or more the amount invested.⁷⁰ In contrast, the market portfolio endowment policy is automatic, guaranteeing 100% participation in a diversified endowment.

4.2.2 Spirit of Inclusiveness

Our discussion has referred to a “citizenry”, but there are significant choices to be made with respect to the eligibility within the portfolio endowment policy. The spirit of inclusiveness has already been alluded to, when ensuring what amounts to an omnibus escrow account set aside for citizens initially missed, including people who are homeless or otherwise marginalized.

Provision can also be arranged for identified groups in specialized situations. For example, if there are aboriginal communities in South Africa who are insufficiently integrated into the formal economy to benefit from standard accounts in the nationwide marketplace supporting the portfolio endowment

⁷⁰See DeGeorge, et al, supra, note 44.

policy, then at least part of their entitlement could be placed into special accounts for which recognized community leaders would serve as trustees.

Further, there seems every reason to include all citizens within the portfolio endowment policy, as opposed to just those meeting some arbitrary age criterion. In particular, children could prove among the most important beneficiaries, with significant impacts on poverty and crime, ultimately promoting sounder long term economic growth in the context of a healthy society. Indeed, President Putin of Russia has recently deployed some of the power of his office to highlight the unacceptability of the amount of homelessness and associated crime among children of Moscow and other regions. Appropriate provision can be made to sequester accounts until children attain the age of majority, with exceptions for basic needs including education,⁷¹ normally arranged by the child's guardian.

Perhaps the strongest justification for including *all* citizens including children in the portfolio endowment policy is the legitimacy inherent in avoiding an arbitrary distinction between two individuals born a day apart, i.e. discrimination between someone just meeting an arbitrary age criterion and someone one day younger. It would seem hard to defend a policy which endowed a childless couple with twice as much as a family comprised of a single mother raising a number of children. This same straightforward logic can be applied as well to the question of how to treat an individual born the day after the effective date for the initial eligibility rolls, highlighting an interesting and appealing opportunity.

By virtue of becoming a citizen, whether by birth or immigration, an individual can be endowed with the same portfolio instrument(s) by which citizens

⁷¹See, e.g., A. Muller, "Education, Income Inequality, and Mortality: A Multiple Regression Analysis", *BMJ* 324:23 (5 Jan 2002), finding that the lack of a high school education "is a powerful predictor of mortality variation among US states".

had been endowed earlier, adjusted for significant capital events such as spin-offs or mergers. This can be achieved by the government making allocations from an equity stake which it has retained, or by entering the market to purchase these financial instruments, say at an annual auction. Even more interestingly, the endowment of future citizens with the same citizen's portion can be a condition imposed upon state sponsored and privatized enterprises, possibly - along with an equity stake initially retained by the government - in lieu of future taxation of corporate profits. Ensuring a citizenry-wide shareholder base could be a valuable prospect for state sponsored enterprises, helping them compete successfully in the open market.

Taking a long perspective, one implication of such endowments of future citizens will be that children of the future could have more valuable endowments for two reasons. First, since the definition of the financial instrument is as a percentage of shares outstanding of component enterprises, secular growth in value of the portfolio of enterprises would mean a more valuable endowment. Of course, this would exactly match the appreciated portfolio of previously-endowed citizens who did not reallocate or consume part of their portfolio instrument, assuming zero personal capital gain (loss) tax on the endowed instrument. Second, in the future as citizens pass away, and if subsequent citizens are endowed with additional tranches of enterprises, then children of the future would be beneficiaries of additional tranches not enjoyed by citizens in the past. Taken together, this expectation of a gradual, secular increase in value of endowments for new citizens can be appreciated as a beneficial aspect of the portfolio endowment policy, consistent with the aspirations inherent in sustainable development that our children into the future will be better off.⁷²

⁷²For a discussion of endowments for future citizens in a context of rapid population growth, see 114ff on the Israeli/Palestinian situation.

This spirit of inclusiveness can be an important positive influence in very challenging situations. The Good Friday Agreement signed in Belfast by Ireland and the United Kingdom,⁷³ and the Irish constitution as amended to reflect it,⁷⁴ reaffirm the citizenship birthright of people in Northern Ireland. Inclusive entitlement to participation in a portfolio endowment policy could promote a healthy spirit of community, which would only be reinforced if cooperatively privatized firms able to capitalize on natural efficiency gains, such as combined energy companies, become part of the portfolio.⁷⁵

⁷³“We, the participants in the multi-party negotiations, believe that the agreement we have negotiated offers a truly historic opportunity for a new beginning.” Good Friday Agreement (April 10, 1998). With respect to constitutional issues, the Good Friday acknowledges the right of self-determination in a careful and balanced manner, and reaffirms the citizenship birthright as follows: “The participants ... will ... : recognise that it is for the people of the island of Ireland alone, by agreement between the two parts respectively and without external impediment, to exercise their right of self-determination on the basis of consent, freely and concurrently given, North and South, to bring about a united Ireland, if that is their wish, accepting that this right must be achieved and exercised with and subject to the agreement and consent of a majority of the people of Northern Ireland; ... recognise the birthright of all the people of Northern Ireland to identify themselves and be accepted as Irish or British or both, as they may so choose, and accordingly confirm that their right to hold both British and Irish citizenship is accepted by both Governments and would not be affected by any future change in the status of Northern Ireland[.]” This expression of the force of the right to self-determination, and its non-simplistic application to achieve a peaceful resolution to a situation imbued with competing rights and perceptions, is evocative of the Palestinian / Israeli situation discussed at p. 104ff.

⁷⁴“We, the people of Éire ... seeking to promote the common good, with due observance of Prudence, Justice and Charity, so that the dignity and freedom of the individual may be assured, true social order attained, the unity of our country restored, and concord established with other nations, Do hereby adopt, enact, and give to ourselves this Constitution... It is the entitlement and birthright of every person born in the island of Ireland, which includes its islands and seas, to be part of the Irish nation... It is the firm will of the Irish nation, in harmony and friendship, to unite all the people who share the territory of the island of Ireland, in all the diversity of their identities and traditions, recognizing that a united Ireland shall be brought about only by peaceful means with the consent of a majority of the people, democratically expressed, in both jurisdictions in the island.” (Bunreacht na hÉireann). As a somewhat rare exception to the spirit of inclusion of the portfolio endowment policy, this author believes that a distinction should be made that merely availing of entry into the Irish Registry of Foreign Births, unless by an Irish parent and then returning to Ireland, should not entitle someone to the same privileges with respect to the portfolio endowment policy as individuals born in the island of Ireland.

⁷⁵See, e.g., Kathy Donaghy, “All-Ireland Power Plan Gets Boost” (Irish Independent,

5 Corporate Governance

Corporate governance of state sponsored enterprises is extremely significant. In the first place, that is true of corporations in general,⁷⁶ and state sponsored enterprises tend to be among the largest and most important corporations of a country (including telcoms, airlines and power companies). In addition, corporate governance has special importance for state sponsored enterprises, since their stakeholders include not only employees, customers and communities, but also the *citizenry as a whole* - since the government had been the trustee and custodian of the assets or firms on its behalf. The fact that state sponsored enterprises are de novo private enterprises whose legacy stakeholders include the citizenry as a whole means that there is an ideal opportunity to establish progressive corporate governance which can serve as a valuable role model even for firms which are already private. Success in achieving effective corporate governance has been linked to successful economic transition.⁷⁷ Finally, corporate governance is particularly significant for the portfolio endowment policy - a fatal weakness according to conventional wisdom.⁷⁸ But we shall see that if we can formulate the purpose of our state sponsored enterprise with appropriate clarity, then the portfolio endowment policy is fully consistent with effective corporate governance.

April 1, 2002), discussing the doubling in April 2002 of the capacity of the electric power interconnection between the two jurisdictions, as being just one example of a vision for an all-island energy market.

⁷⁶“The governance of the corporation is now as important in the world economy as the government of countries.” James Wolfensohn, as quoted on www.worldbank.org, which emphasizes the critical link between effective corporate governance and successful development (February, 2002).

⁷⁷Saul Estrin, Mike Wright, “Corporate Governance in the Former Soviet Union: An Overview”, *Journal of Comparative Economics* 27, 398-421 (1999).

⁷⁸E.g., “[T]he principal advantage of [mass privatization policies] - the fact that they offer in principle a highly equitable way to transfer assets - means that the resulting ownership pattern is likely to be highly dispersed, and corporate governance therefore significantly weakened.” Saul Estrin, “Privatisation in Central and Eastern Europe”, Centre for Economic Reform and Transformation (March 1996).

5.1 The Purpose of a Firm

Below is the outline of a sample objective for an electric power company:

Reliable service Efficient operation Progressive coverage
Reasonable pricing Fair treatment of employees Responsible conduct toward community, environment
Timely payments to suppliers, bondholders Bottom line profit growth for shareholders

This contrasts sharply with the prescription articulated by Milton Friedman: “[In a free society], there is one and only one social responsibility of business - to use its resources and engage in activities designed to increase its profits so long as it stays within the rules of the game, which is to say, engages in open and free competition without deception or fraud.”⁷⁹

⁷⁹Milton Friedman, “The Social Responsibility of Business Is To Increase Its Profits”, New York Times Magazine (Sep. 13, 1970), quoting his book “Capitalism and Freedom”, as reprinted in T. Donaldson, P. Werhane (eds.), “Ethical Issues in Business: A Philosophical Approach” (2 ed., 1983). Note the inapplicability on its face of this prescription to firms dealing in markets with imperfect competition, true in general of transition economies, and particularly true in sectors such as electric power or water supply which used to be considered as natural monopolies. All the same, this influential opinion appears to have become the dominant paradigm in the United States and England: “[A] corporation ... should have as its objective the conduct of business activities with a view *to enhancing corporate profit and shareholder gain*”. “Principles of Corporate Governance: Analysis and Recommendations (1994), as quoted in Mark J. Roe, “The Shareholder Wealth Maximization Norm and Industrial Organization”, Harvard Law School Discussion Paper No. 339 (p.8, Nov. 339, wherein emphasis was added), which goes on to emphasize that this view does not hold sway in Germany and France. “The overriding objective of the corporation should be to optimize over time the returns to its shareholders.”, in “ICGN [International Corporate Governance Network] Statement on Global Corporate Governance Principles” (Jul 9, 1999). OECD and World Bank pronouncements are also

A very popular argument goes: “maximizing shareholder value subject to legal constraints” occupies some sort of privileged if not uniquely feasible status, because it is a well-defined, single-target optimization program, in contrast to including stakeholder or societal interests in a multi-dimensional objective function. However, relying on a superficial analogy with calculus to determine the purpose of important organizations is troubling. Besides, the premise - that Friedman’s prescription is itself well-defined - is false. As Franco Modigliani and Merton Miller pointed out in 1958, “[under uncertainty], the profit maximization criterion is no longer even well defined... The profit outcome, in short, has become a random variable and as such its maximization no longer has an operational meaning. Nor can this difficulty generally be disposed of by using the mathematical expectation of profits as the variable to be maximized. For decisions which affect the expected value will also tend to affect the dispersion and other characteristics of the distribution of outcomes.”⁸⁰

Pursuing this important issue at some length, to what point in time does the maximization refer? Closely related, precisely which shareholders’ value should be maximized? Current ones, at the expense of future ones, perhaps via minimally transparent accounting practices? If “shareholder value” corresponds to share price, and if the share price does not reflect firm-specific risk because of the ability of portfolio-holders to diversify it away, should the management of each firm be indifferent to its own firm-specific risk, in the aggregate *increasing* market risk and systemic instability? What about differ-

consistent with the shareholder wealth maximization idea of corporate purpose, despite including carefully non-constraining language relating to popular issues such as stakeholders and the environment.

⁸⁰Franco Modigliani, Merton Miller, “The Cost of Capital, Corporation Finance and the Theory of Investment”, American Economic Review (pp. 261-97, Jun 1958). While Modigliani and Miller go on to proffer an increase in market value as a litmus test for whether to implement a project, any attempt to *maximize* market value is subject to precisely the same absence of operational meaning as profit maximization, since market value is also perforce a stochastic process.

ent classes of shareholders with different interests, such as tracking shares or preferred shares?⁸¹ According to option theory, bondholders can be viewed as the owners of the assets of the firm, with shareholders owning calls, so should bondholders' value be maximized instead, or in addition, implying more conservative strategies?⁸² If not - because they don't have voting rights - does that mean non-voting common shareholders' value need not be maximized, or that the interests behind "golden shares" with preemptory control rights should be maximized without any concern for ordinary common shareholders? If it is the value for all security holders which is to be maximized, does that include owners of warrants (calls issued directly by the corporation), implying riskier strategies? If the objective is justified by recourse to a social welfare argument - maximizing the "value" of the firm - then the Modigliani-Merton insight that it is the sum of the market value of the shares and bonds which is invariant with respect to leverage⁸³ suggests that bondholders' interests should be treated on a par with shareholders. What is "value"? Should profits be maximized? According to generally accepted accounting principles, in which case the choice of depreciation schedules and the timing of realizing gains on asset sales take on real significance? Or rather the "market value", i.e. the product of shares outstanding and share price, where the price reflects a transient equilibrium between incremental supply and demand, with potentially very different quality of the underlying depth of bids or overhang of offers or sell stops?⁸⁴ And in today's complex arena,

⁸¹If management is remunerated with call options without dividend protection (the typical case), there can be a genuine conflict of interest between it and preferred shareholders relative to declaring dividends.

⁸²There is a range of actions management can take, such as redeeming or issuing additional non-inferior debt, which could affect the relative value of debt and equity.

⁸³At least under certain idealized conditions - see the analysis of hedging below.

⁸⁴In this context, even "shares outstanding" ceases to have a commonly agreed upon meaning, as some market capitalization weighted indices use free float shares. The dot com mania was in significant part a misinterpretation of the significance of the product of the share price and shares outstanding (including very large amounts of non-free float shares), which perhaps should have been called the "dot product" rather than the "market value". The essential point is that while the market price has the virtue of being observed,

is it possible to seriously advance the notion that legal constraints are definite, unambiguous and morally complete anywhere in the world, much less in transition economies? Would Friedman really enjoin a corporation from dealing with its employees more fairly than maximum profits and the law required in apartheid South Africa, or enjoin it to minimize labor costs by purchasing slaves in ante-bellum America?⁸⁵ Or perhaps there is a progressive implication of adherence in addition to a broader and more consistent set of norms represented by international law including human rights?

The opposite to “everything (increasing profits) not allowed is forbidden” may not be “everything not forbidden is required”, but rather “everything not forbidden is allowed - but it is in your genuine interest to be responsible”. Phrased another way, why shouldn’t “freedom to choose” include choosing a corporate purpose?⁸⁶ As just one example, Frances Moore Lappé and Anne Lappé talk about the case of Grameen Bank in Bangladesh, founded by Muhammad Yunus, a former professor of economics. Grameen Bank “offers small loans to the women of Bangladesh”, and “is owned by its members and run primarily to eliminate poverty, with profit as a secondary motive”.⁸⁷ What’s wrong with being free to combine shareholder return with other important issues?

Even if shareholder-value maximization is not completely well-defined, should it be the sole corporate objective because it is *better* defined than the alternative underlying structure of the entire supply and demand schedule, and its vulnerability to adverse events, is of real significance.

⁸⁵I think not. Milton Friedman’s passion for liberty and freedom is very well known.

⁸⁶Below we will discuss how the board of directors is the appropriate custodian of the corporate purpose, including adaptation as warranted. As the board is elected by the shareholders, who are also presumed to be aware of the corporate purpose before purchasing shares, it would seem that an inclusive corporate purpose hardly need violate the board’s fiduciary duty.

⁸⁷‘Hope for a Small Planet’, interview by Begabati Lennihan in ‘Earth Star’ (Feb/Mar 2002).

natives? This is unpersuasive, as it merely characterizes well-definedness as an overriding meta-objective, without justification and even inconsistently (e.g., “doing nothing” is still better defined).

If shareholder-value maximization has no unique stature, can we identify some of the relevant issues which a corporation might reasonably take into account when considering non-coinciding interests of different stakeholders? First, the degree of individuated involvement of a corporation in an issue is very significant. For example, Shell’s involvement with the problems in Ogoniland was highly individuated, in a way that a community creche funded by Armscor would not be.⁸⁸ Next, the relative magnitude of the different interests actually able to be affected must be taken into account. For example, it would be highly significant if a serious health hazard to employees could be avoided at a very small expense beyond profit maximization and legal constraints. Finally, the context of reasonable expectations is very important, including legal requirements, other norms and mores, in addition to *the corporate purpose itself*. For example, if our electric power company, part of whose purpose being “responsible conduct toward community, environment”, were to sequester carbon corresponding to the fossil fuel it burned by planting trees throughout the communities which it served, shareholders would have much less cause to complain than if environmental causes were financed by a hedge fund whose corporate purpose stated only “maximize trading profits subject solely to binding rules”. Reasonable expectations are also able to provide an analytical foundation for identifying legitimate stakeholders among the universe of parties affected by a corporation’s conduct.⁸⁹

Issues such as individuation, relative impact and reasonable expectations

⁸⁸On the other hand, Armscor providing equipment and training personnel to clear minefields in Cambodia or Afghanistan would be individuated involvement on account of their expertise, although the concept of stakeholder would be (justifiably) stretched.

⁸⁹For example, a competing corporation could suffer from free and fair competition and not be entitled to consideration as a stakeholder.

should be considered by management, whose job includes making judgment calls on behalf of the corporation. The resulting judgment will turn out anywhere along a spectrum ranging from prohibited or inappropriate - through a broad band of discretionary action - to appropriate or even mandatory.⁹⁰

The propriety of choosing a corporate purpose not solely restricted to stockholder profit seems quite clear in the case of state sponsored enterprises, whose legacy stakeholders include the citizenry as a whole. Our discussion also provides an analytical foundation for existing expressions of corporate purpose which go beyond just stockholder profit. But, if the corporate governance chosen for state sponsored enterprises is to serve as a role model, can private firms whose expression of corporate purpose is currently restricted to shareholder value progressively *adapt* those expressions without inappropriate transfers of value away from existing shareholders to other stakeholders? Here we can explore an extension of the popular, but somewhat easy, argument that the interests of shareholders and other stakeholders are able to coincide. While it is undoubtedly the case that often there exist opportunities to simultaneously advance multiple stakeholders' interests, for example reducing costs and increasing profits by recycling more and helping the environment, this does not speak to potentially non-coinciding interests or to the tragedy of the commons where valuable community resources may be destroyed in the pursuit of uncoordinated individual interests.⁹¹

One answer is to rely on pervasive and enlightened government regulations which regulate trade-offs among stakeholders and internalize all externalities

⁹⁰To justify his assertion that the purpose of *all* corporations is *solely* to increase profits within the rules, Friedman relies on an example which represents an extreme situation where the non-profit-oriented choice is *least* justified. His example company which lowers its prices solely out of public spirit to reduce inflation has absolutely no individuated responsibility, and achieves minimal effect relative to a severe impact on its profit margins, completely absent any reasonable expectation for such a unilateral strategy.

⁹¹Garrett Hardin, "The Tragedy of the Commons", Science vol 162, pp.1243-48 (1968).

- real-time as soon as they are recognized. But uncertainty, limited government resources and special interest politics make such a reliance unwise.⁹² Another approach could be to recognize that the corporate form is a human invention designed to advance human welfare, and that implicit in every grant of a corporate charter should be the *authority* of the board of directors to articulate and the management to pursue, subject to the standard oversight of shareholder voting, visions of corporate purpose which explicitly integrate stakeholder interests either independently, or as part of a broadened version of shareholder interest. Perhaps, at the point that the legislature replaces that *authority* with a *responsibility* along the lines envisioned by Berle and Means,⁹³ Milton Friedman's intellectual legacy could help prevent legislatures from abdicating too much of their own individuated responsibility to private enterprise.

5.2 How to Achieve That Purpose

The focus of responsibility for achieving the corporate purpose must be the *board of directors*. The composition of the board will be a function of the culture of the society and economy in general, and the specific corporate

⁹²See, e.g., the classic "The Modern Corporation and Private Property", A. Berle, G. Means, p. 313 (1932, 1968 rev. ed): "The rise of the modern corporation has brought a concentration of economic power which can compete on equal terms with the modern state - economic power versus political power, each strong in its own field. The state seeks in some aspects to regulate the corporation, while the corporation, steadily becoming more powerful, makes every effort to avoid such regulation. Where its own interests are concerned, it even attempts to dominate the state."

⁹³... [T]he community [has been placed] in a position to demand that the modern corporation serve not alone the owners or the control [group] but all society... Neither the claims of ownership [i.e., shareholders] nor those of control [i.e., management] can stand against the paramount interests of the community... It remains only for the claims of the community to be put forward with clarity and force... It is conceivable, - indeed it seems almost essential if the corporate system is to survive, - that the "control" of the great corporations should ... balanc[e] a variety of claims by various groups in the community... Id. at 312.

objective itself. For example, our electric power company could include on its board representatives of the employees and bondholders, in addition to environmental organizations and community representatives. However, it should be emphasized that each board member should be held responsible for seeing that the entirety of the corporate purpose is achieved.

As custodians of the corporate purpose, one of the specific responsibilities of the board would be any changes to it. Another would be the hiring, firing and compensation of top executives. Still another would be oversight of the credibility of financial statements. Considering the fundamental nature of such responsibilities, the common tactic of delegating the responsibility to subcommittees of the board may be problematic, because it dilutes board member accountability and increases the risk of capture by top management.

If board members are chosen for their reputation, stature and experience, do not financially depend solely on remuneration from the corporation, and do not benefit from the corporation beyond this remuneration (to avoid undue management influence which could jeopardize effective oversight), then they could be ideally situated to arrive at decisions to align corporate strategy and purpose.

Besides the essential oversight of the board, the corporate purpose can be advanced by appropriate remuneration, polled shareholder voting, and transitional influences by the state during the process of privatization.

5.2.1 Employee Remuneration

At the outset, it is worth revisiting the issue of awarding employees shares at privatization, discussed earlier in the context of possible unfairness (towards the rest of the citizenry), and financial inefficiency (by comparing such an

award with a diversified portfolio of equal value). Here, it is worth noting the genuine, serious risks to effective corporate governance if employees are awarded a large shareholding at the beginning. Basically, if one of the main objectives of privatization is to achieve productivity gains, which is liable to require rationalization of employment practices, then a blocking shareholding by employees is apt to thwart that objective. On the other hand, a potentially fair proposal which could facilitate productivity gains would be to award “rationalization shares” to employees who are made redundant, in an amount designed to reasonably apportion the resulting gain in market value between those employees and the shareholders. Even better would be to create a new portfolio instrument comprised of rationalization shares of all the new state-sponsored enterprises over a given interval, and assign it (presumably in equal shares) to all employees subject to the transitional rationalization. This could promote management-labor cooperation and reduce resistance in quickly encouraging privatized enterprises onto a path of higher productivity.

In contrast with the serious questions about large endowments of shares to employees at the outset of privatization, *on-going* compensation shares or profit-sharing denominated in currency can make a lot of sense. For example, the annual compensation of a chief executive officer could include a multiple of the national average wage plus a small percentage of outstanding shares.⁹⁴ Denominating equity compensation as a percentage of outstanding shares avoids the conflicts of interest concerning dividends, stock buy-backs and other equity events which plague option grants. The proportion of remuneration in stock would increase with seniority, and the compensation for a given year would include an annual stock grant extending into the future for a period also increasing with seniority (to correspond with the anticipated longer-term influence of decisions made by more senior employees). The chief executive officer might be paid only 20% in cash, with the balance in shares

⁹⁴See supra note 5.

spread out over seven years, while the members of the board of directors might be paid solely in shares with the maximum possible duration - a life-time annuity. Upon issue, these shares would not be restricted, except for top management while achievement of demonopolization goals is pending. In the case of a company for which corporate debt plays a significant role, such as an electric utility, senior personnel could also be remunerated by issuing them bonds with seniority equal to representative outstanding debt and in an amount equal to a small, fixed percentage of it. The basic idea is to align the interests of executive management with the owners of the market value of the firm by remunerating them in large part with the instruments making up that market value.

The actual size of remuneration of the most senior executives would be negotiated directly with the board, taking into account competitive realities and with special emphasis on the prospect of the executive furthering the corporate purpose. For example, the director of personnel may be answerable to the board for employment productivity (effective hiring and retention practices, with competitive wages and a sound basis for differentiating between employees), an effective skills enhancement program, and - in the case of redundancies - fair notice and retraining/counseling/placement support.

Current remuneration practice in the United States is quite different. The most senior executives are awarded base salaries complemented by bonus, incentive and retirement plans. However, “[t]he most pronounced trend in executive compensation in the 1980s and 1990s has been the explosion in stock option grants, which on a Black-Scholes basis now constitute the single largest component of CEO pay.”⁹⁵ In 1992, 63% of chief executive officers of 1000 large companies were awarded options.⁹⁶ Such calls tend to have relatively uniform characteristics. 95% are at-the-money. Typically, the

⁹⁵Kevin J. Murphy, “Executive Compensation” (April 1998).

⁹⁶Technically, options written directly by the corporation are termed warrants.

term is set at 10 years, with staggered vesting starting at 3-5 years, and without any early exercise penalty (and perhaps even tacit encouragement). Dividend protection is typically not included in the terms.

There are a number of potentially serious problems with these incentives on top management to maximize the value of their stock options. Management will have a personal bias away from dividends. Unless periodic option grants are expected, there will be a temporal lumpiness in incentives not unlike a large meal making its way through an anaconda, potentially distorting the pipeline of projects, major contract negotiations or announcements, and the natural pattern of growth.⁹⁷ Management will also be biased toward issuing more non-subordinated debt, leading to a more highly geared financial structure able to increase systemic risk. Of special significance are two related issues: 1) the wedge between the cost of the option grant to the corporation and its value to the executive,⁹⁸ and 2) the potential incentive on management to *increase* the stock price volatility.

Qualitatively, these two issues can be summarized as follows. By its terms, a stock option grant prohibits hedging, which is the foundation of the Black-Scholes valuation formula. Therefore, a risk averse executive will value the option below the Black-Scholes cost to the corporation. Nevertheless, using Black-Scholes as a first approximation: the value of very distant calls should be approximately equal to the value of the stock itself;⁹⁹ the value of very close calls should be approximately equal to intrinsic value; but there is an important, wide, intermediate interval where the value of the call is quite

⁹⁷This is analogous to the putative four-year economic cycle in the United States.

⁹⁸See Brian J. Hall, Kevin J. Murphy, "Stock Options for Undiversified Executives", NBER Working Paper 8052 (Nov 2000) for an excellent discussion of how risk aversion and non-diversification on the part of an executive reduce her value of the option below the company's Black-Scholes cost.

⁹⁹Fischer Black, Myron Scholes, "The Pricing of Options and Corporate Liabilities", Journal of Political Economy (May-June 1973, pp. 637-59).

sensitive to prospective implied volatility. In this interval, the two-argument (i.e., expected return, volatility) objective function of the executive and that of the shareholders will have the same sense only for expected return, but will be diametrically opposed concerning the volatility. If this leads management to increase volatility,¹⁰⁰ and considering the pervasiveness of stock options in large American corporations, dangerous systemic instability could result.

To demonstrate the potential advantage of executive remuneration with non-restricted shares, rather than options, we can compare the indifference curves of shareholders with those of management paid in options. Because hedging of remuneration options is not allowed, we will not rely on the Black-Scholes method, but rather focus directly on utility. We will assume a single time horizon applicable to both the executive and shareholder.¹⁰¹ We will assume an at-the-money call, so that the executive's payoff will be equal to any positive gain in the share price. We will consider the utility effect on both the executive and shareholder to be compartmentalized, with the Von-Neumann Morgenstern component equal to g (the logarithm of the gain) or, when appropriate, minus l (the logarithm of the loss). Gain and loss are relative to the mode, and are measured in just-unnoticeable-differences at the mode, with a range of $[1, \infty)$, so that g and l have a range of $[0, \infty)$. The executive and shareholder are considered to be undiversified; i.e., the executive does not write index calls even if allowed, and the shareholder is sensitive to the entire share volatility (both firm-specific and market risk).

Under these assumptions, g and l range from 0 to ∞ , and we are faced with

¹⁰⁰If big increases in volatility are more feasible for management than big increases in expected return, which seems plausible, the significance of this issue is even greater.

¹⁰¹This abstracts away the distinction between option vesting and expiration, the different investment horizons of different shareholders, and the focus on stable distributions in stochastic processes. The proposed remuneration in shares has an advantage here, being less lumpy and explicitly identifying the interest of the executive with those of shareholders over the anticipated period of influence of the executive's decisions.

the question as to their probability distribution function. Earlier, in modelling the logarithm of share prices (ranging from $-\infty$ to ∞), we used the Gaussian distribution. According to E.T. Jaynes, the deepest reason for using the Gaussian distribution is that it is the maximum entropy (“maxent”) distribution, subject to constraints on the mean and variance.¹⁰² The corresponding maxent distribution subject only to constraints on the lower and upper bound is the uniform distribution. It is the third type, the exponential distribution $f(g) \sim \frac{1}{g} \exp(\frac{-g}{g})$, which is the maxent distribution subject to constraints on a single bound (e.g., 0) and the expectation, that we will make use of in this analysis.

The basic idea underlying maxent is that, given a macro-state with sufficient actual or hypothetical observations (e.g., a mean and variance, a mean and a bound, or two bounds), the observer should use the distribution function consistent with those observations (i.e., constraints) that has the largest number of possible distinct micro-states. Normally, the issue of what are distinct micro-states is handled by transforming the probability measure, if necessary. In contrast, rather than effectively transforming the coordinate system, we will (normally) consider transformations of the variable under consideration,¹⁰³ and call a variable “natural” with respect to a given coordinate system if its observed distribution closely approximates the maxent distribution corresponding to the relevant constraints. Then the maximum entropy assertion is: given a *different* set of constraints on that natural variable, the appropriate distribution function to use is the maxent distribution subject to those different constraints. And the maximum entropy hypothesis

¹⁰²E.T. Jaynes, “Probability Theory: The Logic of Science” (manuscript, 1995). This section relies in part on his manuscript, although it reformulates his maximum entropy principle as a maximum entropy assertion, and introduces a distinct maximum entropy hypothesis.

¹⁰³While transformations represented by mathematical functions could be dealt with by either approach, it is not immediately apparent how “real” transformations such as time derivatives would be dealt with by choosing a different probability measure.

is: for variables and coordinates which turn up in real applications, a combination of simple variable transformations (e.g., identity, logarithm, time derivative) will result in a natural variable for which the maxent distribution can be used.

In the case of our call option, the gain (ranging from 1 to ∞ just-unnoticeable-differences) is first subject to a logarithmic transformation,¹⁰⁴ so that our postulated natural variable g is constrained by the lower bound of 0 and its expectation \hat{g} , for which the corresponding maxent distribution is the exponential distribution.

The question whether the same type of distribution function is appropriate for modelling the situation for the shareholder, who owns the stock which can go either up or down, is particularly interesting. First note that the question of modelling the share price here (with a presumed extant corporation trading at a known share price, for which an at-the-money call can be issued, and with a more or less definite modal realization) is different from our earlier pre-privatization model (where a current share price did not exist, so that we were forced to rely on an expectation and variance of the logarithm of the future price to characterize a Gaussian distribution). We are now proposing to model the logarithms of gains and losses of the stock price relative to the mode as separate exponential distributions, so that the distribution function of the change δ is an asymmetric exponential distribution:

$$f(\delta) = \frac{pl}{\hat{l}} \exp\left(\frac{\delta}{\hat{l}}\right), \text{ for } \delta < 0, \text{ and}$$

$$f(\delta) = \frac{pg}{\hat{g}} \exp\left(\frac{-\delta}{\hat{g}}\right), \text{ for } \delta > 0, \text{ where}$$

$$\delta = -l = -\log(\text{loss}) \quad \text{for loss} \geq 1,$$

$$\delta = g = \log(\text{gain}) \quad \text{for gain} \geq 1; \text{ and}$$

¹⁰⁴See Harold Jeffreys, "The Theory of Probability, 3 Ed." (1961), p 117ff. for a justification of a logarithmic prior.

$$p_l = \frac{\hat{l}}{\hat{l} + \hat{g}}, p_g = \frac{\hat{g}}{\hat{l} + \hat{g}} \rightarrow \frac{p_l}{\hat{l}} = \frac{p_g}{\hat{g}} \text{ (continuity at } \delta = 0\text{);}$$

$$\mu = p_g \hat{g} - p_l \hat{l}, \quad \sigma^2 = p_l \hat{l}^2 + p_g \hat{g}^2 + p_l p_g (\hat{l} + \hat{g})^2.$$

Figure 16: Asymmetric Exponential Distribution

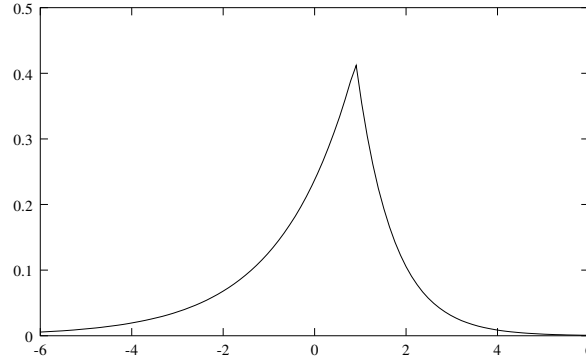


Figure 16 shows an asymmetric exponential distribution for which

$$\hat{l} > \hat{g} \rightarrow p_l > p_g \rightarrow \mu < \text{mode}, \quad \frac{\mu}{\hat{l}} = \left(\frac{\hat{g}}{\hat{l}}\right)^2 - 1.$$

There is interesting empirical support for an exponential distribution. Conventional analyses of historical distributions of stock prices suffer from their assumption of stationarity over the sample period, and from the inability to measure subjective beliefs. However, according to classic option pricing theory, implicit in the market prices of the puts and calls at different strike prices is the risk-neutral distribution function of the underlying price at expiration. Jackwerth and Rubinstein recovered just such distributions, using a comprehensive set of options on the SP500 (the most liquid broad market index of the world's largest stock market) over nearly seven years which include the stock market crash of October 1987.¹⁰⁵ Of most interest to us are

¹⁰⁵Jens Carsten Jackwerth, Mark Rubinstein, 'Recovering Probability Distributions from Option Prices', Journal of Finance (Dec 1996).

their results for the cumulative distribution function of logarithmic returns, reported for -6,-5, ... 0 standard deviations from the mean over four separate time periods.

Figure 17: SP500 Implied Cumulative Distribution Function

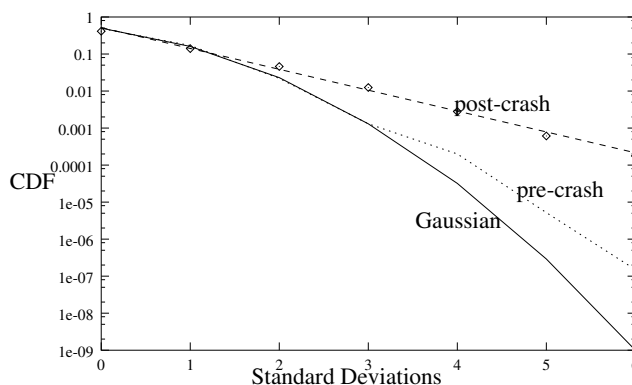
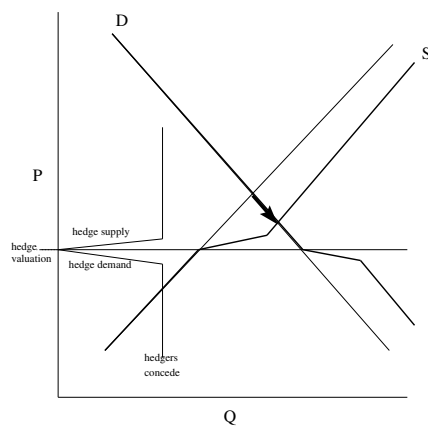


Figure 17 log-linearly graphs the results for the pre-crash period with the reference curve for a Gaussian, and the average of the three post-crash periods (all very similar) with a visually fitted straight line. The pre-crash data are indistinguishable from the Gaussian from -3 to 0 standard deviations, but deviate significantly upward for -4 to -6 standard deviations. The behavior at the tail appears linear and might be associated with an exponential distribution there, although a clue to another interpretation is Jackwerth’s and Rubinstein’s observation that their original objective function generated volatility smiles “approaching the bid implied volatilities for options that are at-the-money, and ask implied volatilities for in- and out-of-the-money options” (p. 1623). This is consistent with the market for out-of-the-money options being driven by speculators going long, who are accommodated by professionals who lay off their vega risk by selling at-the-money straddles, given an appropriate interpretation of hedge valuation formulae, as follows.

Classic hedging formulae such as Black-Scholes and the original, paradigmatic, Modigliani - Merton equity/debt analysis are essentially theoretical predictions of hedge trades which will only tend to adjust the market equilibrium which would have otherwise obtained *toward* the theoretical price, while *increasing* the trade volume (see Figure 18). On this graph, more hedgers make trades as the price deviates from its theoretical reference; however, if the price continues too far “out of line”, the hedgers eventually concede, consistent with updating their belief as to the validity of the theoretical hedge formula and the profitability of their corresponding hedging strategy (not to mention execution problems, capital or liquidity constraints).¹⁰⁶ The nationwide marketplace implementing the portfolio endowment policy actually constitutes the exception, because it can risklessly and exactly execute explicit and implicit arbitrage trades between the portfolio instrument and its constituent stocks in its periodic batch cycles.¹⁰⁷

Figure 18: Hedging Equilibrium Adjustment



Turning to the post-crash period, the log-linear fit to the cumulative distri-

¹⁰⁶The breakdown in the normal program-trading mediated hedge relationship between stock index futures and stock prices during the crash of 1987 is a prominent example.

¹⁰⁷Supra, note 8.

bution function holds extremely well throughout the entire reported range. Log-linearity over the range $\{-\infty, \mu\}$ means:

$$\log(F(x)) = ax + b \rightarrow F(x) = e^b \exp(ax) \rightarrow f(x) = F'(x) = ae^b \exp(ax).$$

Normalizing yields the (downside) exponential distribution: $f(l) = \frac{\rho_l}{l} \exp(-\frac{l}{l})$. Even the modest concavity is explicable, due to the “maximum smoothness” objective function which was used, obscuring the most pronounced feature of the asymmetric exponential distribution - its sharp, non-differentiable peak.¹⁰⁸

In effect, this reasoning suggests¹⁰⁹ that the *structure of the market* changed after the crash of October 1987, so that the natural variable shifted from the logarithm of the stock prices, with observable constraints being expectation and variance, to two separate natural variables, the logarithms of gains and of losses. This corresponds to two related changes: 1) symmetry breaking¹¹⁰ (the Gaussian distribution is inherently symmetric, while the symmetric Laplace distribution is a degenerate case of the asymmetric exponential distribution), so that the market structure reflected a new belief that downside dynamics became qualitatively different from upside dynamics; and 2) using the “time derivative”, i.e. gains or losses, rather than the price itself, reflecting a more sensitive, less stable market (analogous to currency markets shifting from a trading range with a mean-reverting price, to a trending channel with a mean-reverting time derivative).¹¹¹

¹⁰⁸Another reason for deviation from log-linearity could be a specification inconsistency, in that our model postulates that the natural variable is the logarithm of the change, while Jackwerth and Rubinstein effectively use the logarithm of the price. In that case, the functional form of the probability distribution function of $\log(x)$ will not correspond exactly to the form for $\log(x - x_0) = \log(x[1 - \frac{x_0}{x}]) = \log(x) - \log(1 - \frac{x_0}{x})$.

¹⁰⁹We have not adduced any statistical data demonstrating that the upside realizations are also exponentially distributed. In addition, the recovered distributions relate to a specific index, the SP500, for a specific economy, the United States, in a theoretical context of risk-neutrality.

¹¹⁰A concept more typically found in theoretical physics.

¹¹¹Structural shifts in the market such as the one posited above may represent opportu-

Given an asymmetric exponential distribution for the VNM utilities of gains and losses, how would the expected uncertainty utility W of a shareholder compare to that of an executive compensated by calls? The uncertainty utility W of a gain relative to the mode is:

$$W_g = \int_0^\infty f(x) \{x - v \log(\frac{1}{f(x)}) |x - x_r|\} dx, \text{ where}$$

$$f(x) = \frac{1}{\hat{g}} \exp(\frac{-x}{\hat{g}}), \text{ and}$$

$$x_r = 0.$$

It can then be shown that, for v in perbits:

$$W_g = [1 - \frac{v_g}{\ln 2} (2 + \ln \hat{g})] \hat{g},$$

$$W_l = [1 + \frac{v_l}{\ln 2} (2 + \ln \hat{l})] \hat{l};$$

and, given E as the logarithm of the mode minus the current price:

$$W_l^{truncated} = \{1 - (1 + E/\hat{l}) \exp(-E/\hat{l})$$

$$+ \frac{v_l}{\ln 2} [(2 + \ln \hat{l}) - (1 + (1 + E/\hat{l})^2 + (1 + E/\hat{l}) \ln \hat{l}) \exp(-E/\hat{l})]\} \hat{l}.$$

In this case, uncertainty utilities of the executive and shareholder are:

$$W_{exec} = P_g^* W_g - P_l^* W_l^{truncated},$$

nities for useful government policy objectives, in a way that targets for particular prices would not. In other words, fundamental government policies along with stabilization strategies might be capable of preventing unfavorable or causing favorable regime changes, in contrast with a presumptively misguided attempt to fix prices through market interventions. In particular, a conjecture motivated by the crash of October 1987 and subsequent market behavior is that a fear of liquidity crises can play an instrumental role in perpetuating undesirable structural regime changes. Conversely, establishing a nationwide marketplace of citizen owners of diversified portfolios with psychological reference points of zero has the potential of enhancing liquidity and providing a powerful stabilizing influence. In such a case, capital formation and development prospects should benefit correspondingly.

$$W_{sh} = P_g^* W_g - P_l^* W_l; \text{ where}$$

$$P_g^* = P_g - vB(P_g),$$

$$P_l^* = P_l + vB(P_g).$$

There are three parameters which specify our asymmetric exponential distribution, E , \hat{g} and \hat{l} , and presumably management can affect them all (although one plausible conjecture is that \hat{l} is particularly challenging to constrain, but can be allowed to become relatively large in the hope of also increasing \hat{g}). How closely are management and shareholder incentives aligned with respect to these parameters? Consider first \hat{g} and \hat{l} , the parameters specifying the upside and downside exponential distributions, and by continuity their respective probabilities p_g and p_l .

Figure 19 portrays indifference curves and their gradient field (pointing in the preferred direction) in ' \hat{g} (vertical axis) - \hat{l} (horizontal axis)' space, for information preference parameter $v = .00$ (implying VNM utilities) and $.10$, assuming here that $E=0$ and that $v_g^{sh} = v_l^{sh} = v_g^{exec} = v_l^{exec}$. The divergence in incentives is significant for $v = .00$, and increases as v increases.

Figure 19: Diverging Share and Call Incentives in ' $\hat{g} - \hat{l}$ ' Space
shareholder $\rightarrow u=.00 < \text{—exec}$ shareholder $\rightarrow u=.10 < \text{—exec}$

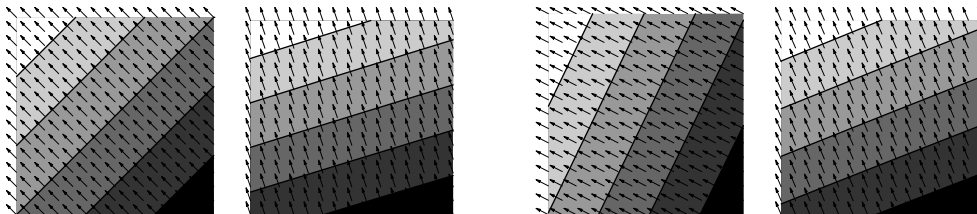
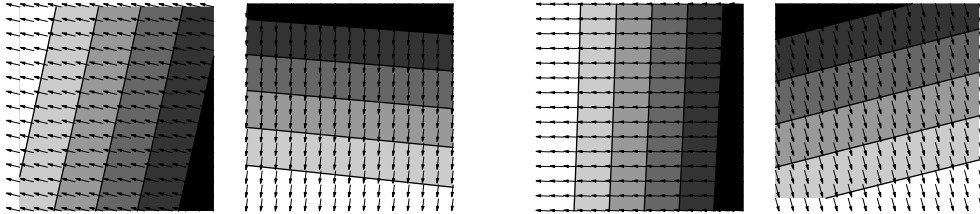


Figure 20 shows the incentives becoming essentially orthogonal for $v = .20$, meaning that as far as the shareholders are concerned, management might as well be on a “frolic” in the legal sense: pursuing their own, different interest. Even worse, for high enough v , management incentives actually become *opposed* to shareholder interests.

Figure 20: Diverging Share and Call Incentives in ‘ $\hat{g} - \hat{l}$ ’ Space
shareholder $\rightarrow u=.20 < \text{—exec}$ shareholder $\rightarrow u=.35 < \text{—exec}$



These counter-intuitive results are explicable by realizing that W_g is able to be expressed as:

$$W_g = \mu - \frac{v}{\ln 2} [2 + \ln \sigma] \sigma,$$

where the exponential distribution implies $\mu = \sigma = \hat{g}$. It is the σ component which turns $\frac{\partial W_g(\hat{g};v)}{\partial \hat{g}} = 1 - \frac{v}{\ln 2} [3 + \ln \hat{g}]$ negative for $v > \frac{\ln 2}{3 + \ln \hat{g}}$. And for $v > \frac{\ln 2}{2 + \ln \hat{g}}$, we have $W_g < 0$ which results in $\frac{\partial W_{exec}(\hat{l}, \hat{g}; v)}{\partial \hat{l}} > 0$, through the functional dependence of P_g^* .¹¹²

Turning to the indifference curves and their associated gradient in ‘ $\hat{g} - E/\hat{l}$ ’ space, it appears that the increasing divergence in interest between management remunerated with options and shareholders as v increases is considerably milder (see Figures 21 and 22).

¹¹²This pattern of increasing divergence between management and shareholder interest as v increases is an inference in a general sense opposite to what some commentators have suggested, that undesirable (VNM) risk-aversion of executives can be offset by remuneration in options.

Figure 21: Closer Share and Call Incentives in ' $\hat{g} - E/\hat{l}$ ' Space
shareholder $\rightarrow u=.00$ \leftarrow exec shareholder $\rightarrow u=.10$ \leftarrow exec

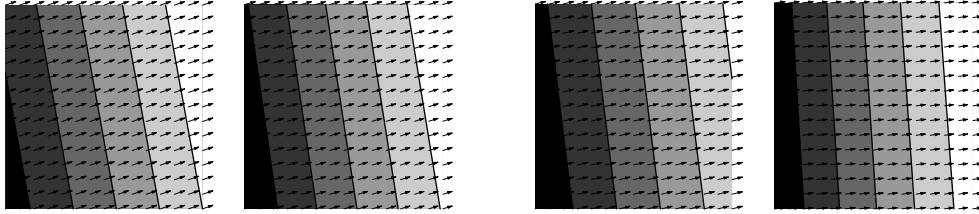
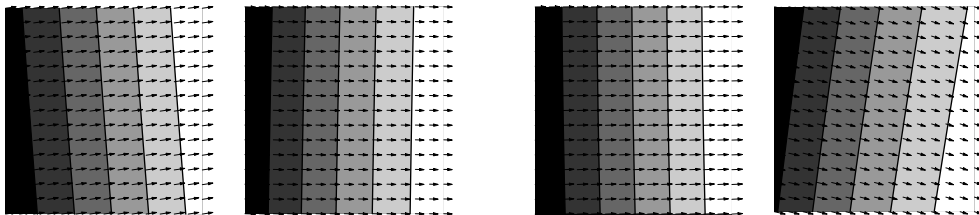


Figure 22: Closer Share and Call Incentives in ' $\hat{g} - E/\hat{l}$ ' Space
shareholder $\rightarrow u=.20$ \leftarrow exec shareholder $\rightarrow u=.35$ \leftarrow exec



The implication of these calculations taken as a whole is that there is a genuine risk that incentives for employees (including executives) remunerated in options will diverge significantly from shareholder interests, possibly even to the extent of being in opposition. Conversely, remunerating employees with shares denominated as a percentage of outstanding shares, constituting an increasing portion of total remuneration and spread out over a longer duration into the future with seniority, represents a potentially useful component of effective corporate governance. In general, the pool of shareholders will be variously diversified and have a range of preference parameters, including VNM utilities, time horizons and v , as will the pool of employees remunerated with shares, so that an exact coincidence of interests is too much to expect. Therefore, pay reviews and retention decisions explicitly consider-

ing each employee's specific performance objectives, set in the context of the overall corporate purpose, will remain important.

5.2.2 Polled Shareholder Voting

According to conventional wisdom, widely dispersed shareholding is inconsistent with effective corporate governance. Actual studies of transition economies portray a less simple picture. In Poland, where the privatization strategy has been closest to the portfolio endowment policy,¹¹³ one study found that both highly concentrated and highly dispersed ownership were associated with elevated productivity growth, interpreting the latter as due to a more liquid stock market exercising informational and disciplining roles more effectively.¹¹⁴ On the other hand, one study of the Czech transition found that increasing ownership concentration improved corporate performance, interestingly stating as a conclusion "The empirical results question the value of distributing shares of firms to a large number of individuals in an environment that gives them little chance to exercise their ownership control rights".¹¹⁵ We now turn to a method by which the portfolio endowment policy is able to provide citizen portfolio owners a genuine chance to exercise their ownership control rights.

¹¹³Although the important *differences* between the portfolio endowment policy and Poland's National Investment Fund voucher privatization should be emphasized. According to David Ellerman, voucher investment funds lack the incentive, leverage, expertise and capital for restructuring, leading to the risk of a "two-sided grab-fest by fund managers and enterprise managers". David Ellerman, 'Voucher Privatization with Investment Funds: An Institutional Analysis'.

¹¹⁴Irena Grosfeld, Thierry Tresselt, "Competition, Corporate Governance: Substitutes or Complements? Evidence from the Warsaw Stock Exchange", Centre for Economic Policy Research No. 2888 (2001).

¹¹⁵Stijn Claessens, Simeon Djankov, "Ownership Concentration and Corporate Performance in the Czech Republic", *Journal of Comparative Economics*, vol. 27, 498-513 (1999).

A classic paradox in political science studied from the perspective of economics is: why does anybody vote?¹¹⁶ If the probability of affecting the outcome is negligible, why go to the time and trouble of becoming informed and casting a vote? We will confront this issue on its own terms, not resorting to ideas such as community or values which are more persuasive in civic life than for shareholders deciding corporate issues.

Assume that shareholders can be characterized by a parameter N_c , signifying the number of voters (N_v) for which they are indifferent to voting, and where their utility is set at a reference level of zero. If $N_v < N_c$, non-voting has negative utility (e.g., due to regret over not availing of the opportunity to affect the outcome). If $N_v > N_c$, voting also has negative utility (e.g., going to the effort without having enough impact). Then given a homogeneous set of shareholders, any combination of voting strategies such that $N_v = N_c$ is a Nash equilibrium, e.g., exactly (any) N_c individuals decide to vote. For inhomogeneity, where F is a strictly increasing cumulative distribution function of the critical values in a continuous population of N shareholders, the unique Nash equilibrium is that only those for whom $N_v < N_c$ will vote, where N_v is the implicit solution to

$$1 - F(N_v) = N_v/N.$$

To implement polled shareholder voting, N_B ballots are sent at random to shareholders.¹¹⁷ The number of ballots can depend on the nature of the vote, e.g. electing board members or approving significant changes to the company

¹¹⁶See Anthony Downs, “An Economic Theory of Democracy” (1957).

¹¹⁷For example, a Monte Carlo approach which takes into account the amount of shares held by each shareholder, such as that described in supra note 5, can be used to decide how to distribute the N_B ballots. As described in that reference, a threshold ownership level defining “large” shareholders can be set, so that such large shareholders are always sent ballots. While such a categorization affects our mathematical model of polled shareholder voting, our discussion is meant to motivate a useful and practical policy rather than quantify response rates in advance.

such as the corporate purpose or equity structure. The number of responders N_v for the unique Nash equilibrium will be the implicit solution to

$$1 - F(N_v) = N_v/N_B,$$

where the response proportion N_v/N_B will increase as N_B becomes smaller. The idea is to choose N_B sufficiently low so that shareholders are motivated to participate in the corporate governance of their company, while keeping N_B high enough to be a representative sample in order to assure legitimacy.

5.2.3 Transitional Government Influence

We have already presented two powerful ways to promote corporate governance able to accomplish the purposes of the corporation, even with a very large number of shareholders: 1) executive compensation comprising a small percentage of outstanding shares over a time-frame reflecting the impact of their decisions, with the amount of compensation (and job retention or promotion) dependent on how well the executive advances the entire corporate purpose; and 2) polled shareholder voting, to motivate effective participation in important corporate decisions.

There is still another arrow in the quiver when dealing with privatized enterprises: transitional government influence. The initial condition is effectively complete government control, and the objective is generally a private enterprise able to flexibly adapt to real market forces and realize valuable efficiency gains. But it is not necessarily desirable to effect this rather dramatic change with no intermediate guidance.

The government has a responsibility to play a lead role in the initial formulation of the corporate purpose itself, considering the interest of the entire citizenry in state enterprises. And in the initial stages of adapting to free

market conditions, when the corporate purpose may need to be adjusted or broadened, the government's role remains invaluable. A number of other transitional issues could require government attention as well, such as the phasing out of any soft budget constraints and rationalization of the workforce (all the way from entry level, through managers, to executives).

A number of modalities can provide such transition influence for the government. Direct authority can be included in the corporate charter. A portion of the shares can be retained, providing an important voting block. The board and executive team can be transitioned as well, if the challenges and needed strengths of the management team will change dramatically (there can be a big difference between starting, reorganizing or overhauling a company, and patiently building a business after that is accomplished). And in the face of a trend toward limiting government oversight of privatized companies,¹¹⁸ perhaps one of the most significant ways for government to oversee a successful transition is judicious use of its moral authority and guidance, with a view to preserving its own and the newly private enterprise's credibility, in order to equitably define and effectively pursue the corporate purpose.

¹¹⁸See, e.g. Andrew Osborn "Golden Shares Lose Glitter" (The Guardian, June 5, 2002), reporting on a set of landmark judgments by the European Court of Justice with the effect that "national governments could only retain the right of veto over takeovers or key decisions if doing so was strictly in the national strategic interest". However, a strong argument could be made that transitional government influence over a strictly limited time period *for the purpose of successful privatization* would either fall outside the court's reasoning or else be strictly in the national strategic interest considering the importance of successful economic restructuring.

6 An Application in the Mideast

Recall that the portfolio endowment policy endows each citizen with a financial instrument representing a portfolio of state-sponsored enterprises, supported by a specialized nationwide marketplace. Let us consider a topical issue of extraordinary significance to international peace and security - the Palestinian / Israeli situation.¹¹⁹ There is perhaps no region where an innovative, fair-minded application of the portfolio endowment policy could be more helpful, by offering a high-consensus alternative to a current trajectory which both peoples consider unacceptable.¹²⁰

Assuming that: 1) humanity has outgrown the belief that “might makes right”,¹²¹ 2) religious fundamentalism will not resolve the situation,¹²² and 3) neither people can ultimately be coerced by agenda manipulation,¹²³

¹¹⁹The sense of history and the potential for unresolved conflict between the two peoples to ignite uncontrolled violence was poignantly evoked on June 5, 2002, when 16 people, including 13 soldiers, were killed in Megiddo - also known as Armageddon.

¹²⁰Following Ludwig Wittgenstein, “Culture and Value” (1980, comprising dated quotes from throughout his life), “This [proposal] is written for those who are in sympathy with the spirit in which it is written” (1930). “Getting hold of the difficulty *deep down* is what is hard. Because if it is grasped near the surface it simply remains the difficulty it was. It has to be pulled out by the roots, and that involves our beginning to think about things in a new way... Once the new way of thinking has been established, the old problems vanish, indeed they become hard to recapture” (1946). And it is certainly the case that the Middle East situation is deep-rooted and complex, as the Chinese representative on the Security Council emphasized in both the discussions of June 6 and November 22, 1967.

¹²¹E.g., from this perspective Saddam Hussein’s attempt at territorial expansion by occupying Kuwait was atavistic conduct consistent with the Medieval law of conquest rather than modern international law.

¹²²E.g., that Allah requires all non-Muslims in the Middle East to submit to Sharia rule, or that Yahweh has deeded all the Holy Land to the Israelites.

¹²³Some of the limits upon those who would control outcomes by attempting to strategically set agendas have been described by Peter Ordeshook and Thomas Schwartz: “[P]ower may lie more with those who are best able to ascertain the implications of particular agendas than with those who control procedures and agenda form.” “[Agenda] setters are also subject to those who would upset their calculations by the introduction of new issues and dimensions.” “[E]ven those unschooled in agenda manipulation soon learn the importance

then the way forward is by the principled identification and balancing of legitimate rights and interests.

The fundamental collective rights at stake are the respective rights to self-determination of the two peoples.¹²⁴ According to Louis Henkin, “much of international law is the same as self-determination or shares the same values”, “much of international law is expressive of the larger principle of self-determination”, and self-determination can be seen as “principle norm of international law today”.¹²⁵ Indeed, the existence of peoples as genuine entities extends further into antiquity than the development of international law - much less the birth of the modern nation-state system which is often dated from the Peace of Westphalia of 1648. Indeed, a compelling case can be made that the right of peoples to self-determination is more deeply rooted than international law itself.

of agenda control and seek the means to thwart that control.” Their ultimate “suspicion” was that any agenda power has more to do with choosing the alternatives to consider than the procedure for selecting one. Peter C. Ordeshook, Thomas Schwartz, “Agendas and the Control of Political Outcomes”, *American Political Science Review* 81:1 (March 1987), pp. 179-200. Ordeshook and Schwartz researched the relatively well-defined arena of U.S. Congressional legislation, with established rules and procedures, and still reached the conclusion that the state of research in political science was “only beginning to identify and understand [participants’ available] strategies.” This reservation applies much more forcefully in the Israeli/Palestinian situation which potentially involves every arena of interaction along with all the different tactics and strategies developed by mankind. Therefore, if neither people should be considered “some kind of fools who can be tricked” (see Jabotinsky, *infra* note 144), perhaps it is worthwhile to consider a focal alternative which attempts to maximize legitimacy in order to reverse the polarity of the relationship between the two peoples. In the context of uncertainty, bounded rationality, unforeseeable consequences and very high stakes, Lao Tsu’s wisdom of 2500 years ago is still relevant: “Why is it so hard to rule? Because people are so clever. Rulers who try to use cleverness cheat the country. Those who rule without cleverness are a blessing to the land.”

¹²⁴There are, of course, vital individual rights also at stake, not least the right to life itself. In this situation, legitimately promoting and safeguarding the collective rights may be the best, or even the only, way to protect those individual rights.

¹²⁵Interview of November 17, 1995 with the author.

Self-determination figures prominently in the foundational document of modern international law: the Charter of the United Nations (emphases added).¹²⁶

¹²⁶WE THE PEOPLES OF THE UNITED NATIONS DETERMINED

to save succeeding generations from the scourge of war, which twice in our lifetime has brought untold sorrow to mankind, and

to reaffirm faith in fundamental human rights, in the dignity and worth of the human person, in the equal rights of men and women and of nations large and small, and

to establish conditions under which justice and respect for the obligations from treaties and other source of international law can be maintained, and

to promote social progress and better standards of life in larger freedom,

AND FOR THESE ENDS

to practice tolerance and live together in peace with one another as good neighbours, and to unite our strength to maintain international peace and security, and

to ensure, by the acceptance of principles and the institution of methods, that armed force shall not be used, save in the common interest, and

to employ international machinery for the promotion of the economic and social advancement of all peoples

HAVE RESOLVED TO COMBINE OUR EFFORTS TO ACCOMPLISH THESE AIMS...

Article 1. The Purposes of the United Nations are:

1. To maintain international peace and security, and to that end: to take effective collective measures for the prevention and removal of threats to the peace, and for the suppression of acts of aggression or other breaches of the peace, and to bring about by peaceful means, and in conformity with the principles of justice and international law, adjustment or settlement of international disputes or situations which might lead to a breach of the peace;

2. To develop friendly relations among nations based on respect for the principle of *equal rights and self-determination of peoples*, and to take other appropriate measures to strengthen universal peace;

3. To achieve international co-operation in solving international problems of an economic, social, cultural, or humanitarian character, and in promoting and encouraging respect for human rights and for fundamental freedoms for all without distinction as to race, sex, language, or religion; and

4. To be a centre for harmonizing the actions of nations in the attainment of these common ends...

Article 55. With a view to the creation of conditions of stability and well-being which are necessary for peaceful and friendly relations among nations based on respect for the principle of *equal rights and self-determination of peoples*, the United Nations shall promote:

a. higher standards of living, full employment, and conditions of economic and social progress and development;

b. solutions of international economic, social, health, and related problems; and international cultural and educational cooperation; and

c. universal respect for, and observance of, human rights and fundamental freedoms for all without distinction as to race, sex, language, or religion.

Article 56. All Members pledge themselves to take joint and separate action in co-operation with the Organization for the achievement of the purposes set forth in Article 55.

The classic description of the scope of the right of peoples to self-determination is found in United Nations General Assembly Resolution 1514 of 1960:

“All peoples have the right to self-determination; by virtue of that right they freely determine their political status and freely pursue their economic, social and cultural development.”

Furthermore, since: 1) self-determination is “essentially the right of peoples to determine their future”,¹²⁷ 2) sustainable development is one possible objective of peoples in determining their future, and 3) sustainable development has in fact been expressly adopted as an objective by the peoples of the world in a series of solemn convocations, then the pursuit of sustainable development is a duty of states under international law.¹²⁸ In the context of the Israeli/Palestinian situation, sustainable development in the first instance comprises freedom, security and peace, in addition to the familiar economic and environmental aspects. These aspects are deeply connected to each other, and the realization of sustainable development for each people is deeply connected to its realization for the other.

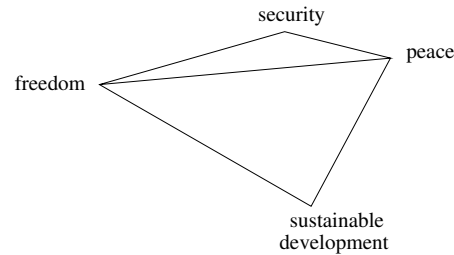
Figure 23 emphasizes those foundational components of sustainable development, the more conventional aspects of economic development and environmental stewardship being understood. The two peoples have demonstrated that as highly as they value peace, they value security more highly, and freedom more highly still. Peace without security is viewed with considerable justification as an ephemeral illusion. But both peoples seem to consider security without freedom even less acceptable.¹²⁹ Indeed, freedom is one of

¹²⁷Interview with Louis Henkin of November 17, 1995.

¹²⁸William J. Hartnett, “The Pursuit of Sustainable Development as a Duty of States under International Law” (MIT Dissertation in Interdisciplinary Studies, 1996), which goes into some depth on the legal foundation and scope of self-determination.

¹²⁹According to Benjamin Franklin: “Freedom is not a gift bestowed upon us by other

Figure 23: Freedom, Security, Peace and Sustainable Development



the defining ideals for the United States as well, according to a poignantly dated quotation by Abraham Lincoln.¹³⁰

There is already a consensus, which continues to strengthen, that the aspirations for self-determination on the part of the two peoples are indeed legitimate, including the ultimate political expression of statehood where territorial integrity is fully respected.¹³¹ The perception of legitimacy can

men, but a right that belongs to us by the laws of God and nature.” And, “Those who are willing to trade freedom for security deserve neither freedom nor security.”

¹³⁰“Our reliance is in the love of liberty which God has planted in us. Our defense is in the spirit which prized liberty as the heritage of all men, in all lands everywhere. Destroy this spirit and you have planted the seed of despotism at your own doors. Familiarize yourselves with the chains of bondage and you prepare your own limbs to wear them. Accustomed to trample on the rights of others, you have lost the genius of your own independence and become the fit subjects of the first cunning tyrant who rises among you.” Abraham Lincoln (Campaign speech of September 11, 1858).

American football fans will also recall Paul McCartney’s Superbowl performance of his specially written “Freedom”, with lyrics: “This is my right, to live a free life, to live in freedom... We will fight for the right to live in freedom.”

¹³¹United Nations Security Council Resolution 1397 (12 March 2002)

The Security Council, Recalling all its previous relevant resolutions, in particular resolutions 242 (1967) and 338 (1973),
Affirming a vision of a region where two States, Israel and Palestine, live side by side with secure and recognized borders...

Consider also the relevant and timely Arab League proposal, unanimously adopted with Palestinian support on March 27, 2002, envisioning normal relations with Israel.

be reinforced among the two peoples themselves on the one hand by viewing Israel's birth - admittedly displacing Palestinian families and communities - as the claim on the part of the Jewish people that its "right of return" to its ancestral land was not extinguished even after two thousand years, and on the other hand by considering the reaction to be expected if a proud and resilient people is subjected to indignities and curtailments of basic liberties for generations on end.^{132,133}

But what if those aspirations, however legitimate they may be, are seen as mutually inconsistent? A logical precondition for a meaningful and stable regime of rights would seem to be that the legitimate exercise of a right requires the respect of that same right for others.¹³⁴ In other words, the legitimate exercise by one people of the right to self-determination requires the

¹³²It may seem superfluous to articulate the case for the right to self-determination of the Jewish people in their State of Israel, considering its military might - including weapons of mass destruction - but recall that our discussion is not premised on the belief that "might makes right". According to the Declaration of the Establishment of the State of Israel of May 14, 1948, this right was based on the "irrevocable" UN General Assembly Resolution 181, and on their "natural and historic right", and that right was "the natural right of the Jewish people to be masters of their own fate, like all other nations, in their own sovereign State." With respect to the Palestinian people, in the words of Dr. Haidar Abdul Shafi, Head of the Palestinian Delegation to the Madrid Peace Conference, in his opening speech on October 31, 1991: "Self-determination, ladies and gentlemen, can neither be granted nor withheld at the whim of the political self-interest of others, for it is enshrined in all international charters and humanitarian law. We claim this right; we firmly assert it here before you and in the eyes of the rest of the world, for it is a sacred and inviolable right which we shall relentlessly pursue and exercise with dedication and self-confidence and pride."

¹³³The right of peoples to self-determination in modern international law developed alongside decolonization, resulting in tension with the powerful principle of the territorial integrity of states, itself cherished by the governments of nation-states both to safeguard their internal authority and to promote some stability of international affairs. But in the Palestinian/Israeli situation, respect for self-determination and territorial integrity could rather be mutually reinforcing, even contingent upon each other, and *together* be vital prerequisites of international stability.

¹³⁴This may be viewed as a necessary, if not sufficient, condition. "[E]veryone's rights are importantly dependent on respect for the rights of others, on the rule of law, and on a healthy society." Mary Ann Glendon, "A World Made New", p. 239 (2001).

respect of that same right of other peoples in the community of nations. This respect must at a minimum include the negative condition of non-deprivation of the other's right. However, many people believe that a healthy and robust regime of rights requires even more: a corresponding *responsibility* to positively promote those rights, either according to one's individuated connection to a situation or even one's ability.¹³⁵

Unfortunately, the history of the right to self-determination includes much more violence than would have been the case had the community of nations not relegated it so much to the category of "self-help" rights. Where it is necessary to balance the rights of different peoples, the community of nations can, ideally, serve as a profoundly valuable referent in identifying and promoting legitimate outcomes. For the Palestinian/Israeli situation, the lodestone pointing toward legitimacy in a complex field of superimposed rights in the historic Middle East is UN Security Council Resolution 242.¹³⁶

¹³⁵See generally "Rights Talk: An Impoverishment of Political Discourse", Mary Ann Glendon (1991), e.g. pp 78-89. Glendon also says (mapping her thoughts on individual rights onto collective rights): "If deliberation is not to take the form of a mere clash of unyielding interests, and to end in seemingly irreconcilable conflicts... equality ... and freedom depend ... on: the belief that each and every [people] possesses great and inherent value, the willingness to respect the rights of others even at the cost of some disadvantages to one's self, the ability to defer some immediate benefits for the sake of long-range goals, and a regard for reason-giving and civility in public discourse." (p. 179)

¹³⁶United Nations Security Council Resolution 242 (22 November 1967)

The Security Council,

Expressing its continuing concern with the grave situation in the Middle East,
Emphasizing the inadmissibility of the acquisition of territory by war and the need to work for a just and lasting peace in which every State in the area can live in security,
Emphasizing further that all Member States in their acceptance of the Charter of the United Nations have undertaken a commitment to act in accordance with Article 2 of the Charter [see below],

1. *Affirms* that the fulfillment of Charter principles requires the establishment of a just and lasting peace in the Middle East which should include the application of both the following principles:

- (i) Withdrawal of Israel armed forces from territories occupied in the recent conflict;
- (ii) Termination of all claims or states of belligerency and respect for and acknowledgement of the sovereignty, territorial integrity and political independence of every State in the area and their right to live in peace within secure and recognized boundaries free from threats

With this background,¹³⁷ let us ask: is it possible for the legitimate aspiration of the two peoples, as epitomized by UN Security Council Resolutions 242 and 1397, to be not only reconciled but mutually reinforcing?

Consider an application of the portfolio endowment policy where new enterprises are created in a “collaborative development zone” or “Green Belt”

or acts of force;

2. *Affirms further* the necessity

(a) For guaranteeing freedom of navigation through international waterways in the area;

(b) For achieving a just settlement of the refugee problem;

(c) For guaranteeing the territorial inviolability and political independence of every State in the area, through measures including the establishment of demilitarized zones;

3. *Requests* the Secretary-General to designate a Special Representative to proceed to the Middle East to establish and maintain contacts with the States concerned in order to promote agreement and assist efforts to achieve a peaceful and accepted settlement in accordance with the provisions and principles in this resolution;

4. *Requests* the Secretary-General to report to the Security Council on the progress of the efforts of the Special Representative as soon as possible.

United Nations Charter Article 2 includes in relevant part:

3. All Members shall settle their international disputes by peaceful means in such a manner that international peace and security, and justice, are not endangered.

4. All Members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state, or in any other manner inconsistent with the Purposes of the United Nations.

¹³⁷Why this background discussion of such basic issues underlying the Israeli/Palestinian situation? Because throughout, this analysis has tried to identify and address real-world feasibility constraints (e.g., the challenge of corporate governance in the face of widespread shareholding). And a positive, realistic and respectful perception on the part of both communities could be the most important factor in assuring the feasibility here of the portfolio endowment policy. Besides our discussion justifying how such a perception could find deep roots in the legitimate rights of both peoples, there is also good reason to believe that such a perception is indeed consistent with both heritages. For generations, Israel has unleashed only a small part of its military capability, and for extended periods Palestinians have sought to achieve viable self-determination by negotiation, all the while both peoples being subjected to the vicissitudes of internal, regional and international affairs. While the danger of developments even worse than recent events is very real (especially if people fall prey to maladaptive perception traps such as discussed at 31ff. or 36ff.), it is reasonable to believe that at some level both peoples accept that they will be neighbors and that the better neighbors they are the better off they and their children will be. But it also seems to be true that “The parties on their own cannot find a solution. There is an urgent need for political action by the whole international community.” (Statement of Seville European Union summit, as reported by Ha’aretz, www.haaretzdaily.com, June 23, 2002).

along the Green Line demarcating territories occupied in the 1967 conflict (see Figure 24). The collaborative development zone could be established by a truly classic Treaty of Friendship, Commerce and Navigation between Israel and Palestine. All the dynamics, flexibility and potential advantages of the portfolio endowment policy discussed earlier would apply here as well, so we will focus on selected aspects of particular significance.

In this scenario, the Green Belt consists of a necklace of enterprise parks, such as illustrated in Figure 25. Capital from the United States, Europe, Asia and the Middle East itself is invested in appropriate enterprises, such as education, technology, medicine, resource stewardship, dispute resolution techniques, consumer manufacturing (domestic and export), etc., but excluding military-oriented enterprises.¹³⁸ The people in Israel and Palestine may find that an impressive reservoir of good will around the world would welcome their genuine collaboration.¹³⁹ Natural choices might include for Jerusalem itself to be bracketed by an interdenominational religious heritage center and a tourism development / genealogy center, and to locate a research institute on international peace and security and the control of weapons of mass destruction near Megiddo.

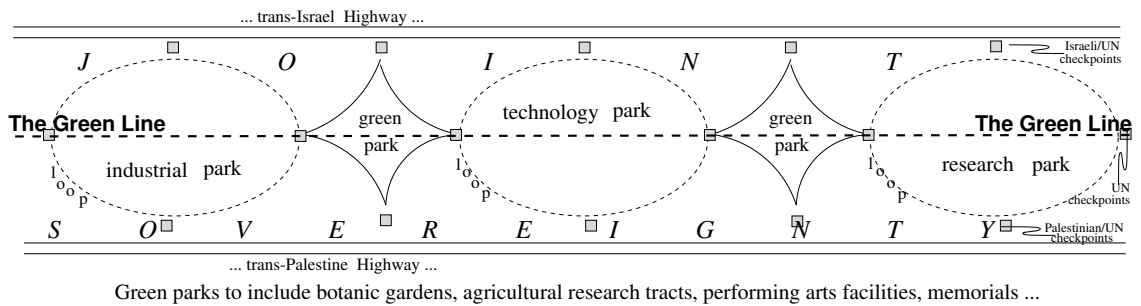
¹³⁸Perhaps ideally, if it were the will of the parties, the collaborative development zone could be constituted under a regime of joint sovereignty, even requesting civil policing of the zone by United Nations personnel. Such joint sovereignty would symbolize the “positive-sum” nature of this proposal. If Israel and Palestine were amenable, unresolved disputes concerning the zone could be arbitrated, for example, under rules established by the UN Security Council.

¹³⁹As the Japanese delegate to the Security Council session passing Resolution 242 stated: “I do not wish to conclude my statement on a note that may seem to be too visionary; but my delegation can foresee the time - and we ardently hope that it will soon arrive - when the dissensions, the belligerency and the war that have so grievously torn asunder the countries of the Middle East for so long a time will give way to an era of peace, an era when those countries will find it possible to co-operate harmoniously for the benefit of the peace and security, the prosperity and the welfare of all the peoples of the area.” It might be noted in passing that Japan, one of the world’s richest nations, and heavily dependent on energy imports, today suffers from *excess* domestic investment.

Figure 24: Green Line: Current Status (www.bbc.co.uk)



Figure 25: Green Belt: Collaborative Development Zone



Enterprise profits would be tax-free in Palestine, Israel and the country of origin of the capital, in return for which enterprises would match shares issued for new capital by an equal number of issued shares to be included in portfolio endowments for Israeli and Palestinian citizens, including refugees.¹⁴⁰

The combination of a tax-free regime and issuing matching endowment shares could be viewed as equivalent to an effective initial tax rate of 50%, plus endowments for future citizens. This focal proportion of half and half is not a constraint, but could very well be reasonable because: 1) presumably a primary motivation of capital investors would be to promote international peace and security, and 2) there could be a genuine potential for significantly elevated real returns if the dynamism exhibited by the peoples of Israel and Palestine is sublimated into genuine collaborative development.

¹⁴⁰While such endowments could be important assets for the refugees, they are not meant to substitute for a right of return and compensation called for by General Assembly Resolution 194 or the necessity of a “just settlement of the refugee problem” affirmed by Security Council Resolution 242. After all, the members of both communities who are not refugees will benefit from those endowments as well. However, a compensation obligation might be resolved, at least in part, by an additional amount of the portfolio endowment. And if strong regional economic growth were unlocked by genuine collaboration between the two peoples, one could envision Israel *encouraging* resident status for Palestinians displaced from its territory (especially in view of complementary sectoral emphases by the two heritages), in fulfillment of Resolution 194 (par. 11) which “Resolves that the refugees wishing to return to their homes and live at peace with their neighbours should be permitted to do so...” Such an approach could very well be more secure, and much more appealing, than the strategy referred to in “The Samson Option” by Seymour Hersh (1991). (Recall that the eponym does not survive.) As Theodor Herzl’s exemplar of a statesman, David in “Old-New Land” (infra, note 143), says: “The more people come here to work, the better off everyone will be. It is not altruism alone that prompts me to proclaim: ‘Man, thou art my brother!’ Sheer self-interest, also, urges that we declare: ‘Brother, thou art welcome here!’ ” (p.153). But it is worth pointing out an important distinction between “inviolable” and “unqualified” when talking about rights. While certain important rights should be considered “inviolable” vis-a-vis unjustified deprivations, in general even important rights may need to be qualified by the respect for other important rights. Therefore, it is only reasonable that a Palestinian right of return, best viewed as comprising *both* the individual rights of those affected and an important part of the collective Palestinian right to self-determination, be legitimately *balanced* against the Jewish right to self-determination in the state of Israel.

As discussed earlier (see page 74), there are very good reasons to endow future citizens as well, including actual immigrants and new children. In particular, the endowment of future children symbolizes hope and confidence in the future, and epitomizes the reinforcement of sustainable development by the portfolio endowment policy. How would such future endowments affect the enterprise market value, in particular the part owned by investors who bought shares rather than being endowed? Suppose that total market value of the portfolio of enterprises grows by 10% a year, and population at 3% a year; then the value of shares held by non-endowed investors would grow by $(1 - .03)(1 + .10) \approx .07$, or 7% per year. Prospects for significantly elevated real returns, and a demographic transition exaggerated by behavioral adjustments to a strong downward shift in prospective child mortality, could lead to even better results.¹⁴¹

To promote peace and security, Green Belt enterprises could only be insured by a collective comprised of them, symbolizing the inherently collaborative nature of sustainable development of the two peoples. It seems clear that stability and peace for Israel and Palestine together would be a major, if not dominant, factor in market valuations of citizen portfolio endowments, well beyond the obvious financial losses which would result from intentional damage to physical premises. This has the salutary effect of making self-enforcing the provisions of the Treaty of Friendship, Commerce and Navigation establishing the zone, in the game-theoretic sense of a sub-game perfect cooperative equilibrium. Through a gradual (a generation?) transition of confidence building and normalization, Green Belt enterprises could progres-

¹⁴¹There is an understandable current focus on the immediate critical issues of freedom, security and peace. But looking ahead, an exaggerated demographic transition promises very welcome elevated per capita productivity and economic growth for the upcoming generation (as the working age proportion of the population spikes upward), but portends a pensions crisis in two generations (as the proportion of pensioners spikes upward). The portfolio endowment policy is ideally suited to avert such a pensions crisis *at the outset*, by means of segregated social security sub-accounts which have restrictions on withdrawals and eligible investments.

sively assume financial responsibility for administrative operations in the collaborative development zone. The net effect is to join citizens of Israel and Palestine together into a powerful constituency for peace and stability.

As might be expected, special issues arise in formulating the corporate purpose of enterprises in the Green Belt. True stakeholders include all the citizens of Palestine and Israel along with international investors, and also include the international community taken as a whole, through the connection with international peace and security (as reflected in UN involvement by Security Council Resolutions and contributions to assuring order in the zone). The corporate purpose of each Green Belt enterprise should incorporate an explicit commitment to respect (in a formal, legal, sense) the collective rights of the Jewish and Palestinian peoples, and the individual rights of each Palestinian, Jew and other individual with whom it interacts, and also to respect (in a more colloquial sense) the heritage of both communities.

In a sense, the portfolio endowment policy implemented in a collaborative development zone is expressive of a valuable current opportunity to finally reconcile two foundations of Zionism. Theodor Herzl was “the spiritual father of the Jewish State”¹⁴² and articulated a vision of the Jewish people living in genuine harmony with the Palestinians, who would benefit from the association.¹⁴³ Vladimir Jabotinsky believed there was a conflict of interest between the Jewish people and the Palestinians - centering on freedom of Jewish immigration - which could only be resolved in favor of Zionism by “an iron wall which the native population cannot break through”.¹⁴⁴

¹⁴²The Declaration of the Establishment of the State of Israel, May 14, 1948, par. 4.

¹⁴³Theodor Herzl, “Alt Neuland” (1902). See, e.g., the translation by Lotta Levensohn “Old-New Land” (1960), p. 124.

¹⁴⁴Vladimir Jabotinsky, “The Iron Wall (We and the Arabs)” (published in Russian in 1923). According to Avi Shlaim, in “The Iron Wall: Israel and the Arab World” (2000), Jabotinsky’s “iron wall” was effectively adopted as Jewish policy in the Middle East for practically all of the 20th century.

The collaborative development zone serves as Jabotinsky's security barrier as necessary, but also represents Herzl's promise of genuine cooperation and, in today's terminology, sustainable development. The required change in generations-old patterns of thought and conduct by the two peoples amounts to "knowledge restructuring",¹⁴⁵ with fundamental changes in core concepts (the other people as neighbor and in fact brother instead of usurper or threat) and acceptable explanations (genuine collaboration instead of domination or resistance). Adopting an attitude of acceptance, respect and collaboration would be an important identity-determining decision for the two peoples.¹⁴⁶ Embracing such a challenge requires true fortitude, since the result is liable to be rapid societal transformation with unpredictable results.

Several more significant and topical statements of Jabotinsky in "The Iron Wall":

- 1) "There will always be two peoples in Palestine." (I.e., forswearing ethnic cleansing.)
- 2) "I am prepared to swear, for us and our descendants, that we will never destroy this equality [of all peoples] and we will never attempt to expel or oppress the Arabs."
(Here, Jabotinsky anticipates the UN Charter, which consistently refers to "equal rights and self-determination of peoples". See supra, note 126.)
- 3) "I am optimistic that ... both peoples, like good neighbors, can then [i.e., when the Arab world is ready to accept a Jewish homeland in the Middle East] live in peace."
This final quote of Jabotinsky is particularly topical, considering the unanimous Arab League proposal of March 27, 2002 affirming that the Arab countries would:
"a. Consider the Arab-Israeli conflict ended, and enter into a peace agreement with Israel, and provide security for all the states of the region.
b. Establish normal relations with Israel in the context of this comprehensive peace."
where that comprehensive peace includes:
"a. Full Israeli withdrawal from all the territories occupied since 1967, including the Syrian Golan Heights to the lines of June 4, 1967 as well as the remaining occupied Lebanese territories in the south of Lebanon.
b. Achievement of a just solution to the Palestinian Refugee problem to be agreed upon in accordance with UN General Assembly Resolution 194.
c. The acceptance of the establishment of a Sovereign Independent Palestinian State on the Palestinian territories occupied since the 4th of June 1967 in the West Bank and Gaza Strip, with East Jerusalem as its capital."

(As reported in the Jerusalem Post of March 28, 2002, from on-line Jewish Virtual Library.)

¹⁴⁵See S. Carey, "Cognitive Science and Science Education", 41 (No. 10) American Psychologist 1123, 1126 (Oct. 1986).

¹⁴⁶A very serious author has noted the tendency to defer important identity-determining decisions. Avner Cohen, "Israel and the Bomb" (1998) (epilogue). While such a tendency is understandable, sometimes deferring things can erode or foreclose vital opportunities.

This policy proposal is straightforward but still highly implementation-sensitive, in the sense that significant choices would be faced during implementation, and it would be all too easy to distort the spirit in which it is offered. Also, it might be objected that this policy proposal is unrealistic, or only a dream.¹⁴⁷

But a proposal is not a prediction, and as Theodor Herzl said, “*Dreams are not so different from Deeds as some may think.*”¹⁴⁸ In “State of Dreams” Palestinian poet Basima Farhat says “*dreams are of what we are made*”.¹⁴⁹ Around 1945 (significantly), Ludwig Wittgenstein wrote “*Words are deeds.*”¹⁵⁰

Perhaps the words, deeds, and dreams of the Jewish and Palestinian people are inextricably linked, for better or worse. If so, perhaps an innovative and fair-minded application of the portfolio endowment policy could serve to help both peoples consolidate their right to self-determination as they pursue sustainable development.¹⁵¹

¹⁴⁷Writing half a century ago, Munya Mardor wrote that he cherished the notion of mutual understanding and cooperation, but concluded back then “Alas! Jewish-Arab cooperation on that scale remains a dream.” Munya Mardor, “Strictly Illegal” (1957, tran. 1964).

¹⁴⁸“...Dreams are also a fulfillment of the days of our sojourn on Earth. Dreams are not so different from Deeds as some may think. All the Deeds of men are only Dreams at first. And in the end, their Deeds dissolve into Dreams.” Theodor Herzl, supra note 143 (the final words in the book).

¹⁴⁹“Now I lay me down to sleep...
sleep woman and enter a State of Grace
for you see dreams are of what we are made
Here you lie, a forgotten breath within this place of dreams
I am a Nation or am I but a seeker in the void?
Jew or Arab I am neither and I am both
What difference to this place I come to every night?
This place I call my own, is yours as well Here in the dream state...”
Basima Farhat “State of Dreams” (2000) (liberty taken concatenating lines).

¹⁵⁰Supra, note 120.

¹⁵¹Sustainable development has been defined as “*ongoing improvement of the world system according to a legitimately constructed social preference relation*”, from note 128.

7 Concluding Remarks

The *portfolio endowment policy*, by which citizens are endowed with a portfolio of state-sponsored enterprises, has a number of potential advantages. It can enhance ordinary efficiency (smaller operational and transaction costs due to automatic endowments and economies of scale) and financial efficiency (reducing risk by diversification). It can enhance equity by assuring each citizen an equal opportunity to benefit, and avoiding dangerous increases in inequality. There could be a number of significant, innovative applications, for economic restructuring, financial market stabilization, demonopolization, supporting micro-entrepreneurship, and international peace and security. And the portfolio endowment policy in important respects is more realistic politically than conventional schemes, which have induced strong public opposition due at least in part to perceptions of resulting inequality.

This analysis was met with a number of decisions about what to focus on. The amount of significant policy implications for major privatization is intimidating. My choice has been in some cases to deemphasize analytical generality, for example using specific utility functions selected for intuitive appeal, or contrasting the portfolio endowment policy with a polar opposite single stock alternative in exploring financial efficiency.

I chose to emphasize other issues such as uncertainty utility, for their relevance to evaluating the portfolio endowment policy and potential future research interest. Other topics, such as corporate governance in the context of very widespread shareholdings, were focused on to demonstrate feasibility. My hope has been to help policy-makers gain insight into some genuinely important issues while stimulating related research.

The richness of policy-related choices to be made ensures that the portfolio endowment policy will be very implementation-sensitive. This is good in so far as it means it can be flexibly adapted in a particular situation, but it also means that the spirit of equity which motivates the policy could still be distorted in subtle but highly significant ways in a sort of homeostatic reversion to some of the effects of conventional policies in the past.

Furthermore, the policy is not represented to be a panacea: indeed, the analysis develops theoretically preferable alternatives in particular instances (including sufficiently precise knowledge of the characteristics of individual citizens and individual enterprises). Rather, this analysis demonstrates that the portfolio endowment policy is feasible, with important potential benefits, and merits serious consideration.