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THE CURRENCY SYSTEMS OF THE UNITED KINGDOM PERIPHERY

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Johns Hopkins Institute for Applied Economics,
Global Health, and Study of Business Enterprise

The Currency Systems of the United Kingdom Periphery

By Brandon Dixon

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About the series

The *Studies in Applied Economics* series is under the general direction of Professor Steve H. Hanke, Co-Director of the Institute for Applied Economics, Global Health, and Study of Business Enterprise (hanke@jhu.edu).

This working paper is one in a series on currency boards. The currency board working papers will fill gaps in the history, statistics, and scholarship of the subject.

About the author

Brandon Dixon is a second-year student at the University of Chicago, where he plans to double major in economics and mathematics. In addition to his studies, Brandon throws for the University of Chicago's varsity track and field team. He wrote this paper while working during the summer of 2014 as a Research Assistant at the Institute for Applied Economics, Global Health, and the Study of Business Enterprise at Johns Hopkins University. He wishes to commit his career to furthering the understanding of various economic processes and markets through an obligation to mathematical rigor and design.

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Summary

In and around the United Kingdom, local monetary issuers separate from those of the Bank of England exist in Scotland, Northern Ireland, the Isle of Man, Guernsey, and Jersey. I briefly summarize the history of these arrangements and examine whether they are currency boards. To test whether they are, I use three measures—the reserve ratio, the annual change correlation, and reserve pass-through—as well as an analysis of institutional arrangements.

Keywords: United Kingdom, Great Britain, Scotland, Northern Ireland, Isle of Man, Guernsey, Jersey, note issue, coins, currency board.
JEL codes: E59.

Introduction

This paper assesses the currency systems of Scotland, Northern Ireland, the Isle of Man, Guernsey, and Jersey. Scotland and Northern Ireland are part of the United Kingdom. The Isle of Man, Guernsey, and Jersey are not part of the United Kingdom but are possessions of the British Crown; the British government can legislate for them and it manages their foreign affairs and defense. These states, all of which have a history intertwined with England, continue to have locally issued notes (in Scotland and Northern Ireland) or notes and coins (in the Isle of Man, Guernsey, and Jersey) at parity with the pound sterling issued by the Bank of England and the Royal Mint. This means that any person in possession of a local pound can exchange it for a pound sterling at one-to-one. To ensure the functioning of such a program, the resident governments have provided legislation as to entice a 100 percent backing of all local notes and coins in circulation in the form of low-risk "foreign" assets, largely or entirely held in sterling.

By fixing local currency to the pound sterling and legislating a 100 percent minimum reserve requirement, these monetary regimes seem to resemble currency board systems; however, to determine whether they maintain currency board orthodoxy, we must examine the relationship between the monetary base—the state's ultimate financial unit of debt settlement—and the foreign reserves.

In an orthodox currency board system, local money in circulation (to be precise, the monetary base) is closely tied to demand: it expands if and only if people trade their holdings of the anchor currency for local currency. It follows, then, that when the economy gains local money in circulation, the currency board's reserve fund also gains, hence an increase in one correlates with an increase in the other. Symmetrically, a decrease in one correlates with a decrease in the other.

Accordingly, this paper applies several tests to judge whether the currency systems of Scotland, Northern Ireland, the Isle of Man, Guernsey, and Jersey comply with this mechanical relationship.

(1) Is the exchange rate rigid, as in an orthodox currency board? All the systems examined have rigid exchange rates with the pound sterling.

(2) Are there any exchange controls with the anchor currency? An orthodox currency board has no such controls, and neither do any of the systems examined.

(3) From the standpoint of the jurisdiction under consideration, is the monetary base set through the nondiscretionary workings of market forces, or in a discretionary manner by a local monetary authority?

(4) What is the ratio of foreign reserves to the monetary base? In an orthodox currency board system, it is at least 100 percent; however, this ratio does not exceed an upper

bound, typically no greater than 115 percent. This ensures that the monetary authority does not sterilize inflows of foreign reserves without limit. The purpose of the modest reserve in excess of 100 percent is to insure against depreciation of the currency board's assets, so that in practice they never fall below 100 percent (Hanke 2002: 205). To check, I apply a simple reserve ratio, dividing the reserve fund at the end of the financial year by the contemporaneous total value of local notes and coins in circulation. Readers should be aware that in Hong Kong and some other cases, governments have commingled external reserves held against currency in circulation with other external reserves, such as those arising from government budget surpluses. Such arrangements make it harder to separate changes in foreign reserves arising from monetary factors from changes arising from nonmonetary factors.

(5) Does the monetary base rise and fall with changes in foreign reserves? In an orthodox currency board, a positive value in the annual change of the local currency—an expansion of the notes and coin in circulation (plus deposits at the currency board, if any)—matches a positive value in the annual change of the reserve fund. Necessarily, it follows that a negative value in the annual change of the local currency—a contraction of the notes and coins in circulation—matches a negative value in the annual change of the reserve fund (Hanke 2008: 56-58). A way to test for this effect is to measure "reserve pass-through": the ratio of the change in the local monetary base divided by the change in the foreign reserves during a period. The reserve pass-through allows us to distinguish among sterilization of foreign reserve inflows or outflows—as indicated by values between zero and 100 percent; magnified reserve effects—values above 100 percent; and super sterilization—values less than zero.

An orthodox currency board, in principle, should maintain a reserve pass-through ratio of 100 percent. In practice, confounding factors exist that create "noise" in the test. One is the timing of income or expenses. If certain expenses are paid quarterly, then the end-of-quarter months will show a bigger drop in reserves than other months in the quarter. A way to handle the problem is to calculate reserve pass-through on a year-over-year basis, which should eliminate ordinary seasonal factors. Another confounding factor is interest earnings. A currency board where the monetary base is unchanged but interest earnings are 3 percent will appear to have a ratio of zero divided by the amount of interest earnings. Yet another confounding factor is changes in the value of assets. If assets are assessed at their market value, they may rise or fall in value even if there is no, or little to no, change in the monetary base. Because of these confounding factors, as a rough-and-ready rule, it is reasonable to establish a band around the 100 percent central value. Following the advice of experienced researchers on currency boards, I will consider the band of probable orthodoxy to be 80 to 120 percent. Even then it should be remembered that there may be one-off accounting changes or temporary deviations from orthodoxy that result in ratios outside the 80 to 120 percent band but do not necessarily disqualify a system from being a currency board.

By examining the legal foundations of the monetary systems in the jurisdictions under scrutiny and applying criteria (3)-(5) to them, we will determine whether they are in fact currency boards.

Scotland

Originally a separate country from England and Wales altogether, Scotland came under the ruling of the same monarch in 1603 with the ascension of King James VI (James I in England) to the throne. Even though James I attempted unification throughout his entire rule, it would take until 1707 with the Act of Union to enforce it. This relationship with England has continued to the present, having recently been reaffirmed in a referendum on September 18, 2014 in which a majority of Scottish voters chose to remain part of the United Kingdom.

Table S-1. Key Legislation on the Scottish Monetary System

Year	Number	Short Title	Significance
1695	Scottish Parliament	Act for Erecting a Bank of Scotland	Established the Bank of Scotland
1707	6 Anne c. 40	Act of Union	United Scotland with England and Wales; ended the Scots pound as a separate currency
1727	Royal warrant, May 31	Royal Bank of Scotland charter	Established the Royal Bank of Scotland as a rival to the Bank of Scotland
1765	5 Geo. III c. 49	Bank Notes Act	Prohibited notes of less than £1 in Scotland
1845	8 & 9 Vict. c. 38	Bank Notes (Scotland) Act	Required Scottish bank notes to be backed 100 percent at the margin by gold and silver reserves
1928	18 & 19 Geo. V c. 13	Currency and Bank Notes Act	Allowed for securities and English notes to back Scottish notes
1971	1971 c. 24	Coinage Act	Allowed only the Royal Mint to produce coins
2009	2009 c. 1	Banking Act	Provided stricter regulation on Scottish note production (namely, daily accountability on English reserves)

Scottish note issue began with the 1695 Act of the Scottish Parliament for Erecting a Bank of Scotland. The Bank of Scotland was founded only a year after the Bank of England and modeled after it in many ways. Before the end of 1695, the Bank of Scotland initiated printing Scotland's own paper currency in response to the deficient supply of hard coinage. With a continued emphasis on independence, the Scottish people had no desire to link their currency with the English pound sterling; however, this mindset begins to transform with the aforementioned Act of Union in 1707 (CSCB n.d.). Scotland adopted the pound sterling as its monetary unit at Scots £12 = £1 sterling. As incentive to unite with England, Scottish government creditors and other persons received an amount of British government securities known as "the Equivalent." In 1727 the "Equivalent Company" formed to represent the interests of the holders of the securities secured a royal warrant establishing the Royal Bank of Scotland. In the same year, the Royal Bank of Scotland opened and issued its own notes in competition with the Bank of

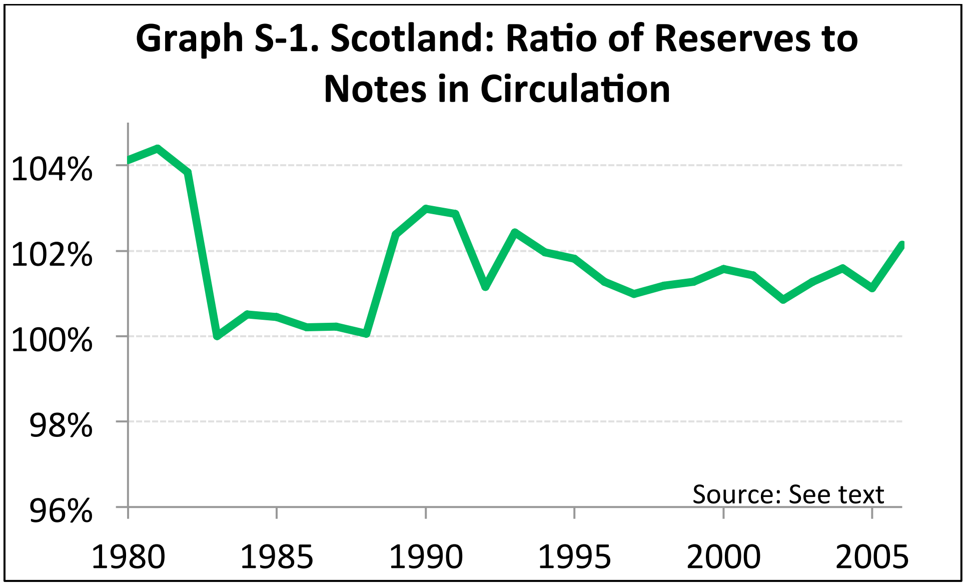
Scotland, beginning an era of "free banking." Other note-issuing banks were established later, although only the British Linen Bank was given a charter like the Bank of Scotland and the Royal Bank of Scotland, limiting the liability of its shareholders. Other Scottish banks operated with unlimited liability until the second half of the 19th century, when it became possible to attain limited liability without a special act of Parliament.

Paper currency only grew in popularity, so much that many small merchants issued notes. There was a belief that it was better for ordinary, poor people to use coins rather than notes for everyday transactions, because coins, issued only by the government and having a metallic value equal or close to their face value, did not carry the risk of default that notes had. The British Parliament's Bank Notes Act of 1765 prohibited notes for less than £1 in Scotland, as well as notes not payable on demand. (An act of 1775 extended the £1 restriction to England and Wales.)

A series of financial crises in England, from which Scotland was largely exempt, provoked extensive debate about currency regulation. The English system was one in which there was a privileged central bank, the Bank of England, having a predominant--though not yet monopoly--role as note issuer. Limits on the number of owners had restricted the size of other English banks, which were also forbidden from issuing notes if they had branches in London. The Scottish system had no bank as privileged as the Bank of England, so it developed a better balanced system of relatively large, strong banks with extensive branch networks that could issue notes anywhere in Scotland. (Cross-border branching between England and Scotland was nearly nonexistent then; it later became commonplace.) In the debate over currency regulation, the proponents of extending the Bank of England's influence won. An 1844 act confirmed the Bank of England as a true central bank, establishing provisions that eventually would lead to all other English banks ceasing to issue notes. The complementary piece of legislation for Scotland was the Bank Notes (Scotland) Act of 1845. It required Scottish banks to back notes in excess of levels at the time the act was passed by external reserves. These reserves were to be held mainly at the Bank of England and would account for a 100 percent backing of the pounds in circulation, averaged and checked every Wednesday. This would remain the protocol until the 2009 Bank Notes (Scotland) Act, which provided increasing transparency to the practice, and whereas previously the reserve requirement was averaged and checked only on a weekly basis, this new regulation enforced a constant 100 percent reserve requirement on all Northern Irish notes in circulation.

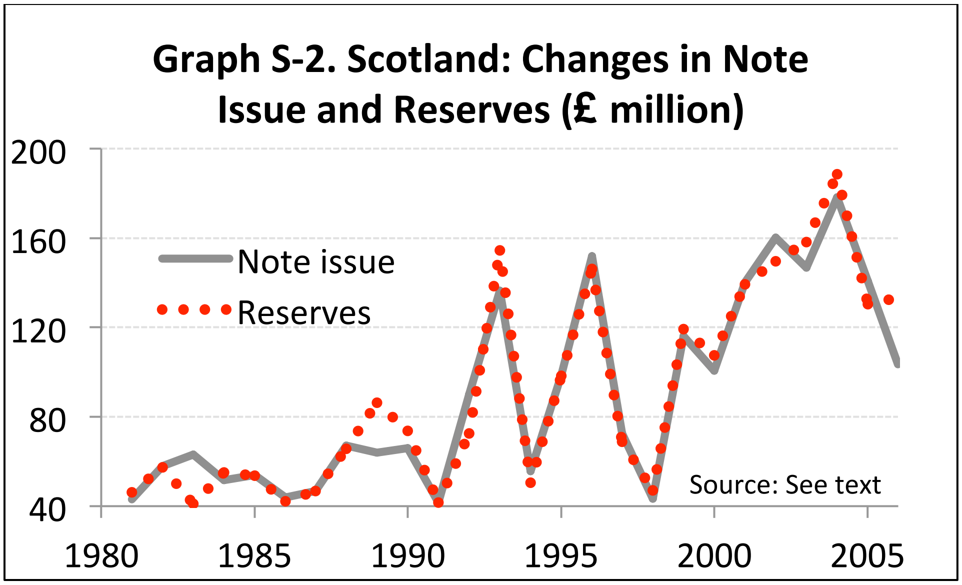
To continue with our understanding of the legal underpinnings of this rather peculiar system, it is important to remark that coins are legal tender throughout the United Kingdom (Royal Mint 2014), but Scottish notes are not legal tender even in Scotland. Nor are Bank of England notes legal tender in Scotland (ACBI 2012), though they are in England and Wales. Despite this, trade in Scotland and even some parts of England regularly employ Scottish notes as means of exchange, and Scotland imposes no limits on the use of Bank of England notes (Bank of England n.d.).

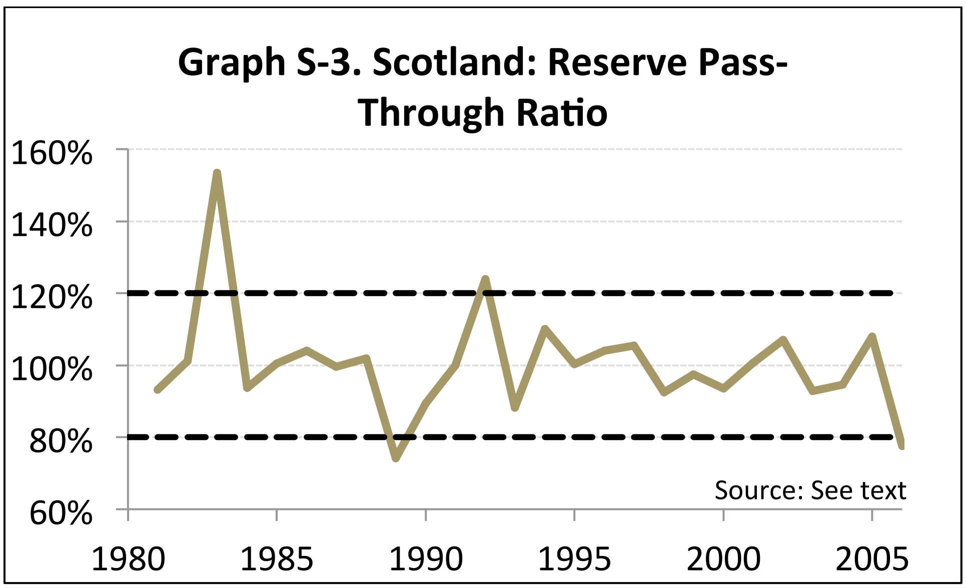
As we have seen, the law requires that external assets back every note circulated by the three Scottish banks that continue to issue notes today: the Bank of Scotland (now part of Lloyds Banking Group), the Royal Bank of Scotland, and the Clydesdale Bank (now part of National Australia Bank Group). As the chart below shows, on the aggregate, the private Scottish banks not only consistently maintain a reserve ratio between 100 percent and 105 percent, but tend towards the 100 percent point that represents the currency board ideal.



In the second graph, as opposed to the annual *levels* we were dealing with previously, the data displayed show aggregate annual *changes* in Scottish bank notes in circulation mapped alongside the aggregate annual change in the reserve accounts providing backing. By simply subtracting each year's aggregate number of notes and aggregate reserve value from the previous year's totals, we may construct the annual change data. As observed, over the course from 1980 to 2006, we see an increase in the number of Scottish notes in circulation consistently matched with an increase in the reserve value. Observe that the change is always positive; there are no year-over-year shrinkages of Scottish notes in circulation, though there may be shrinkages over shorter periods for which I did not collect data.

To illustrate the degree to which Scottish bank note issue may involve sterilization, the figure nearby shows reserve pass-through. To repeat, for reasons discussed above the orthodox ratio is not considered to be 100 percent, but a band of 80-120 percent. Although the previous graph showed no deviation from orthodox currency board practice, this graph shows reserve pass-through considerably above the band in 1983 at 153 percent with lesser deviations in 1989 (74 percent), 1992 (124 percent), and 2006 (78 percent). It would take further research to determine whether there might be special factors accounting for the deviations.





So, is Scotland a currency board or not? Of the five considerations mentioned at the start, Scotland clearly meets three: rigid exchange rate, no exchange controls with England, and external reserves close to 100 percent. It mostly meets the fourth consideration, reserve pass-through "close" to 100 percent, but not completely. That leaves the fifth consideration, namely, whether the monetary base is set through the nondiscretionary workings of market forces (as in a currency board system) or in a discretionary manner by a local monetary authority (as under central banking). Here, both the law and market practice say that it is a central banking system, though with some unusual features. To repeat, under the Act of Union Scotland and England have had the same currency since 1707. Scottish bank notes are denominated in pounds sterling, not in legally defined, distinct Scots pounds. Bank of England notes circulate in Scotland alongside Scottish bank notes and with no connotation that they are a foreign currency. The total supply of bank notes in Scotland is therefore determined at least in part in a discretionary manner, by a monetary authority that is equally as local as the Scottish note-issuing banks. Scottish banks are inside the British monetary system, in which the Bank of England sets the monetary base in a discretionary manner. At least since the late 19th century, when the Bank of England recognized a responsibility as a lender of last resort, Scottish banks have been able to borrow from the Bank of England on terms that might not be available in the open market. During Scotland's free banking period, in contrast, the Bank of England sometimes lent to Scottish banks, but not within the context of acting systematically as a lender of last resort, and there was therefore a degree of separation between the English and Scottish banking systems that no longer exists. Scotland today does not have the degree of separation from the English monetary system that would make it a currency board, though it would become one if Scotland became independent while also maintaining the existing arrangements.

Table S-2. Scottish Notes in Circulation by Bank, 1980-2006 (£ sterling)

Year	Bank of Scotland	The Royal Bank of Scotland	Clydesdale Bank Plc	Aggregate
1980	163,371,891	227,172,861	80,682,379	471,227,131
1981	170,579,124	244,156,414	99,641,730	514,377,268
1982	169,413,957	251,909,304	150,972,661	572,295,922
1983	187,403,645	262,143,338	185,753,794	635,300,777
1984	215,667,356	310,536,822	160,777,057	686,981,235
1985	241,880,091	331,092,242	167,925,528	740,897,861
1986	262,519,047	344,570,782	177,682,822	784,772,651
1987	278,975,827	371,599,922	180,906,338	831,482,087
1988	252,670,757	455,988,781	189,814,861	898,474,399
1989	265,092,094	490,105,945	207,256,576	962,454,615
1990	280,194,956	532,863,248	215,384,183	1,028,442,387
1991	283,211,370	559,814,862	227,030,451	1,070,056,683
1992	304,814,691	601,835,481	253,309,358	1,159,959,530
1993	337,135,264	683,139,613	276,030,702	1,296,305,579
1994	349,385,024	710,914,769	291,580,652	1,351,880,445
1995	373,074,884	756,100,753	321,278,371	1,450,454,008
1996	436,219,881	811,768,030	354,412,282	1,602,400,193
1997	464,091,438	843,232,654	367,560,068	1,674,884,160
1998	473,001,844	869,980,792	375,342,772	1,718,325,408
1999	530,075,919	914,858,423	389,508,762	1,834,443,104
2000	570,464,725	949,565,545	414,976,855	1,935,007,125
2001	625,601,561	997,082,724	452,536,987	2,075,221,272
2002	676,384,693	976,927,190	581,986,718	2,235,298,601
2003	725,352,103	1,000,421,779	656,273,487	2,382,047,369
2004	806,764,825	1,025,486,857	728,002,203	2,560,253,885
2005	809,575,516	985,639,353	905,842,486	2,701,057,355
2006	812,727,662	973,381,845	1,018,456,817	2,804,566,324

Notes: For all tables on Scotland, the underlying sources of data are the *London Gazette* and *Edinburgh Gazette,* and the data given are monthly averages for March. Monthly data exist, but due to constraints on research time, I only collected annual figures.

Table S-3. Scottish Note Reserve Backing by Bank, 1980-2006 (£ sterling)

Year	Bank of Scotland	The Royal Bank of Scotland	Clydesdale Bank Plc	Aggregate
1980	168,691,568	235,717,090	86,278,253	490,686,911
1981	177,461,050	253,443,513	106,098,098	537,002,661
1982	175,535,849	260,999,013	157,725,627	594,260,489
1983	187,335,998	262,352,948	185,624,086	635,313,032
1984	217,191,263	311,762,046	161,560,231	690,513,540
1985	243,714,929	332,510,223	167,995,071	744,220,223
1986	263,693,964	345,177,003	177,546,877	786,417,844
1987	279,954,392	372,306,898	181,064,370	833,325,660
1988	252,882,634	456,285,353	189,866,092	899,034,079
1989	272,247,342	501,063,266	212,012,920	985,323,528
1990	292,478,295	545,319,314	221,266,474	1,059,064,083
1991	292,544,296	575,610,627	232,537,035	1,100,691,958
1992	316,238,058	594,930,376	262,083,044	1,173,251,478
1993	348,548,014	694,880,654	284,445,497	1,327,874,165
1994	359,676,548	720,136,392	298,579,928	1,378,392,868
1995	381,350,239	765,273,524	330,037,927	1,476,661,690
1996	445,671,197	818,784,846	358,399,775	1,622,855,818
1997	470,412,420	851,243,161	369,892,646	1,691,548,227
1998	479,535,472	881,416,610	377,589,392	1,738,541,474
1999	538,508,107	922,439,782	396,830,094	1,857,777,983
2000	580,593,476	966,666,182	418,133,589	1,965,393,247
2001	637,796,013	1,006,501,295	460,428,420	2,104,725,728
2002	686,827,412	982,419,528	584,971,960	2,254,218,900
2003	736,521,456	1,011,635,747	664,260,578	2,412,417,781
2004	820,935,354	1,040,758,542	739,285,767	2,600,979,663
2005	822,046,108	998,450,159	911,005,698	2,731,501,965
2006	846,927,982	991,955,834	1,025,988,495	2,864,872,311

Table S-4. Annual Scottish Reserve Ratio

Year	Aggregate Value of Backing Reserves	Aggregate Number of Notes in Circulation	Reserve Ratio
1980	490,686,911	471,227,131	104.1%
1981	537,002,661	514,377,268	104.4%
1982	594,260,489	572,295,922	103.8%
1983	635,313,032	635,300,777	100.0%
1984	690,513,540	686,981,235	100.5%
1985	744,220,223	740,897,861	100.4%
1986	786,417,844	784,772,651	100.2%
1987	833,325,660	831,482,087	100.2%
1988	899,034,079	898,474,399	100.1%
1989	985,323,528	962,454,615	102.4%
1990	1,059,064,083	1,028,442,387	103.0%
1991	1,100,691,958	1,070,056,683	102.9%
1992	1,173,251,478	1,159,959,530	101.1%
1993	1,327,874,165	1,296,305,579	102.4%
1994	1,378,392,868	1,351,880,445	102.0%
1995	1,476,661,690	1,450,454,008	101.8%
1996	1,622,855,818	1,602,400,193	101.3%
1997	1,691,548,227	1,674,884,160	101.0%
1998	1,738,541,474	1,718,325,408	101.2%
1999	1,857,777,983	1,834,443,104	101.3%
2000	1,965,393,247	1,935,007,125	101.6%
2001	2,104,725,728	2,075,221,272	101.4%
2002	2,254,218,900	2,235,298,601	100.8%
2003	2,412,417,781	2,382,047,369	101.3%
2004	2,600,979,663	2,560,253,885	101.6%
2005	2,731,501,965	2,701,057,355	101.1%
2006	2,864,872,311	2,804,566,324	102.2%

Table S-5. Annual Change in Scottish Notes in Circulation and Note Reserve Backing

Year	Aggregate Annual Change of Scottish Notes in Circulation	Aggregate Annual Change of Scottish Reserves	Scottish Reserve Pass-Through
1981	43,150,137	46,315,750	93.2%
1982	57,918,654	57,257,828	101.2%
1983	63,004,855	41,052,543	153.5%
1984	51,680,458	55,200,508	93.6%
1985	53,916,626	53,706,683	100.4%
1986	43,874,790	42,197,621	104.0%
1987	46,709,436	46,907,816	99.6%
1988	66,992,312	65,708,419	102.0%
1989	63,980,216	86,289,449	74.1%
1990	65,987,772	73,740,555	89.5%
1991	41,614,296	41,627,875	100.0%
1992	89,902,847	72,559,520	123.9%
1993	136,346,049	154,622,687	88.2%
1994	55,574,866	50,518,703	110.0%
1995	98,573,563	98,268,822	100.3%
1996	151,946,185	146,194,128	103.9%
1997	72,483,967	68,692,409	105.5%
1998	43,441,248	46,993,247	92.4%
1999	116,117,696	119,236,509	97.4%
2000	100,564,021	107,615,264	93.4%
2001	140,214,147	139,332,481	100.6%
2002	160,077,329	149,493,172	107.1%
2003	146,748,768	158,198,881	92.8%
2004	178,206,516	188,561,882	94.5%
2005	140,803,470	130,522,302	107.9%
2006	103,508,969	133,370,346	77.6%

Northern Ireland

With a similar monetary and political relationship as that which has historically existed between England and Scotland, the Northern Ireland analysis largely mirrors that done on Scotland. The legal relationship between Northern Ireland and England, however, is a much more recent one. After being in effect a British colony following its conquest by England in the 16th century, Ireland became part of the United Kingdom in 1800, gaining representation in the British Parliament. Conflict over religious and political doctrine continued to simmer. In 1916 Irishmen favoring independence began a revolt. Parliament responded with the Government of Ireland Act in 1920, splitting the country in two. Predominantly Protestant Northern Ireland remained a state in the United Kingdom, while predominantly Catholic Ireland became independent. Despite hostility and acts of violence since, the relationship between Northern Ireland and the United Kingdom remains unaltered.

Table NI-1. Key Legislation on the Northern Irish Monetary System

Year	Number	Short Title	Significance
1800	39 & 40 Geo. III c. 67	Act of Union	United Ireland with England, Wales, and Scotland
1816	56 Geo. III c. 98	Consolidated Funds Act	Merged the public funds of Ireland and Britain
1825	6 Geo. IV c. 79	Currency Act	Ended the Irish pound as a separate currency from the pound sterling
1845	8 & 9 Vict. c. 37	Bankers (Ireland) Act	Declared Bank of England notes not legal tender in Ireland; required Irish notes in circulation to be backed by silver and gold
1920	10 & 11 Geo. V c. 67	Government of Ireland Act	Established Northern Ireland as a separate entity from Ireland
1928	18 & 19 Geo. V c. 15	Bankers (Northern Ireland) Act	Applied the measures of the Bankers (Ireland) Act 1845 to Northern Ireland
1928	18 & 19 Geo. V c. 13	Currency and Bank Notes Act	Allowed for securities and English notes to back Northern Irish notes
1971	c. 24	Coinage Act	Allowed only the Royal Mint to produce coins
2009	c. 1	Banking Act	Provided stricter regulation on Northern Irish note production (namely, daily accountability on English reserves)

Like Scotland, Ireland originally had its own currency distinct from the pound sterling. The Irish pound and the pound sterling were generally quite close in value. A Parliamentary act of 1825 unified them at Irish £13 = £12 sterling. Ireland's banking system was distinct from the English and Scottish systems, and in term of restrictions on note issue it lay somewhere between

English and Scottish systems until 1845. The 1845 Bankers (Ireland) Act, like the Bank Notes (Scotland) Act passed the same year, required Irish banks to back notes in excess of levels at the time the act was passed by external reserves, held mainly at the Bank of England, backed 100 percent of the pounds in circulation, averaged and checked every Wednesday.

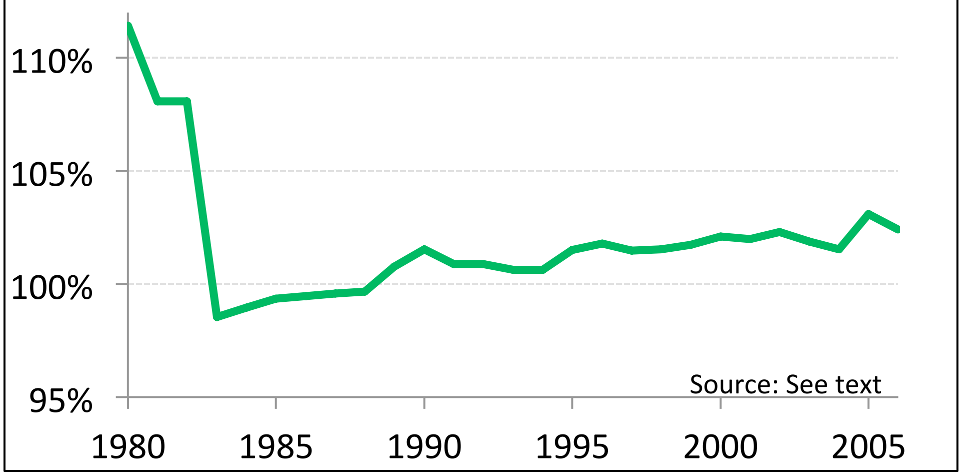
The splitting of Ireland into two required an updating of currency and banking laws. Southern Ireland began to issue its own currency, the Irish pound (in Gaelic, punt). In 1928, through a currency board, the Irish pound was equal to the pound sterling. As for Northern Ireland, the Bankers (Northern Ireland) Act of 1928 continued to apply to the north the 1845 act that had formerly applied also to the south. The Currency and Bank Notes Act, also of 1928, allowed English notes and coins as well as securities to provide backing for Northern Irish notes in addition to gold and silver. Northern Irish monetary regulation continued, little changed, until the passage of the Banking Act of 2009, which, being the same piece of legislation taking effect in Scotland, imposed stricter regulatory measures on Northern Irish note backing. Before, weekly averages of reserves and notes had satisfied the regulation, but henceforth, constant 100 percent backing of all Irish notes in circulation would become mandatory.

In Northern Ireland today, four banks issue notes: the Bank of Ireland (whose headquarters is in Dublin); the Northern Bank (a subsidiary of Denmark's Danske Bank); First Trust Bank (formerly Provincial Bank and Allied Irish Banks; the only note issuer that is locally owned); and the Ulster Bank (part of the Royal Bank of Scotland Group). The National Bank, a bank long ago merged into the Bank of Ireland, still has a small amount of notes outstanding, but they are not seen in circulation and likely all held by collectors or destroyed.

Despite the reserve-backing requirements of Northern Irish notes, the United Kingdom still does not consider them legal tender. As explained in the section on Scotland, England continues to operate with a definition of the term legal tender such that only English notes and coins meet the qualifications amongst monies. However, given the same legislative consideration as the Scottish pound, Northern Irish notes circulate throughout the English economy, as a legal currency. Means of trade remain at the discretion of the individuals taking part in the interaction (Bank of England n.d.). In Northern Ireland, on the other hand, no note constitutes legal tender, and thus, neither Northern Irish notes nor Bank of England notes meet the qualifications for legal tender (ACBI 2012). English coins, on the other hand, hold legal tender status throughout the United Kingdom (Royal Mint 2014).

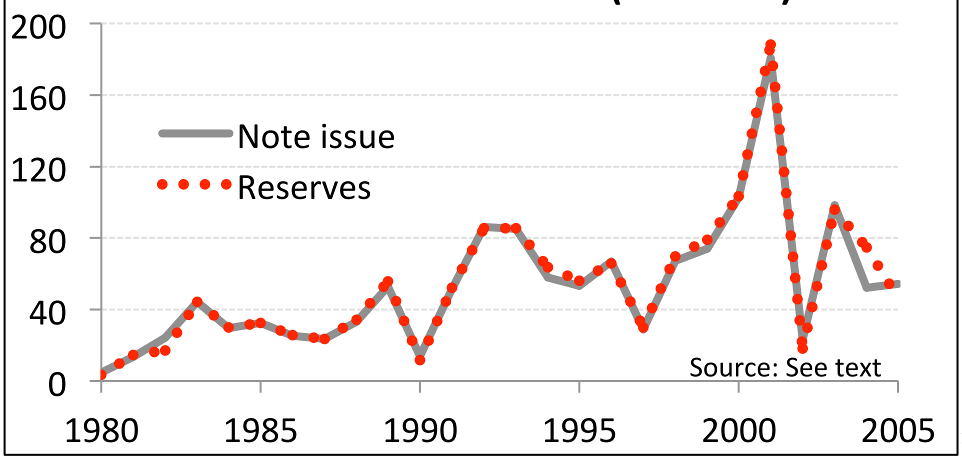
As we did with Scotland, let us examine the reserve ratio against Northern Irish note issues; annual changes in note in circulation and external reserves; and reserve pass-through.

Graph NI-1. Northern Ireland: Ratio of Reserves to Notes in Circulation



Surprisingly enough, despite legislation enticing a 100 percent reserve ratio, between 1982 and 1985, Northern Ireland, as a whole, operated at less than full backing, as low as 98.5 percent.

Graph NI-2. Northern Ireland: Changes in Note Issue and Reserves (£ million)

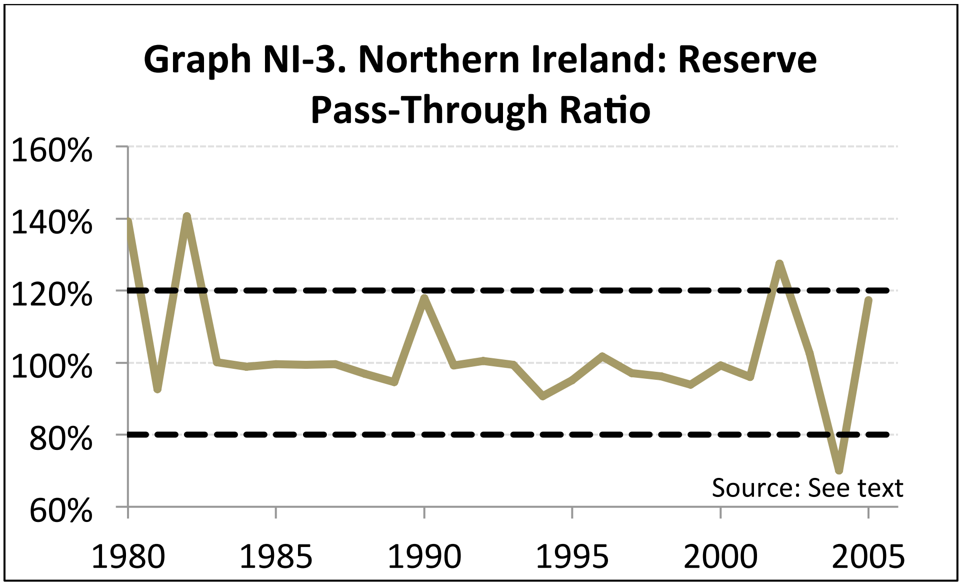


[1]

The relationship between the aggregate annual change of Northern Irish notes in circulation and the aggregate annual change of the Northern Irish reserves looks like that of Scotland. Not only do these figures expand alongside one another over the course of 1981 to 2006, but they also seem to be expanding at nearly a similar rate throughout the entire period. It should be

[1] The data from 1986, 1987, and 1989 was not electronically available for the Northern Irish system, so, in order to provide continuity, the analysis utilizes the annual average change from 1986-1988 and from 1989-1990

noted that although the money supply expands year-over-year, it is possible that the monetary base experienced contractions over smaller periods which I did not collect the data.



In regards to the Northern Irish reserve pass-through, as was the case in Scotland, the ratio has a tendency to stray outside of the 80-120 percent band. Specifically, in 1980 and 1982 the ratio was 140 percent; in 2002 it was 128 percent; and in 2004 it was 70 percent.

After examining all these figures, we are still left to the question: does Northern Ireland operate a currency board? In applying the same argumentation found in the Scottish section, it is clear that Northern Ireland is not a currency board, because the Bank of England sets the monetary base in a discretionary manner.

Curiously, publicly available figures for Scottish and Northern Irish note issue seem to cease publication in the Gazettes after 2006. Inquiries to various official and academic sources in the United Kingdom have indicated the Bank of England database would contain the necessary statistics; however, I have been unsuccessful in locating subsequent distinctive figures.

Table NI-2. Northern Irish Notes in Circulation by Bank, 1981-2006 (£ sterling)

Month	Year	The Bank of Ireland	First Trust Bank/ Allied Irish bank/ Provincial Bank of Ireland	The Northern Bank Limited	The Ulster Bank Limited	The National Bank Limited	Aggregate
March	1980	6,807,055	10,858,823	20,918,384	12,482,048	80,007	51,146,317
March	1981	7,493,627	12,862,484	22,727,842	12,675,265	70,507	55,829,725
March	1982	14,408,295	16,262,201	25,936,450	12,725,332	70,507	69,402,785
March	1983	13,307,580	25,099,400	32,287,228	22,719,448	66,507	93,480,163
March	1984	28,003,387	32,563,082	45,605,224	31,647,989	64,507	137,884,189
March	1985	36,769,188	36,243,611	52,071,955	42,211,809	64,507	167,361,070
April	1988	45,688,318	53,563,504	79,229,159	58,811,377	61,507	237,353,865
May	1990	65,035,377	75,298,858	130,104,464	72,237,173	61,507	342,737,379
March	1991	85,059,884	68,593,186	127,420,779	75,288,052	61,507	356,423,408
March	1992	103,380,761	78,650,865	142,237,052	83,666,150	61,507	407,996,335
March	1993	124,192,908	120,467,874	150,978,479	98,346,467	61,507	494,047,235
March	1994	148,439,018	157,530,297	160,019,372	112,941,359	61,507	578,991,553
March	1995	183,314,935	152,547,500	175,016,507	125,870,600	61,507	636,811,049
March	1996	190,385,073	163,546,250	193,182,626	142,838,690	61,507	690,014,146
March	1997	212,780,106	172,736,000	221,460,927	149,971,506	61,507	757,010,046
March	1998	233,071,127	178,166,500	216,379,438	158,267,054	61,507	785,945,626
March	1999	272,574,265	192,645,500	218,922,255	168,768,299	61,507	852,971,826
March	2000	330,507,093	199,090,500	215,639,645	181,811,613	61,507	927,110,358
March	2001	377,842,266	215,032,250	227,362,755	209,401,392	61,507	1,029,700,170
March	2002	473,629,961	235,494,750	255,130,347	245,951,003	61,507	1,210,267,568
Feb.	2003	483,032,916	235,576,250	262,450,295	252,140,276	61,507	1,233,261,244
March	2004	508,975,704	257,067,500	284,217,225	281,244,124	61,507	1,331,566,060
March	2005	536,739,631	294,150,275	226,222,219	326,622,987	61,507	1,383,796,619
March	2006	555,410,750	298,042,700	233,160,067	351,600,090	61,507	1,438,275,114

Notes: For all tables on Northern Ireland, the underlying source of data is the *Belfast Gazette*. Monthly data exist, but due to constraints on research time, I only collected annual figures from March or, if not available, the month nearest March for that year. Data from 1986, 1987, and 1989 were not readily available.

Table NI-3. Northern Irish Note Reserves by Bank, 1981-2006 (£ sterling)

Month	Year	The Bank of Ireland	First Trust Bank/ Allied Irish bank/ Provincial Bank of Ireland	The Northern Bank Limited	The Ulster Bank Limited	The National Bank Limited	Aggregate
March	1980	6,755,037	10,810,311	25,527,978	13,787,712	100,000	56,981,038
March	1981	7,464,352	12,587,256	26,393,789	13,798,717	100,000	60,344,114
March	1982	14,406,845	16,265,729	29,617,250	14,612,030	100,000	75,001,854
March	1983	12,598,053	25,017,135	31,898,188	22,501,683	100,000	92,115,059
March	1984	27,414,286	32,348,813	45,216,816	31,408,327	65,000	136,453,242
March	1985	36,304,367	36,232,201	51,690,512	41,982,785	65,000	166,274,865
April	1988	45,271,739	53,652,259	78,953,679	58,579,061	65,000	236,521,738
May	1990	65,672,479	76,841,725	131,723,988	73,648,666	65,000	347,951,858
March	1991	85,602,140	68,418,119	128,578,773	76,900,272	65,000	359,564,304
March	1992	104,187,938	78,427,680	143,406,739	85,484,893	65,000	411,572,250
March	1993	124,576,185	120,249,325	151,963,338	100,318,476	65,000	497,172,324
March	1994	148,741,656	157,310,576	161,617,813	114,946,976	65,000	582,682,021
March	1995	183,656,226	157,757,253	177,314,617	127,649,489	65,000	646,442,585
March	1996	190,934,016	167,685,447	197,158,908	146,559,407	65,000	702,402,778
March	1997	213,584,564	177,468,564	224,243,856	152,925,678	65,000	768,287,662
March	1998	233,352,241	182,340,214	219,447,819	162,874,494	65,000	798,079,768
March	1999	275,343,427	194,500,515	222,859,542	174,936,368	65,000	867,704,852
March	2000	334,195,993	202,989,114	219,582,371	189,782,352	65,000	946,614,830
March	2001	381,107,226	218,198,828	232,007,172	218,685,334	65,000	1,050,063,560
March	2002	477,351,696	241,706,988	259,894,321	259,158,393	65,000	1,238,176,398
Feb.	2003	486,729,925	240,353,856	267,930,500	261,128,405	65,000	1,256,207,686
March	2004	511,765,070	263,205,343	288,735,647	288,271,912	65,000	1,352,042,972
March	2005	543,136,427	299,065,936	240,732,245	343,662,706	65,000	1,426,662,314
March	2006	559,931,283	302,426,571	239,789,923	370,842,572	65,000	1,473,055,349

Table NI-4. Northern Irish Reserve Ratio

Year	Aggregate Value of Foreign Reserves	Aggregate Value of Notes in Circulation	Reserve Ratio
1980	56,981,038	51,146,317	111.4%
1981	60,344,114	55,829,725	108.1%
1982	75,001,854	69,402,785	108.1%
1983	92,115,059	93,480,163	98.5%
1984	136,453,242	137,884,189	99.0%
1985	166,274,865	167,361,070	99.4%
1988	236,521,738	237,353,865	99.6%
1990	347,951,858	342,737,379	101.5%
1991	359,564,304	356,423,408	100.9%
1992	411,572,250	407,996,335	100.9%
1993	497,172,324	494,047,235	100.6%
1994	582,682,021	578,991,553	100.6%
1995	646,442,585	636,811,049	101.5%
1996	702,402,778	690,014,146	101.8%
1997	768,287,662	757,010,046	101.5%
1998	798,079,768	785,945,626	101.5%
1999	867,704,852	852,971,826	101.7%
2000	946,614,830	927,110,358	102.1%
2001	1,050,063,560	1,029,700,170	102.0%
2002	1,238,176,398	1,210,267,568	102.3%
2003	1,256,207,686	1,233,261,244	101.9%
2004	1,352,042,972	1,331,566,060	101.5%
2005	1,426,662,314	1,383,796,619	103.1%
2006	1,473,055,349	1,438,275,114	102.4%

Table NI-5. Annual Change in Northern Irish Notes in Circulation and Reserves Backing Notes, 1981-2006 (£ sterling)

Year	Aggregate Annual Change of Northern Irish Notes in Circulation	Aggregate Annual Change of Northern Irish Reserves Backing Northern Irish Pound	Northern Irish Reserve Pass-Through
1981	4,683,408	3,363,076	139.3%
1982	13,573,060	14,657,740	92.6%
1983	24,077,378	17,113,205	140.7%
1984	44,404,026	44,338,183	100.1%
1985	29,476,881	29,821,623	98.8%
1986	23,330,932	23,415,624	99.6%
1987	23,330,932	23,415,624	99.6%
1988	23,330,932	23,415,624	99.6%
1989	52,691,757	55,715,060	94.6%
1990	52,691,757	55,715,060	94.6%
1991	13,686,029	11,612,446	117.9%
1992	51,572,927	52,007,946	99.2%
1993	86,050,900	85,600,074	100.5%
1994	84,944,318	85,509,697	99.3%
1995	57,819,496	63,760,564	90.7%
1996	53,203,097	55,960,193	95.1%
1997	66,995,900	65,884,884	101.7%
1998	28,935,580	29,792,106	97.1%
1999	67,026,200	69,625,084	96.3%
2000	74,138,532	78,909,978	94.0%
2001	102,589,812	103,448,730	99.2%
2002	180,567,398	188,112,838	96.0%
2003	22,993,676	18,031,288	127.5%
2004	98,304,816	95,835,286	102.6%
2005	52,230,559	74,619,342	70.0%
2006	54,478,495	46,393,035	117.4%

Note: Because the data for 1986, 1987, and 1989 are not electronically available, I interpolate them.

Isle of Man

A small island situated in the Irish Sea almost equidistant from England, Wales, Scotland, and Ireland, the Isle of Man has shifted in and out of English control throughout its history. In 1866 it gained a measure of home rule. To repeat, the Isle of Man, Guernsey, and Jersey are not part of the United Kingdom but are possessions of the British Crown. The Isle of Man has a monetary history partly distinct from that of the surrounding jurisdictions. Assessing it will help in determining whether the island's current monetary system functions as a currency board.

Table IM-1. Key Legislation on the Manx Monetary System

Year	Number	Short Title	Significance
1679		Tynwald Act of this Year[2]	Made Murrey Pennies first national currency
1765	5 Geo. 3 c.26	Isle of Man Purchase Act[3]	Incorporate the Isle of Man into the British Empire
1865		Companies Act[4]	Allows for the opening of the Isle of Man Bank Limited[5]
1866	29 & 30 Vict. c.23	Customs, Harbours, and Public Purposes Act[6]	Provided a degree of independence (home rule) for the Isle of Man
1961		Isle of Man Government Notes Act[7]	Gave sole power of printing Manx notes and coin to the Treasury
1992		Currency Act	Allowed for the one-to-one exchange of Manx notes and coin and British notes and coin
1995		European System of National and Regional Accounts 1995 [8]	Classified Isle of Man banks as non-residents of UK in statistics

The Isle of Man, like many states at one time or another, allowed for privately issued currency. During the early 1600's, one could find many varieties of coins, and even stamps, issued by different private and public interests circulating in the Isle of Man. In fact, it would take until 1679 for the Isle of Man to first develop the notion of a national currency. In that year an act of the Tynwald (parliament) determined that the "Murrey Penny" would be the only legal currency allowable for trade. This declaration would stand until 1765 when England purchased

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[2] Only a reference and a brief excerpt of the legislation could be found (Clay 1858: 54-55).
[3] Mills (1821: 527-530).
[4] Gill (1872: 368-461).
[5] Royal Bank of Scotland Group (2005).
[6] Only a reference to this legislation could be found within the Isle of Man (Loans) Act of 1880 (Great Britain. Parliament. House of Commons. 1880: 493-500).
[7] Only a reference to this legislation could be found (CORRIE Ltd. 2002).
[8] Thame and Lamming (2000).

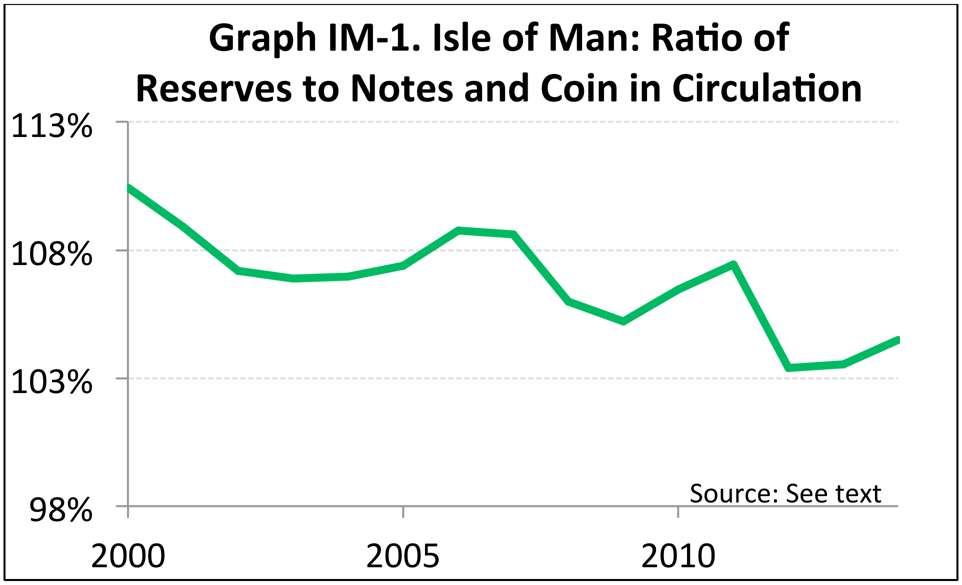
the Isle of Man from the Dukes of Atholl and subsequently introduced the pound sterling. As in England, there were multiple private note issuers operating with unlimited liability, though there was no privileged counterpart to the Bank of England. Private issue of notes continued on the Isle of Man until 1961, making it, with South West Africa (now Namibia), one of the last places on earth to have a form of free banking. The Isle of Man Government Notes Act of 1961 made note issue a government monopoly.

Even before the Isle of Man gained home rule, the Tynwald continued to issue some legislation relevant to the monetary system. Perhaps the most significant was the 1865 Companies Act concerning limited liability corporations, under which the allowance for the creation of the Isle of Man Bank came about. In 1866 the Isle of Man received home rule, and slowly regained autonomy in subsequent legislation passed by the British Parliament.

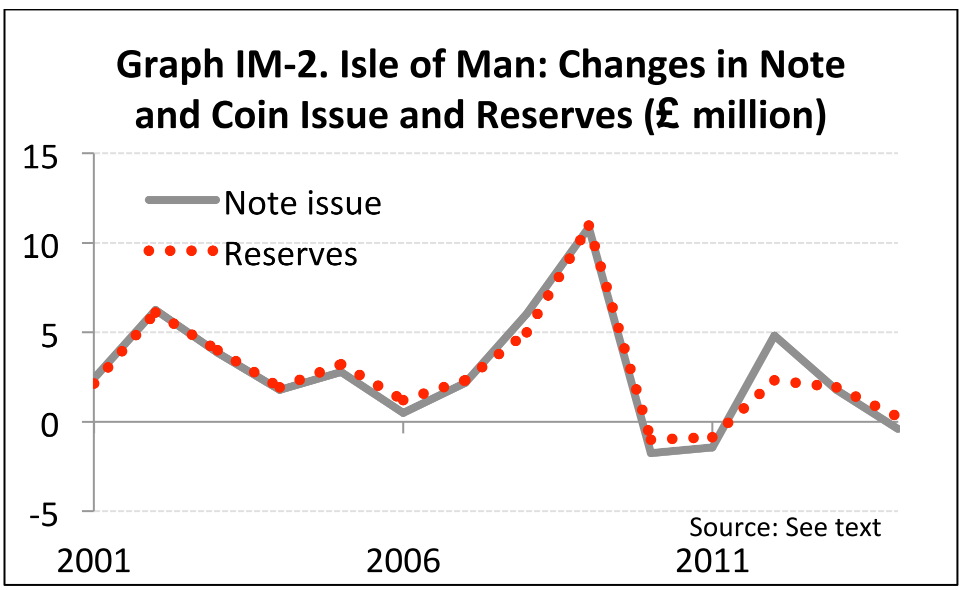
Nonetheless, the Isle of Man decided to remain in monetary union with the United Kingdom. The Currency Act of 1992, however, implies that the island's currency is distinct from the pound sterling. The opening clauses of the act are worth quoting in full:

> **1 Currency of the Isle of Man**
>
> (1) The currency of the Isle of Man shall continue to be the pound (in this Act referred to as "the Manx pound") which shall be divided into 100 pence.
>
> (2) The Manx pound shall continue to have parity with the pound sterling.
>
> **2 Legal tender**
>
> (1) Government notes shall be legal tender at their face value for the payment of any sum.
>
> (2) Coins shall be legal tender at their face value —
>
> (a) in the case of coins of a denomination of one pound or more, for the payment of any amount;
>
> (b) in the case of coins of other denominations, for the payment of any amount not exceeding £10.
>
> (3) Subsections (1) and (2) shall apply (with the necessary modifications) in respect of notes or coins which are legal tender in any part of the United Kingdom.

(Not having seen older legislation, such as the Currency and Bank Notes (Legal Tender) Act 1955, I am uncertain how far back the Manx pound was at least nominally a separate currency from the pound sterling.) Bank of England notes and British coin are legal tender in the Isle of Man alongside Manx note and coins. Manx notes and coins, in contrast, are not legal tender in the United Kingdom, although are considered legal currency under English law, and thus English merchants may choose to accept them as payment (Royal Mint 2014).

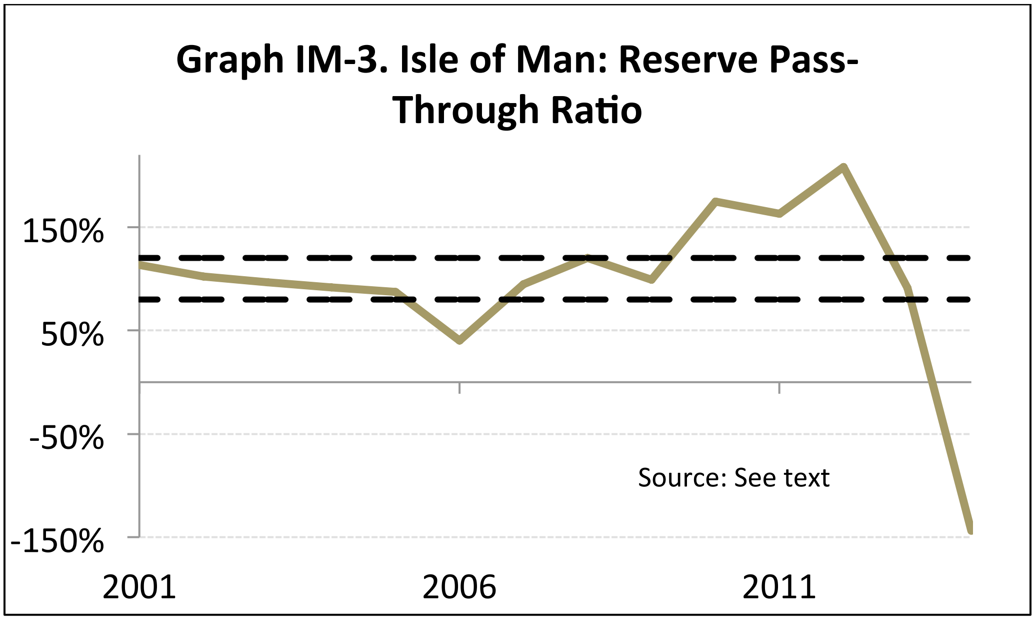


The Currency Act of 1992 imposed no specific external reserve requirement against Manx notes and coins. Even so, the government established the Manx Currency Fund to provide backing to all Manx pounds and coin in circulation. Examining the external reserve ratio for the years readily available (since 2000) shows that it has remained within a range from 103 to 110 percent, and thus the reserve ratio seems to comply with currency board orthodoxy.



However, comparing the annual change in the Manx Currency Account and Manx pounds in circulation we observe a marked deviation in 2014 where a contracton of the money supply was matched with an expansion of the Manx Currency Account. In addition to this finding, the reserve pass-through shows many deviations from the 80-120 percent range. In 2006, the reserve pass-through hits a low of 50 percent, which on its face seems to indicate sterilization. From this point, the value only grows up to a 208 percent mark in 2012, which would mean the

Manx currency felt the magnified foreign reserve effects from 2010, when it first surpassed 120 percent, to 2012. From this point, the reserve pass-through falls dramatically, though expectedly, ending up at a -144 percent value in 2014. These numbers certainly do not pose a strong case for the orthodoxy of the currency system.



And yet, examining the raw numbers, the deviations from currency board orthodoxy do not look so large. In the year ending with March 2014, Manx currency in circulation fell £388,711 (0.53 percent), while reserves rose £269,939 (0.36 percent). The hugely negative reserve pass-through ratio is therefore the ratio of two small numbers. As was mentioned above, interest on external assets can confound calculations of reserve pass-through. That is especially the case when the change in currency in circulation is very small. The figures just mentioned imply that the result could have been produced by a return on assets of less than 1 percent. Perhaps we need some further measures of currency board orthodoxy to address the issue?

Table IM-2. Manx Currency in Circulation, 1980-2014

Year	Amount of Manx Notes and Coin in Circulation	Manx Currency Account Balance	Reserve Ratio
1980	9,206,343		
1981	9,993,203		
1982	10,750,960		
1983	11,315,192		
1984	11,728,826		
1985	12,145,173		
1986	12,343,594		
1987	12,720,104		
1988	13,241,435		
1989	14,140,749		
1990	13,278,472		
1991	13,612,765		
1992	18,117,385		
1993	20,277,701		
1994	22,905,398		
1995	23,513,530		
1996	25,442,323		
1997	26,435,528		
1998	27,253,562		
1999	29,217,280		
2000	32,600,891	36,002,565	110.4%
2001	35,016,968	38,137,766	108.9%
2002	41,279,378	44,243,909	107.2%
2003	45,132,270	48,240,732	106.9%
2004	46,913,891	50,177,578	107.0%
2005	49,710,628	53,388,307	107.4%
2006	50,195,914	54,595,011	108.8%
2007	52,386,582	56,903,515	108.6%
2008	58,416,867	61,908,222	106.0%
2009	69,277,590	72,885,222	105.2%
2010	67,522,510	71,879,692	106.5%
2011	66,090,726	71,001,087	107.4%
2012	70,900,138	73,308,401	103.4%
2013	72,663,444	75,242,901	103.5%
2014	72,274,733	75,512,840	104.5%

Notes: For all tables on the Isle of Man, the underlying source of data is an annual statement produced by the Manx government called the *Detailed Government Accounts.* E-mail communications with 4the Manx Treasury enabled me to locate electronic issues from 2000 onward; pre-2000 Manx Currency Account data is not online and remains excluded here; however further communication allowed for the obtaining of pre-2000 data concerning the amount of Manx note and coin in circulation, which is included.

Table IM-3. Annual Change in Manx Currency in Circulation, 1981-2014

Year	Annual Change in Manx Notes and Coins in Circulation	Annual Change in Manx Currency Fund	Manx Reserve Pass-Through
1981	786,860		
1982	757,757		
1983	564,232		
1984	413,634		
1985	416,347		
1986	198,421		
1987	376,510		
1988	521,331		
1989	899,314		
1990	-862,277		
1991	334,293		
1992	4,504,620		
1993	2,160,316		
1994	2,627,697		
1995	608,132		
1996	1,928,793		
1997	993,205		
1998	818,034		
1999	1,963,718		
2000	3,383,611		
2001	2,416,077	2,135,201	113.2%
2002	6,262,410	6,106,143	102.6%
2003	3,852,892	3,996,823	96.4%
2004	1,781,621	1,936,846	92.0%
2005	2,796,737	3,210,729	87.1%
2006	485,286	1,206,704	40.2%
2007	2,190,668	2,308,504	94.9%
2008	6,030,285	5,004,707	120.5%
2009	10,860,723	10,977,000	98.9%
2010	-1,755,080	-1,005,530	174.5%
2011	-1,431,784	-878,605	163.0%
2012	4,809,412	2,307,314	208.4%
2013	1,763,306	1,934,500	91.2%
2014	-388,711	269,939	-144.0%

Bailiwick of Guernsey

The Bailiwick (also known as the Isle) of Guernsey is one of the Channel Islands. It pledges allegiance to the Royal Family of England as a legal dependency and has done so since 1206, when it first guaranteed its loyalty to King John during his invasion of France (States of Guernsey 2014). Despite this political affiliation, Guernsey's culture has historically maintained French ties, as shown by the usage of French currency as the principal monetary unit until the early 1800s. During World War II, Guernsey was invaded by German forces, which issued an occupation currency (Lamine 2006: 70). It never managed to achieve greater popularity than the currency of the Guernsey government (Bányai 1970: 42). After the war, the prewar monetary system of a link to the pound sterling resumed.

Table G-1. Key Legislation on the Monetary System of Guernsey

Year	Short Title	Significance
1914	Ordinance of the Royal Court of Guernsey [9]	(see Act of the States of Guernsey, below)
1914	Act of the States of Guernsey [10]	Provides a monopoly on currency production to the States of Guernsey
1921	Currency and Legal Tender Ordinance [11]	-Grants legal tender status to the English Pound -Links Guernsey currency to English currency at a one-to-one exchange rate
1954	Currency and Legal Tender Ordinance[12] [13]	Grants legal tender status to only English and Guernsey currency
1995	European System of National and Regional Accounts 1995 [14]	Classifies Isle of Guernsey banks as non-residents of UK in statistics

For many years banks issued their own notes. Nationalization of note issue began with the Ordinance of the Royal Court of Guernsey 1914 and the Act of the States of Guernsey in 1914. Together, these two pieces of legislation removed the right to print money from privately owned banks and provided a monopoly on currency production to the States of Guernsey (Adler 1937: 342; see also p. 343). After World War I, the French franc suffered depreciation against the pound sterling, prompting the Guernsey government to adopt a monetary parity with sterling (My Finance Tree 2008). This was accomplished in the "Ordonnance relative au changement du Cours Légal de la Monnaie en cette Île, et les Île de Sercq, d'Herm et de Jethou" [Currency and Legal Tender Ordinance] in 1921. In addition to establishing parity with sterling, the ordinance granted legal tender status to English currency on the Isle of Guernsey.

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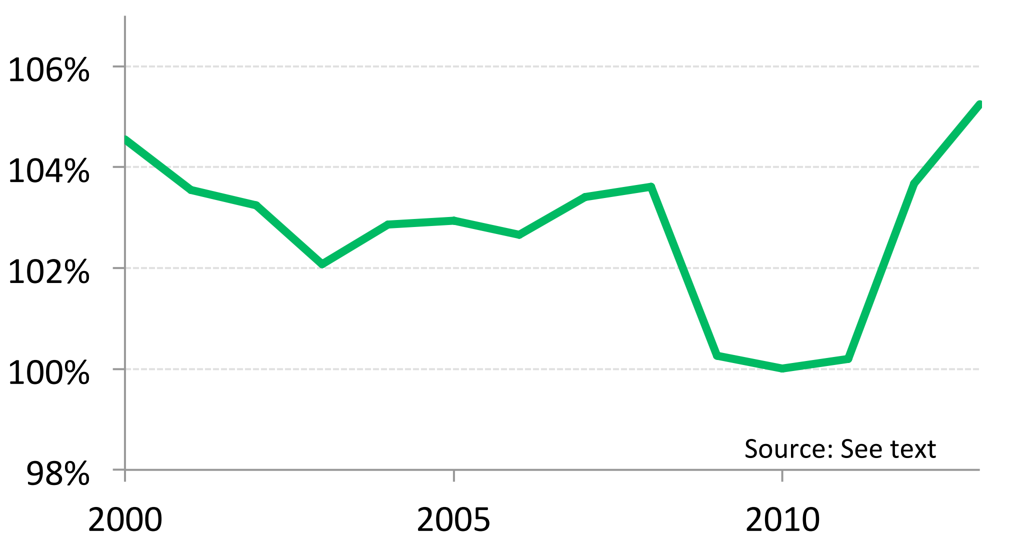
[9] Adler (1937: 342; see also p. 343).
[10] Adler (1937: 342; see also p. 343).
[11] I have not been able to locate a digital copy of this legislation but have managed to find a reference (Page 1954).
[12] This piece of legislation has been updated several times seemingly to account for changes in legal tender policy held by the Bank of England.
[13] Page (1954).
[14] Thame and Lamming (2000).

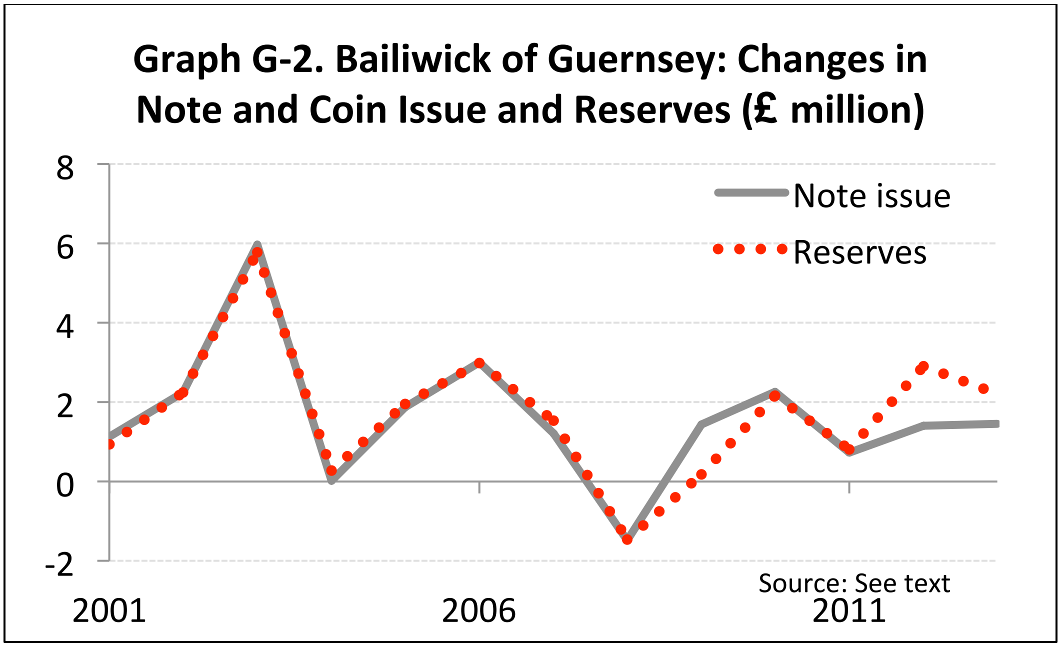
The Currency and Legal Tender Ordinance of 1954 updated the currencies accepted as legal tender, granting status only to Bank of England and Guernsey banknotes; however, Manx, Scottish, Northern Irish, and Jersey Pound notes may still circulate across the island as a means of trade. Based on points mentioned in previous sections, it follows too that Isle of Guernsey pound notes and coin are not considered legal tender in England, although they may be legally used as currency, as this remains a decision by merchants (Royal Mint 2014).

I have not been able to find any legislative reference to Guernsey's 100 percent reserve-backing policy despite the fact that the government operates the Guernsey Notes and Coins Account to accomplish just this. It may be a result of the 1921 Currency and Legal Tender Ordinance, which I have not been able to locate, or it may be only a policy that could be changed by an executive decision.

Graph G-1. Bailiwick of Guernsey: Ratio of Reserves to Notes and Coin in Circulation

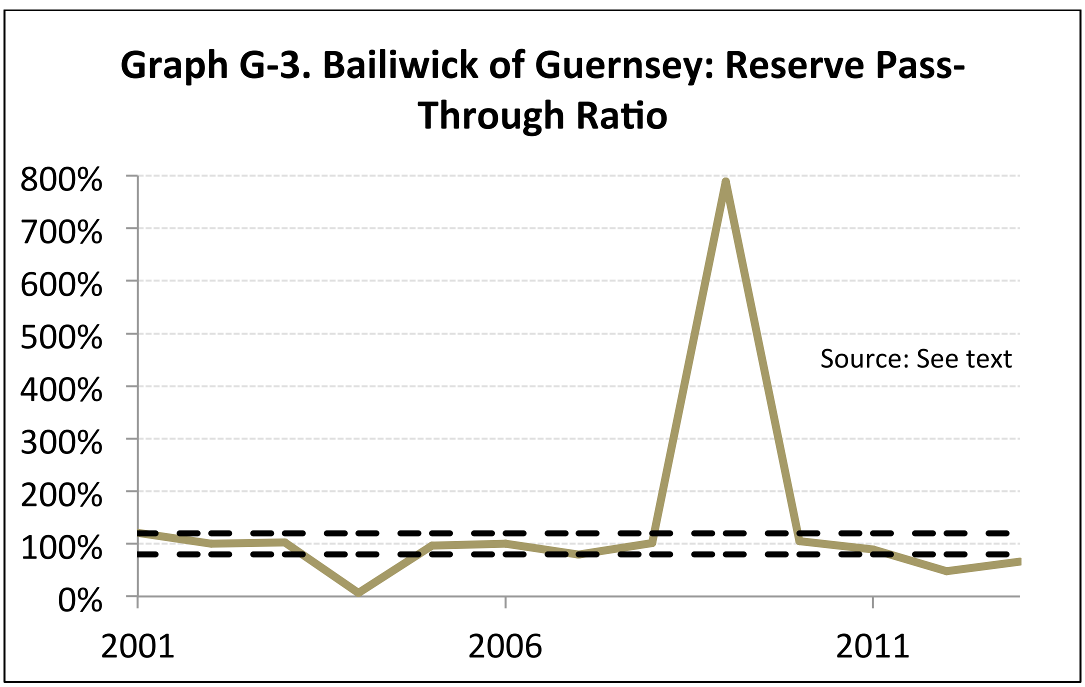


Data are available online from 1998-2013 from the *Accounts of the States.* As the graph above makes clear, reserve backing for notes and coins in circulation has been confined to a narrow range, 100-105 percent, nearing the theoretically orthodox 100 percent reserve value.



Looking now at the annual changes of currency in circulation and of reserves, they track each other closely, though with some differences in 2009 and 2012. Despite these few removals, even the year-over-year rate of change is matched significantly similarly through 2008.

The reserve pass-through ratio shows these results:



The reserve pass-through ratio reveals several unorthodox statistics, most significantly a 6 percent value in 2004 and an 800 percent value in 2009. As has already been explained, the reserve pass-through tends to intensify as the change in the money supply nears zero. A simple observation of the raw data reveals the number of Guernsey notes and coins in circulation rose by a mere 0.05 percent in 2004 and 3.8 percent in 2009. Because of the meager 2004 increase of notes and coins in circulation, the interest bore on the Guernsey reserves account ought to account for such a low value. However, the 3.8 percent increase in Guernsey notes and coins in circulation clears some of the "noise" away from the ratio. This, along with the lack of legislative data on the matter, calls for a more rigorous analysis on the currency board status of Guernsey.

Table G-2. Guernsey Notes and Coins in Circulation and Guernsey Notes and Coins Account from 2001-2013

Year	Guernsey Notes in Circulation	Guernsey Coins in Circulation	Total Guernsey Notes and Coins in Circulation	Notes and Coins Account Total	Reserve Ratio
1998	16,174,734	4,355,200	20,529,934	21,544,974	104.9%
1999 (a)	18,761,268	4,792,312	23,553,580	24,335,464	103.3%
1999 (b)	16,174,734	4,355,200	20,529,934	21,311,818	103.8%
2000	18,761,268	4,792,312	23,553,580	24,623,610	104.5%
2001	19,617,016	5,068,322	24,685,338	25,562,409	103.6%
2002	21,446,640	5,490,339	26,936,979	27,810,411	103.2%
2003	25,635,017	7,280,099	32,915,116	33,597,028	102.1%
2004	25,039,101	7,893,842	32,932,943	33,877,551	102.9%
2005	26,632,412	8,174,488	34,806,900	35,828,552	102.9%
2006	29,200,876	8,605,505	37,806,381	38,813,029	102.7%
2007	30,184,918	8,839,865	39,024,783	40,354,942	103.4%
2008	32,430,000	5,105,000	37,535,000	38,892,000	103.6%
2009	33,591,000	5,379,000	38,970,000	39,074,000	100.3%
2010	35,632,000	5,605,000	41,237,000	41,238,000	100.0%
2011	36,231,000	5,728,000	41,959,000	42,045,000	100.2%
2012	37,486,000	5,872,000	43,358,000	44,952,000	103.7%
2013	38,719,000	6,098,000	44,817,000	47,170,000	105.3%

Notes: For all tables on Guernsey, the underlying source of data is the Guernsey Treasury and Resources Department's *Accounts of the States.* The 1999 statistics originally published in 2000 are in the row labeled 1999 (a); strikingly, when republished in 2001, the data, reproduced in the row labeled 1999 (b), were considerably different. The tables show calculations for both 1999 statistics but I exclude them from the graphs, analyses, and conclusions due to the lack of credibility.

Table G-3. Annual Change in Guernsey Notes and Coins in Circulation and in the Guernsey Notes and Coins Account from 2002-2013

Year	Annualized Change in Total Guernsey Notes and Coins Circulated	Annualized Change in Guernsey Notes and Coins Account	Guernsey Reserve Pass-Through
1999 (a)	3,023,646	2,790,490	108.4%
1999 (b)	0	-233,156	0.0%
2000 (a)	0	288,146	0.0%
2000 (b)	3,023,646	3,311,792	91.3%
2001	1,131,758	938,799	120.6%
2002	2,251,641	2,248,002	100.2%
2003	5,978,137	5,786,617	103.3%
2004	17,827	280,523	6.4%
2005	1,873,957	1,951,001	96.1%
2006	2,999,481	2,984,477	100.5%
2007	1,218,402	1,541,913	79.0%
2008	-1,489,783	-1,462,942	101.8%
2009	1,435,000	182,000	788.5%
2010	2,267,000	2,164,000	104.8%
2011	722,000	807,000	89.5%
2012	1,399,000	2,907,000	48.1%
2013	1,459,000	2,218,000	65.8%

Bailiwick of Jersey

Although no political union exists between the two states, the Bailiwick (also known as the Isle) of Jersey shares a history with the Bailiwick of Guernsey. Both were under the rule of the Duchy of Normandy centuries ago, both are currently crown dependencies, and both link their currencies to the pound sterling. Jersey became subservient to the English Crown in 1066 when William the Conqueror invaded the Channel Islands. The Bailiwick of Jersey would remain part of the Duchy of Normandy until 1204 when King John of England, to convince the Jersey people to take the side of the English while the French were conquering the rest of the duchy, enticed them with legislative independence and military defense. Over the course of the next several centuries, this independence continued to expand into the modern Crown Dependency of the Bailiwick of Jersey (States of Jersey n.d.).

Table J-1. Key Legislation on the Monetary System of Jersey

Year	Short Title	Significance
1834	Order in Council of 1834 [15]	Gives sole legal exchange currency status to the English currency
1840	Order in Council of 1840 [16]	Allows for the minting of a Jersey copper penny pegged to a partial value of the English shilling
1876	Emission de Monnaie de Bronze [17]	Reintroduces the Jersey copper penny, except at the same divisions and values of the English currency
1941	Currency Notes (Jersey) Law [18]	Introduces notes printed by the States of Jersey in response to the removal of silver coins by occupying forces
1955	Bank Notes (Jersey) Law [19]	Grants legal tender status to all notes of the Bank of England payable on demand
1959	Currency Notes (Jersey) Law [20]	Pegs Jersey notes to all notes considered to be legal tender at a one-to-one exchange rate, payable on demand
1995	European System of National and Regional Accounts 1995 [21]	Classifies Isle of Jersey banks as non-residents of UK in statistics

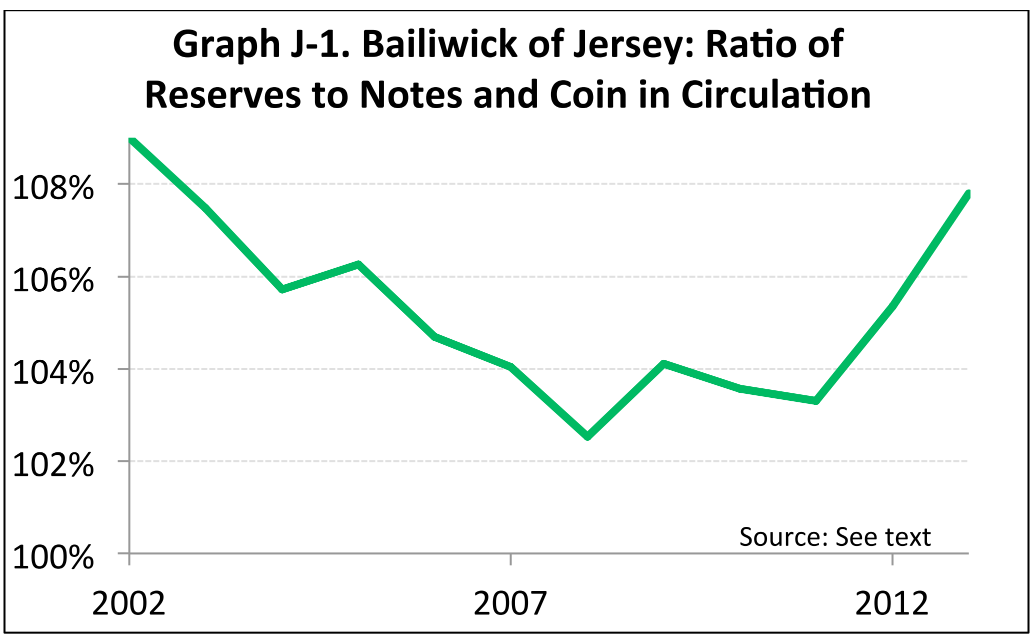
Due to its proximity to France, for most of its monetary history the Isle of Jersey used the French *livre tournois* as the major currency. However, because the *livre tournois* was replaced by the French franc as a result of the French Revolution, the Isle of Jersey's supply of coins of the old currency diminished in the late 18th and early 19th centuries. An Order in Council of 1834

[15] States of Jersey (1834).
[16] States of Jersey (1840).
[17] States of Jersey (1876).
[18] I only managed to find electronically accessible reference to this piece of legislation (Bois 1959).
[19] States of Jersey (1955).
[20] Bois (1959).
[21] Thame and Lamming (2000).

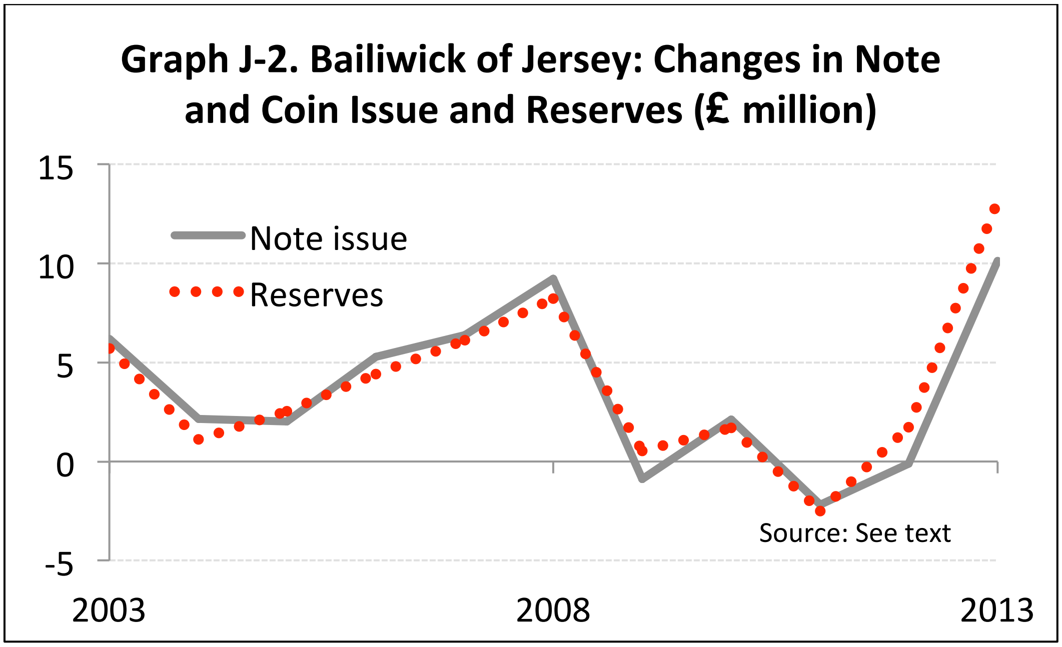
reacted to this depletion, making the pound sterling the sole legal tender medium of exchange; nonetheless, the *livre tournois* continued to carry be used in Jersey citizens until the coins became too worn and scarce to use (Lamine 2006: 70). In 1840, the Bailiwick of Jersey began to issue its own currency in the form of copper coins pegged at either one fifty-second, one twenty-sixth, or one thirteenth the value of an English shilling. This would remain the States of Jersey's sole currency, with the *livre tournois* continuing circulate extensively until 1876 with the Emission de Monnaie de Bronze. This would introduce a Jersey copper penny with the same divisions and value of English coins. The following century would continue to introduce new coins into the Jersey monetary system. Moreover, the Currency Notes (Jersey) Law of 1941 introduced state-issued notes as a response to the removal of Jersey coin by occupying German forces (States of Jersey 2014).

The 1955 Bank Notes (Jersey) Law identified all notes and coin payable on demand and pegged to the pound sterling as legal tender, meaning all the notes of the other jurisdictions mentioned in this paper hold legal tender status in the Bailiwick of Jersey. Despite this, as explained already, England does not consider Jersey notes to be legal tender but allows that they are legal currency, as that is a matter of interpersonal trade rather than centralized policy (Royal Mint 2014). The 1959 Currency Notes (Jersey) Law, which continues to govern locally issued notes, provided that note holders were entitled to receive payment in any notes they specified that were legal tender on the island. Neither the 1959 law nor, apparently, any subsequent law specifies a minimum ratio of external reserves to currency in circulation.

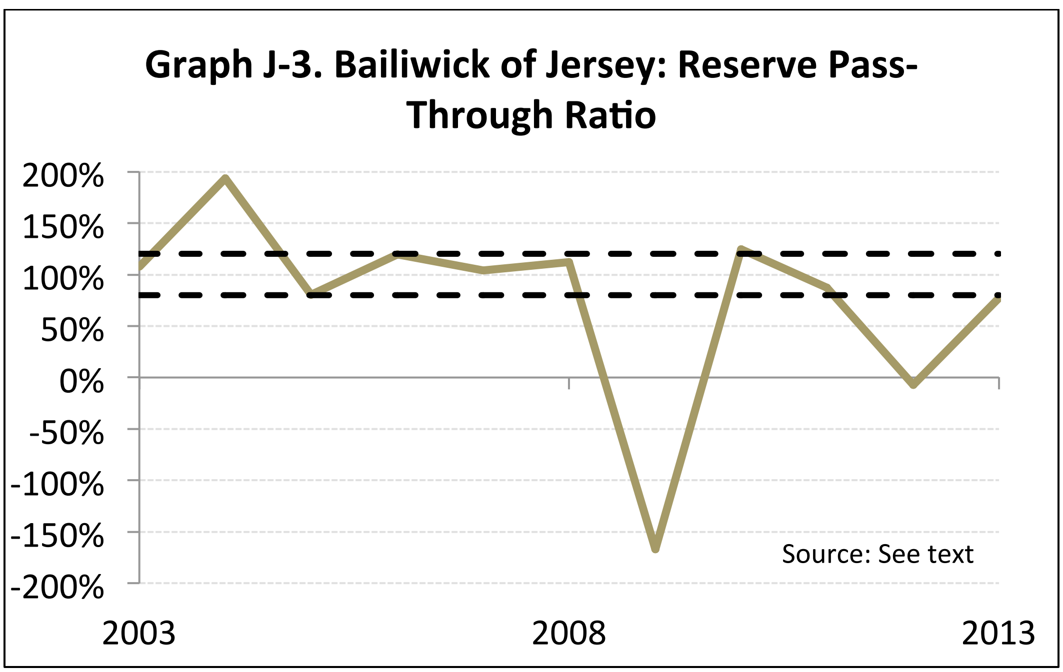
Online data are available from 2002-2013 using the Isle of Jersey's *States Accounts.* Unfortunately, the Jersey Treasury and Resources Department does not consistently record the total value of the Jersey Currency Fund. I calculated it as total assets less all listed liabilities other than the total value of notes and coins in circulation.



As the graph above shows, over the period for which there are data, the reserve ratio remains within the range 100-110 percent, as would be expected from an orthodox currency board.



The change in reserves and the change in currency in circulation track each other closely. The only exception being in 2009 and 2012 where, in both instances, an expansion of the reserves was matched by a contraction in the number of Jersey notes and coin in circulation.



Reserve pass-through shows frequent deviations from 80-120 percent range, including figures of 194 percent in 2004 and -167 percent in 2009. The 2009 figure might be explained as the 2014 Isle of Man figure was: a small decline in currency in circulation more than offset by interest earnings on external reserves, not necessarily indicating deviation from operating like a de facto currency board. The 2004 figure sits less well with the presumption that the system operated like a currency board. The assets of the Jersey Currency Fund increased only about half as much as currency in circulation. For the system to have worked like a currency board, the figures imply that the Jersey Currency Fund must have suffered negative returns, or that the government took money from the fund, reducing its reserves. I found no signs for either possibility, and therefore adduce it as reason to be skeptical that Jersey's currency system consistently operates on orthodox currency board principles.

Table J-2. Jersey Currency in Circulation, 2002-2013

Year	Jersey Notes in Circulation	Jersey Coins in Circulation	Total Jersey Notes and Coins in Circulation	Value of Jersey Currency Fund	Reserve Ratio
2002	55,215,158	5,086,608	60,301,766	65,733,149	109.0%
2003	61,016,580	5,458,720	66,475,300	71,447,676	107.5%
2004	62,839,708	5,795,120	68,634,828	72,563,074	105.7%
2005	64,471,526	6,197,944	70,669,470	75,092,406	106.3%
2006	69,570,380	6,368,078	75,938,458	79,501,990	104.7%
2007	75,648,534	6,658,826	82,307,360	85,634,417	104.0%
2008	84,527,006	7,022,106	91,549,112	93,864,006	102.5%
2009	83,350,187	7,314,028	90,664,215	94,393,930	104.1%
2010	85,226,851	7,552,568	92,779,419	96,091,968	103.6%
2011	82,707,000	7,889,000	90,596,000	93,586,000	103.3%
2012	82,281,000	8,189,000	90,470,000	95,317,000	105.4%
2013	92,265,000	8,344,000	100,609,000	108,459,000	107.8%

Notes: For all tables on Jersey, the underlying source of data is the Bailiwick of Jersey Treasury and Resource Department's *Annex to Financial Report and Accounts.*

Table J-3. Annual Change in Jersey Currency in Circulation, 2003-2013

Year	Annualized Change in Jersey Notes and Coins in Circulation	Annualized Change in Jersey Currency Fund Value	Jersey Reserve Pass-Through
2003	6,173,534	5,714,527	108.0%
2004	2,159,528	1,115,398	193.6%
2005	2,034,642	2,529,332	80.4%
2006	5,268,988	4,409,584	119.5%
2007	6,368,902	6,132,427	103.9%
2008	9,241,752	8,229,589	112.3%
2009	-884,897	529,924	-167.0%
2010	2,115,204	1,698,038	124.6%
2011	-2,183,419	-2,505,968	87.1%
2012	-126,000	1,731,000	-7.3%
2013	10,139,000	13,142,000	77.1%

Conclusion

In and around the United Kingdom, local monetary issuers separate from those of the Bank of England exist in Scotland, Northern Ireland, the Isle of Man, the Bailiwick of Guernsey, and the Bailiwick of Jersey. All exchange at one-to-one with the pound sterling. All have legislation or policies providing 100 percent reserve backing for notes and (if locally issued) coins in circulation. Each jurisdiction therefore has, at the very least, a resemblance to a currency board system. However, the paper has shown that each state deviates in some way from orthodox currency board practices.

In the cases of Scotland and Northern Ireland, the explanation is simple. They are part of the United Kingdom monetarily as well as politically, and, as such, the Bank of England sets their monetary base internally. Thus, Scotland and Ireland do not constitute currency board systems.

The other three cases, being more independent from England both monetarily and politically, are harder. For each, we must look directly to the analyses performed on the data. As with Scotland and Northern Ireland, each seemed to reveal deviations from currency board orthodoxy, especially by reserve pass-through measures. On their face, all states analyzed in this account failed to comply with standards of orthodoxy, overwhelmingly indicated by marks of sterilization as well as magnified reserve effects. However, the amount of data on these states is extremely limited, with the small window of data only produced annually. With the introduction of monthly or quarterly releases on the statistics published in this paper, we could prove more conclusively the status of these currency board-like systems.

On top of this discrepancy is the lack of legislative transparency in these isles. For all three, I was unable to locate the legislation outlining the principles by which they enumerate the powers and limits of those who control the reserve accounts. Without this critical information, it makes difficult to remove the "noise" from the data. For the time being, we may only leave this notion as mere speculation and focus only on the intricacies of the data within possession. That being said, the intricacies do not indicate the operations of orthodox currency boards, and so this is how we must conclude.

Investigation of the underlying data also raises a question how good an indicator reserve pass-through is of currency board orthodoxy when changes in currency circulation are small. Particularly in the case of a decline in currency in circulation that is small, external assets can continue to grow as long as yields are near or above, say, 1 percent a year. The reserve pass-through ratio makes it appear as if sterilized intervention is happening even though it may not be. Perhaps there are supplementary measures or adaptations of the reserve pass-through measure that would make it more useful for such cases.

I hope this analysis provides opportunity for future research on the data provided. Perhaps even more significantly, I would hope this paper's conclusions and future conclusions on behalf of this paper's data allow for analysis on the costs and benefits of operating such regimes, for we must always take into regard that behind any concentration of economic data lie the operations of people.

Data Note

The data presented here are also in an accompanying spreadsheet workbook that should be posted with this paper. If it is not, I will provide the workbook on request. The workbook may be more convenient than the working paper for researchers interested in analyzing the numbers. I have provided copies of the primary sources used in the working paper and the workbook to the Institute for Applied Economics, Global Health and the Study of Business Enterprise. It maintains an archive of currency board annual reports and related material, which is available for consultation by scholars.

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