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The neutrality illusion: biased economics, biased training, and biased monetary policy. Testing the role of ideology on FOMC voting behavior

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The Neutrality Illusion:
Biased Economics, Biased Training & Biased Monetary Policy

Testing the role of ideology on FOMC voting behavior

The age of quantification is now full upon us. We are now armed with a bulging arsenal of techniques of quantitative analysis, and of a power – as compared to untrained common sense – comparable to the displacement of archers by cannon. (...) I am convinced that economics is finally at the threshold of its golden age.

George Stigler (1965: 16)

The curious task of economics is to demonstrate to men how little they really know about what they imagine they can design.

Friedrich von Hayek (1974)

Introduction

It is in times of crisis and associated uncertainty that difficult and risky policy choices must be taken. As a result, contrasts sharpen and deep divides re-emerge: between conservative and innovative, between theorists and historians, between laissez faire and interventionists, and between hawks, doves, owls and seagulls. The recent global financial crisis has been a case in point. Both fiscal policy – whether stimulus was and is still needed, whether it worked or did not work, whether it did not work because it was too small or because it could not work –and monetary policy – raising the rates earlier or later, using unconventional tools or not – have been subject to raging debates and divides in academia as well as in policy-making circles across the Eurozone, the UK, the US, Japan and China.

These divides appear hardly avoidable as, in Rodrik's words (2014b:192), 'cognitive and other limitations force political agents to live in a world of Knightian uncertainty with

respect to their understanding of causal relationships'. The divides thus display very different visions of how the economy work, different methodological lenses, different paradigms and beliefs, grounded in the history of economic thought, loosely endorsed by political parties or mapped in political debates as left or right leaning views. We use in this paper the term 'ideology' to refer to these different Weltanschauungen (worldviews in the philosophical sense) – that is: 'a system of ideas and ideals which forms the basis of economic or political theory and policy' (Oxford Dictionary 2016).

The present work will focus on the conduct of monetary policy, as one of the major area of policymaking of our times where the cleavage is clear. We indeed argue that central bankers do cling to ideological priors and specific views on how the world works.

The literature on the determinants of central bankers' voting behaviour has already revealed that governors do not simply respond to economic variables and models' outputs. They are influenced by deliberation, by the chairman, by politics through appointment choices and by pressures in and out of election times; and by their pre-central-bank career and post-central-bank career plans. In this paper, the analysis is extended to include yet one more variable: ideologically-influenced academic training[1].

The central argument of this paper is indeed that central bankers having studied in conservative (Keynesian)[2] departments will have a tendency to vote for tighter (easier) monetary policy. It goes in several steps: it argues that 1) there are significant cleavages among economists as well as ideological sorting across universities, 2) this variation shapes the ideological preferences of students studying for advanced degrees, 3) those early built preferences will be reflected when central bankers vote, 4) leading monetary policy – thought to be a purely technical and independent area – to be partly driven by ideology. The results show robust empirical evidence for this in one specific case: the Federal Open Market Committee, armed with a new database on votes and determinants.

This article thus relates to the very core of the now large body of the International Political Economy (IPE) literature on the role of ideas in policymaking, but serves two original purposes. The first is to bring together a number of strands of scholarship: a more sociological literature focusing on the power of ideas in economic policy, strongly put forward by the neo-constructivist strand[3] in IPE, and the more rationalist strand literature that has studied central bankers' voting behavior. The second is - following the innovative work by Chwieroth (2007a) on the International Monetary Fund (IMF) - to use academic training to determine quantitatively the causal weight of ideas and to prove its potential extension to other institutions (here the Fed).

This work can thus contribute to several key debates in IPE: On the methodological side, it backs up the claims on the importance of ideas and the possibility of their measurement. On the theoretical side, it sheds new light on the political economy of central banking by taking a different perspective on the possibility of true central bank independence. Finally it brings tools to understand the current economic news at a time when, on the one hand, ideological divides among economists are at their utmost intensity and when on the other hand monetary policy has been assigned in all advanced countries the unprecedented role to solve all the economic predicaments of our time.

The first section will argue against economics as a consensual, depoliticised and scientific discipline, demonstrating deep ideological divides among economists and across universities.
The second section will argue against monetary policy as a neutral, independent and technical exercise, highlighting the several factors that impede true central bank independence.
The third section will develop our central argument and justify the use of our key variable (economic training) and case study (the Federal Open Market Committee (FOMC)).
The final section will describe the data, econometric model and discuss the main results.

PART I: The Myth of a Depoliticised & Consensual Economics

Warring ideological camps

When reflecting on their discipline, some economists believe that economics is and should be a science and that there is a broad consensus among economists on the key issues (Mankiw 2006; Solow 1985; Stigler 1965); against those who think there is a clear spectrum of views and fundamentally different visions of how the economy works (Hayek 1974; Smith 2013; Wolfers 2013).

In the former camp, Chetty (2013) argues that despite newspapers' opposition (say Niall Ferguson v. Paul Krugman) or journalists' voluntary polarization (say Eugene Fama v. Robert Shiller), everybody shares a profound agreement in the Mertonian norms of open science, peer review and replication that will lead to the formation of some commonly accepted truths (Mankiw 2006). Consensus would thus be a question of time. Stigler (1965)'s argument is in the same spirit: ideological preferences are absent of economic research; scientific methods would purge ideology out of economics.

In the latter camp, Robert Hall already drew in 1976 a clear ideological and methodological line between two schools: the freshwater school (Midwest of the US: e.g. Chicago or Minnesota), for which the government is not capable of reviving the economy because fluctuations come from supply shifts as opposed to the saltwater school (in coastal US universities: e.g. Berkeley, Harvard, or Princeton) which focuses on stimulating demand through government policies. Starting in 2008, Paul Krugman's NYT columns have famously revived the terms. The deemed nefarious influence of Freshwater economics and the Chicago school had led economists to turn a blind eye on market imperfections (Krugman 2009).

For Krugman (2013), if it is true that in such areas as the return to the gold standard or the benefits of free trade, economists mostly agree; the divide is very strong in business cycle

macroeconomics, which he deems the most crucial for current policy debates. As George Bernard Shaw emphatically put it, it may be the case 'if all economists were laid end to end, they would not reach a conclusion'.

We roughly describe this broad ideological divide by opposing a 'conservative' vs. a 'Keynesian' camp on these questions. Following many studies referenced in this paper[4], we use the term 'conservative' to broadly describe a more freshwater worldview which sees government as not capable of reviving the economy because fluctuations come from supply shifts, which values fiscal responsibility, and with regards to monetary policy which doesn't believe an expansionary monetary policy can revive growth in the long term and thus attaches more importance to price stability. We oppose this category to what can be loosely defined as the 'Keynesian' worldview, which relates more to the saltwater school above-described, demand oriented, and interventionist. Admittedly crude[5], this distinction however offers a testable theoretical framework adequate for the argument presented in this paper.

Empirical Evidence across Economists and Universities

Several scholars have tried to test empirically whether a consensus among economists exists. A first body of research relies on the conduct of surveys of economists' views. Fuchs et al (1997: 2) interestingly found in a panel of labour and public economists in 40 leading US universities 'considerable disagreement among economists about policy proposals'.

Based on the IGM survey, Gordon and Dahl (2013) found on the contrary broad consensus on most big economic debates, and that the few existing disagreements are linked to the absence of a large academic literature, confirming Stigler and Chetty's idea that the more research, the more consensus.

The problem with such surveys is that they suffer from several econometric flaws. The sample is either not representative or too small. Hence, a completely different methodology has been built by Onder and Tervio (2014): they ask whether scholars tend in academic papers to cite systematically more often scholars of a specific institution compared to another, and thus potentially of a specific ideology. They managed to demonstrate the existence of two clear clusters of citations across the top 50 departments in economics. They conclude that the Freshwater/ Saltwater camps are not a thing of the past as their two clusters convincingly mirrors the ideological divides raised by Hall (1976) with Chicago, Minnesota, Northwestern, Penn and Rochester in one camp, MIT, Princeton, Berkeley, Harvard and Columbia in the other. Even more interestingly their time series show that universities basically remain in the same cluster over the years, allowing us to downplay in our argument the hypothesis of institutional changes over time.

A final big empirical piece of evidence lies in the detailed research by Jelveh et al (2014) who found an important correlation between patterns of academic writing and political behaviour. They demonstrate a systematic ideological bias in academic research that corresponds to the ideological and political priors of the scholar. Moreover, these ideological biases are significantly distributed across fields and departments in economics. Could it really be that results derived from long mathematical processes systematically include ideological biases? Yes, the authors say: there is for instance a surprisingly strong correlation between the score of ideology of economists and the elasticities their empirical work calculate, 'with conservative economists report[ing] larger labor supply and taxable income elasticities as well as larger disemployment effects of the minimum wage' (Jelveh et al 2014 : 35).

'Methodological innovation is in fact driven by economists looking to overturn results that are contrary to their political priors. Empirical works in economics, including randomized trials, are still subject to numerous decisions about implementation, interpretation, and

generalizability' (Jelveh et al 2014:36). While they claim to be the highest defenders of neutrality, even solid empirical methods do not escape the pangs of ideology.

We can fairly conclude from this part that there is significant evidence both anecdotal and empirical that 1) the 'house' of economics is divided; 2) ideology is the principal factor of this divide, undermining the claim that economics is a neutral science; and 3) there is a significant ideological sorting across universities.

PART II: THE MYTH OF A DEPOLITICISED & TECHNICAL CONDUCT OF MONETARY POLICY

In the same vain, following the idea that fine-tuning of complex mathematical models could solve all our economic problems, it seemed reasonable to delegate one of the most important branch of economic policy, namely monetary policy, to those same 'neutral' experts. The case for central bank independence (CBI) appeared overwhelming.

'Ideas are critical in the monetary realm, because of continuing uncertainty over the basic workings of macroeconomics, the difficulty of collecting and interpreting signals from macroeconomic data about the effects of policy, and the lack of agreement over what constitutes "correct" macroeconomic policy' (McNamara 1998:55).

Indeed, if the discipline and the training are ideologically marked, concluding that policymaking also display biases need just one more logical step: through academic-results-turned-policy-recommendations and through socialised-students-turned-policymakers or central bankers.

The economic policy turn of the 1970s and the adoption of CB Independence

The post-World War II or Bretton Wood order was built on a British-American compromise deeply influenced by Keynes' ideas – what Ruggie (1982) called 'embedded liberalism'. On the financial side, it consisted in avoiding internal devaluation, reintroducing capital controls, and giving far more discretion to central banks in managing its exchange rate and reserves. Centrals banks were subservient to governments and financial systems were significantly constrained (Goodhart 2011). But traditional Keynesian recipes proved unsuccessful in curing the phenomenon of stagflation (inflation + stagnation) appearing in the 1970s, with the Philips curve turning vertical (Phelps 1970)[6] and in preventing the collapse of the Bretton Woods system in 1972. At that period, the monetarism school led by Friedman, borrowing aspects of Hayek's earlier reflexions, gained major influence and shifted the focus and priority to price stability. According to the monetarists, only a stable price mechanism is capable of accomplishing the informational and incentive functions needed in a free market economy with perfect competition. This 'consensus shift' led to, in the terms of Best (2004), 'a hollowing out of Keynesian norms', replaced by what she calls the 'neoclassical synthesis' and from mid 1970s 'monetarism'/ 'neoliberalism'. Discretionary monetary policy should be abandoned in favour of a strict rule coupled with central bank independence ensuring the credibility of the latter[7].

In the European context, McNamara (1998) demonstrated how the German ordo-liberal school of thought and overall the neoliberal consensus managed to gain the political influence needed to shape the EMS and the ERM in 1979 and later on the Maastricht Treaty which led to the creation of the most independent central bank in the world, endorsing price stability as its primary objective.

The uniqueness of monetary policy: neutrality and technicality

CBI also follows from a 'money is too important to be left to politicians' type of claim. But money is also too complex. Monetary policy models have followed the trend in economics in the 1990s towards mathematization. The faith in central banks was then at its highest.[8] And rightly so: it was the 'Great Moderation', a NICE period (Non-Inflationary Continuously Expansionary) for monetary policy. As had happened in physics before the quantum field restarted everything from zero, economists thought they had solved macroeconomics and policymakers thought global crises were a thing of the past. Central banking was seen as a purely technical matter that required nothing more than careful conduct by experts, separated from the political branch. Central bankers even started to ask the government to apply the Fed methods to other areas of policy[9].

Central banker Alan Blinder summarized well the consensus at the time in believing that 'central bankers set aside their own personal beliefs about what is best for society (α or k [the ideal inflation rate]) and adopt instead parameter values that lead them to "do their duty"' (Blinder 1997a: 14).

The problem is that defining price stability as top priority in the very first place does involve values, as Stiglitz (1998) and Berman and McNamara (1999) argued in their criticisms of CBI: preferring inflation fight over unemployment and growth involves ideological positions as monetary policy actions have redistributive consequences. There are thus important stakes in defining priorities for monetary policy, shaped following specific worldviews and ideology.

The hollowing out of Keynesian norms had however been accompanied with a 'faith in the neutrality of technique' (Best 2004).

The contours of the 'neutrality illusion'

But following the Global Financial Crisis, a complete rethinking of such views had to happen – at least in academia – about the role of monetary policy and the role of CBI. The Great

Moderation period, seen as the 'end of history' for monetary policy, had actually ended up setting the stage for the crisis. Financial stability had been neglected under the idea that bubbles were unpredictable, and monetary policy had been too loose for too long.

CBI has actually always lived with significant flaws that are only rediscovered right now. While politicians may not be capable of conducting a socially adequate monetary policy, these flaws led Milton Friedman (1968) to paraphrase French President Raymond Poincaré in saying 'money is too important to be left to central bankers'. [10]

Bringing politics back in

If paradoxically we now live in a situation where much more is being asked to central bankers and where central banks have gained significantly more power, this should not overlook the fact that politics has come back with force into central banking after the crisis.

The official mandate of central banks had been let aside with for example the ECB often prioritizing the improvement of employment and growth conditions over its inflation target. The Fed is in the same position, although the change is less important as officially the Fed has to follow a dual mandate of economic stabilization plus inflation fight. Also, by openly engaging in fiscal policy and debt management after the crisis, because of the large distributional issues that fiscal policy actions imply, independence simply cannot be preserved (Meltzer 2009, Goodhart 2011). Both QE and the acceptance of macro-prudential power run against the possibility of a purely independent central bank and are the sign of a return to the very discretionary policies that the time inconsistency theorists had fought against.

In the end, political pressures to follow government preferences have always been more or less present: never a central bank has acted in complete contradiction with government preferences (Friedman 1968). As former Fed chairman Arthur Burns strikingly said, 'we dare not exercise our independence, for fear of losing it'.

Regardless of the legal/ de jure changes (i.e Eijffinger and De Haan 1996, Cukierman 1994), political interference has always existed to a variable extent (Taylor 2013, Meltzer 2009, Goodhart 2011).

Bringing interests back in

Another flaw of the CBI argument is to consider central bankers in the Weberian ideal of the skilled, neutral and impersonal bureaucrat (Weber 1946). Central bankers are not human beings simply motivated by the common good, as explicitly thought by the earlier Blinder's quotes.

This is what Adolph (2013) tried to tackle at length in *the Myth of Neutrality*. He starts off saying that 'central bankers are the most important political actors still veiled by the myth of bureaucratic impartiality' and surprisingly so compared to the overwhelming role played by material interests in traditional IPE models.

Such a view clearly overlooks the distributional consequences of monetary policy. The current massive liquidity expansion that is now being done by all the major central banks has clear winners and losers: the losers are the poor savers, the retirees, and the pension funds; while the wealthiest win, being able to take advantage of rising asset prices. Distributional consequences lead necessarily to the existence of conflicting preferences and to the potential lobbying of interest groups and constituencies.

Hence Adolph (2013) reveals the major role played by interests in the conduct of monetary policy. He argues and indeed finds evidence of a systemic effect of career incentives on central bankers' votes. Depending on which career target one has in his subsequent professional life, members will send signals to those sectors according to the preferences of the targeted sectors. Hence the desire of a career in finance (government) systematically leads to a higher probability of favouring a tighter (easier) monetary policy.

Bringing sociology and ideas back in

The other side of Adolph (2013) argument on the role of career types is a mechanism of career socialization, closer to the argument presented in this paper. He also empirically demonstrates that central bankers' preferences on inflation are built in earlier professional life by socialization to the preferences of the sector in which they worked. Years of experience in finance will thus socialise individuals into higher inflation reluctance, while years in the government would lead to faith in Keynesian stimulus.

While in his words, 'monetary policy is a subject few give any thought before adulthood' (Adolph 2013:53), we disagree and argue that earlier professional life is not the most importance period for the formation of inflation preferences. Instead, we try to demonstrate the role of academic training and the socialization that happens not in the different types of careers, but in the different types of universities.

Again, the conclusion is far from the idea of a group of neutral individuals letting their own personal beliefs aside. Central bankers are frequently biased by their ideological preferences, be they formed during their earlier career as Adolph argues or during their academic training as we argue here – without deriving any normative implications from this conclusion[11]. But like the role of politics and interests, it would however ask for a profound nuancing of the concept of CBI.

We have for now argued against the common assumption of neutrality for both economics as an academic discipline and for monetary policy as a policy area. Linking the two arguments we now move on to the empirical validation of our claim that the bias in academic training leads to a bias in central bankers' conduct of monetary policy.

PART III: TESTING THROUGH TRAINING THE ROLE OF IDEOLOGY IN MONETARY POLICY: THE ARGUMENT

Quantifying Ideas in IPE: the Use of Academic Training (Chwieroth 2007)

The importance of testing the causal weight of ideas in IPE

The type of argument developed in the present work links to the core of the constructivist approach in IPE, which has put at the forefront of the debate the power of economic ideas in explaining policy outcomes, against traditional rationalist explanations emphasizing interests. This literature pointed out that not only ideas enter the equation, but that actually ideas shape interests: they shape preferences, constraints, and the choice of variables (Blyth 2003, Rodrik 2014b).

The work of scholars like Best, Blyth or McNamara, quoted earlier on, has shaped the discipline, demonstrating forcefully the impact that ideas have had in various contexts and periods in shaping policymaking.

However, while there is now a lot of evidence that ideas do matter in a variety of ways and lots of time 'trump interests' (Rodrik 2014b), the constructivist agenda and ideational research in general has bumped into the major problem in assigning causal weight, basing itself on detailed historical accounts, surveys, interviews that still lie in the domain of qualitative research.

IPE quantitative models are for the most part interest-based. Ideas have been integrated, but they are typically held as exogenous and loosely proxied: studies like Alesina and Rosenthal (1995) and the Partisan politics literature have for instance associated political parties with explicit ideologies like the preferences for inflation over unemployment. However, as pointed out by Rodrik (2014b), the issue - that those models do not explain where the preferences come from - started to be tackled recently: Alesina, Cozzi and Mantovan (2012) is an example of endogenous model for the determination of preferences.

The underlying problem remains that there is no straightforward way to quantify ideas empirically. Quantifying idea would exactly solve what Parsons (2002) labelled the how much question (assigning causal weight) and the how to question (how to measure the desired variable). Such a strategy would also solve the sentiment of scepticism that ideational research typically faces (Chwieroth 2007b). The present work believes in the future of a strand of the neo-constructivist literature that would adopt quantitative technics.

The importance of people's background

In a variety of branches of social sciences, it has been found that people's background matter: biographical history has dived into decisionmakers' early life to understand their subsequent choices; political sociology has specialised in determining which factors from income, family history, parents' preferences, type of education, geographical origin … would influence the

vote; labour and education economics have done similar tests to understand educational or professional achievements.

All seem to suggest a certain path dependency, certain continuity in individual ideology.

Coming back to monetary policy, in order to understand where Janet Yellen stands on the economic spectrum, it helps to know that her mentor at Yale was James Tobin and her husband and co-author happens to be Nobel Prize winner George Akerlof. Another example would be the deep influence of libertarian novel writer Ayn Rand and former Fed chairman Arthur Burns on Alan Greenspan.

Moving beyond important but anecdotal elements, training is a crucial variable that has a systematic effect. Chwieroth (2007b:6) points out that 'there is strong evidence that the content of an individual's professional training in a particular organization leads that individual to adopt certain beliefs, that organizational background can serve as a reasonable proxy for the ideas that individual shares'. As Finnemore and Sikkink (1998:905) put it, 'professional training does more than simply transfer technical knowledge; it actively socialises people to value certain things above others'.

Biased Economics Training & Its Use as a Measure of Ideology

In this article, a very specific set of these 'things' that Finnemore and Sikkink talk about is analysed, namely the classic trade-off in economics presented above: inflation or employment. Following the ideological divide we identified and defined earlier, 'conservative' ('Keynesian') preferences are to be understood as (not) valuing first and foremost the fight against inflation over any other priorities, preferring in that regard tight (easier) monetary policy.

Once one starts looking into economics training as a measure of ideology, the above discussion on the ideological sorting across universities takes a whole new perspective.

The work of Klamer and Colander (1990) and then Colander (2005, 2007) make the link clear by surveying graduate school students directly[12]. It gives evidence for such a socialization mechanism, and holds the professors' ideological influence on students as very powerful. If Colander (2005) found that the ideological differences across universities have been reduced over time, the results confirm the idea that the ideological sorting of universities influence students, and most importantly controlling for pre-selection before entering the school (Chicago students are most convinced of the importance of neoclassical economics, Harvard least; Chicago students have the highest confidence in the market while Harvard ones are the most sceptical). Students directly speak of 'accepting everything' their instructors offer them (Chwieroth 2007b: 10).

The discussion in this section points to a potentially powerful (both methodologically and practically) use of economics training in determining economic ideas (of policymakers), and thus economic policy (following a typical constructivist reasoning). This is the hypothesis Chwieroth (2007b) has posed and tested.

Empirical evidence of the importance of economics training: the training of IMF staff and the liberalization of capital controls in developing countries

Chwieroth tests economics training's ideology in a specific case: the socialised actors being IMF staff, the ideological set being the preference for capital account liberalization. He finds evidence that the across-the-board recruitment of staff trained in neoclassical economics department in the 1980s and until mid 1990s has been significantly correlated with the removal of capital controls in developing countries.[13] This study provides the first quantitative test for the power of ideas using economics training.

Problems of the preceding measure

Chwieroth's measure of ideological leaning of universities is based on several strong assumptions: the strongest one being that the number of publications in the AER is a good indicator for being neoclassical. First, the idea that university ideology can be proxied by journal ideology rests on the assumption that journals are ideologically biased, a point that has been debated (Jelveh et al 2014). Second, because the AER is undoubtedly among most prestigious review in the field, it is not surprising to find more publications from the top US schools. This leads him to classify in the same 'neoclassical'/ 'neoliberal' (used as substitutes in the paper, and which indeed tries to capture a broadly similar ideological bent as our and Gordon et al (2013) and Jelveh et al (2013)"conservative" definition) group Columbia, Berkeley, MIT, Chicago and NYU. This runs in sharp contrast with our previous discussion where teaching differences between Harvard, MIT and Berkeley on the Keynesian/ Saltwater side of the spectrum and Chicago and NYU on the conservative / Freshwater side of the debates were found important. It seems that this indicator thus does not reflect well the diversity of US universities.[14]

On a purely methodological point of view, there is also a case for having a continuous variable to describe the ideological position of economics departments and universities. As mentioned earlier, departments are distributed across a spectrum. A binary variable 'neoliberal/ other' - or following the terms used in this paper a binary 'conservative/ Keynesian' - would be much less precise.

Our Argument: Economic training in monetary policy and the FOMC

The present research wants to expand the promising avenue of research led by Chwieroth and explores a very different area of IPE: the voting behaviour of central bankers and the correlation with their constructed preferences on inflation, with the consequent important stakes described above. Central bankers having studied in conservative (Keynesian)

universities will have a tendency to vote for tighter (easier) monetary policy, leading consequently monetary policy – thought to be a purely technical and independent area – to be partly driven by ideology [15].

While our argument has a potential cross-country and cross-policy-area reach, our empirical analysis is restricted to one specific case of central bank: the Fed. The reasons are multiple:

1) The Fed is known to have very detailed records and transcripts; the biographical data for members are easier to find; the data sample is allowed to start earlier in time; economic projections are also more detailed;

2) Our preferred measure for ideology of university calculates scores only for US universities;

3) Analysing the FOMC allows us to place this article in an already very dense empirical literature on the determinants of the votes of members, on which we can fruitfully rely.

4) Finally the implications of our hypothesis if it is confirmed by the data are larger than for any other central bank, as the impact of Fed decisions is truly global (Rey 2015, Edwards 2015).

We found indeed that education has been poorly analysed overall by the literature on FOMC member voting behaviour[16].

Moreover, our data on the Fed and extended after 2000 show a large importance of economics training and a relative upward trend in the presence of economists over time.

(Figure 1: Share of votes per year by academic training)

(Table 1: Number of FOMC members by Alma Mater)

PART IV: ECONOMETRIC MODEL AND RESULTS

Data Description & Literature Review on the determinants of Fed voting

An updated database on the votes of the Fed was created, running until the end of 2014 and including a new variable: the ideological leaning of members' academic training.

Data Sample

Main Data sample: Only economics trained members

Our data sample includes the characteristics for all individual votes on monetary policy at the FOMC from 1966 to 2014. Following our main argument that preferences on monetary policy are formed during advanced economics training, our main sample thus removes the lawyers and business school trained.

For robustness check purposes, an alternative sample with members of all background was also constructed[17].

Dependent Variable

Main dependent variable: Voting records of FOMC members, '*vote*'

Our dependent variable is the vote by each individual of the FOMC. The data come from the minutes or transcripts published by the Fed. Votes are coded in the following way:

1 = dissent for easier monetary policy
2 = vote with the consensus
3 = dissent for tighter monetary policy

The data from 1966 to 1996 were given by Adolph (2013). We have coded the remaining years: 1996 to 2014.

(Figure 2 & 3: Number of Dissents per year)

For robustness check purposes, we also construct an alternative dependent variable 'ideal rates' which are the desired interest rates by FOMC members inferred from transcripts.[18]

Variables of interest: ideological score of the university the member attended, '*Jel1 ideology score'*

Data is taken from the crucial paper by Jelveh et al (2014) quoted earlier. The authors have managed to construct scores of ideology for every economist publishing in the main economics journals. Their first methodology in classifying topics and calculating scores – called here '***Jel1 ideology score'*** - is linked to the classification codes of the Journal of Economic Literature. Within each defined topic, through automated content analysis by defining economic left-leaning (which relates to the Keynesian worldview above-discussed: e.g. 'post_keynesian', 'aggreg_demand', 'labor_force') and right-leaning terms (related to our 'conservative' definition as well as Chwieroth neoliberal discussion: e.g. public_choice, laissez_faire, monetari_econ, price_distortion), they demonstrate evidence for some systematic ideological biases in published academic papers, strongly correlated with a measure for the predicted ideology of scholars outside of academia (campaign contribution, petition signing).

They summed the scores of individual economists belonging to specific departments to have an aggregated measure of ideology by economics department.[19] We associate this ideology score for each university to each member of the FOMC having studied for their most advanced degree in this economics department.[20]

The higher the jel1 score, the more conservative is the department. The coefficient is thus expected to be positive with regards to the probability of tighter dissent.

(Figure 4: Selected Universities by JEL1 Score)

(Table 2: Top 5 Most Conservative / Least Conservative Universities in sample)

For robustness check purposes, we use an alternative variable of interest « ***Lda50 ideology score*** » computed differently by Jelveh et al (2014) [21].

Control Variables

Economic variables

Following the large literature on FOMC voting determinants, the usual economic variables are added, the '***Expected inflation***', expected unemployment '***Expected unemployment***' and expected growth '***Expected growth***' that come from the Greenbook (the very economic forecasts that are built by the Fed staff) published at each meeting[22]. These have been found to be better than contemporary economic data, and much better than revised economic data. [23]

FOMC members are traditionally expected to vote tighter when expected inflation is high, and easier when expect economic performance is low. But the effect should be small. [24]

Political variables

The literature on FOMC voting has shown the importance of the party appointing the members, both theoretically through the principal/ agent framework and Partisan Theory of Politics (Alesina, Sachs 1988), and empirically. Havrilesky and Gildea (1991a) showed correlation between FOMC votes for tighter monetary policy and appointment by the Republicans.

We have also coded our political variables from 1996 to today. We thus need to control for the party appointing each member '***Republican appointee***'.

Republican appointees are expected to vote tighter than democrat appointees.

We also control for the traditional PBC argument (Nordhaus 1975, Allen 1986) that the agent (FOMC member) will vote easier if appointed by a party with a president running for re-election the year of the vote '***Appointee by party in re-election year***'.

Those members are expected to vote easier.

Variables specific to the Fed

A big part of the literature has focused on whether reserve bank presidents in each of the Fed district really are tougher on inflation than the governors of the Fed board in Washington. One of the reasons raised is that governors are appointed directly by politicians, while a more independent local board appoints Fed presidents. We thus include a dummy variable '***Bank president***' (Havrilesky and Gildea 1991a, Belden 1989).

Bank presidents are traditionally expected to be more hawkish than governors.

Belden (1989) has argued that the key determinant for monetary policy, explaining outcomes more than economic or political variables is the influence of the chairman and its personality. Schonhardt-Bailey (2013) and several others have focused on the importance of deliberation and the role of the chairman in creating this consensus. We thus add dummies for each chairman: '***Chair is***...'

We finally add a variable describing the level of the Fed fund rates '***Fed funds rates***' and a lagged variable '***Lagged fed funds rates***'. It may be the case that members prefer easier monetary policy because they find the level of interest rates too high in absolute/ historical terms.

The coefficients are expected to be negative, but the effect minimal [25].

Career variables

We follow here above-described work by Adolph (2014) on the importance of career socialization and career incentive. As a reminder, he assesses that years of experience at the Treasury '***Treasury experience***' or in Finance '***Financial sector experience***' prior to Central bank appointment will lead to tighter votes, while experience at the Fed '***Central Bank experience***' or in the Government '***Government experience***' will lead to easier votes.

The number of years spent in the financial sector has been used by Havrilesky and Gildea (1991) to predict FOMC members' dissent in favour of tightness. Woolley (1984) and Belden (1989) have also found that regional bank presidents' conservatism was linked to their careers in the banking sector.

The variables are expected to work in the above-mentioned direction but to have less explanatory power than claimed by Adolph. [26]

(Table 3: Basic Summary of variables)

Model specifications & Results

Specifications

Because our dependent variable (***vote***) can only take the values (1,2,3), we cannot use a linear regression and should thus use a probit or logit model.

As argued in Meade and Sheets (2005), an ordered logit is better than the multinomial for our purposes since it takes advantage of the information provided by the implicit ordering of the dependent variable to produce a single set of coefficient estimates and standard errors along with estimated threshold parameters or break points for each category.

For our alternative dependent variable (***ideal rate***), it is possible to use a normal linear multivariable regression, as the variable is continuous.

For both models, we use heteroskedasticity robust standard errors.

Following the literature, we drop the chairman observations as a chairman cannot dissent.

Main Results

(Table 4: Determinants of Dissents for Economics- trained members)

Political variables: Our results here follow the recurrent findings in the literature on the importance of political variables: all our coefficients are statistically significant and the directions of the correlations are all as expected. Namely: republican appointees are more likely to be inflation hawks than democrat appointees giving credit to the Partisan theory in IPE; and members appointed by the party of the president will vote for easier monetary policy in election year, giving credit to the PBC literature in IPE.

Economic variables: Economic growth forecast is not significant (Table 4, Column 2). The coefficients for unemployment and inflation forecasts go in the expected direction: when there are expectations of high inflation (unemployment), members will have a tendency to dissent for tighter (easier) monetary policy. The unemployment variable is however not significant, and both coefficients are very small. The reason is certainly as explained earlier that those expectations are already included in the chairman's proposition and thus do not matter much for dissents.

Variables specific to the Fed: our results for the Fed funds rates and their lagged value (Table 4, Column 3 & 4) also go in the right direction: the higher the rates, the more likely members will dissent to decrease them. However coefficients are not significant.

The coefficient for bank president is significant at 99,9 per cent and of a sizeable effect, in line with the large number of study holding it as crucial: bank presidents systematically dissent for tighter monetary policy more than governors. The 'Washington dovish bias' is hence confirmed.

Chairman variables (Table 4: Column 5): None of the dummy for specific chairman happens to be significant, denying the systematic effect argued by Belden (1989).

Career variables (Table 4: Column 6): the careers variables constructed by Adolph (2013) display very mixed results: only the years at the Treasury and in government have a significant coefficient, not those in the financial sector or at the Fed. On the first two, only government goes in the direction theorised by Adolph: experience in government does lead to more easy dissents confirming the 'Washington bias' but years at the Treasury instead of making one an inflation hawk has an even larger dovish effect. Why? The answer comes certainly that our sample just includes economics students, but the theoretical reason for such changes remains unclear.

Ideological Training variable: our variable of interest '***Jel1 ideology score***' displays very strong results for all model specifications: coefficients are for all variants statistically significant at 99 per cent or 99,9 per cent, go in the expected direction (that having studied in more conservative economics department leads to more probability of hawkish dissents), and has the largest explanatory power among all our variables on the voting behaviour of members. [27]

A member that has studied in a university with the mean ideological score dissents 2.4 per cent of the time for easier monetary policy and 4 per cent of the time for tighter monetary policy.

A member that has studied in a **more** conservative university dissent only 1.8 per cent of the

time for easier monetary policy (that is **24.1 per cent less than our average central banker**) and 5.3 per cent of time for tighter monetary policy (that is **30.8 per cent more than the average central banker**).

To put it another way, a member trained at the University of Chicago dissent for easier monetary policy 40.6 per cent less than the average central banker and dissent for tighter monetary policy 78.1 per cent more than average. In contrast, a member trained at Berkeley will dissent more often for easier monetary policy.

(Figure 5: Probability of casting a hawkish dissent depending on the ideological score of economics department)

(Figure 6: Probability of casting an easy dissent depending on the ideological score of economics department)

Robustness Checks: Alternative Specifications & Results

(Table 5: Alternative Dependent Variable: Ideal Rates)

(Table 6: Determinants of Dissent for All Members)

Alternative ideological training indicator (Table 4: Column 7)

As explained earlier, Jelveh et al (2014) have constructed another indicator under a different methodology to measure the ideology of economists: '***lda50 ideology score***'. The variable is still significant, the direction is correct and the coefficient high, underlining the robustness of our variable of interest.

Alternative dependent variable (Table 5)

We now regress our covariates on the implicit preferred rates for each member. Our ideological training variable is not significant. A first answer to this result could be that the

number of observations we have on ideal rates is much less than on the votes, preventing our model to correctly capture the effect of biased training.

Alternative data sample

(Table 6, Column 1): When the full sample is taken and law-trained and business-trained people are included, the results are also good for our ideology variable: the effect is strong and significant. This means that our argument on the training in economics could potentially be extended to law and business departments: it would then not be economics only that is biased in its teaching, but also law and business.

(Table 6, Column 2): When, keeping the full sample, we try again to regress our variables on desired rates, the results for our ideology variable become positive, even though not significant. This confirms our hypothesis that more data could allow us to capture the effect on ideal rates. The previous failure to find results hence does not appear to undermine the overall conclusion.

On the whole, even under the strains of alternative specifications, our results end up robust.

Theoretical & Empirical Limits of our Study

Limits of an analysis of dissents:

From an econometric point of view, dissent data are quite frustrating in the sense that relative to the number of observations in the sample (more than 5000), the number of dissent observations is low allowing for the possibility of big changes in the results from changes on a few dissent data.

However, the problem was the same for all previous studies on FOMC votes; the only credible alternative is the ideal rates variable - which does not fully solve the problem. Comparatively, going up to 2014 gives us in this regard more observations than the earlier literature.

Limits of our education measure [28]

Professors within the same economics department can have very different ideology. However, this should not remove power for our idea if aggregated evidence for a systematic bias is demonstrated.

Ideology of department necessarily evolves over time as new professors come in and earlier ones leave. In that regard the measure that is taken from Jelveh et al (2014) is less bad than any other measures in the sense that it does not measure ideology for universities for a specific or even recent year but have a sample of papers covering the years from 1973 to 2011. This mitigates but does not remove this important caveat.

The main theoretical caveat relates to the possibility of students having ideological priors before entering the school. However, our argument makes the assumption that on a thing so complex as preferences on inflation, it seems dubious that they could exist before entering university or completely formed even before graduate school. Klamer and Colander (1990) seem to conclude from their surveys that a clear ideological influence of the school on students can be isolated from priors, but more work would certainly be needed on this point.

There is a possibility that inflation preferences are not truly proxied by our measure of conservativeness of universities: for example free market convictions from education are delinked from inflation preferences. [29] It is assumed that these are exceptions and that conservative people in an economic sense generally are averse to inflation.

Conclusion: Humility of economists and policymakers

This article has tried to shed light on two myths that are usually widespread: the first one being the idea of the academic economist as a neutral scientist finding incontestable consensual truths thanks to incontestable empirical methods, the second the idea of the central banker as a Weberian neutral bureaucrat setting aside personal beliefs to act mechanically for the common good.

Deconstructing this 'neutrality illusion', this paper argued that economics is actually a divided and ideologically marked discipline despite its aim at natural-science-type-legitimacy. It argues in a related discussion that such ideological bias also impedes a purely neutral conduct of monetary policy, undermining the very idea of central bank independence.

Linking these two arguments, we argued that graduate training in economics is the first place for the formation of biased preferences, because of the substantial ideological sorting that exists across universities. This idea was tested on a specific topic (preferences about inflation) and in a specific case and country (the voting behaviour of FOMC members) through an updated database on votes at the Fed. Despite unavoidable caveats, we find robust evidence of a systematic impact of the ideological features of their alma mater on FOMC members' voting behaviour – impact that is found to be more important than the other traditional determinants of central bankers' actions.

In the future, it could well happen an ideological and teaching convergence among universities as already sketched by Colander (2007), which could downplay our reasoning

here. But for now, members from conservative (Keynesian) departments do vote for tighter (easier) monetary policy.

This paper has thus contributed to several discussions in IPE: in the very first place, it extended the literature on FOMC voting determinants by adding yet another variable of sociological blend: ideologically marked academic training. By extension it could also be tested interestingly on other central banks like the ECB or the BoE.

Then, it adds to the literature on CBI by further undermining the idea, agreeing with Friedman (1968)'s conclusion that CBI is in the end never really possible and that as a result, the best solution is a rule based conduct of monetary policy away from discretion.

More broadly, it backed up the claim that ideas matter in policymaking and that the quantification of ideas is a promising area of research. The influence of ideology in monetary policy could be certainly demonstrated in a more precise manner, as well as extended to other countries and areas of policymaking. More importantly, even more innovative and precise ways to measure ideas would certainly help in this regard.

Overall, and while recognition of- and caution about ones' biases is needed, disagreements among economists and different preferences on monetary policy should not be seen as a problem or failure of the discipline, but exactly as a healthy element (Rodrik 2014a). Rodrik rejoins Hayek, calls for humility and warns against the 'Pretence of knowledge'.

NOTES

[1] The background of FOMC members has very recently been discussed in the public media, education included (Neil Irwin in the New York Times in September 2015, Aaron Klein for Brookings in August 2016).

[2] A discussion of what is understood by the rough terms 'conservative' and 'Keynesian' is provided later on.

[3] See below for more details on the theoretical contextualisation.

[4] As an example, Gordon et al (2013: 1) states that 'economists coalesce into different camps, to a degree reflecting a liberal/ conservative divide, with one group focusing on evidence that government intervention is almost always too costly ex post to be justified and another that market failures are all too frequent and can be alleviated by well-designed policy interventions'. Similarly, Jelveh et al (2014: 33) speaks about 'low minimum wages, an optimistic view of social mobility, and ineffective government macroeconomic stimulus, all of which are plausibly held to be conservative positions'.

[5] This paper recognises the wide diversity of strands and nuances within each camp and views (monetarist, Austrian, neo-Keynesian etc). The various distinctions of supply side v. demand side economics, freshwater v. saltwater economics etc all have ground in common. Rodrik (2014: 193) summarizes well this discussion with the following questioning: 'Does the economy work better under laissez-faire or planning? Are economic growth and development more rapid under free trade or under protection? Does macroeconomic stability require Keynesian countercyclical policies or Hayekian non-intervention?' The concept of 'ideology' should be here taken broadly, and indeed the classical definition of ideology fits the broader concept used in the paper: 'a system of ideas and ideals which forms the basis of economic or political theory and policy'. As far as politics is concerned, the left has traditionally supported

a more Keynesian worldview while the right has supported the conservative view. The paper however takes a much broader concept than simply political ideology.

[6] The Phillips Curve describes an historical inverse relationship between unemployment and inflation. It is a crucial economic concept very much used for the conduct of monetary policy and still widely discussed today.

[7] The case for independence of the central bank has been defended through several arguments (Eijffinger and de Haan 1996) which were backed up with – now debated, at the time uncontested - empirical evidence (i.e Alesina and Summers 1993). Political business cycle (PBC) theory has argued that the central bank will be exposed to pressures from the government to act in line with its preferences, leading to socially suboptimal level of inflation and government deficit (Nordhaus 1975, Allen 1986). Partisan theory (Alesina and Rosenthal 1995) has argued that monetary policy will diverge from one administration to another depending which political party is in power. Finally, an important discussion about the time inconsistency problem and the need for policy rules over discretionary policy (Kydland and Prescott 1977, Taylor 2013, Woodford 2011) concluded that the delegation to an independent central bank could serve as partial commitment to the rules.

[8] The Fed appeared in the polls as the most trusted institution in the US (Zakaria 2003). Fed Chairman Alan Greenspan was considered the most capable man of the country. Central banking was in the words of William Buiter (2006), 'a cult whose high priests perform the sacred rites far from the prying eyes of the non initiates'.

[9] CBI marked indeed the start of a larger movement at the global scale of delegation of technical decisions to unelected independent agencies (Vibert 2007). Hence, former Fed

governor Alan Blinder (1997b: 1) was to write, '(the US) system is too political' and to urge to 'learn from the Fed'. In contrast to the highly political life at the White House, at the Fed it is only 'serious policy discussions' where 'overtly partisan talk is deemed not just inappropriate, but ill mannered', where 'attitudes of particular legislators, interest groups, or political parties toward monetary policy are rarely mentioned', and where 'criteria are clearly apolitical'.

[10] Friedman was however wrong in attributing the quote to Raymond Poincaré. Georges Clémenceau actually pronounced the famous « *War ! It is too serious a thing to be left to the military* ».

[11] If the word 'biased' is used extensively in this paper, it shouldn't be read as implying normative judgment despite the traditional negative connotation of the term. Ideological bias for both economic research and monetary policy isn't necessarily bad. The entire discussion actually claims that it is unavoidable. If economics is a very complex discipline that cannot be brought down to universal empirical truths, if the consequences of today's monetary policy innovations are simply unknown to policymakers, individuals are forced and actually need to hold on to specific – ideologically marked – paradigms and frameworks. As Rodrik (2014b:192) nicely puts it, 'Policymakers operate under certain working assumptions about how the world works. Their worldviews shape their perception of the consequences of theirs' and other's actions'.

[12] Undergraduate students in economics almost all learn basics microeconomics and macroeconomics in the pure neoclassical tradition. Indeed, there seems to be little teaching variation and little differences on the whole between the major economics 101 textbooks. As Mankiw (2006) points out, the three leading textbooks today (Blanchard, Bernanke, and

himself) have all been written by economists who were taught at MIT - in the neo-Keynesian tradition of Samuelson and Solow. If students receive more or less the same introductory courses, the socialization of students with the specific ideological features of professors and departments should happen later on. The right focus is thus on graduate training in economics as Klamer and Colander (1990) explain, exactly because this is the time when students will really become 'economists' and would decide their own view on the key economic debates of the time.

[13] Nelson (2014) has a similar methodology and argument and concludes that IMF lending is driven by the 'degree of similarity of beliefs between IMF staff and key policymakers in the country'.

[14] It might well be that in the period analysed, most of the economics department in the US had strong neoclassical ties and that there was a wide consensus about the benefits of capital account liberalization. However, econometrics is useful in explaining variations, not consensus. In any case, such measure would not be applicable to our much less consensual ideological set: preferences on inflation.

[15] To hold, this argument is based on several assumptions developed earlier on, namely 1) different universities have different and measurable ideological leaning; 2) students are socialised with this specific leaning.

[16] Several studies like Havrilesky and Gildea (1991a) have sometimes included some variables of education: dummies if members have a PhD in economics, a law degree or a business degree. This appears unsatisfying insofar as our argument does not concern as much the type of degree but the type of university and their ideological leaning. Adolph (2013) is talking briefly about education, but soon denying its importance by raising two surprising

facts: first, economics training beyond undergrad is uncommon for central bankers of advanced economies, barely reaching 30 per cent; second, central bankers come from a wide range of universities – not only US or top national schools. However, he later himself implies a major role for education saying for example that the recent dissents by Narayana Kocherlakota of the Minneapolis Fed and Charles I. Plosser of Philadelphia are easily understood 'when knowing that they both are conservative economists trained at the University of Chicago' (Adolph 2013:140). Moreover, his database ends in 1996. First, the percentage of people going into higher education has increased a lot in recent decades. If it was possible to have FOMC members without any university background in the first half of the twentieth century (i.e. Mangels who sat in the Committee between 1956 and 1961), it is not the case anymore. Second, economics itself has taken a much more important role in policymaking in the most recent decades (Fourcade et al 2015).

[17] For robustness check purposes, we built an alternative data sample containing the votes from all members: lawyers and business trained members included. This would be a test if our argument of ideology in specific university goes beyond the economics department and apply to the school as a whole.

[18] A big part of the literature on the FOMC has pointed out that dissents are actually infrequent because of the several advantages to show an image of consensus: credibility of the central bank, peer pressure, formation of consensus by the chairman. This has led several scholars to try to infer from the discussions directly (coming from the transcripts published with a 5 year lag) the rates preferred by each member even though they do not dissent. This has the advantage to have more precise information; it also has the significant drawback to reduce significantly the number of observations. Chappell, McGregor, and Vermilyea (2004) collect these revealed interest rate preferences for all voting FOMC members at each meeting

between 1970 and 1978 (under Arthur Burns' chairmanship) and between 1987 and 1996 (under Alan Greenspan). We have coded the data from 1996 to 2009 (last year for which the transcripts are published) by reading the transcripts of these later years.

[19] It is to our knowledge the best and most accurate measure of university ideology that can be used at the moment, and more precise than the one previously developed by Chwieroth (2007) or Nelson (2014).

[20] In our sample, on the 81 economics-trained members, 67 have a PhD. Following our argument, we take as our variable the highest degree the members have achieved. The empirical difference in this study between master/ PhD/ undergrad should however be minor.

[21] Jelveh et al (2014) have computed an alternative measure through a different methodology for classifying topics of academic papers, called lda50 that follows the Latent Dirichlet Allocation algorithm, a process of Bayesian machine learning. If the scores per university are clearly different between jel1 and lda50, they are still supposed to measure generally the same thing. We expect this measure to have the same effect on the voting behaviour: the higher the lda50 score, the more conservative is the university and thus the higher the probability of tight dissent from a former student of that university.

[22] Economic data were coded by Chappell et al (2004) until 1996. We have coded the remaining data from 1997 to 2015.

[23] Meade et al (2005) have also shown the importance of regional economic variables: they found evidence that individuals vote easier if the economic performance of their region is worse than the national average.

[24] Even though these forecasts have an important effect on the level of interest rates set by the committee, they would have a much smaller effect on the dissents because these economic expectations would have already been integrated in the chairman's proposed interest rate. Our econometric analysis on dissent want to explain the *variation* in preferences within the committee, not the overall level of interest rates decided.

[25] Same argument than note 14.

[26] We do not have access to career data for the remaining years from 1996 to today and thus test the career variables only in 1966-96 data.

[27] Interpreting the coefficients of an ordered probit model is not straightforward and cannot be done in the same way as traditional OLS regressions. A clear way to interrogate the model is to compare the predicted likelihood of easy or tight dissent under a specific counterfactual value of our training variable, with the predicted likelihood of easy or tight dissent under the average level of our training variable (keeping all other variables at their mean values). We compare here a central banker whose university has a degree of ideology one standard deviation above the mean (more conservative university) with our average central banker.

[28] An obvious « practical » limit is that our measure just has scores for the top 50 universities; this reduces significantly the number of voting observations that we can integrate in the model. However, this is the best and most precise measure we found for such a complex idea of ideology of department.

[29] Thornton (2002) notes that Robert McTeer, president of the Dallas Fed who was openly free market or even Austrian has always voted for expansionary monetary policy and did not seem to care much about rising inflation.

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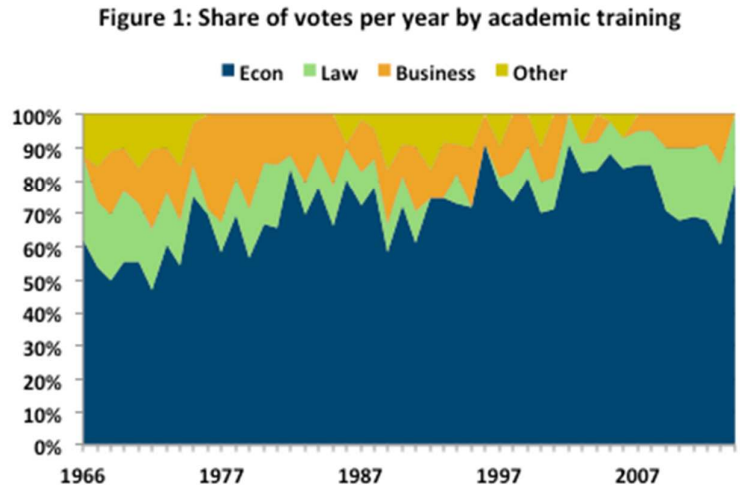
FIGURES & TABLES

Figure 1



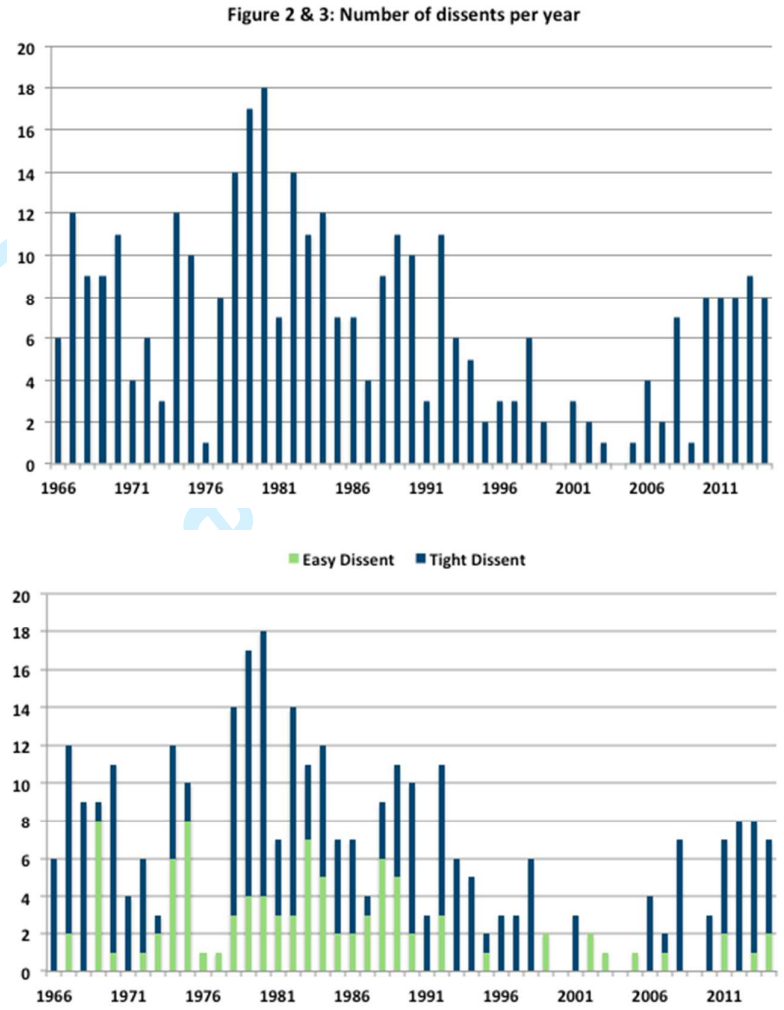
Source : FOMC, Author's calculations

Table 1:
Number of FOMC members by Alma Mater (Top 10)

Harvard	25
U Penn	9
MIT	7
Indiana	6
Michigan	6
Missouri	6
Berkeley	5
Yale	4
Chicago	4
John Hopkins	4

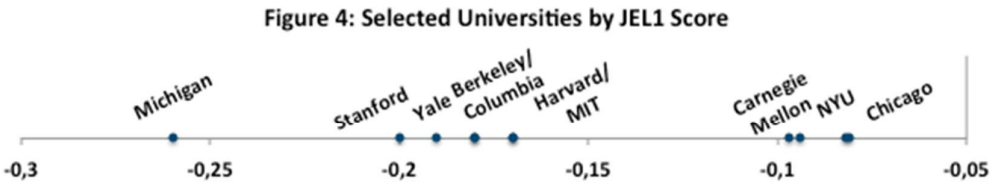
Source : FOMC, Author's calculations

Figure 2 & 3



Source : FOMC, Author's calculations

Figure 4



Source : Jelveh et al (2014)

Table 2:
Top 5 Most Conservative / Least Conservative Universities in sample

Most		Least	
Vanderbilt	-0.032	Stanford	-0.20
Chicago	-0.081	UC Davis	-0.23
Ohio State	-0.082	Dartmouth	-0.26
Maryland	-0.084	Michigan	-0.26
NYU	-0.094	Rochester	-0.29

Source : Jelveh et al (2014)

Table 3: Basic Summary of variables

N	Mean	SD	Min	Max	
2161	2.02	0.29	0.00	3.00	
1023	4.72	2.51	0.00	12.25	idealRate
1458	0.23	0.31	0.00	0.85	Financial sector experience
1458	0.11	0.13	0.00	0.47	Government experience
1458	0.03	0.07	0.00	0.27	Treasury experience
1458	0.24	0.30	0.00	1.00	Central Bank experience
2161	3.93	2.37	0.30	11.90	Expected inflation
2161	6.29	1.63	3.50	10.90	Expected unemployment
2161	2.66	2.34	-7.30	7.85	Expected growth
2161	0.11	0.31	0.00	1.00	Appointee by party in reelection year
2161	0.40	0.49	0.00	1.00	Republican appointee
2161	0.36	0.48	0.00	1.00	Bank president
1946	6.09	3.54	0.00	19.14	Fed fund rates
2161	-0.19	0.05	-0.25	0.04	Lda50 ideology score
2161	-0.17	0.05	-0.26	-0.08	Jel1 ideology score

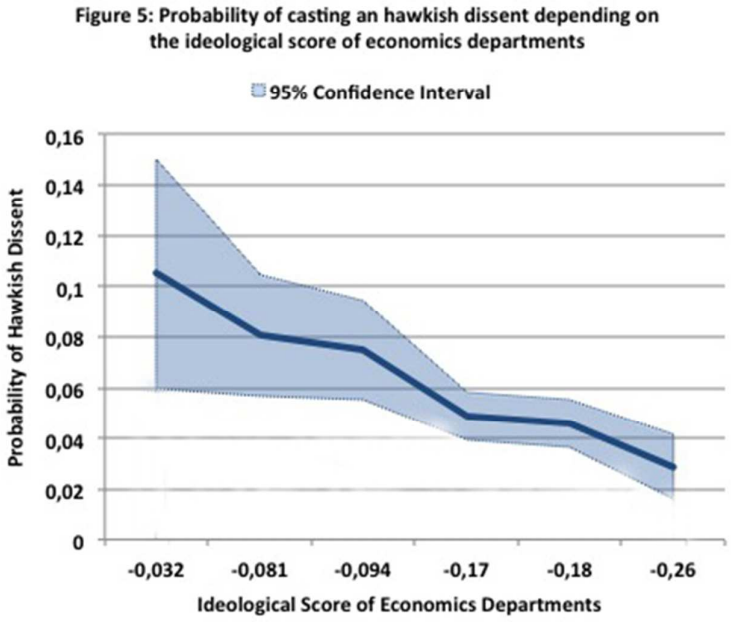
Source : Author's calculations

Table 4: Determinants of Dissents for Economics-trained members

	main	growth	FF	lag FF	chairman	careers	lda50
vote							
Jel1 ideology score	7.515***	7.481***	9.153***	9.105***	7.576***	10.69***	
	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	
Expected inflation	0.0631	0.0602	0.0357	0.0489	0.0304	0.127*	0.0583
	(0.091)	(0.113)	(0.591)	(0.469)	(0.639)	(0.011)	(0.126)
Expected unemploym~t	-0.0261	-0.0287	-0.0808	-0.0875	-0.168*	0.00919	-0.0304
	(0.619)	(0.599)	(0.192)	(0.149)	(0.017)	(0.912)	(0.564)
Appointee by party~n	-0.488*	-0.484*	-0.567*	-0.566*	-0.325	-0.490	-0.496*
	(0.035)	(0.036)	(0.030)	(0.030)	(0.205)	(0.064)	(0.034)
Republican appointee	0.626**	0.629**	0.850***	0.840***	0.633**	0.362	0.519*
	(0.003)	(0.003)	(0.000)	(0.001)	(0.006)	(0.187)	(0.012)
Bank president	0.965***	0.969***	1.019***	1.012***	0.927***	0.726**	0.985***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
Expected growth		-0.0108	-0.000538	0.00357			
		(0.752)	(0.988)	(0.923)			
Fed fund rates			0.0544				
			(0.189)				
Lagged fed fund ra~s				0.0471			
				(0.303)			
chairIsMartin					-0.809		
					(0.212)		
chairIsBurns					-0.591		
					(0.342)		
chairIsMiller					0.933		
					(0.205)		
chairIsVolker					0.548		
					(0.410)		
chairIsGreenspan					-0.382		
					(0.497)		
chairIsBernanke					0.415		
					(0.467)		
Financial sector e~e						0.384	
						(0.443)	
Government experie~e						-1.473*	
						(0.034)	
Treasury experience						-3.444	
						(0.050)	
Central Bank exper~e						-0.149	
						(0.696)	
Lda50 ideology score							3.085*
							(0.029)
cut1							
Constant	-7.321***	-7.368***	-7.596***	-7.608***	-8.514***	-7.878***	-6.592***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
cut2							
Constant	-4.185***	-4.232***	-4.537***	-4.549***	-5.378***	-4.476***	-3.465***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
cut3							
Constant	2.211***	2.164***	2.004***	1.988***	1.189	1.718**	2.872***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.144)	(0.009)	(0.000)
Observations	1838	1838	1656	1656	1838	1207	1838
Adjusted R-squared							

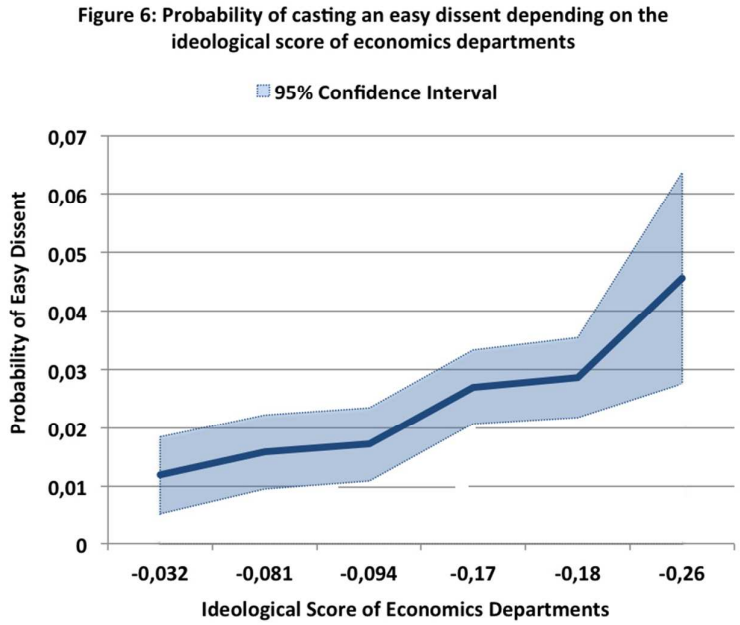
p-values in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Figure 5



Source : Author's calculations

Figure 6



Source : Author's calculations

Table 5

Table 5: Alternative Dependent Variable: Ideal Rates

	(1) idealRate
Jel1 ideology score	-2.355 (0.100)
Expected inflation	0.974*** (0.000)
Expected unemploym~t	-0.837*** (0.000)
Appointee by party~n	-0.219 (0.314)
Republican appointee	-0.344* (0.015)
Bank president	-0.107 (0.392)
Constant	5.981*** (0.000)
Observations	938
Adjusted R-squared	0.603

p-values in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Source : Author's calculations

Table 6

Table 6: Determinants of Dissents for All members

	on votes	on ideal r~s
main		
Jel1 ideology score	5.332*	0.887
	(0.015)	(0.457)
Expected inflation	0.0506	0.929***
	(0.243)	(0.000)
Expected unemploym~t	-0.0216	-0.876***
	(0.717)	(0.000)
Expected growth	0.0316	
	(0.319)	
Appointee by party~n	-0.259	-0.0858
	(0.282)	(0.599)
Republican appointee	0.469*	0.499***
	(0.015)	(0.000)
Bank president	1.158***	0.522***
	(0.000)	(0.000)
Constant		6.586***
		(0.000)
cut1		
Constant	-3.956***	
	(0.000)	
cut2		
Constant	3.030***	
	(0.000)	
Observations	2643	1439
Adjusted R-squared		0.553

p-values in parentheses
* p<0.05, ** p<0.01, *** p<0.001

Source : Author's calculations