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by

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Beggar Thy Neighbour:

Exchange Rate Regime Misadvice from Misunderstandings of Mundell (1961)

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Abstract

Mundell's optimal currency area model has been misconstrued, being at base an argument against multiple currencies as Mundell himself stated in that paper and frequently since. This paper shows two things. First use of this model has generated beggar-thy-neighbour advice concerning exchange rate changes. Second, because of its certainty assumptions, the model's findings that an exchange rate change could restore equilibrium after certain types of shocks is only plausible if 1) there to have been no prior exchange rate change in living memory, and 2) if there is something precluding any currency area subsequently generating another exchange rate change.

Key words optimal currency area; exchange rate regime; certainty; uncertainty effects; beggar-thy-neighbour policies; SKAT the Stages of Knowledge Ahead Theory; complexity; equilibrium

JEL Classification D80, F31

Part 1 presents the gist of the optimal currency model and its origin the Swan assignments model. Part 2 outlines Mundell's consistent opposition to use of that model to justify distinct currencies and floating exchange rates and some of its identified deficiencies. Part 4 elucidates over a trio of overlooked deficiencies. These are assumptions of (i) certainty concerning the future exchange rate and (ii) certainty concerning the ability of policy makers to discern where is equilibrium, and (iii) every country being too small to damage any other or face retaliatory action. It explains how this set of assumptions vitiates the plausibility of the model's mechanism for enabling exchange rate changes to restore equilibrium after a shock. Part 5 looks at the actual use of the model in proffering economic policy advice in the complexity of our real world where equilibria are in the eye of the beholder and no country is an island unto itself, too small to harm anyone else. It demonstrates how real world complexity interacts with the model's certainty assumption to generate beggar-thy-neighbour advice. Part 6 indicates the way forward, of including anticipatable effects of an exchange rate being uncertain, and their implications for

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exchange rate regime choice. This way forward involves going beyond standard risky choice theories such as expected utility theory, to SKAT, the Stages of Knowledge Ahead Theory.

1 Background

Beggar-thy-neighbour dirty floats were commonplace in the 1930s. A country depreciated to seek to solve its unemployment problem by boosting its export and import competing industries. Often soon after another country retaliated with a depreciation. In due course countries decided that none was too small to be sure of escaping retaliation, that a preferable exchange rate regime was the Bretton Woods Agreement.

Swan (1952) pioneered analysis of how a country might maintain macroeconomic equilibrium internally (neither over nor under activity) and externally (current account balance. Swan put the case that the official sector ought assist, not rely exclusively on market forces after shocks as in the gold standard era. He noted that two instruments that the official sector could use in re-establishing equilibrium internally and externally after shocks could be the exchange rate and fiscal policy (the level of demand). If a shock meant that nominal wages were too high, given that nominal wages were sticky, a depreciation could, given certain speeds of response of other variables, more quickly restore equilbrium, and so forth. He proposed assigning control of the exchange rate to the central bank and fiscal policy to the treasury. He furnished informative algebraic and graphical accounts of the possible speeds of re-attaining equilibrium internally and externally, with further developments in Swan (1953 and 1960).

Mundell applied Swan's model to ask what sort of shocks must a country encounter for use its exchange rate instrument to be an efficient way to restore equilibrium after shocks, and conversely under what sort of shocks would this be inefficient, so that it would be preferable for the country to form a currency union, Mundell (1961). Mundell via this model has captured the imagination of generations of economists with curiosity to ascertain the nature of shocks buffetting an area, and whether their nature indicates, according to Mundell (1961), retention of a separate currency so as to use exchange rate changes to restore equilibrium more quickly.

2 Deficiencies

Mundell (1961) attributes the horrors of the 1930s to the failure to quickly enough make the Bretton Woods agreement and remove floating exchange rates and beggar-thy-neighbour competitive depreciations. He never advocated the abandonment of Bretton Woods, never

praised floating exchange rates, as have numerous scientists who refer to his 1961 model. Unlike Swan, he has never been an advocate of using power to alter exchange rates.

He rightly complains that he distanced himself from floats in Mundell (1961), not merely in his consistent advocacy since of a single world money, eg Mundell (2003). He objects to the persistent misinterpretation of his 1961 article by those advocating floating exchange rates. He advocates a single money. He advocates a single world currency simply on the grounds that this will reduce transactions costs, eg Mundell (2003).

The optimal currency literature has however by and large ignored Mundell's 1961 observation that the logic of the model would render almost every tiny village an optimal currency area – that something is wrong with the concept at base. Instead it has modified the model to incorporate various omitted effects, none of which vitiate its basic feature that an area subject to particular (rather common) sorts of shocks might do well to keep its own currency. For informative surveys of the modifications, see Obstfeld (20010 and Kenen (2002).

3 Overlooked Deficiencies

In the Swan-Mundell model there is implicitly a once for all shock, never to be repeated, and nobody ever expects another shock, and the official sector knows precisely where is equilibrium before and afte. Ie everybody believes in certainty, always did before the shock, and always does after. This remains true, even when one uncertainty was added, that about people's desire for more leisure as distinct from more material goods (by working harder) as in an Obstfeld (2001) extension.

But such certainty, including with respect to the exchange rate remaining at the position to which it has now moved, is, to put it mildly, a dubious assumption for deciders being even half way rational. But then, often deciders are irrational, or at least myopic and unduly inward looking. For instance, it did take countries in the 1930s a while to discover that other countries would retaliate and that instead of a certain future, exchange rates were exceedingly uncertain and unpredictable.

However, it is dubious to propose that a country can use the Swan-Mundell exchange rate solution more than once. No matter how small a country is moreover, lenders to it like repayment, not default. Borrowers, even ones living in a tiny isle, are unappreciative of unaticipated hikes in what becomes due for repayment.

A repeat Swan-Mundell solution requires both countries and all those other countries dealing with them to be rather more myopic and non-anticipatory than is the norm. The

norm is after a currency area depreciates sharply and unexpectedly, lenders to that area sharply increase the currency area risk premium. The increase in currency risk premium can plausibly be interpreted as a realisation that the country's exchange rate is uncertain, something excluded under the Swan-Mundell model's reliance on certainty. This in turn excludes repeated use of the Mundell (1961) model within the period before forgetting occurs and people get lulled into seeing the future as certain. See Allais (1972) and Blatt (1983) for evidence on how long is required for such forgetfulness. Yet scientists employing the Mundell (1961) model to investigate advantages and disadvantages of a currency union, to the authors' knowledge, fail to comment on this matter. Ie they fail to take into account that a country could only ever use the exchange rate once – without the model's assumption of certainty becoming altogether implausible, and its implications correspondingly false.

The model's assumption of certainty before and after the single shock moreover excludes all possibilities of anyone being ignorant about the type of shock and its consequences. This assumption of full knowledge about the shock's type and the shock's consequences, has misled economists in their analysis and policy advice concerning exchange rate regime as shown below.

3 Certainty in Attaining Instantly the New Equilibrium

In the Swan-Mundell model everybody in both countries understands where, after the shock, is the new equilibrium. Everyone understands that it is good (with rigid nominal wages) for one of the two countries to depreciate to restore the international level of competitiveness after a special sort of shock. Thus there is no scope for retaliation. Everybody agrees that the single never-to-be repeated exchange rate change is beneficial to both countries and will be instantly implemented. There could not be a case of the country that has appreciated protesting that now its wages are too high, and that as a consequence it is suffering unemployment, losses in export markets and in import competing markets.

In this Swan-Mundell world, no country would ever need to risk being accused of beggar-thy-neighbour activity in lobbying another country to appreciate or in itself depreciating. In this Swan-Mundell world as in reality, there is an adding up accounting identity. After a shock, each pair of countries recognises and readily agrees whether it is the sort of shock where one country should appreciate, and the other depreciate.

Let us now contrast this academic exercise – in which the accounting identity holds – with what economists tell an actual country to do in an actual situation. The authors have been unable to identify any country other than Singapore that has a body of economists writing

in academic journals or advising the government, seeking to have that country's wage level raised because it is excessively competitive in the international arena. Instead the authors find economists advising virtually every land that their country's unemployment woes arise via too high wages.

The notion that, apart from Singapore, every country has suffered a special sort of shock that might be aided by a depreciation is thus untenable. It violates accounting identities. The fair Swan-Mundell model translates in the complexity of the real world into a beggar-thy-neighbour dirty float policy. The complexity of the real world generates uncertainty on just where is equilibrium and just what sorts of shocks have occurred.

Thus US economists see a solution to its jobless private sector recovery from China appreciating, and estimate the trade gains from a Renmimbi appreciation. They seem quite promising, Thorbecke (2006). For its part, China seeks to avoid this appreciation as far as is feasible, given its massive unemployment problems. Economists concerned for poor China, worry that it could follow Japan into long term recession if it yields substantially to US pressure to appreciate, McKinnon (forthcoming). In practice, therefore, in the murky world where nobody knows where the equilibrium is and has only a vague notion of what sort of shocks have occurred, the Swan-Mundell world translates into unidirectional advice. This advice is depreciate in or order to beggar-thy-neighbour. There is essentially zero countervailing advice to appreciate in order to help other countries out of their unemployment difficulties.

4 The Way Ahead

We need a new theoretical umbrella. We need one that does two things. First it needs to recognise that official sectors, private sectors and we their actual and would-be economic advisers are human beings. We operate in a murky complex world. Maximising would be feasible if we could collapse our goals to a univariate dimension and operated in a perfectly understood simple economy with equlibrium transparent to all. We live however in a complex world. We need to pause to think of the implications that out of sample we have yet to discover exchange rate fundamentals that predict better than a random walk over the pertinent time horizon for decision making, Meese and Rogoff (1983), Chinn, Cheung and Pascual (2005), Alquist and Chinn (2006). We need a model that includes the real life heuristics of the movers and shakers in exchange rate markets – par excellence the official sectors. As central bankers themselves report and those watching them, they do not attempt the impossible of maximising techniques. It is time our modelling admitted that we also as

their economic advisers transparent fail to maximise. Otherwise we would not be in the embarrassing situation of such unilateral beggar-thy-neighbour advice.

We need to include a realistic evaluation stage – instead of assuming that this is a costless instantly done maximising process yielding the Swan-Mundell equilibria. We thus need to abandon EUT, axiomatised expected utility theory, which makes these assumptions, and starts the decision procedure at the point of choice with this maximisation exercise already accomplished. We need to include the earlier stages of how choosers find alternatives, and how they evaluate them.

We cannot just graft these earlier stages onto EUT either. This is because EUT, when consistently applied, excludes attributing utility to any segment of the outcome flow that occurs before all risk and uncertainty is past, Samuelson (1952), Pope (2006) and that remaining segment of the outcome flow must, as Friedman and Savage (1948) put it, be evaluated "as if certain". See Figure 1.

Figure 1
The Jump Through of the Prior Periods of Uncertainty to Certainty
that occurs under EUT and its Standard Rank Dependent Generalisations

$t=0$	$0 \leq t < k$	$t \geq k$
Choice	*Period(s) of risk*	Period after risk is past
a risky act ie an act with at least $I \geq 2$ possible final segments Y_i, $i=1, ... I$ of the outcome flow	These segments of the outcome flow are **jumped over** and ignored even though they occur after $t=0$	utility $U_i = U(Y_i)$ of each possible final segment Y_i, $i=1, ... I$

EUT's ignoring of risk in mapping outcomes Y_i into utilities can be seen from the right hand column of Figure 1 where the probability distribution – that denotes the chooser's degree of risk, ie of knowledge ahead – does *not* affect the U_i's. V, the utility U(V) of a risky choice is,

$$U(V) = \sum_{i=1}^{I} p_i \, U(Y_i) \qquad (1)$$

atemporal aggregation weight
outside time

anticipated utility of outcome Y_i
within time

Nothing that is anticipated to be happen in the future in reality – ie *within time* –concerning risk that can impact on utility, is in EUT's equation (1). The only way risk enters is *atemporally*, in how probabilities concerning the mutually exclusive outcomes aggregated to attain a single overall value of the alternative. This limit of risk effects to their atemporal aggregation role pertains to the limited role of risk in the Obstfeld (2001) extension of the

Swan-Mundell model to include risk in the form of shock changes in the preference for leisure relative to material goods in one of the countries.

Under EUT the atemporal aggregation rule is simple probability weights. Under cumulative prospect theory of Tversky and Kahneman (1992) and other standard rank dependent generalisations, the atemporal aggregation rule is a more complex (de-) cumulative probability function, but still no real time risk effects are included as the anticipated utility mapping is identical to that of equation (1).

The same "as if certain" property is even inadvertently embedded, generating timing contradictions, in efforts to solve the problem by elaborating the EUT outcomes, Pope (1983, 1985a, 2000). It even recurs when the axioms are replaced by temporal ones as in Kreps and Porteus (1978) or Klibanoff and Ozdrenen (2007). This is because an axiomatisation has to derive its representation theorem – its distinctive expected utility property of using probabilities as atemporal weights to aggregate the mutually exclusive outcomes. To derive this it has to include a compound gamble axiom in which its falsely attributes simultaneity to the sequence of when the temporal succession of probabilities successively become degenerate, Pope (1985a, 2005, 2006).

To consistently and free of timing contradictions model the decision process and avoid missing out on all those cause effect chains generated by uncertainty before and after choice, we need SKAT, the Stages of Knowledge Ahead Theory, Pope (1983, 1995) and Pope, Leitner and Leopold-Wildburger (2006). Each stage is demarcated by one matter of risk and uncertainty ending, because of a change in knowledge ahead on that issue. To illustrate the four main stages, consider the central bank of France and its decision procedure, upon learning of the July 1993 attack of the franc. Table 1 is fictional, but draws on analyses of this event, Eichengreen, Wyplosz, Branson and Dornbusch (1993), Cobham (1994) and Mélitz (1994).

Table 1
The Banque's Four Main Stages of Knowledge Ahead After Encountering a Crisis

Stage / Period Outcome Segment	Activity	Unknown
1 Pre-Choice set	Discovering Alternatives	Choice set
2 Pre Choice	Evaluating Alternatives a) safe option – raise interest rates at once; or b) safe option – depreciate at once and exit the EMS; or c) risky option – try to ride out the crisis with three possible outcomes: 1, failure – big depreciation after losing huge amount of taxpayers' funds in a vain effort to	Chosen alternative

hold the Franc within the EMS band and failing to persuade the EMS committee to widen the band;

2, modest luck – a bit of a drop below the old band in the franc's value, and havign to keep interest rates higher than desirable to fend off future attacks, but able to get the band widened so that still in the EMS; or

3 huge luck – no

Lay out for each alternative its major possible effects and evaluate how these impact on the Banque's various goals in order to choose among them

3 Pre-outcome*	Waiting to learn its luck with choice of c) and finding the economy's efficiency diminished through speculation / hedging	Last Outcome Segment
4 Post-Outcome	Living with modest luck under its choice of c) of not too big a loss in taxpayer funds and to private sector stakeholders with prior debts in DM that have become more burdensome	Nothing – full knowledge ahead, certainty

* Irrelevant, as of zero duration, if the Banque had chosen sure alternative a) or b)

Table 1's stages of knowledge ahead framework allows us to identify, for the chooser who has encountered a problem that warrants action what is uncertain, risky, at each stage. Within this framework that highlights uncertainty and avoids us skipping over it as in EUT, we can construct models to shed light on the key exchange rate regime choice issue. This key issue is whether the costs of exchange rate uncertainty outweigh the possible benefits of using it to beggar-thy-neighbour without much retaliation – or theoretically using it to help one's neighbour out of his high unemployment problems. These are the questions that are important for us to start addressing. We have to quit modelling as if there are no costs of retaliation and no general costs of higher risk premia for being an exchange rate risk – devaluation prone currency, Pope (2005). We need to balance these against the costs of exchange rate pressure for holding exchange rates.

Already useful work has been done on measuring the degree of pressure experienced in holding exchange rates, eg Horváth (2005) and predecessor work in this area. The next steps in this direction are to measure the uncertainty costs of applying such pressure. There is scope for descriptive and qualitative work describing the actual pressures on official and private sector key participants in the exchange rate process. As Simon (1993) warns, arm chair theorising is no substitute for looking and describing how choices are derived, how the evaluations are conducted. Out of this look during a period as a student worker in a government office, he constructed his satisficing model (1955). A variant on this model is the aspiration adaptation procedure of Sauermann-Selten (1962) and Selten (1998). Analyses of how central bankers evaluated and chose include, for France those already

listed above Table 1, for England, Cobham (2002a, 2002b) and for the US, Mehrling (2001) and Goodfriend and King (2005).

As regards the private sector, a distinction needs to be made between three sets of operators, those shifting among currency areas: 1) portfolio capital, 2) direct investment and 3) goods. At least for 2 and 3 the lags between events, decisions and actions need to be considered. We need to stop wearing out EUT lens where all this is instantaneous. We need to understand the evaluation stage in Table 1, and how lengthy it is, including implementation aspects since nothing is quite certain until that is done. Consider for instance the drop in the EURO soon after its introduction attributed in the financial press (possibly with inside knowledge) to the lags in three European companies paying for their massive US direct investments by shipping funds from the EURO bloc. As regards trade flows, estimates from Pope (1981, 1985b and 1987) suggest a response lag of 15 months after an exchange rate change. This is likely because deciding whether to alter inter-country supply lines following relative price changes can involve production changes and such a firm typically only does once a year, whereas it responds monthly or even more rapidly to demand changes that often only involve matters of varying overtime, slack or minor increments and decrements in the labour force.

When we look adequately in stage 2 of Table 1, we shall start getting more suitable modelling of the effects of exchange rate variability. Presently we often try to estimate it with quarterly data, or even monthly or weekly (as this gives us more degrees of freedom, and consider only lags up to a year. But if the actual lags for most of the effects start little before a year when we look at real world decision making, we can see that we have been misusing econometrics. We can see for instance that the minimal effects detected on trade from exchange rate variability in most studies, stems from us starting and ending the lags far too soon.

Already useful work has also been done on the costs of variable exchange rates without identifying any extent to which this is caused by the uncertainty itself, or by other factors. Thus Mundell (1961) attributes to variable much of misery of the great depression. Rose (2000) identifies trade costs from any unpredictability at all in exchange rates. An interesting step at qualitatively separating transactions from pure uncertainty effects on trade, is Adam and Cobham (2005), a study that also ventures into measuring the effects of more versus less unpredictable exchange rates.

SKAT allows us to look in a sensible realistic way into the micro-foundations of decisions taken by those influencing exchange rate changes. It allows us in a sensible realistic way to

lay out the anticipated beneficially or (mostly) adversely affected by these unpredictable changes, and to analyse some of the uncertainty effects with more realistic lags.

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