

Central Bank Independence in Small Open Economies

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May 2014

Conference Version

By

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Preliminary: please do not quote.

We are greatly indebted to David Laidler for his comments on an early version of this paper, to J. R. Sargent for his comments on a subsequent draft, and to Anandadeep Mandal for assistance with data and Ali Kabiri for his suggestions of data bases and sources.

Introduction

Central bank independence has for many years now been popular, seen as being not only associated with but actually contributing to low inflation. The modern-day pioneer in establishing an independent central bank with a focus on inflation was New Zealand. There a new central bank constitution was passed into law in 1988, and that constitution gave the central bank the primary objective of low inflation.¹ This was preceded by a considerable amount of work by economists which showed that central bank independence was associated with low inflation, and by some theoretical work which demonstrated that central bank independence would lead to, in the sense of cause, low inflation. There was the occasional partial dissent – Adam Posen (1993), for example, maintained that central bank independence and low inflation were in fact simultaneously produced by the structure of a country’s financial system; but no-one disputed that there was correlation. The starting point for this paper is a neglected aspect of that body of work; we focus on small open economies.

The reason for doing so is as follows. In a previous study (Capie and Wood, 2014 forthcoming) we argued that crises inevitably compromise central bank independence, as response to the crisis involves changes to the law governing the central bank. This was supported by evidence from several countries and over two centuries. But every country examined was, at least by the standards of the time, large. Why do we consider that small open economies might be different?

¹ Details on the Act, and on why it was passed, can be found in Wood (1994)

At first glance one might expect the finding to hold there too. By their nature such economies are particularly exposed to shocks. Terms of trade shocks have a substantial effect in a small economy. If the exchange rate is fixed they have a fluctuating price level, and if the exchange rate is floating, while a stable price level can be maintained the exchange rate will by its fluctuations affect particular sectors of the economy and produce cries for action by and from politicians. But we nevertheless consider that such economies may be more successful at retaining a stable central bank constitution aimed at maintaining low inflation.

The argument is straightforward and its essence can be stated briefly. It relies on two propositions. First, the more detailed is a law the less likely it is to be capable of covering all contingencies. Second, high trust societies function more efficiently than low trust societies because in the former transactions costs, in the widest sense, are lower. The next section of this paper develops these points to show the argument in full. We then turn to how well our analytical conclusions conform with any patterns there may be in the data. The penultimate section analyses and compares results across several small open economies (New Zealand, Australia, and Spain) and considers our argument in a tentative way in relation to Norway (comparative ignorance limits our capacity to take it further). The final section of the paper comprises an overview followed by a few remarks on whatever policy implications we think can be drawn from our work. There are also three appendices.

But before proceeding further we must dispose of two misconceptions. Fixed and floating exchange-rate regimes are often seen as alternatives, the adoption of which depends on the confidence there is in the monetary authorities of a country to behave properly. They are alternatives in the sense that either one

delivers balance of payments equilibrium. A floating exchange rate is more likely to be adopted by a country with a reputation for sound monetary management. A fixed rate is likely to be more appealing to a country seeking to establish such a reputation. For a country with a floating exchange rate there is no exchange rate policy – it looks after itself. An independent monetary policy can be employed. Under truly fixed rates the exchange rate is the target and there is no monetary policy, with monetary conditions determined through the balance of payments.

But Friedman showed that there was an important third type of regime, pegged rates, sometimes called ‘fixed-but-adjustable’ rates. Under this regime there can be some attempt at monetary policy at the same time as the exchange rate is being targeted. With pegged rates the monetary base has both domestic and foreign components. In some cases this last was effectively implicit in the working of the different exchange equalization accounts. If capital flows were considered excessive there would be an attempt at sterilizing the inflow².

Central bank independence is just as likely to prevail when there is an exchange-rate target in place. Such a target is given in a fixed rate regime but could also be employed in a regime of floating rates or of pegged or adjustable. Thus under the gold standard there was an exchange-rate target and a central bank might be entrusted to pursue the policies that ensured the currency was kept at parity. The same was true under Bretton Woods, although as noted there might well be both some monetary policy and some exchange-rate targeting. In fact central banks have mostly been happy with and even preferred exchange-rate targets since they give the banks more obvious power and prestige.

(Johnson, 1969)

² See Fforde (1992) for details of one example of such a regime.

But nowadays most central banks have an inflation target largely because of a preference for floating rates that evolved after the breakdown of Bretton Woods. Further, there is currently no obvious anchor for the system, no dominant country whose monetary policy others could happily follow³.

The second misconception is the far from rare assertion that small open economies are price takers, with the inference that their price level and inflation rate are determined outside their borders. We reject that and agree with Mervyn King, the former Governor of the Bank of England (2003-2013) that, ‘you can have whatever inflation rate you want’. It is obvious that a very small and open economy such as New Zealand has been highly successful over the last two decades or so in achieving a low and stable inflation rate of its choice. Similarly, a larger but still relatively small open economy, Canada, has had the same kind of success. And there are others. But as King also remarked it is possible to take the Turkish or Zimbabwean route. A flexible exchange rate allows bad choices as well as good choices to be made.

³ In an earlier paper (Capie, Mills, and Wood, 1994) we examined the evidence on central bank independence, first reviewing and comparing previous studies and then extending the work back in time. We recognised, following Friedman, that so-called fixed exchange-rate regimes are seldom truly and rigidly fixed. Rather, in practice they allow some latitude for domestic monetary policy. Looking back into the pegged-rate period found the association between central bank independence and low inflation broadly confirmed.

Why Size Matters: Conventions, Trust, and the Role of Law

The claim that “my country is special” is in general a dubious one. As the late Karl Brunner was inclined to point out when that claim was made, in most countries water usually flows downhill. Nonetheless, although wary of the claim in general, we think it worth taking seriously in the present context. A recent volume, Braude et al., contains several studies which make this point. Appendix Two comprises an overview of this volume: its most useful chapter on Norway we consider further below.

So far in this paper we have written as if the only possible, the absolutely inevitable, model of an independent central bank is one established by a central bank law. That is the normal, and sometimes explicit, assumption in this field. That central bank law should, among other things, lay down the objectives the central bank had to achieve, what it had to do if it failed to achieve them, and what possible excuses for failure there were. Further, it might well set out circumstances in which the government of the day could intervene in the operations of the bank by issuing instructions which over-rode the law. It is time to consider whether this law-based (some have called it legalistic) notion of independence is the only possible such notion, or at the least the best one in all circumstances.

First we must make absolutely clear what we mean by independence in the context of central bank law. It is important to emphasise that it is not an absolute concept⁴.

Milton Friedman's paper (1962) which opened up the question of central bank independence in the 20th century, and on which essentially all subsequent studies of the subject have been founded, was it should be observed published in a volume called "In search of a Monetary Constitution" (a title which has particular resonance where that book was published, the United States, in view of the importance the US Constitution plays in that country). His paper was concerned with institution design. He contrasted two institutions, an independent central bank and a monetary rule, and considered which was likely to be preferable in terms of both retaining political control over monetary policy (essential he maintained in a democracy) and achieving price level stability. In order to develop this contrast he had to make clear what he meant by an independent central bank.

The law that establishes the central bank could, for example, say that the bank can conduct monetary policy in any way it likes to achieve any end it wishes; or at perhaps the opposite extreme could say that the bank must conduct policy in a way prescribed by the government to achieve an objective chosen by the government, but that it is independent to choose, for example, the colour of the coats its doormen wear. The model he used in his discussion was one where the bank had a target chosen by the government but was free to operate as it wished to achieve that target.

Note, then, that the basic model of a central bank established under law encompasses an enormous range of what might be called independence. The various attempts to measure independence (of which Capie and Wood's 1994

⁴ We are indebted to Professor Giangiacomo Nardozi for pointing out to us the importance of doing this.

paper is a particularly wide-ranging one) are all within the basic Friedman framework: they represent developments of it, and are not a body of work independent of and entirely distinct from that framework.

That point is readily demonstrated by some examples from Bank of England history (a particularly useful history in this context as the Bank, although founded after the Riksbank, took on central banking functions first, and can thus be regarded as the world's oldest still extant central bank). Throughout this history the Bank usually had clear instructions as to what it was required to achieve, but it never had instructions as to how it was to achieve it.

So, for example, the Bank of England in the nineteenth century was given the task of maintaining the gold standard and left entirely alone as to how it achieved that. There were no instructions. Similarly, in the second half of the twentieth century when it was charged with delivering a particular monetary aggregate growth it was left alone to do that. The Treasury showed an interest in how and how well that was being done but gave no instruction. Once again the Bank was left entirely alone to deliver. (Capie, 2010)

Having set out exactly what we mean by central bank independence, we now go on to develop our argument as to why small open economies may be more successful than most at retaining a stable central bank constitution aimed at maintaining low inflation.

A useful starting point is provided by Ronald Coase's remarkable and imaginative paper of 1937, in which he first assumed the complete absence of transactions costs, and explored the consequences of this assumption before relaxing it to show how real world institutions depended for their existence on the presence of such costs. Here we make a different, but analogous, starting assumption.

We assume that we are dealing with a society where a set of conventions has evolved over the years⁵. Because the conventions have evolved, they have arrived at a situation where they are economically efficient. We claim this on the basis of the arguments and evidence that common law evolves thus. (This has been found by for example Mahoney (2001) and by Epstein (2005.) Not only are these institutions efficient, but, we also assume, and this is the novel element we introduce, they have evolved in what we term a “Virtuous Society” – one where everyone conforms to these conventions, and it is the universal expectation that everyone will conform to them. No-one ever deviates from such behaviour⁶.

In such a society there would be no laws. The conventions evolved – no laws set them out – and no laws are needed to enforce them. The central bank itself would be constrained purely by convention to produce low inflation. No contract would be needed to enjoin that. The central bank would aim at low inflation because of the proven benefits of doing so, and the notion of formal contracts is foreign to the society. In such a society, then, there would be no

⁵ The best discussions of this evolutionary process which are known to the authors are the Mais Lecture given at Cass Business School by Frederick Hayek shortly before his death – for which reason it regrettably remains unpublished - and Jonathan Sacks’s “Markets, Governments, and Virtues”, of 2001.

⁶ The evolution of common and shared norms, institutions, and values in a virtuous society was described by Adam Smith in his “Theory of Moral Sentiments” (1759). By their nature, he maintained, human beings while self-interested are also genuinely social actors. They have sympathy for others and care for them, and so are able to learn from their own personal experience which acts are compatible with the well-being of others and of the society as a whole, and which are harmful and therefore should not be pursued. This, Smith argued, is the very basis of virtue in society. The particular relevance of this to small societies was urged in a subsequent edition. In the 1790 edition Smith included a new book, book VI, where he studied “Virtue”. Section ii therein discusses “The character of the individual, so far as it can affect the happiness of other people”. There Smith underlines the gradations of affection, care and attention individuals give to others, with different intensity depending on how near they are to them, starting with family and ending with country and humanity.

central bank law because everyone would trust the central bank to deliver low inflation on average, without any law to tell them to do that. (There would still be money. For money's main reason for existence is the existence of transactions costs. (See e.g. Clower, 1967) And there would also still be a central bank: see Appendix One.)

Now of course we recognise that whatever might be the situation in some idealised Rousseau-esque society, no such society exists in the world today. But what does exist is a wide range of societies with different degrees of trust. Some states have essentially broken down because they depended not on convention but on the rule of law, and that is largely absent (Somalia, perhaps), while in others crime rates are low, and many, maybe even the majority, of crimes are the result of mental illness or extreme stress. Predatory behaviour and violence for pleasure are both extremely rare.

How might we expect the central bank contract in such a “high trust” (but not *completely* virtuous) society to be written?

It could be written loosely. That is to say, the preference for low inflation might be expressed in it for convenience, and as a precaution permission to act as lender of last resort in a crisis could be there for the avoidance of doubt when action is urgent, as it is in a crisis⁷. In addition, a tolerance range around which inflation was allowed to fluctuate might be expressed, if economic knowledge (which term we assume for the sake of discussion not to be an oxymoron) allowed that to be done. Otherwise, the only reason for it would be to help people form their expectations. The contract would be free of detailed instructions, since the central bank would be trusted to do the right thing as best it could.

⁷ For explanation of what is meant by Lender of Last Resort action see Wood (2000).

Our argument on the importance of trust has implications for the resilience of central bank independence in the face of shocks. Let us briefly repeat our earlier argument as to why central bank independence seems inevitably to be compromised by a crisis. Central bank independence, we suggested, requires a well-defined contract. It is impossible to write a complete contingent contract. Hence at some time a crisis occurs which is not anticipated in the contract. The contract therefore requires modification, and there is then scope for the government implicitly or explicitly to claim that it has no choice but to interfere with some aspect of the bank's contractual independence. This conclusion was supported by the examples we studied in our forthcoming paper (Capie and Wood, 2014). But these examples were from "normal" societies. Certainly they were not ones where the rule of law had broken down, but nor were they ones where trust is unusually high by the standards of developed nations.

That particular problem occurs, though, only because the contract was detailed. A contract scarcer in detail would allow a central bank much greater discretion, and thus greater freedom to respond as seemed best to previously completely unforeseen events. The contract would not require updating after a crisis, so there would be no scope for the compromising of independence. These seem to us to be the implications for central bank independence of being in a high trust society. How do these implications bear on the present study? Because, we would argue, of the kind of societies most likely to be high trust.

High Trust Societies.

You may not actively distrust someone you do not know. But trust is much more likely among people who know each other, and have reason for trust. We can imagine groups of people who know each other, and who trust each other as a consequence of regular interactions. These networks can extend, as the groups will not be closed. Each member, or at any rate most, will know individuals

outside the group. People who live in a village nowadays will know people outside the village. The network of trust will thus extend, and could extend across the whole society. It would be self-reinforcing because self-rewarding behaviour if it did, because it would reduce the costs of transacting, by for example reducing the amount of pre-contract diligence which it seemed necessary to undertake.

Such a network of interlinked trust groups could not extend across the whole of the UK, for example. Accordingly, high trust societies will be small societies. And small societies are small economies, and small economies are except by the occasional political quirk (North Korea) inevitably open economies. (We do not assert that small societies are inevitably high trust; rather that high trust societies are inevitably small.)

Hence small open economies, exposed to crises as they are, may nonetheless have central banks which if independent retain that independence through crises. Does the evidence support this conclusion? Or do they lose that independence and revert to high and perhaps variable inflation?

What does “Small and Open” Mean in Practice?

The use of large and small in the international trade literature is usually taken to mean the ability or not to change a country's terms of trade. A large country is defined as one that can change its terms-of-trade and a small country one that cannot. So, for example, to pick up on a recently spotted instance of that view, Dannhauser (2013) writes that the usual “...assumption of a ‘small’ economy will be maintained, i.e. we abstract from economies, such as the USA, that have sufficient market power to influence prices in world markets for internationally traded goods.” But the definition which that quotation implies might well result in all countries being classified as small. It is difficult to find a country that can

change its terms-of-trade in anything more than a very limited range of products. How much influence does the US have in world markets and how many others like her could there be? Similarly, at the other end of the spectrum a small country that supplied the world with say, a rare mined metal is likely to have greater influence on world prices than most other countries. Almost all countries could therefore be categorised as small in the common international trade sense. It might be more useful in the present context simply to consider some measure of absolute size on the grounds that absolute size is what matters in the present context since it is that, given openness, which determines the importance of shocks of any given size to the price level. But openness is key. Closed economies can do as they wish and lose their interest for us in this sense.

Measuring Openness

How open is open? We turn here to the question of how to measure how open an economy is. The degree of openness has typically been represented by the trade/income relationship – the extent of trade in relation to total output, and usually captured by calculating:

$$\{(X+M)/2\}/Y$$

But there have been many variations around this⁸. For example, Grassman (1980) presented a measure of what he called real openness, with the ratio defined as volumes of exports (X) and imports (M) adjusted by their respective price indices:

$$R1 = (XP_x + MP_m) / NP_n + XP_x - MP_m$$

Where N is domestic output not exported and P_n is the general price level.

Beenstock and Warburton (1983), however, showed just how greatly prices mattered in that calculation. If import prices rose the ratio rose whereas if the

⁸ We deal only with trade in goods due to data limitations for a considerable part of the period we cover.

non-traded prices rose the ratio fell, and if export prices rose the effect was ambiguous. Moreover, ‘most leverage of price movements with respect to R1 will occur through changes in Pm and Pn rather than Px’. They then showed that removing price changes resulted in a substantially different picture of openness for both the US and the UK over the century prior to 1980.

It is thus clear that our results might be critically dependent on a particular measure of openness: an unsatisfactory situation. Fortunately, it is possible in the context we are working to reject some openness measures a priori. The argument is as follows. Our concern is with the shocks (crises) which can affect a country from overseas. It does not matter for our purposes whether the shock is purely nominal – a price change only – or a purely real one such as the vanishing of a market for a country’s goods (an example is the kind of shock Finland experienced with the collapse of the Soviet Union). Hence we can consider both real and nominal shocks without distinguishing between them, and need not make the “Grassman Adjustment”.⁹ The next stage is therefore to identify the countries we are to call small and open.

The Data and the Methods

In the spirit of Capie and Wood (1994 op. cit.) we consider a long run of data. Observations are for seventeen countries, comprising the current G10 and seven others. The data points are generally every five years, adjusting slightly to omit

⁹ It is customary when discussing shocks to distinguish not only between real and nominal shocks, which we maintain we need not do in the present context, but also between permanent and transitory ones and between anticipated and unanticipated ones. We do not make the former distinction either, on the grounds that when the shock actually occurs, and that is usually when any policy response is made, it is not possible to decide whether a shock is permanent or transitory. One might say in objection that some shocks are obviously transitory – a war, for example. But precedent suggests that even in that context transitory can mean up to 30 years. And as for the claim that with modern technology wars will inevitably be short, that may well have been said at the start of the Thirty Years War. Nor does the usual anticipated/unanticipated distinction matter, for it would affect only the timing of any government response.

the years of the First and Second World Wars. Thus, starting at 1890, the points are 1890, 1895,...1910, 1913, 1919, 1924..., 1938, 1948, 1953....., 2008. We end at 2008 to avoid the financially turbulent following five years.

As well as real GDP, openness, inflation (as measured by a retail price index appropriate to each country), central bank independence, and an index of economic freedom. The central bank independence measure comes from Capie and Wood (1991), and is supplemented where necessary by that produced by Alex Cukierman et al (1992). We use the latest available index of economic freedom (Prados 2014). These data are in an appendix to the paper, in the above order, in a series of tables. The sources for the other data are given in appendix three.

Next comes how to decide which economies we regard as small and open. The procedure is as follows. We construct a series of diagrams, one for data up to 1914, one for 1919 to 1938, one for 1953 to 1978, and one for the remainder of our period. Each diagram contains the within-period averages for GDP and for openness for every country in our set. (There are it will be observed five GDP observations and five openness observations averaged for each country in each diagram.)

The diagrams are of four quadrants, constructed as follows. The vertical axis measures GDP, the horizontal measures openness, and their point of intersection is at the median of each series of these two series in the period of the diagram.

It can be seen that for each diagram the small open economies (as compared to the others in the period of the diagram) will lie in the bottom right-hand quadrant. That enables us to produce another table, of small open economies in each five year period, and then to see which, if any, entered or left that group over our data period as a whole. The next section of our paper then explores

whatever connection there may be between openness and low inflation, and openness and central bank independence. But first to the data.

The Charts

Before discussing these we simply lay them out in date order.

Chart 1: 1890 - 1913

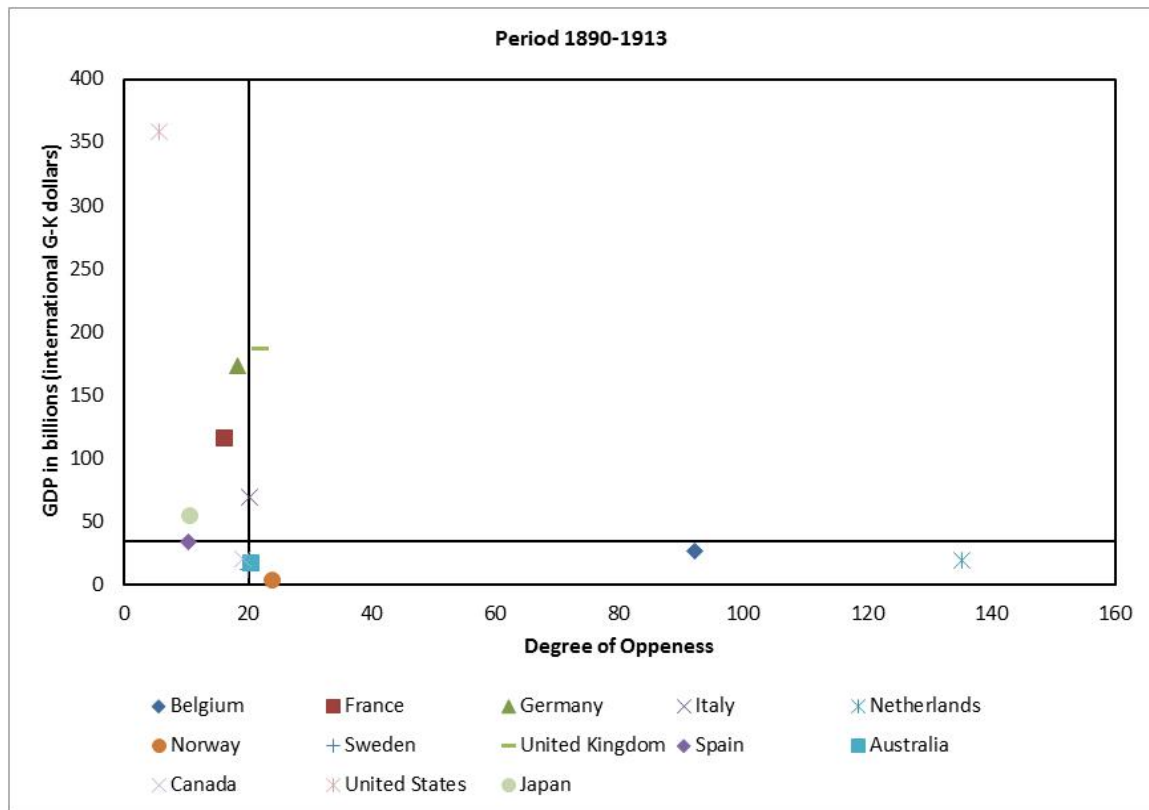


Chart 2: 1919 - 1938

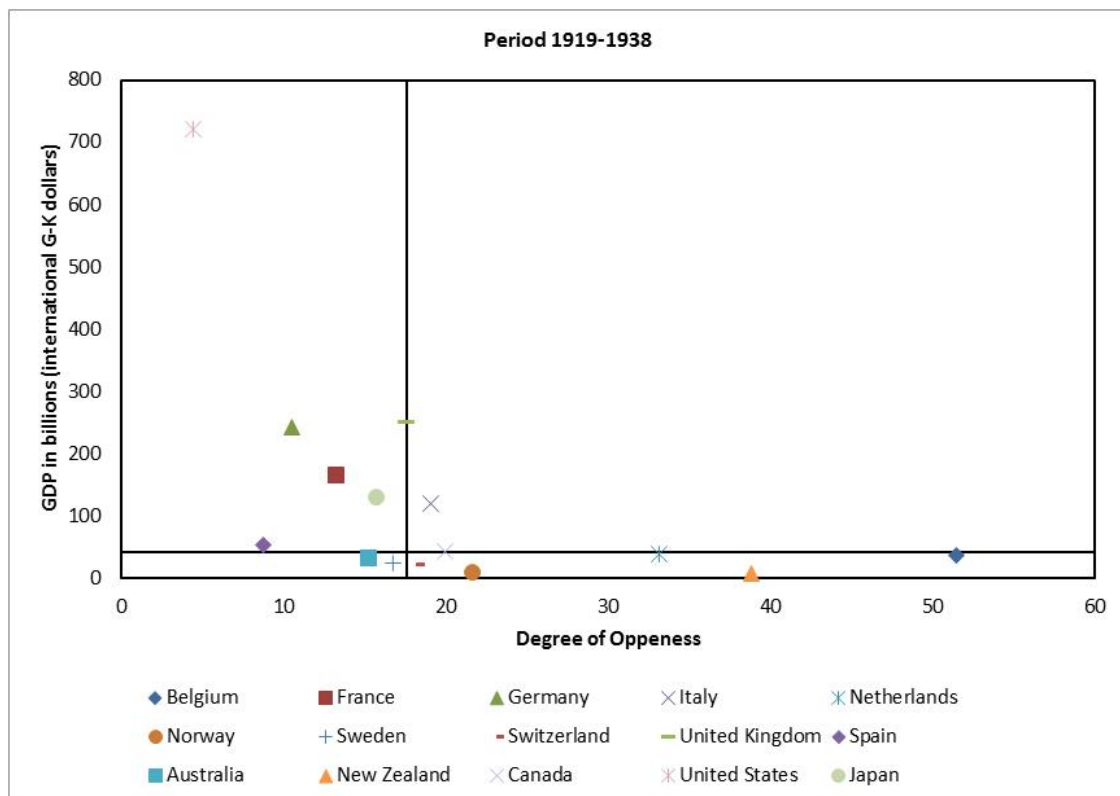


Chart 3: 1953 - 1978

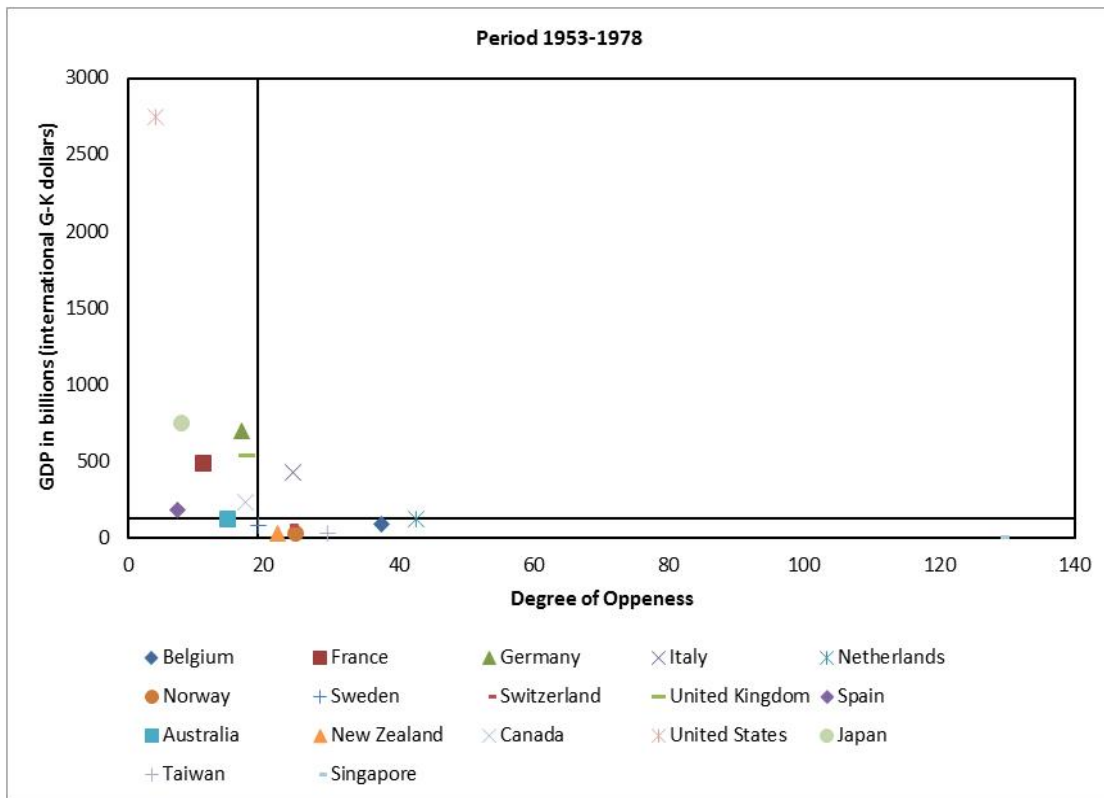
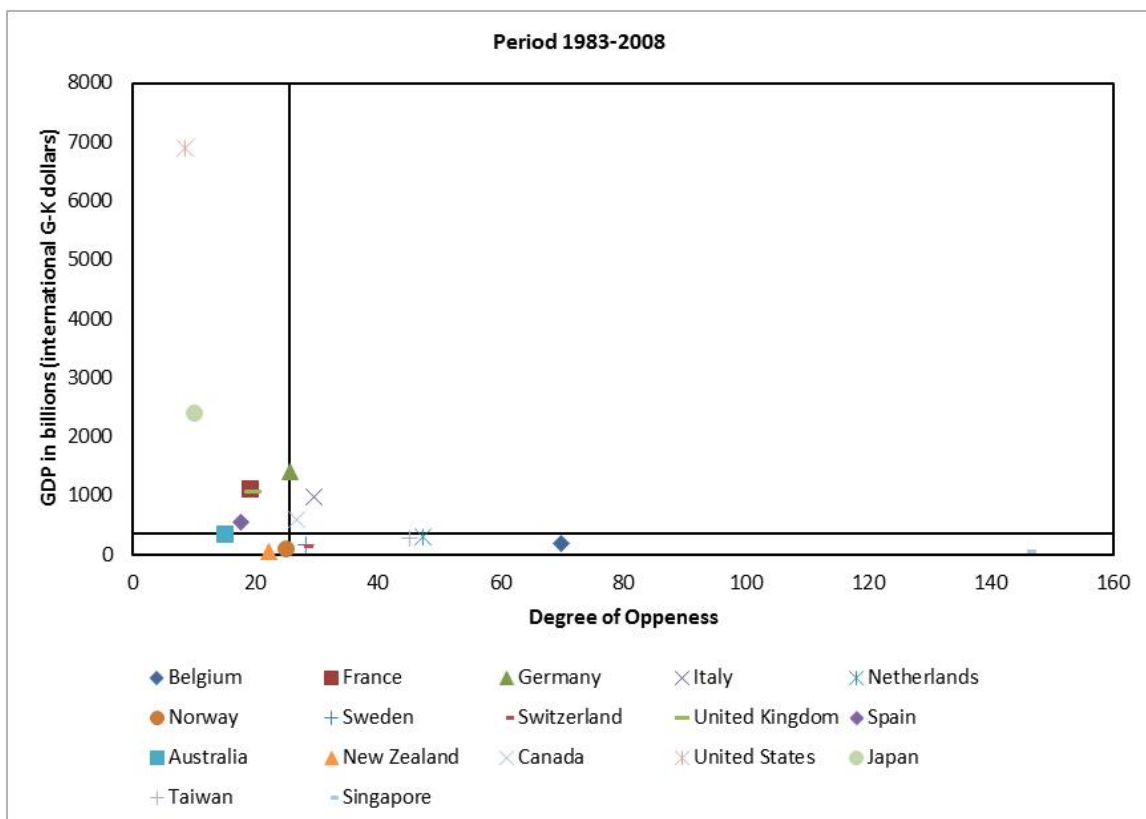


Chart 4: 1983 - 2008



Our charts are easily read. The horizontal line is the median size of the countries in the chart. The vertical line is the median degree of openness for these same countries. Their intersection gives us four quadrants. Those in the lower right are small and open. Those in the upper left are large and less open. So, for example, the first chart, which covers the period 1890-1913, shows in the lower right quadrant the two small economies that we normally think of as being very open, Belgium and the Netherlands. The median for openness is 20 on our measure and there is considerable clustering around that. The United States, well known in the nineteenth century as highly protectionist, is one of the least open and by far the largest economy. In this period Norway is both very small and open.

In the following period, the interwar years, as we would expect, the degree of openness has fallen and the median is closer to 16 on our measure. If anything the U.S. became more closed with two major tariff hikes in 1922 and 1929. The U.K. also has become less open but represents the median. The major factor reducing openness was the collapse of international trade. Nevertheless most countries retain their general positions in the quadrants.

Although in the years after the Second World War there were many moves in the direction of freeing up the international economy it took a long time to have a clear effect. Trade grew faster than output but the measure of openness, the median, was restored to no more than the 20 or so of the pre First World War period. The U.S. while less protectionist than previously continues to appear among the less open economies largely because the external sector is so small in relation to the domestic economy. The main point to make about the period is that there is a greater clustering around the intersection of the medians. Japan makes its appearance as the second largest economy but is relatively closed.

Finally, again as might be anticipated the period from the 1980s onwards becomes more open, the median rises to more than 20, and interestingly the clustering lessens. The U.S. remains stubbornly 'closed'. The small open economies are as before.

The next stage is to examine the relationship, if any, between the degree of openness and inflationary performance. Does good performance depend in some way upon size and/or openness? There already have been some attempts at establishing the connection between openness and inflation. Romer, for example, started from the point that unanticipated monetary expansion leads to real exchange-rate depreciation and observed, uncontentiously, that real exchange-rate depreciation is more damaging the more open is the economy. He then went on to argue that whatever might be the benefits of unanticipated monetary expansion they would be lower in more open economies. Therefore, he concludes to explain his finding, the authorities in small open economies have a lower incentive to use unanticipated monetary expansion because of the damage to the real exchange rate.

So while the absence of pre-commitment in monetary policy, that is the absence of central bank independence, generally leads to excessive inflation it does this less, he suggests, in more open economies.

Are our results consistent with his? Tables 1 to 4 summarise the data for the small open economies for the four periods already indicated. These show for each country in each period the average size and average inflation rate across the period. Each table also shows the status of each country's central bank. Additionally, the average rate of inflation for all the other countries is given to allow some comparison.

Table 1: Small Open Economies. Period 1: 1890 - 1913

	GDP (average)	Inflation (average)	Central Bank Independence	Inflation (average, rest of countries)
Belgium	26,541	2.28	Unclassified	1.59
Netherlands	19,339	0.69	NA	
Norway	4,473	3.22	NA	
Sweden	12,399	1.25	Dependent	
Australia	17,622	1.36	NA	

Notes: Central Bank independence as classified by Capie and Wood (1991). GDP in million 1990 International Geary-Khamis dollars

Table 2: Small Open Economies. Period 2: 1919-1938

	GDP (average)	Inflation (average)	Central Bank Independence	Inflation (*) (average, rest of countries)
Belgium	36,172	5.03	Unclassified	2.86
Netherlands	38,710	2.23	NA	
Norway	9,324	3.01	NA	
Sweden	25,004	3.00	Dependent	
Switzerland	22,446	2.07	NA	
New Zealand	7,752	2.03	Unclassified (**)	

Notes: (*) Excluding Germany and thus its deflationary episode of 1924, average inflation would be around 4.5%
(**) The New Zealand Reserve Bank was established in 1933. It was nationalised and became statutory dependent in 1936
Central Bank independence as classified by Capie and Wood (1991). GDP in million 1990 International Geary-Khamis dollars

Table 3: Small Open Economies. Period 3: 1953-1978

	GDP (average)	Inflation (average)	Central Bank Independence	Inflation (average, rest of countries)
Belgium	87,403	2.98	Dependent (*)	5.44
Netherlands	128,914	3.55	Dependent (*)	
Sweden	85,931	4.46	Dependent	
Switzerland	84,912	2.78	Independent (*)	
New Zealand	27,860	5.95	Dependent	
Taiwan	34,134	8.80	NA	
Singapore	8,261	8.48	Dependent (*)	

Notes: Unless indicated, Central Bank independence as classified by Capie and Wood (1991). GDP in million 1990 International Geary-Khamis dollars
 (*) Legal Central Bank independence following Cukierman, Webb and Neyapti (1992). We have adopted 0.50 as the threshold for a central bank to be defined as independent

Table 4: Small Open Economies. Period 4: 1983-2008

	GDP (average)	Inflation (average)	Central Bank Independence	Inflation (average, rest of countries)
Belgium	190,266	2.62	Dependent/Independent (**)	3.55
Netherlands	301,997	2.02	Dependent/Independent (**)	
Sweden	167,153	4.14	Dependent/Independent (***)	
Switzerland	152,208	1.83	Independent (*)	
Taiwan	290,140	1.31	Dependent (*)	
Singapore	70,095	1.95	Dependent (*)	

Notes: Unless indicated Central Bank independence as classified by Capie and Wood (1991). GDP in million 1990 International Geary-Khamis dollars
 (*) Legal Central Bank independence following by Cukierman, Webb and Neyapti (1992). We have adopted 0.50 as the threshold for a central bank to be defined as independent (up to 1989)
 (**) By 1998 all EMU Member States granted independence to their central banks
 (***) The Riksbank was granted independence in 1999

In the first table the results are mixed. Perhaps for the gold standard years this should be expected. All the countries shown, except Australia, had the institutions that we recognise as central banks. Inflation is low as the average of

1.59% for the rest of the group shows. Both this and the similarity of inflation rates were consequences of the world monetary standard at the time.

Taken across all the periods the results provide support, albeit modest, for Romer's conclusion. Our small open economies with independent central banks do a little better than the average. But it must be emphasised that the inflation in these economies is relatively as well as absolutely low – a stronger finding than that of Romer.

What of central bank independence? Is that more durable in small open economies? Across the whole period dependency is the more common position. But the tables do show central bank independence (or dependence) for our small open economies. Does one relationship or the other emerge as the predominant one? And more important, are there any significant changes in this relationship?

Table 5: Changes in statutory independence in small open economies

Period 1: 1890 - 1913		
	Change, year	Direction
Belgium	No	
Netherlands	Yes (1903) (*)	Less independent
Norway	Yes (1892) (*)	Less independent
Sweden	Yes (1897)	More independent
Australia	Established in 1912	
Period 2: 1919 - 1938		
	Change, year	Direction
Belgium	Yes (1937)	Less independent
Netherlands	No	
Norway	No	
Sweden	No	
Switzerland	No	
New Zealand	Yes; and nationalised (1936)	Less independent
Period 3: 1953 - 1978		
	Change, year	Direction
Belgium	No	
Netherlands	Nationalised, 1948	Less independent
Sweden	No	
Switzerland	No	
New Zealand	Yes	
	1960	Less independent
	1964	More independent
Taiwan	Yes	
	Re-established, 1961	Under the government
	1961	More independent
	1979	Less independent
Singapore	Established 1971	Under the government

Period 4: 1983 - 2008		
(Table 5, cont.)		
	Change, year	Direction
Belgium	Yes	
	1993	More independent
	1998	More independent
Netherlands	Yes, 1998	More independent
Sweden	No	
Switzerland	Yes	
	1999	More independent
	2003	More independent
Taiwan	No	
Singapore	No	

Notes: (*) In these cases, permission to buy public debt or an extension of the loans to the government was granted by law.

Sources: Arnone et al (2006) on the OECD countries; Pohl and Freitag (eds, 1994) on the European countries; Swiss National Bank (ed. 2007) several chapters on the origin and evolution of the Swiss National Bank; Linlater (1992), Bell (2004), Hawke (1973) on New Zealand; Shea (1994) on Taiwan; and Sheng-Yi (1990) on Singapore. The statutes of the national central banks were also consulted and accessed via central banks' official websites.

While the results are of course mixed, it does appear that central banks in small open economies do better than the others in terms of retaining their independence. The majority of those that start independent in our data remain so. More important, this is notably the case in the turbulent interwar years of table 2 and as we move from them to the relative stability of the years of table 3.

Independent central banks do appear more likely to remain so in small open economies.

We posited at the outset that high trust societies were likely to function more efficiently than other societies and that high trust was more likely to be found in small open economies. At this point we wish to add tentatively that economic freedom will be found to be greater in these same small open societies; and that better inflation performance should be found in the economies with greater economic freedom. This would remain conjecture were it not for the recent

availability of an historical index of economic freedom produced by Leandro Prados. There are some such indexes that cover the second half of the twentieth century. Prados has extended these back to the middle of the nineteenth century. That allows us at least to make a start on testing the hypothesis. All the cautions on the indexes apply as usual.

The main caution to bear in mind in this case is that the indexes of economic freedom are constructed using many of the indicators that we have used implicitly for high trust societies. We would in any case expect freedom to be associated with small open economies and so expect some confirmation of the previous results.

The first step was to examine the rank correlations for economic freedom and inflation in our four sub-periods. The results are not strong but in three of the four sub-periods a negative sign is obtained. That is, if you like, a positive! It is what we expect. The less economic freedom there is the more inflation there is. The relationship is strongest of all in the 1953-1978 period, something to which we return.

We next calculated correlation coefficients for the raw annual data. Again it was for the second half of the twentieth century that the strongest results were found. In fact stronger results were found for both periods: 1953-1978 was $-.875$ and 1983-2008 was $-.287$. These results are broadly supportive of our earlier position but we would not want to make too much of them. They do raise a number of questions. Our first conjecture at this stage is that the period 1953-1978 was one generally of financial repression with exchange controls in

particular being highly restrictive. And with the Bretton Woods arrangements in place together these might explain much of the better inflation performance.

As far as the earlier periods go it could be argued that for the interwar years there was greatly diminished economic freedom and that the mix of hyperinflation and deflation experience distorts the overall results. For the gold standard years again inflation was pinned down and not necessarily closely related to economic freedom.

Some Examples of Contracts.

In this section we examine the contracts of individual central banks that are of particular interest. These banks all highlight the importance of the circumstances in which central banks gain their independence, and support further our suspicion of the notion of the independent central banker as a deus ex machina who regardless of where he is delivers the desired objective of low inflation.

We start with New Zealand, the country and bank which pioneered the revival of central bank independence in the late 20th century. One would expect New Zealand to be a relatively high trust society. It is small (the population about half that of London although scattered over an area of land a little bigger than that of Britain), it is isolated, and its population did, with the exception of the fairly small minority, come primarily from a society with a high degree of trust¹⁰. Does that country have a loosely drawn central bank contract? In fact the

¹⁰ One of the authors can advance an anecdote to support New Zealand's being a high trust society. Fairly recently one of us (Wood) while working in the New Zealand Treasury took a flight from Wellington to Auckland along with one of his then colleagues. Airport security comprised of the passengers and airport staff greeting each other by name, and enquiring about various developments in respective families. Wood was introduced by his locally known colleague, and accorded the same treatment.

answer is an emphatic no. For details of the contract see Capie and Wood (1994, op cit) or Wood (1994). But although New Zealand is we maintain a high trust society in general, when the contract was put in place (1989) it was a low trust society as far as monetary policy went. For the preceding government had become notorious for the politicisation of all aspects of economic policy, including monetary policy, and there was strong desire to ensure that could not readily be done again. The contract was drawn tightly and in a way manifestly intended to make government interference in monetary policy not impossible – that would be undesirable in a democracy – but certainly difficult.

Britain is interesting as an example of a society which, while not low trust by any means, did not satisfy the conditions expected to be a high trust one either. It is an “intermediate” case. The central bank contract there was at least initially comparatively loosely drawn. There was an inflation target, with bands around it, but the only explicit penalty for failure was that the Governor of the Bank had to enter into an exchange of letters with the Chancellor of the Exchequer, in which the Governor explained the failure and what it was proposed to do about it, and to which the Chancellor then replied letting the Governor know if he approved of the proposal for correction. Again, though, note the circumstances. Policy was being taken away from those, the politicians, who were seen as largely responsible for previous failures, and given to a group with clean hands, and which had, indeed, performed well in the central bank capacity of maintaining financial stability, an area of work where it had been untroubled by government. (Further, that the Bank had its contract modified after the recent crisis is we have argued (Capie and Wood, 2014) actually due to the Bank’s not making adequate use of its freedom, and only reluctantly using its Lender of Last Resort capacity.)

Australia provides a slightly different example. The Reserve Bank of Australia was founded in 1959 but it had a forerunner in the Commonwealth Bank which

had been founded in 1911. There had long been a desire in Australia in the nineteenth century to have an institution similar to the Bank of England. The banking crises of the early 1890s provided a reason and the circumstances were more favourable after Federation in 1901. The Commonwealth Bank is generally reckoned to have been a central bank before the First World War. After 1920 when it had responsibility for the note issue it even more closely resembled the Bank of England. It was 1959 though before the central banking functions were separated from the commercial banking functions. The Reserve Bank nevertheless remained subordinate to the Treasury until the 1980s after which it can be regarded as independent.

The Australian central banking story for the period after the Second World War reads much like that for the United Kingdom. Wartime controls were continued as a means of keeping inflation down, together with the supposed anchor of the pegged exchange rate. Like many other OECD countries Australia enjoyed great prosperity during the 'Golden era' but the seeds were sown in the 1960s for the stagflation of the 1970s. There followed a period until the 1990s during which policy lacked coordination. There was a slow acceptance of the need for monetary discipline. Monetary targeting was adopted after 1976 (and abandoned in 1985). By the late 1980s the Bank was being criticised for allowing an asset bubble to develop, for lacking a clear monetary framework, and being insufficiently independent to carry out monetary policy.

By the early 1990s the requisite independence was acquired, inflation was brought under control and inflation targeting was being followed. (Cornish, 2010) This independence has survived.

Our inclination is to put Australia in the high trust category (in stark contrast to the U.S. with its rules and litigation). There is co-operation between the RBA

and the APRA consistent with institutions being more resilient when shocks occur.

The genesis of central banking in Spain follows a very well-established pattern, one by which a government in desperate need of funds could not resort yet again to national or international creditors and opted for establishing a new bank to finance its obligations. The origins¹¹ of the *Banco de España* are in the last quarter of the eighteenth century, during the Anglo-French war years, when Spain aligned with France and faced extraordinary war payments. To facilitate the access to new borrowing, a new bank, the *Banco de San Carlos*, whose primary function was the redemption of the new public bonds issued to cover war expenses was given a royal charter. The *Banco de San Carlos* can in fact mainly be viewed as just the *bank of the Government* and it was not until much later that the central bank started to provide other financial services to the economy.

The costs of the Napoleonic war and the run of a succession of budget deficits led to an accumulation of public debt in the balance sheet of the Bank that the State was clearly unable to honour; the Bank was finally liquidated in 1829. A new Bank, *Banco de San Fernando*, was established that was in effect just a continuation of the *Banco de San Carlos* and thus its main function was still to act as the bank of the State. Following what had happened many times before in

11 For the 18th and 19th centuries we have mainly followed Tortella's (1994) excellent work on the origins and development of central banking in Spain. More details can be found in Tedde (1988) and Tedde and Marichal (1994).

many other countries (including Britain), in exchange the *Banco de San Fernando* was granted the monopoly of note issue in Madrid. After many travails and different names the bank was finally renamed as the *Banco de España* in 1856.

Even though a private bank, the *Banco de España* remained under the influence of the Government, which appointed the Governor, and its main activity was the provision of credit to the State. Given the weak fiscal position of the State, the need for more borrowing from the Bank continued. With the preparations to join the Latin Monetary Union, Spain launched the Peseta as the national currency in 1868 and adopted a bimetallic monetary system; however, the successive running of both public and trade deficits led to the abandonment of gold (but not silver) convertibility very soon in 1883.

The modernisation of the Bank came as a result of the 1921 Banking Act. Rather than financing the State by purchasing its debt directly, private banks (a select group of them) were given more advantageous credit facilities from the *Banco de España* if they used public bonds as collateral. At the same time, the establishment of new commercial banks was restricted and new supervisory powers were given to the *Banco de España*. The central bank was expected to provide regular lending to the banking sector. And indeed, very soon the Bank had to intervene in the markets and acted as the lender of last resort in the 1931 financial crisis.

After the civil war (1936-1939), with the new 1946 Banking Act the Bank lost almost all its powers and autonomy and became fully dependent on General Franco's government. From 1946 to 1962 the Bank was just an instrument in the hands of a very interventionist government aimed at managing the economy, via the imposition of interest rates and capital and bank controls. With the new

1962 Act the Bank, even though nationalised, resumed some of its lost competences and independence particularly in relation to monetary policy. As a result of three successive new acts (1971, 1980 and 1988) the Bank achieved even more autonomy in relation to the implementation of monetary policy decisions and was given more supervisory powers of both saving and commercial banks.

In 1994, in fulfilment of one of the requisites to join European Monetary Union, the Bank was granted full independence in relation to the implementation of monetary policy and the provision of credit to the Government was prohibited. In 1998 the *Banco de España* joined the European System of Central Banks and the country adopted the euro as the national currency and finally has delegated its monetary sovereignty since January, 1st 1999.

Note then that in the Spanish case the evolution of the Bank of Spain and of its constitution closely reflect what is going on in the country. Initially the creature of government, a succession of wars external and internal, followed by many years of highly centralised, perhaps authoritarian, government led to a central bank which became independent of government ultimately only as a result of external pressures. There was no prospect here of an independent central bank emerging to provide low inflation. It was conferred by a *deus ex machine*. The political background over-rode openness and size. One can only conjecture whether if allowed enough time the new political culture in Spain would have allowed independence.

Finally but briefly, to the Norwegian experience. Norway is certainly a small economy and by the measures we have used is a very open economy. The Norges Bank Act of 1816 established the Bank as one whose main purpose was

issuing the currency, which was convertible into silver. While the governing members were appointed by Parliament the ultimate authority over the discount rate rested with the Bank. Over the nineteenth century the Bank's commercial activities gradually diminished and it took on responsibility for the banking system though it did not supervise or regulate it, that being done by other bodies.

In 1873 Norway adopted the gold standard and in 1875 joined the Scandinavian Currency Union. In 1892 the Norges Bank Act was revised with the Bank of England as model. Norges Bank then played its part as lender of last resort in the severe financial crisis of 1899. Across the nineteenth century and beyond the Bank's room for independent action was limited. It would have to be classified as dependent.

In 1914 the gold standard was abandoned and then re-established in 1928 before being abandoned again in the Great Depression in 1931. German occupation in wartime paved the way for considerable inflation after the war which in turn reduced the Bank's policy-making authority further. Government took control of interest-rate policy and the discount rate. Nationalisation followed in 1949 and in 1965 a new Act established that interest rates and credit volumes were to be regulated by government. We leave the detailed history and analysis of central bank independence here to those who have all the essential skills, including the ability to read Norwegian. We note only that independence has survived.

Conclusions

Low inflation is clearly associated with independent central banks. But why? The Barro and Gordon (1983) explanation based on the notion of time inconsistency is a common one, and is implicit in Romer's (op.cit.) explanation of why many small open economies have low inflation. Other influences may also matter, however, and this may well be fortunate, as that explanation requires policy makers to have considerable economic knowledge – perhaps more than may actually exist – about economies and how they respond, and how quickly they respond, to policy changes.

We support Romer in his finding of small open economies often being low inflation economies by an explanation additional to and independent of his. Independent central banks tend to be more durable in their independence in such economies because these economies have the option of being, and often are, high trust societies. These allow the writing of simple, and therefore less affected by shocks, central bank contracts, and as Friedman argued many years ago in his pioneering discussion of central bank independence, central banks need a set of instructions and that takes the form of a contract.

This emphasis on the notion that the kind of central bank contract that a society has is in part endogenous to the nature of a society is reinforced by our discussion of four special cases all of which show that contracts depend substantially on the circumstances in which they came about.

Accordingly, we conclude with some confidence that central bank independence is much more likely to be durable in small open economies than in large economies, regardless of the degree of openness of the latter. This can be further tested when banking systems and the central banks at the heart of them have settled down after the recent crisis – but that is still some time off.

Appendix One: Free Banking in a High Trust Society?

As so often, some work by Milton Friedman provides an insight into this matter. In his 1960 lectures published as A Program for Monetary Stability he discusses (pages 4- 9 of the 1983 reprint), whether government should have any role in “monetary and banking questions”.. He starts from a “...pure commodity standard, which at first sight seems to require no government intervention”. (p.4)

He goes on to observe that governments often got involved in such a standard by being assigned or assuming “the function of stamping the weight or fineness of the metal”, although it could be done privately. Keeping such a standard purely metallic, however, involves considerable resource use (see pages 5-6 of the volume for his calculations), so a fiduciary element is introduced. Now, he observes, there is a role for the government to enforce the convertibility contracts. If the currency evolves further, to a purely fiduciary one, then over-issue would lead to a situation where it was once again a “purely commodity standard”, as there was “...no equilibrium price level short of that at which the money value of currency is no greater than that of the paper it contains”. (p 7) Hence he concludes that there must be an “external limit” to maintain the value of such a fiduciary currency, because “...competition does not provide an effective limit”.

Note that this conclusion depends crucially on the assumption that without a law to constrain over – issue, it will occur because “...any individual issuer has an incentive to issue additional amounts”. That is the essence of his argument. Individuals are not bound by any convention not to over-issue. This seems to imply that in a high trust, convention based, society, free banking could function – but only in such a society. Whether a Lender of Last Resort would be needed is an interesting additional speculation. Banks would still fail in such a

society. Such failures would all be honest mistakes. But that seems to us not necessarily to suggest that there would not be contagion: rational (but not perfectly informed) individuals could fear a failure was the first signal of a common shock¹².

Appendix Two: Studies of Small Open Economies

Stanley Fischer's introduction to the volume edited by Braude suggests there are ten lessons which central bankers should derive from the recent crisis. One is unexceptionable. In a crisis, do not panic. But otherwise, Fischer's lively introduction does not relate particularly to the kind of economies discussed in the book.

Huw Pil and Frank Smets make three observations relevant to our work: "malfunctioning" of capital markets has contributed to the length and depth of the current recession, and that dealing with these malfunctions will help recovery: second, that the "solid anchoring" of inflation expectations was stabilising in the crisis, and that therefore not only should price stability remain the focus of monetary policy but that it is worth considering moving to a target which does not automatically forgive previous target misses: and third that as financial imbalances contributed to the bust as well as the boom, monetary policy should pay heed to monetary and credit aggregates so as to avoid contributing to future imbalances. The second of these points directs attention to how best to anchor price expectations in open economies and to the benefits of doing so, and the third to the problems (as well as benefits) that international capital flows can bring.

On the question of capital flows Jonathan Ostry concludes that controls may occasionally enable the best to be made of a bad job. That far from ringing

¹² It should be observed that Selgin (1988) and White (1995) differ from this conclusion.

endorsement can probably be accepted as justifying a few special cases. But what policy response should there be to sudden stops in external capital flows? The lesson he draws is an important one – “...an economy that follows prudent macroeconomic policies...tends to be in a better relative position to cope with the adverse consequences of a financial crisis”. (p. 213) (As Robert Mundell put it, ‘... there is no such thing as a bad capital movement only bad exchange-rate systems’) So again, domestic policies are important in very open economies.

The book contains several case studies of small open economies - Australia, Norway, Israel, and Ireland. The chapter on Norway is perhaps the most instructive of the case studies. There is lots of information on a country and its banking system about which most readers will know little. Of particular interest is the “flexible inflation target” framework for monetary policy. The policy is very transparent, and forecasts are published in detail – in particular a conditional interest rate forecast is published. This degree of detail and transparency, if well communicated, is surely very helpful in forming and cementing expectations. This opens up discussion of the benefits that may accompany being small – maybe small highly educated democracies do have some special features which affect how their economies behave. This leads us to our discussion of why this may be the case.

In summary, the book reinforces our opening conjecture that in some respects small open economies are “special”.

Appendix Three

Table 1: GDP Levels

(in million 1990 International Geary-Khamis dollars)

Sources: Data from the original A. Maddison dataset (at the *Groningen Growth & Development Centre* website)

	Belgium	France	Germany	Italy	Netherlands	Norway	Sweden	Switz.	UK
1890	20,896	95,074	115,581	52,863	15,070	3,414	8,456	9,389	150,269
1895	22,611	103,021	135,279	52,027	16,015	3,672	9,611	10,861	161,500
1900	25,069	116,747	162,335	60,114	17,604	4,185	11,303	12,649	184,861
1905	27,851	118,336	182,034	69,477	19,953	4,369	12,488	13,543	194,295
1910	30,471	122,238	210,513	85,285	22,438	5,211	15,265	16,177	207,098
1913	32,347	144,489	237,332	95,487	24,955	5,988	17,273	16,483	224,618
1919	25,854	108,800	156,591	105,980	28,049	6,773	17,129	15,707	226,640
1924	35,743	168,474	200,557	107,312	35,561	7,410	20,514	19,631	221,024
1929	40,595	194,193	262,284	125,180	44,270	9,468	25,338	25,466	251,348
1934	38,202	175,843	256,220	121,826	40,078	10,456	28,217	24,642	261,680
1938	40,466	187,402	342,351	143,981	45,593	12,514	33,821	26,785	297,619
1948	42,989	180,611	190,695	142,074	53,804	16,466	44,037	41,768	337,376
1953	51,071	247,223	341,150	204,288	68,652	20,116	50,505	48,001	371,646
1958	58,316	312,966	481,599	265,192	83,701	23,436	59,605	58,732	411,450
1963	72,988	408,090	623,382	371,822	105,686	29,265	76,200	79,370	490,625
1968	90,293	523,967	755,463	482,462	138,627	36,476	95,229	94,272	574,775
1973	118,516	683,965	944,755	582,713	175,791	44,852	114,064	117,251	675,941
1978	133,231	777,544	1,050,404	678,494	201,024	56,173	119,985	111,847	720,501
1983	142,648	852,644	1,119,394	758,360	208,014	64,551	127,742	120,659	755,779
1988	160,632	961,287	1,260,983	880,671	236,824	76,006	145,926	135,709	920,841
1993	175,552	1,048,641	1,350,421	937,303	271,352	86,129	144,709	145,387	955,305
1998	197,587	1,163,069	1,478,795	1,026,365	323,975	106,995	168,815	155,651	1,123,047
2003	219,074	1,298,819	1,572,784	1,107,193	360,759	117,891	194,945	165,515	1,289,685
2008	246,103	1,423,562	1,713,405	1,157,636	411,055	132,365	220,781	190,328	1,446,959

(Table 1, cont.)

	Spain	Australia	N.Zealand	Canada	US	Japan	Taiwan	Singapore
1890	28,839	13,850	2,497	11,697	214,714	40,556		
1895	30,668	12,066	2,677	12,256	254,552	46,933		
1900	33,164	15,014	3,469	15,887	312,499	52,020		
1905	34,005	17,145	4,457	21,962	390,624	54,170	1,738	
1910	37,633	22,793	5,556	29,225	460,471	64,559	2,509	
1913	41,653	24,861	5,781	34,916	517,383	71,653	2,545	413
1919	43,112	24,488	6,313	34,357	599,130	100,959	3,210	
1924	51,443	31,524	6,943	37,360	713,989	107,766	4,254	
1929	63,570	33,662	7,741	52,199	843,334	128,116	5,028	
1934	62,231	33,810	7,400	40,712	649,316	142,876	5,795	
1938	45,255	40,639	10,365	52,060	799,357	176,051	7,252	
1948	59,970	53,754	12,701	93,121	1,334,331	138,290	4,668	
1953	72,806	66,481	16,084	121,228	1,699,970	216,889	9,029	2,758
1958	94,829	82,351	20,957	149,021	1,859,088	303,857	12,923	3,485
1963	130,477	103,413	25,749	185,041	2,316,765	496,514	18,534	4,848
1968	185,747	134,913	29,095	242,703	2,983,081	813,984	30,423	7,123
1973	266,896	172,314	37,177	312,176	3,536,622	1,242,932	53,284	13,108
1978	332,597	196,184	38,097	376,894	4,089,548	1,446,165	80,608	18,245
1983	361,902	218,539	42,955	409,246	4,433,129	1,706,380	111,545	27,695
1988	431,389	274,737	46,435	510,815	5,512,845	2,107,060	175,747	36,491
1993	485,899	314,360	49,627	529,921	6,146,210	2,428,242	248,023	55,404
1998	568,115	390,635	57,449	629,755	7,413,357	2,558,595	334,622	77,549
2003	686,076	461,200	69,243	746,491	8,431,121	2,686,224	391,261	93,910
2008	797,927	531,503	77,840	839,199	9,485,136	2,904,141	479,645	129,521

Table 2**Inflation (year on year rate of growth of CPI, %)**

Notes: Own calculations of inflation based on data on the price level from Mitchell's *International Historical Statistics* volumes: On Africa, Asia and Oceania, 2003; The Americas, 1998; and Europe 1998, unless indicated. Updated from the mid 90s onwards from the IMF's *World Economic Outlook* (April, 2013) database (accessed online), as well as other national statistics offices. See exceptions and further details on the series and sources below.

	Belgium	France	Germany	Italy	Netherlands	Norway	Sweden	Switz.	UK
1890	3.45	0.00	2.74	3.56	1.06	NA	2.56	NA	0.00
1895	-2.44	-1.04	-1.35	-0.56	-3.37	0.00	1.35	0.00	-1.15
1900	12.66	1.06	1.32	0.46	2.38	11.84	1.19	0.00	4.55
1905	2.56	0.00	3.80	0.11	0.00	0.00	2.38	1.19	0.00
1910	2.22	1.03	2.22	2.77	2.75	1.15	0.00	2.13	1.05
1913	-4.76	0.00	0.00	0.20	1.30	3.09	0.00	-0.99	-1.01
1919	NA	20.24	37.24	1.51	8.83	6.90	15.79	8.66	10.05
1924	16.33	10.68	-100.00	3.52	0.90	9.92	-1.90	2.94	-0.53
1929	6.38	3.01	1.01	1.60	-0.93	-4.76	-0.99	0.00	-1.11
1934	-6.17	-10.08	2.60	-5.16	0.00	0.00	0.00	-1.23	0.00
1938	3.57	12.59	1.23	7.68	2.33	3.00	2.08	0.00	1.20
1948	14.39	42.43	5.46	5.88	3.54	-0.61	1.32	2.96	7.61
1953	0.00	-2.07	-1.96	1.95	0.00	2.04	1.01	-0.99	3.05
1958	0.93	8.95	1.87	4.79	1.73	5.36	3.51	1.90	3.20
1963	1.77	5.01	2.54	7.52	3.82	3.08	3.01	3.48	1.89
1968	3.33	5.31	2.17	1.27	3.69	3.53	2.25	2.17	4.65
1973	8.11	8.49	7.21	10.37	7.99	7.02	7.02	8.77	9.10
1978	3.73	9.72	2.74	12.45	4.05	7.87	9.94	1.34	8.30
1983	3.38	9.29	3.26	14.99	2.83	8.48	9.18	2.73	4.59
1988	2.15	3.08	1.01	4.95	0.71	6.73	5.94	1.95	4.91
1993	3.31	2.07	4.44	4.20	2.06	2.44	4.63	3.19	1.59
1998	0.91	0.27	0.94	1.80	1.92	2.27	-0.27	0.02	3.43
2003	1.51	2.16	1.05	2.46	2.14	2.48	1.92	0.64	2.89
2008	4.49	1.00	2.63	3.23	2.49	3.77	3.44	2.43	3.97

(Table 2, cont.)

	Spain	Australia	N. Zealand	Canada	US	Japan	Taiwan	Singapore
1890	1.05	0.00	NA	1.22	0.00	4.70	(1900 on)	(1963 on)
1895	1.88	-3.45	-1.72	-1.65	-3.85	1.14		
1900	3.43	-5.00	1.79	8.09	0.00	3.86	12.82	
1905	-2.37	5.08	6.90	2.15	0.00	14.98	4.85	
1910	-1.43	3.08	1.85	2.47	0.00	4.04	8.20	
1913	2.55	8.45	1.79	-12.99	2.41	3.87	-3.23	
1919	6.62	7.22	7.22	13.00	14.86	13.44	24.23	
1924	5.81	0.00	0.00	0.00	0.20	0.00	6.90	
1929	1.06	0.91	0.91	0.00	0.00	-1.09	0.95	
1934	6.40	0.00	0.00	0.00	3.35	2.74	2.30	
1938	13.73	2.04	2.04	2.22	-1.86	14.94	5.61	
1948	7.64	8.71	7.81	15.65	7.77	83.43	562.94	
1953	8.12	4.14	4.50	-1.75	0.75	6.65	12.99	
1958	11.76	1.37	4.59	2.30	2.73	-0.36	1.50	
1963	7.69	0.62	1.94	1.60	1.21	7.47	0.59	2.21
1968	4.95	2.74	4.32	4.27	4.20	5.15	6.02	0.71
1973	11.58	9.64	8.25	5.49	6.23	11.65	24.05	26.28
1978	20.09	7.92	12.11	9.14	7.66	4.14	7.65	4.72
1983	12.10	10.15	7.37	8.37	3.22	1.81	-1.19	1.04
1988	5.40	6.12	4.97	4.14	4.08	0.70	1.10	1.52
1993	4.65	1.25	0.86	2.12	2.95	1.16	4.63	2.29
1998	2.27	0.86	1.27	1.12	1.56	0.67	2.11	-0.27
2003	3.10	2.73	1.75	4.48	2.28	-0.25	-0.06	0.49
2008	4.13	4.35	3.96	2.10	3.84	1.38	1.26	6.61

Further notes: Belgium data updated from 1994 onwards from the IMF. Germany: CPI data from the Statistisches Bundesamt and the German Institute for Statistics (Destatis). Updated from the IMF data from 2008. France (Global Financial Data). Italy, from the Italian National Institute of Statistics (ISTAT). The Netherlands: (1880-1900) from Mitchell's, (1901 onwards) from the Dutch national bureau of statistics (CBS). For the UK we have used the Retail Price Index: (1) (1880 to 1987) from O' Donoghue's "Consumer price inflation since 1750", in Economic Trends no. 604, March 2004 and (2) (1988 -) from the Office for National Statistics. For Spain (1850 to 2000) prices data corresponds to (1) the GDP deflator as estimated by Prados' (2003) and (2) the CPI (2000 onwards) from IMF. For New Zealand: (1) (1891 to 1907) prices corresponds to Mitchell's wholesale prices, then CPI prices. (2) 1994 on from IMF. Canada (Global financial Data): (1848-1912) wholesale prices and CPI from 1914 onwards. For the US: (1) From 1913 onwards from the US Bureau of Labor Statistics Consumer Price Index; (2) for earlier periods data from the Historical Statistics of the United States. (3) From 2010 onwards: IMF. For Japan: (1880-1922), Mitchell's wholesale prices; (1923-1946) RPI in Tokyo. From 1994 on from IMF, Global Insight and Nomura database. Taiwan: (1900-1903) from Global Financial Data; (1904-1993) from Mitchell's and from 1994 onwards the IMF. Singapore: (1961-1979) from Mitchell's and from 1980 onwards the IMF.

Table 3 Degree of openness (%)
 $((X + M)/2/\text{Nominal GDP}) \times 100$

Sources: Data on exports (X) and imports (M) of goods and nominal GDP extracted from Global Financial Data; with the exception of the US international trade data: (1879-1956) from NBER Macro History Data (accessed online), (1957 on) from Global Financial Data. As to Spain, France and The Netherlands: updated from 2005 onwards with Eurostat data.

Notes: Only tradable goods included in both exports and imports data. France 1919 data corresponds to 1920.

	Belgium	France	Germany	Italy	Netherlands	Norway	Sweden	Switz.	UK
1890	(1913 on)	15.81	17.19	16.35	103.36	22.54	22.50	(1929 on)	22.74
1895			15.88	17.24	116.45	22.37	20.50		20.18
1900		14.83	17.37	19.64	134.15	22.44	20.28		20.07
1905			18.03	21.23	143.71	24.80	20.13		20.96
1910		17.88	19.47	23.83	158.33	24.68	17.26		23.71
1913	92.17		21.67	23.18	155.75	26.31	20.16		24.29
1919	NA	21.20	NA	26.95	41.39	28.09	18.63		18.03
1924	68.95	16.95	NA	22.78	39.30	24.14	16.93		24.03
1929	NA	12.31	18.39	21.38	39.45	21.72	18.07	24.15	20.72
1934	38.49	7.15	7.28	11.47	20.51	16.71	14.31	14.05	12.59
1938	46.90	8.59	5.98	12.70	25.28	17.57	16.04	16.48	12.60
1948	32.54	7.02	NA	17.15	29.66	21.51	15.26	22.41	15.92
1953	27.12	9.43	16.67	18.58	44.33	24.97	17.81	21.50	17.74
1958	30.17	9.22	16.12	18.59	45.47	25.12	18.51	21.86	15.67
1963	36.06	10.33	14.38	23.04	47.39	22.64	18.75	23.83	15.40
1968	39.92	10.81	16.89	26.37	43.53	26.02	18.54	24.48	16.43
1973	48.43	14.80	17.02	29.26	46.64	28.22	22.20	25.59	18.66
1978	48.02	15.98	19.68	36.91	41.20	24.30	23.15	27.72	22.10
1983	63.92	18.17	24.58	35.40	50.40	25.91	27.41	26.03	20.62
1988	59.12	17.22	24.07	30.67	42.02	22.79	24.56	27.01	19.59
1993	55.08	16.00	18.12	30.93	40.28	23.61	22.92	23.07	19.43
1998	69.92	19.95	22.70	36.91	48.23	25.75	30.14	26.71	19.81
2003	78.48	20.50	26.90	19.66	45.58	23.75	29.15	28.24	18.24
2008	92.66	22.79	37.03	23.84	57.16	28.42	35.77	36.88	20.07

(Table 3, cont.)

	Spain	Australia	N. Zealand	Canada	US	Japan	Taiwan	Singapore
1890	9.74	15.63	(1931 on)	15.53	6.35	6.20	(1961 on)	(1957 on)
1895	9.44	23.48		18.00	5.80	8.04		
1900	11.26	24.23		21.39	6.11	9.86		
1905	10.96	20.25		20.24	5.55	12.79		
1910	10.04	20.56		19.05	4.82	12.27		
1913	11.36	18.62		20.93	5.35	14.20		
1919	10.69	16.88		28.25	6.97	14.88		
1924	9.47	15.62		22.16	4.90	15.35		
1929	9.09	15.71		20.29	4.61	15.53		
1934	5.78	13.42	43.18	14.68	2.84	18.37		
1938	NA	14.49	34.48	14.55	2.89	14.43		
1948	3.35	23.26	27.91	19.19	3.52	2.15		
1953	2.15	17.98	25.33	16.52	2.99	9.45		
1958	6.32	13.62	23.02	14.21	3.25	8.80		157.97
1963	7.95	12.60	19.91	14.03	3.20	8.17	16.51	138.10
1968	9.14	11.68	19.17	17.04	3.59	8.13	19.93	102.86
1973	10.29	11.04	19.05	18.21	4.90	8.49	37.56	103.09
1978	10.78	12.00	20.53	21.32	6.64	8.84	43.58	143.75
1983	15.05	11.80	23.11	20.32	6.20	11.39	42.85	139.40
1988	14.08	12.98	18.44	21.79	7.22	7.61	45.32	156.96
1993	14.08	14.49	23.32	24.82	7.60	6.93	35.35	135.40
1998	20.12	16.18	21.86	33.69	9.05	8.52	41.03	129.66
2003	20.55	15.22	21.44	27.97	8.58	9.91	44.35	145.92
2008	21.68	19.41	24.54	31.32	11.88	15.03	61.62	169.57

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