CENTRAL BANK INDEPENDENCE AND INFLATION: A NOTE

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We document increased central bank independence within the set of industrialized nations. This increased independence can account for nearly two-thirds of the improved inflation performance of these nations over the past two decades. (*JEL* E42, E58)

I. INTRODUCTION

A remarkable achievement among industrialized nations during the past two decades is the dramatic decline in annual inflation rates. A long line of research dating to Kydland and Prescott (1977) and Barro and Gordon (1983a, 1983b) has argued that larger degrees of central bank independence can improve average inflation rates.[1] Hence, a natural question to ask is: How much of the improved inflation performance of the industrialized nations can be attributed to increased central bank independence?

To answer this question, we use two measures of central bank independence from two different points in time. The first is the measure of independence used by Alesina and Summers (1993), which represents a measure of independence for the period 1955–1988. Second, we use a more recent measure of independence reported by Fry et al. (2000), which is derived from a central bank survey conducted in 1997. We restrict our analysis to the industrialized nations. Since many of our nations are now part of the European Central Bank (ECB), we restrict the time frames to 1955–1988 (the original time frame in Alesina and Summers [1993]) and 1988–2000 (pre-ECB).

We report three principal results. First, measured independence has significantly increased across time for nearly all the central banks in the survey. The average independence score rose from an index of 59 to an index of 83. Second, the slope of the linear relationship between inflation and independence that was originally reported in Alesina and Summers (1993) is statistically identical to the fitted slope in the more recent data. This suggests some stability in the inflation-independence trade-off. Third, using this fitted slope, we deduce that increased independence is responsible for nearly two-thirds of the decline in the inflation rates for industrialized countries as a whole.

II. DATA AND RESULTS

All the data used for this analysis are reported in Table 1. The first three columns in Table 1 are the data used by Alesina and Summers (1993) in their study of central bank independence and inflation performance. Alesina and Summers' (1993) measure of independence is an average of the scale used by Bade and Parkin (1982) and the scale used by Grilli, Masciandaro, and Tabellini (1991). Bade and Parkin's (1982) measure of independence reflects "political independence," which is defined as the ability of the central bank to select its policy objectives without influence from the government. This measure is based on institutional factors such as term length of bank governors, whether government representatives sit on the board. Grilli, Masciandaro, and Tabellini (1991) combine this measure of political independence with what they term "economic independence," which is defined to be the ability to use monetary

ABBREVIATION

ECB: European Central Bank

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1. Walsh (2003) includes a survey of this research.

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TABLE 1
Measured Independence and Inflation

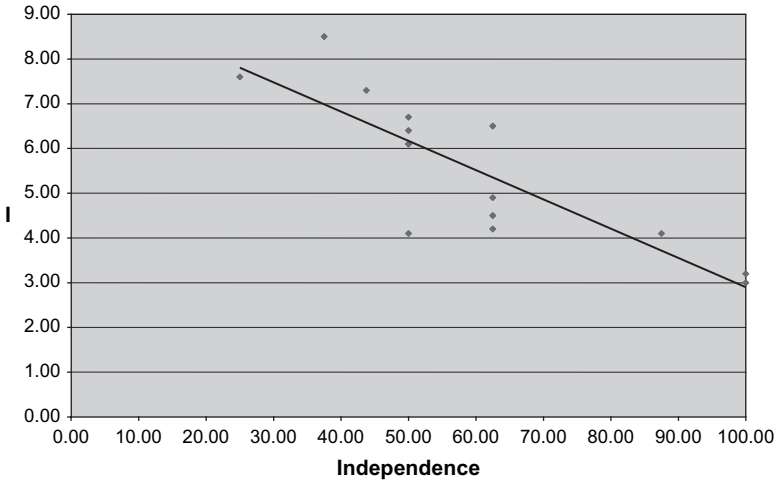
	Alesina and Summers' Independence	Alesina and Summers' Independence Rescaled[a]	Average Inflation, 1955–1988	Fry et al.'s Survey of Independence	Average Inflation, 1988–2000
Australia	2	50.00	6.40	73	3.33
Belgium	2	50.00	4.10	77	2.22
Canada	2.5	62.50	4.50	91	2.54
Denmark	2.5	62.50	6.50	88	2.44
France	2	50.00	6.10	90	2.01
Germany	4	100.00	3.00	96	2.41
Italy	1.75	43.75	7.30	88	4.14
Japan	2.5	62.50	4.90	93	1.10
Netherlands	2.5	62.50	4.20	91	2.41
New Zealand	1	25.00	7.60	89	2.68
Norway	2	50.00	6.10	57	2.85
Spain	1.5	37.50	8.50	80	4.35
Sweden	2	50.00	6.10	97	1.65
Switzerland	4	100.00	3.20	90	2.27
UK	2	50.00	6.70	77	3.98
United States	3.5	87.50	4.10	92	3.25
Austria				68	2.43
Finland				91	2.70
Greece				86	5.29
Hong Kong				74	6.10
Iceland				59	6.17
Ireland				87	2.79
Korea				73	5.51
Portugal				85	6.36
Singapore				90	1.98
Taiwan				85	2.73
Mean		58.98	5.58	83.44	3.30
SD		20.91	1.62	10.70	1.48
N		16	16	26	26

[a]Alesina and Summers' (1993) independence measure was a 0–4 scale. To make it comparable to the 0–100 scale of Fry et al. (2000), we multiplied Alesina and Summers' independence measure by 25.

policy instruments without government restrictions, for example, whether the central bank is required to finance the government deficit. Alesina and Summers (1993) normalize their independence scale on a 0–4 index.

The remaining two columns of Table 1 report Fry et al.'s (2000) data set. This data set includes a larger set of industrialized nations. As is clear in Table 1, countries that had little independence in Alesina and Summers' (1993) sample had significantly greater independence in the latter sample. The variation of independence among Alesina and Summers' (1993) countries thus decreased, limiting our ability to draw conclusions about independence in the latter time period. Because of this, we broaden our sample to include the other industrialized nations reported in Fry et al. (2000). The new sample includes the original Alesina and Summers' (1993) countries plus Austria, Greece, Hong Kong, Iceland, Ireland, Korea, Portugal, Singapore, Taiwan, and Finland. Fry et al.'s (2000) measure of independence follows Grilli, Masciandaro, and Tabellini (1991) by considering a wide range of characteristics including governors' term of office, legal objectives, deficit finance. Fry et al. (2000) normalize their scale from 0 to 100. Because of the different scales, we transform Alesina and Summers' (1993) 0–4 scale to make this index comparable to Fry et al.'s (2000) 0–100 scale. Since the means have clearly changed over the period, we need another way to transform the different scales. We assume that the independence score for the

FIGURE 1
Inflation versus Independence, 1955–1988



most independent central bank stayed the same across the sample periods. The most independent country in Alesina and Summers' (1993) data was Germany, with an independence score of 4, while in Fry et al.'s (2000) sample, Germany had a score of 96 (essentially 100). Hence, our transformation amounts to multiplying Alesina and Summers' (1993) scale by 25. With this transformation, it is comforting to note that the U.S. independence score in Alesina and Summers' data set is essentially the same as in Fry et al.'s data set. Arguably, there was little change in U.S. central bank independence between the two time periods.

Turning first to Alesina and Summers' (1993) data, Figure 1 plots their (transformed) data along with the linear regression line. The coefficients for this regression line are reported in Table 2. The celebrated result of Alesina and Summers' (1993) is the remarkably good fit of the inflation-independence trade-off, with a statistically significant slope coefficient of −.065. After adjusting for the rescaling, this coefficient is identical to the one originally reported by Alesina and Summers (1993).

Comparing Alesina and Summers' data with Fry et al.'s (2000) data, we note a substantial increase in mean central bank independence scores across the two time periods. Independence increased from a score of 59.0 in the 1955–1988 time period to 83.4 in 1997. There was also a sharp decline in the standard deviation of independence across nations. This data strongly support the assertion that the central banks of industrialized nations are substantially more independent than they were two decades ago. Furthermore, and not surprisingly, the improvement is most pronounced for the central banks that were the least independent in Alesina and Summers' original study.

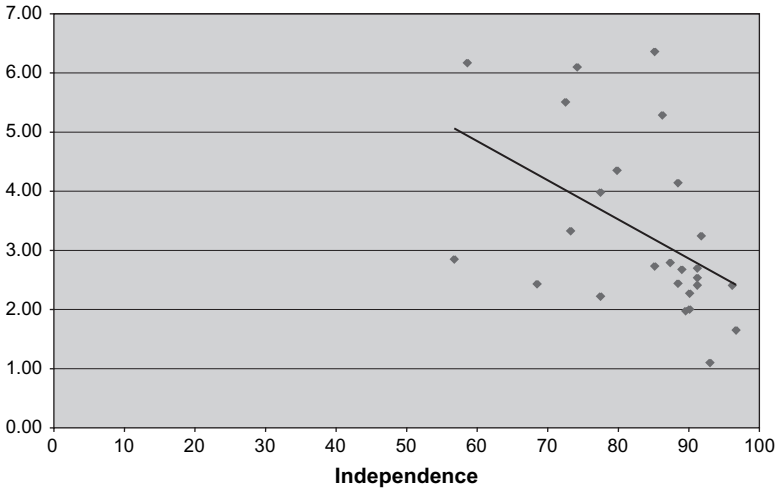
Fry et al.'s (2000) data are plotted in Figure 2 along with the linear regression line. Because all nations have substantially more

TABLE 2
Regression by Time Period

Time Period	Constant	Coefficient on Independence	R^2
1955–1988	9.44* (0.69)	−.0654* (0.011)	.71
1988–2000	8.82* (2.09)	−.0662* (0.025)	.23

Notes: Linear regression of inflation on independence. Standard errors are given in parentheses.
*Significant at 1% level.

FIGURE 2
Inflation versus Independence, 1988–2000



independence now than in the earlier sample, there is less variability with which to clearly identify the slope coefficient. However, as noted in Table 2, the slope coefficient is statistically significant with a point estimate of −.0662. This is essentially identical to the earlier slope coefficient. An F test fails to reject the hypothesis of a common slope at a 1% confidence level.

Table 3 reports the results of a pooled regression in which we combine Alesina and Summers' (1993) data with Fry et al.'s (2000) data. In particular, our regression has 42 observations and is of the form:

$$\text{Inflation} = \beta_0 + \beta_1 \text{Independence} + \beta_2 I_F + \beta_3 (I_F \times \text{Independence}).$$

I_F is the indicator variable or the dummy that takes a value of 0 for Alesina and Summers' (1993) data and a value of 1 for Fry et al.'s (2000) data. We add dummy variables for Fry et al.'s (2000) data points to allow for a different constant (β_2, the coefficient on the dummy) and a different slope (β_3, the coefficient on the interaction term). The results of the pooled regressions again strongly suggest a common slope across the two samples (the interaction term is insignificant) but an intercept difference of about 65 basis points. In other words, the data suggest that 65 basis points of the 2.3 percentage point decline in inflation is due to factors other than independence. Figure 3 plots the combined data set along with the two linear regression lines. The 65 basis point gap is quite apparent.

In summary, we conclude that the data support the assertion that (1) central banks of industrialized nations are significantly more independent now than in the earlier sample and (2) there is evidence of stability in the

TABLE 3
Pooled Regression

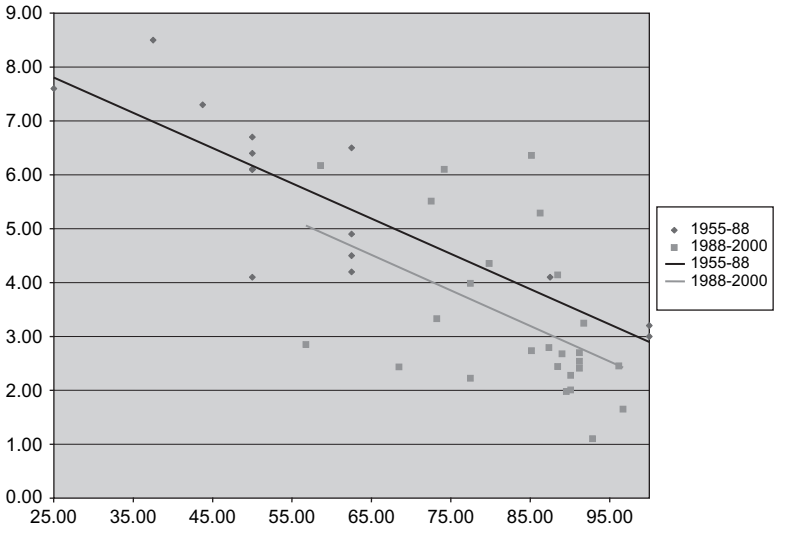
Constant	Coefficient on Independence	Dummy Variable†	Interaction = Dummy × Independence	R^2
9.45* (0.77)	−.0657* (0.012)	−.679 (0.48)	NA	.80
9.44* (0.92)	−.0654* (0.015)	−.618 (2.08)	−0.0008 (0.027)	.80

Notes: Linear regression of inflation on independence, Fry dummy, and Interaction. Standard errors are given in parentheses. NA, not applicable.

*Significant at 1% level.

†Equals one if in Fry et al. (2000) data set.

FIGURE 3
Inflation versus Independence, Pooled Data



independence-inflation relationship across the two time periods.

We can now use these two implications to assess the importance of independence in reducing mean inflation rates. Using a slope coefficient of −.06 and the 24-point mean increase in independence from 59 to 83, the statistical relationship predicts a decline in average inflation rates of 1.44 percentage points. The actual mean decline in inflation is 2.3 percentage points. By this approach, we conclude that increased independence explains 1.44/2.3 = 63% of the decline in average inflation rates.

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