



**Instituto de Ensino e Pesquisa  
Programa de Mestrado Profissional em Economia**

**GUILHERME SPILIMBERGO COSTA**

**An Empirical Analysis of the Monetary Policy Committees Composition and its  
Relationship with Monetary Policy**

**SÃO PAULO - SP  
2019**

GUILHERME SPILIMBERGO COSTA

An Empirical Analysis of the Monetary Policy Committees Composition and its  
Relationship with Monetary Policy

Dissertação apresentada ao Programa de  
Mestrado Profissional em Economia do  
Insper – Instituto de Ensino e Pesquisa como  
requisito para obtenção do título de Mestre  
em Economia.

Área de concentração: Economia dos  
Negócios.

Linha de Pesquisa: Macroeconomia.

Orientador: Prof. Dr. Diogo Abry Guillén

SÃO PAULO - SP  
2019

### **Ficha Catalográfica**

COSTA, Guilherme Spilimbergo.

An Empirical Analysis of the Monetary Policy Committees Composition and its Relationship with Monetary Policy. / Guilherme Spilimbergo Costa. – São Paulo, 2019.

Dissertação (Mestrado Profissional em Economia) - Insper – Instituto de Ensino e Pesquisa, 2019.

Área de concentração: Macroeconomia.  
Orientador: Prof. Dr. Diogo Abry Guillén

GUILHERME SPILIMBERGO COSTA

**An Empirical Analysis of the Monetary Policy Committees Composition and its Relationship with Monetary Policy**

Dissertação apresentada ao Programa de Mestrado Profissional em Economia do Insper – Instituto de Ensino e Pesquisa como requisito para obtenção do título de Mestre em Economia.

Área de concentração: Economia dos Negócios.

Linha de Pesquisa: Macroeconomia

Orientador: Prof. Dr. Diogo Abry Guillen

Data de Aprovação: \_\_\_\_/\_\_\_\_/\_\_\_\_

**BANCA EXAMINADORA**

---

Prof. Dr. Diogo Abry Guillén  
Itaú Unibanco

---

Prof. Dr. Marco Bonomo  
Insper

---

Prof. Dr. Guilherme Batistella Martins  
Itaú Unibanco



## **AGRADECIMENTOS**

Agradeço a meu orientador, Diogo Guillén, por todo o apoio e conselhos durante todo esse percurso. A Raphael Vasconcelos por sua inestimável ajuda com a construção da base de dados. Aos meus amigos Felipe, Mirella e Leonardo pelo companheirismo durante todos esses anos. Finalmente, agradeço a Tatiane e aos meus pais, sem o suporte e compreensão de vocês nada seria possível.

## RESUMO

Este artigo testa se as características individuais dos membros dos Comitês de Política Monetária (MPC) são significativamente relacionadas à política monetária. Foi compilado um banco de dados com informações sobre 439 indivíduos, que atuaram como membros do conselho de política monetária em 16 bancos centrais diferentes de 1999 a 2018. Em seguida, usamos modelos de regressão em painel para testar se a composição média de cada MPC é significativa para o desempenho da política monetária, em relação ao nível e a volatilidade da taxa de inflação, e ao trade-off entre a taxa de inflação e o hiato do produto (a inclinação da curva de Phillips). Os resultados indicam que algumas das características individuais dos membros que formam um MPC são relevantes para o desempenho da política monetária. Em particular, encontramos evidências de que: (i) uma proporção maior de membros com doutorado em economia está associada a um menor nível e volatilidade da taxa de inflação, mas também a uma curva de Phillips menos inclinada; (ii) uma maior quantidade de mulheres como membros dos MPCs estão relacionadas com inflação mais baixa e menos volátil; (iii) um MPC com uma idade média entre 55 e 60 anos parece estar ligado a uma inflação menos volátil; e (iv) existem evidências que relacionam uma maior proporção de membros do MPC com experiência anterior no setor privado e na academia com uma taxa de inflação mais baixa.

**Palavras-chave: Banco Central. Política Monetária. Metas de Inflação.**

## **ABSTRACT**

This paper tests if the individual characteristics of Monetary Policy Committees (MPC) members are significantly related with monetary policy. We compiled a database with information for 439 individuals, who served as board members for 16 different central banks' MPCs from 1999 to 2018. Then we use panel models to test if the average composition of each MPC is significant for the performance of monetary policy, regarding inflation level, volatility and trade-off with the output gap (the Phillips curve slope). Our results show that the individual characteristics of the members that forms an MPC are relevant for the performance of monetary policy. In particular we find evidence that: (i) a higher proportion of members with PhD in economics is associated with a lower inflation level and volatility, but towards a flatter Phillips curve; (ii) more women as MPC members are related with both lower and less volatile inflation; (iii) the average MPC age inside a range between 55 and 60 years seems to be linked with less volatile inflation; and (iv) there is evidence associating a higher share of MPC member with former experience in the private sector and in academia with lower inflation.

**Keywords: Central Bank. Monetary Policy. Inflation Targeting.**



## RESUMO EXECUTIVO

Este trabalho procura estabelecer uma relação entre as características individuais dos membros dos comitês de política monetária dos bancos centrais que seguem regimes de meta de inflação e a performance dos mesmos em relação ao cumprimento de seus mandatos. Diversos bancos centrais ao redor do mundo seguem um sistema de metas de inflação, ou seja, o mandato destes bancos centrais é operar a política monetária (via taxa básica de juros) de modo que a inflação fique ao redor de uma meta preestabelecida. A decisão a respeito de alteração ou manutenção da taxa de juros é, usualmente, feita de modo colegiado por meio de um comitê de política monetária (em alguns poucos países a decisão é tomada de forma monocrática pelo presidente do banco central) composto por diversos membros que deliberam, e, seja por meio de consenso, ou por votação majoritária, decidem qual a taxa de juros deverá vigorar até a próxima reunião do mesmo.

Com o objetivo de encontrar alguma relação entre o perfil dos indivíduos que compõem estes comitês de política monetária, e a eficácia da mesma, foi construída uma base de dados que agrega algumas informações sobre os membros desses comitês. Esta base de dados é composta com informações de 439 indivíduos que serviram nos comitês de política monetária de 16 bancos centrais diferentes que seguem o regime de metas de inflação, entre 1999 e 2018. Esta base de dados agrega informações como: a idade; gênero; tempo de experiência; qual o campo em que possui título de bacharel; se possui pós-graduação em área relacionada a finanças (mestrado ou doutorado em economia, ou MBA em finanças); em quais setores foram suas experiências profissionais passadas (setor privado, setor público, academia, equipe do próprio banco central, ou organismos multilaterais).

Utilizando as informações desta base de dados o trabalho utiliza uma técnica estatística conhecida como regressão em painel, para estabelecer relações entre a eficácia da política monetária e o perfil médio (com base nas características citadas) de cada comitê de política ao longo do tempo. Deste modo, é possível encontrar quais dessas características são estatisticamente relacionadas com uma boa ou má performance de política monetária, com os efeitos sendo corrigidos pelas características de cada banco central e por cada momento do tempo. Os critérios utilizados para avaliar a performance da política monetária, ou seja, as variáveis dependentes das regressões em painel, são: (i) o nível médio da taxa de inflação; (ii)

a volatilidade da taxa de inflação; (iii) a relação conhecida como “taxa de sacrifício” que é o custo em termos de crescimento econômico para aumentar ou reduzir a taxa de inflação.

Os resultados deste trabalho indicam que algumas características dos membros que compõem os comitês de política monetária se relacionam com a performance da taxa de inflação. Os principais resultados encontrados foram: (i) uma proporção maior de membros com doutorado em economia está associada a um menor nível e volatilidade da taxa de inflação, mas também a uma curva de Phillips menos inclinada; (ii) uma maior quantidade de mulheres como membros dos MPCs estão relacionadas com inflação mais baixa e menos volátil; (iii) um MPC com uma idade média entre 55 e 60 anos parece estar ligado a uma inflação menos volátil; e (iv) existem evidências que relacionam uma maior proporção de membros do MPC com experiência anterior no setor privado e na academia com uma taxa de inflação mais baixa.

Mesmo que os resultados deste trabalho apontem em direção de um vínculo entre o perfil médio das características individuais dos membros de um MPC com o desempenho da política monetária, os resultados são meramente associativos e não garantem uma relação causal entre ambos. Além das características individuais dos membros dos MPCs, muitos outros fatores estão em jogo para gerar um resultado melhor ou pior para a política monetária. Entre estes fatores podemos destacar: a independência do banco central do governo; o arcabouço institucional em que o banco central atua; o processo de tomada de decisão dentro de um MPC; o grau de transparência do banco central; entre outros. Ainda assim, este trabalho lança alguma luz sobre quais características objetivas que a sociedade deve procurar ao selecionar seus formuladores de política monetária.

## CONTENTS

TABLES .....	11
FIGURES .....	12
1. INTRODUCTION .....	13
2. RELATED LITERATURE .....	14
3. MPC DATABASE .....	17
4. PANEL ANALYSIS AND EMPIRICAL RESULTS .....	23
4.1. Results for Inflation Level .....	25
4.2. Results for Inflation volatility .....	27
4.3. Results for the Phillips Curve Rolling Beta Coefficients .....	32
4.4. Summary of Results .....	35
5. CONCLUSION .....	37
REFERENCES .....	39
APPENDIX .....	42

## TABLES

Table 1 – Central Banks Organizational Characteristics .....	19
Table 2 – MPC Average Profile by Country.....	21
Table 3 – MPC Average Profile by Country (Cont.).....	22
Table 4 – Panel Results for Inflation Level .....	26
Table 5 – Panel Results for Core Inflation Level .....	30
Table 6 – Panel Results for Absolute Core Inflation Deviation from Target .....	31
Table 7 – Panel Results for Standard Deviation of Core Inflation.....	33
Table 8 – Panel Results for Phillips Curve Slope .....	34
Table 9 – Main Results Summary. ....	37
Table 10 – MPCs Average Profile by Year.....	42
Table 11 – MPCs Average Profile by Year (Cont.).....	43
Table 12 – Characteristics Correlation Matrix.....	48

## FIGURES

Figure 1 – Gender Composition .....	44
Figure 2 – Average Age .....	44
Figure 3 – Average Experience .....	45
Figure 4 – Bachelor Degree Composition .....	45
Figure 5 – Post Graduate Degree Composition.....	46
Figure 6 – Professional Background Degree Composition .....	46
Figure 7 – MPC Members Entry Age (Descriptive Statistics) .....	47
Figure 8 – Characteristics Scatter Plot Matrix .....	49
Figure 9 – Average MPC Gender Composition .....	50
Figure 10 – Average MPC Age.....	50
Figure 11 – Average MPC Experience .....	51
Figure 12 – Average MPC Bachelor Degree Composition .....	51
Figure 13 – Average MPC Post Graduate Degree Composition .....	52
Figure 14 – Average MPC Professional Background Composition .....	52
Figure 15 – Phillips Curve Rolling Beta Coefficients .....	53

## 1. INTRODUCTION

Choosing the right people to conduct monetary policy is very important with respect to how well it performs. Even on a well institutionalized central bank, with a clear and objective mandate, monetary policy will still be dependent on the discretion of the people who operate it. As pointed by Reis (2013, p. 25): “Society can give a central bank a clear mandate with long and short-run goals, but eventually it must appoint individuals to execute that mandate, and they will always have some discretion. Choosing the central banker is a complementary way to pick an objective function for the central bank.” It is central to performance of monetary policy to have people with the right set of skills and commitment towards its objectives in order to achieve a good result. The goal of this paper is to map if and which personal characteristics are associated with the best results for monetary policy.

In order to do so, we compile a database aggregating personal characteristics of more than 400 individuals, who served in 16 different central banks between 1999 and 2018. We focused on three types of individual characteristics: (i) **demographics**, grouping traits such as gender and age; (ii) **professional background**, or which sector he/she worked before joining the Monetary Policy Board (MPC) of the Central Bank; (iii) **academic background** as a proxy for the level of economic training - e.g. is she a bachelor in economics or in law? Does she have a masters or PhD in economics or an MBA?

According to the literature, there is a trend of central banks moving away from an individual decision towards an MPC, as is the case of the Bank of Israel and the Reserve Bank of New Zealand. Blinder & Morgan (2005) argue about the benefits of group vis-à-vis individual decisions, and Blinder (2004) points that monetary policy action taken by a committee is: (i) less volatile; (ii) less extreme; (iii) more diverse - which is preferable in an uncertain environment; and (iv) taken by more than a single decision rule. In the present work, we took the average characteristics of the individuals serving in each MPC of our sample by year, and built a panel to evaluate which individual characteristics are associated with a better outcome for monetary policy.

Our results show that many individual characteristics influence the outcome of monetary policy. A larger number of PhDs in economics within an MPC is associated with a lower inflation level and volatility, but also to a larger trade-off between growth and inflation. In addition, a greater proportion of women in MPCs is also related with

both lower and less volatile inflation. An MPC with an average age range between 55-60 years old yields the less volatile inflation. Also, while there is evidence associating a higher share of former private sector and academia professionals with lower inflation, we found that both groups plus past multilateral organization's employees tend to be tied to a steeper Phillips curve.

The institutional framework of the central bank, and its degree of influence on how the decision inside the committee is taken (if it is more or less collegiate, for example) are very important factors. Likely so is the profile of the policy makers chosen to carry out the decisions itself. Still, we caution against reading our results as causality, or simply as if it is only the policy makers' individual characteristics that defines the monetary policy outcome.

While we agree with Romer & Romer (2004) that "some education in economics, experience on Wall Street and largely nonpartisan public service may increase the odds that a nominee will be guided by sensible views, they provide no guarantee." However, we think that the background profile of the central bankers are important proxies for their views and beliefs regarding monetary policy and should be taken in consideration as one more input while society choses its monetary policy makers.

The remainder of this paper will be divided as follows. In section 2, we make a brief summary of the relevant literature on how individual characteristics of central bankers influence MPCs, and previous empirical findings about this topic. Section 3 entails the description of the database, as well as an in-depth analysis of the profile of the MPCs across countries and over time. The empirical findings and a discussion of the main results of this paper is found on section 4. Finally, we conclude in section 5.

## **2. RELATED LITERATURE**

Much of the empirical research on the background of individual members of MPC is focused on classifying their stance in terms of monetary policy. In this spirit, the work of Eijffinger, Mahieu & Raes (2018) analyses the voting records of the Bank of England (BoE) to classify and rank the members of its MPC as either Doves (more likely to preferer a lower interest rate) or Hawks (more likely to prefer a higher interest rate) using an ideal point methodology. This study also analyses if the career background of the members makes them more prone to be more dovish or hawkish. The conclusion that emerges is that only members with a private sector background

(excluding finance) differ from the others, as they tend to vote more on the hawkish side. Such methodology is also applied to other central banks, like Sweden, Hungary, Poland and Czech Republic (Eijffinger, Mahieu & Raes, 2013) and the United States (Eijffinger, Mahieu & Raes, 2015). These studies rely on the publication of extensive voting records, which requires a degree of transparency that is still lacking in the majority of Central Banks.

Several other papers follow the same goal of linking the career background of MPC members with a dove or hawk pattern, assessing whether an individual MPC member is more prone to ease or tighten monetary policy other than in measuring its effect on the performance of monetary policy as a whole. Havrilesky & Schweitzer (1990) analyze the voting patterns for the Federal Reserve (Fed) board members, finding that previous experience in academia is associated with a monetary policy tightening bias. On the other hand, Eichler & Lähler (2013) conclude that the Fed's MPC members with a background in the financial private sector are more worried about the stability of inflation than activity, as measured by Gross Domestic Product (GDP). In other words, more prone to a hawkish stance. Harris, Levine & Spencer (2011) make a similar study for the BoE, but find that previous experience in non-financial private sector is associated with a monetary policy tightening bias.

In the work of Apergis & Smales (2015), the authors look at 3226 voting records of 87 members of the Fed's MPC, and aim to model what defines the preferences of the individual members of the board using the deviations of a Taylor-type Rule. Their empirical findings reveal that the time spent within the board and the influence exerted by the Chair are more relevant to explain those deviations than characteristics of the individual members of Fed, such as age, professional and educational background.

There are other studies that follow a similar approach to the one we will take, using MPCs average individual characteristics in panel data to assess their effects on the performance of the monetary policy. We extend on this research in terms of the sample of Central Banks and scope of analysis. The literature is commonly focused only in developed countries and - to the best of our knowledge - nothing similar has been made on emerging markets economies. In addition, the literature is mainly focused in the effects of MPCs composition on the inflation level – here, we extend the literature by looking not only the level, but also volatility and the trade-off between inflation and growth.



First, Gohlmann & Vaubel (2007) use data from 391 central bank MPC members that served in 11 European Central Banks and for the Federal Reserve from 1973 to 2003. The authors gather not only career background information, but also educational background, using the proportion of members with each characteristic to run a panel data model and relate that with the observed inflation rate of these countries. Their main finding is that, controlling for the exchange rate regime and central bank independence<sup>1</sup>, a higher proportion of former members of the central bank staff are associated with a lower inflation rate, while members with past experience in government and labor unions tend to be connected to higher inflation than otherwise. The results for the educational background are less conclusive, but the authors find some evidence that relates a larger proportion of law background to higher inflation.

Second, Farvaque, Hammadou & Stanek (2010) organize a database for nine developed countries' central banks<sup>2</sup> from 1999 to 2008, gathering information for 175 MPC members. Their databases contemplate gender, professional and educational background, mapping out those characteristics as a proportion of the entire MPC. Using a panel data framework, the authors analyze the relationship between those characteristics and the performance of inflation. Their results show that the professional background is significant for the inflation outcome. In particular, a higher proportion of members with a background in the private sector and in academia are associated with a lower inflation on average, while a background in the public sector is linked to higher levels of inflation<sup>3</sup>. Our analysis will expand these conclusions to effects beyond the level of monetary policy and look into its relation to inflation volatility and the slope of the Phillips curve.

In addition to the professional background, the authors study the relation between a higher proportion of women and the performance of inflation. Their findings show that a higher proportion of women in the MPCs is associated with a lower inflation

---

<sup>1</sup> Note that for much of the period analyzed, the Central Bank's governance was very different from that observed today.

<sup>2</sup> The European Central Bank (ECB), the Reserve Bank of Australia (RBA), the Bank of Canada (BoC), the Bank of Japan (BoJ), the Reserve Bank of New Zealand (RBNZ), the Swedish Riksbank, the Swiss National Bank (SNB), the Bank of England (BoE) and the Federal Reserve (Farvaque, Hammadou & Stanek, 2010, p. 224). Our database contains all Central Banks used in Farvaque, Hammadou & Stanek (2010), with the exception of the BoJ and the SNB.

<sup>3</sup> The framework used breaks up the sample between inflation and non-inflation targeting countries, so while a background in academia and the private sector are significant in reducing inflation in inflation-targeting central banks, the public sector background is related with higher levels of inflation in non-inflation targeting central banks.

rate. In other words, they find that women tend to be less inflation-prone, or more hawkish. This result is consistent with the work of Masciandaro, Profeta & Romelli (2016) and Diouf & Pépin (2017), the latter makes a survey of women who were chair of central banks and show that women put more emphasis on the inflation stabilization side of their mandate than their male counterparts. However, Chappell & McGregor (2000) find that women are within the most dovish members of the Federal Reserve. Their work looks at the voting records and shows that six of the seven women who served in the FOMC between 1966-1996 are among the thirteen most dovish members.

Another result from Farvaque, Hammadou & Stanek (2010) is the optimal size of an MPC. Using their novelty data, the authors estimated an U-shaped relationship between inflation and the MPC size, and found that an MPC of nine members is the size associated with the lowest inflation outcome. In a similar fashion, Berger & Nitsch (2011) estimate that the optimal size would be between five to nine members, using data from 30 countries from 1960-2006 to run a panel model. These results are also consistent with other works, such as the empirical study of Blinder & Morgan (2008) that finds decisions made by a group of eight to be slightly preferred to the ones made by a group of four, and Silbert (2005), that five is a reasonable size for an MPC.

### **3. MPC DATABASE**

We compiled a database that contains relevant and accessible characteristics of individual MPC members. This database was built gathering data from Central Banks, MPC members' CVs or newspaper articles. We aggregated information for 439 individuals, who served as board members for 16 different central banks' MPCs from 1999 to 2018. This database contains information only for inflation targeting central banks and includes: the Federal Reserve<sup>4</sup> (Fed), Bank of England (BoE), Central Bank of Brazil (BCB), Reserve Bank of New Zealand (RBNZ), Sveriges Riksbank, National Bank of Poland (NBP), Bank of Israel (BoI), Bank of Mexico (Banxico), Central Bank of Chile (BCCh), European Central Bank<sup>5</sup> (ECB), Central Bank of Iceland (CBI), Czech

---

<sup>4</sup> The Federal Reserve started publishing a formal target of 2% inflation rate in 2012 (FEDERAL RESERVE, 2012), but the board has agreed in 1996 with price stability being consistent with a PCE inflation rate of 2% (FEDERAL RESERVE, 1996). We will assume that the Fed behaves as an inflation targeting Central Bank with 2% target.

<sup>5</sup> Since it was established in 1998, the ECB has defined price stability as inflation below 2%. Later in 2003 they tweaked its objective language to "maintain inflation rates below but close to 2% over the

National Bank (CNB), Bank of Canada (BoC), Reserve Bank of Australia (RBA), Norges Bank, and Colombian Bank of the Republic (BanRep). There are two main reasons for selecting the start of the database: in 1999 almost all central banks were adopting inflation targeting regimes, formally or informally; and, by then the internet was becoming more popular, allowing to find complete information on MPC members.

It is possible to arrange the individual characteristics in three different groups: (i) demographics, (ii) educational background, and (iii) professional background. The demographics group encompasses information such as the share of women and median age of each MPC member<sup>6</sup>. The variable gender will be the proportion of women inside the MPC. The same approach will be followed to the experience of the individual in the MPC, with a variable that counts 1 for the first year the individual has joined the board and will increase as time goes by (note that if one member leaves and then rejoins the same MPC his/her experience will resume as if he/she has never left).

In the educational background group, the characteristics refer to the individuals' bachelor degree, with the variables Economics and Law assuming the value 1 if he/she has a bachelor degree in the respective field (note that if the individual has more than one degree he/she will be classified in more than one category). Additionally, we will investigate the postgraduate background of MPC members. Hence, variables PhD and MSc will be 1 if the individual has a doctoral or a master's degree in economics, respectively (note that it will be counted only the highest degree, so MSc and PhD cannot be 1 simultaneously). Lastly, the variable MBA maps if the individual has an MBA title, since many MBAs provide a considerable background in finance, but not in economics, it will be used as a separate variable, we believe this approach allow us to differentiate members with formal training in economics from those with a more generic background of skills.

The professional background group sorts each individuals' past professional experience. We divided in five categories that could be relevant to our analysis: (i) private sector, (ii) academia, (iii) public sector, (iv) multilateral organizations, and (v) central bank staff. Since one person may have gone through different jobs, the same individual can be classified in multiple categories. Nonetheless, we attempted to be

---

medium term" (SCHELLER, 2006). We will assume that the ECB behaves as an inflation targeting Central Bank with a 2% target.

<sup>6</sup> It is important to note that the Age variable is the difference between the year that the individual is in the board and the year when he/she was born, so it will increase as the same individual stays in the committee.

parsimonious in the categorization: only professional experiences that we judged to be relevant were considered.

**Table 1 – Central Banks Organizational Characteristics**

	Inflation Target		MPC Organization		
	Target (2018)	Formal Adoption	Number of Members	Term Length (Governor) in years	Term Length (Others) <sup>7</sup> in years
<b>USA</b>	2.00%	2012 <sup>8</sup>	19	14	5 <sup>9</sup>
<b>BRA</b>	4.50%	1999	8	No fixed term	No fixed term
<b>NZL</b>	2.00%	1989	1 <sup>10</sup>	5	
<b>SWE</b>	2.00%	1995	6	6	5 to 6
<b>POL</b>	1.75%	1998	10	6	6
<b>ISR</b>	2.00%	1997	6 <sup>11</sup>	5	4
<b>GBR</b>	2.00%	1992	9	8	4
<b>MEX</b>	3.00%	2001	5	6	8
<b>CHL</b>	3.00%	1999	5	5	10
<b>EUR</b>	2.00%	1998	25 <sup>12</sup>	8	Variable <sup>13</sup>
<b>ISL</b>	2.50%	2001	5 <sup>14</sup>	5	5
<b>CZE</b>	2.00%	1997	7	6	6
<b>CAD</b>	2.00%	1991	6	7	7
<b>AUS</b>	2.00%	1993	9	7	5
<b>COL</b>	3.00%	1999	7	4	4
<b>NOR</b>	2.00%	2001	7	6	4

Source: Author and Hammond (2012)

Since one of the goals of this paper is to relate how the board's composition influences monetary policy, we use the simple average composition of each board for each year. Members enter and leave MPCs along the years, so we include both the former and the new members in the average for the year of the change<sup>15</sup>. Table 2 and Table 3 summarize the average characteristics for each Central Bank across all the years – e.g.: they show the average composition of the MPCs from 1999 to 2018.

<sup>7</sup> We use terms for the external members when they differ from other members.

<sup>8</sup> Even though the Fed only formally adopted the inflation target regime in 2012, we work with the assumption that it was informally in place since 1996 (note 4).

<sup>9</sup> Here we treat the regional branches presidents as external members.

<sup>10</sup> Recently the RBNZ adopted an MPC with seven members.

<sup>11</sup> Israel's MPC was formed only by the Governor until 2010.

<sup>12</sup> As more members joined the ECB the size of the MPC increased.

<sup>13</sup> Here we treat the national central banks presidents as external members.

<sup>14</sup> The Central Bank of Iceland MPC was composed of three members until 2009.

<sup>15</sup> For many MPC members we do not have the information about the exact date when he/she joined or left the MPC, otherwise we could make a weighted average taking in consideration the proportion of the year that this member was in the MPC. Given that changes in the MPC are generally incremental, we do not expect that to change our results materially.

It is possible to note some aspects from Table 2 and Table 3 on how MPCs differ. For example, the Scandinavian countries (Sweden and Norway) have the largest proportion of women in its MPCs, with 40.5% of the average composition in Sweden and 33% in Norway. Apart from New Zealand (single person MPC) - where the RBNZ never had a woman as Governor - Latin American countries have the lowest proportion of women in Central Banks' MPCs: 1.0% in Mexico (which had the first woman in 2018), and 4.3% in Brazil and Colombia. Even though women are still minority in most MPCs, their average share has been rising in the last decade, coming from 9% in 2009 to 21% in 2018. Regarding the average age of MPC members, it is possible to see that it ranges in the 50's for almost all central banks - the exceptions are the Czech National Bank with 45.6 years and the Central Bank of Israel with 63.5 years. If we look at the age that an individual first joins the MPC, the 439 individuals surveyed have an average entry age of 52.6 years, with a standard deviation of 8.3 years. It is also possible to see an increasing trend in the average age of our sample of MPCs, going from around 53 years in 1999 to around 57 years in 2018. As seen in the overall sample, we note that the average share of members with bachelor degrees other than economics and law has been falling, from 27% in 1999 to 14% in 2018. Also, the share of members with a masters in economics as their highest degree more than doubled from 10% in 1999 to 22% in 2018, while the share of PhDs is falling slightly from 62% to 53% in the same period.

**Table 2 – MPC Average Profile by Country**

	Demographics		Educational Background					
	Women	Age	Bachelors in Economics	Bachelors in Law	Other Bachelor Degree	Master Degree in Economics	MBA Degree	PhD in Economics
<b>USA</b>	19.1	58.4	75.9	9.9	24.8	12.2	18.3	67.8
<b>BRA</b>	4.3	50.7	59.5	0.0	40.5	6.9	10.6	48.7
<b>NZL</b>	0.0	58.8	100.0	50.0	17.5	32.5	0.0	67.5
<b>SWE</b>	40.5	55.8	95.3	5.5	20.2	0.0	0.0	58.4
<b>POL</b>	15.8	58.9	86.5	12.0	0.0	0.0	7.9	95.3
<b>ISR</b>	11.6	63.5	100.0	0.0	32.5	0.0	3.1	96.9
<b>GBR</b>	17.2	53.4	87.5	0.0	47.4	32.0	6.5	44.9
<b>MEX</b>	1.0	57.1	76.0	0.0	24.0	19.0	2.0	67.0
<b>CHL</b>	8.4	53.9	90.0	0.0	10.0	5.8	0.0	85.8
<b>EUR</b>	4.9	58.4	66.1	19.5	15.9	25.0	4.2	46.1
<b>ISL</b>	10.9	56.4	63.1	12.1	24.8	6.0	5.8	46.9
<b>CZE</b>	9.6	45.6	92.3	0.6	11.7	15.0	0.6	74.4
<b>CAD</b>	23.2	54.6	94.1	2.1	9.3	17.6	7.4	70.8
<b>AUS</b>	19.4	57.9	72.0	6.6	20.0	19.1	10.1	26.8
<b>COL</b>	4.3	54.2	90.2	6.5	8.8	18.9	16.1	67.7
<b>NOR</b>	33.0	53.8	86.2	10.4	3.4	45.2	26.8	19.6

Source: Author (2019).

Regarding the education background, the entirety of the MPC members in New Zealand and Israel have bachelor’s degrees in economics, while the lowest proportion is observed in Brazil with an average of 59.5%. Law degrees are more common in the MPC of New Zealand<sup>16</sup> and in the European Central Bank, with an average of 19.5% of its members being trained lawyers. In the Bank of England and the Central Bank of Brazil we observe the highest proportion of bachelor degrees in fields other than economics and law, with 47.4% and 40.5% respectively. The highest proportion of members with PhD in economics is observed in Israel, with an average of 96.9%, followed by Poland with 95.3%. On the other hand, Norway and Australia have the lowest average composition of members with PhDs, with 19.6% and 26.8%, respectively.

Looking at the professional experience of the MPC average composition, we note a very high proportion of former academia professionals in both the Polish and the Chilean Central Banks, with 89.6% in the former and 85.8% in the latter. The Reserve Bank of Australia has both the lowest proportion of former academics (8.9%) and the highest average proportion of members with relevant time in the private sector (59.1%), likely a consequence of being historically composed by business leaders.

<sup>16</sup> The sample is influenced by the long-time governor Alan Bollard, who had a double degree in economics and law.

Former public servants are more frequent in the Colombian MPC, making on average 76.2% of the board in the surveyed period, while this number is only 9.7% in Brazil. The Brazilian Central Bank's MPC also addresses administrative roles, with members of the staff accounting for 50.3% of its average composition, second only to the Canadian Central Bank with 57.2%. Lastly, former employees of Multilateral Organizations make the least proportion of members in half of our sample of Central banks. The one outlier is the Bank of Israel<sup>17</sup>, with 71.8% of its average composition being of former workers in Multilateral Organizations. The two most interesting points regarding the trends in the average composition are: (i) after dropping below 30% in the early 2000's, the average share of members with a background in academia edged higher to around 40% in the last 10 years; and, (ii) there is a falling trend for the average share of former public employees, dropping from 39% in 2003 to 23% in 2018.

**Table 3 – MPC Average Profile by Country (Cont.)**

	Professional Experience					Years of Experience in MPC
	Academia	Private Sector	Government	Multilateral Organizations	Central Bank Staff	
<b>USA</b>	29.3	30.8	12.6	1.1	44.2	7.1
<b>BRA</b>	10.5	27.7	9.7	10.1	50.3	3.6
<b>NZL</b>	0.0	22.5	50.0	27.5	0.0	6.4
<b>SWE</b>	24.6	20.8	15.4	17.6	21.5	4.6
<b>POL</b>	89.6	1.7	50.9	2.7	6.7	3.9
<b>ISR</b>	64.9	29.6	25.0	71.8	39.7	4.0
<b>GBR</b>	35.9	33.5	17.6	5.3	21.7	4.2
<b>MEX</b>	45.0	30.0	34.0	14.0	36.0	6.9
<b>CHL</b>	85.8	23.5	41.8	7.5	14.2	5.6
<b>EUR</b>	21.3	11.1	47.5	9.6	39.3	6.1
<b>ISL</b>	19.3	6.4	23.5	9.2	41.6	6.2
<b>CZE</b>	48.5	25.7	19.1	0.0	28.7	5.3
<b>CAD</b>	22.4	10.0	24.1	11.5	57.2	6.4
<b>AUS</b>	8.9	59.1	12.2	1.4	23.1	5.7
<b>COL</b>	44.8	13.9	76.2	14.8	27.5	5.2
<b>NOR</b>	30.3	38.1	27.7	5.8	24.9	4.7

Source: Author (2019).

Finally, Table 3 shows the average years of experience for each MPC, which is associated with the turnover rate of members. In other others, lower average experience is related to more frequent changes in the composition of the committee.

<sup>17</sup> The Bank of Israel MPC was composed of a single governor until 2010, when the law was changed and an MPC board with six members was created (Retrieved November 22, 2019, from <https://www.boi.org.il/en/MonetaryPolicy/MonetaryCommittee/Pages/Committee.aspx>).

Here the numbers usually range between 4 to 6 years, but two cases stand out. First, Brazil has only 3.6 years of average experience for its members, probably due to the fact that the Brazilian Central Bank MPC doesn't have a fixed term mandate for its members - it is common for board members to serve only for a couple of years before leaving the institution. On the other side, we have the United States, with an average of 7.1 years. The Federal Reserve Board of Governors members have a long mandate of 14 years, although it is unusual for them to serve their terms in full. In addition, the presidents of the regional branches of the Federal Reserve usually serve multiple times 5-year terms.<sup>18</sup>

To summarize, looking at the descriptive Table 2 and Table 3 it is possible to note the heterogeneity in the composition of each Central Bank's MPC that we surveyed. Central Banks do not follow a single predetermined rule to define their MPC composition, on the contrary: MPCs around the world have idiosyncrasies in their composition, making them very diverse between one and another. However, this also means that many are skewed to be composed by a specific group of people, sharing similar backgrounds that could reinforce group thinking.

#### **4. PANEL ANALYSIS AND EMPIRICAL RESULTS**

In this section we present the main findings of our panel analysis relating the compositional characteristics of the MPCs to the performance of monetary policy. We will use five different dependent variables in our models: (i) the annual inflation rate retrieved from the IMF world economic outlook database<sup>19</sup>, similar to the approach used in the works of Gohlmann & Vaubel (2007) and Farvaque, Hammadou & Stanek (2010), (ii) the year-end core inflation, retrieved from the Haver Analytics database<sup>20</sup>, (iii) the absolute value of the difference between the aforementioned core inflation rate and the inflation target pursued by the central bank, (iv) the rolling five-year standard deviation of the quarterly year-over-year core inflation rate, (v) the trade-off rate between output and inflation – i.e., the beta related to the output gap in a Phillips Curve.

---

<sup>18</sup> In our sample the average years of experience of a Board of Governor's member is 6.2 years, while for the regional presidents that figure increases to 7.8 years.

<sup>19</sup> International Monetary Fund (2019 Retrieved September 21, 2019, from <https://www.imf.org/external/pubs/ft/weo/2019/01/weodata/index.aspx>).

<sup>20</sup> From the Haver Analytics Database we retrieved a variety of core inflation measures published by either the official bureau of statistics or the central bank of each country. Our goal is to use a measure of inflation that is less susceptible to short term volatility.



For each dependent variable we ran a panel regressing them against control variables and the MPCs members' mean characteristics. The model equation will be the following:

$$y_{it} = \rho y_{it-1} + \sum_j \gamma_j z_{jit} + \sum_k \beta_k x_{kit} + w_i + \varepsilon_{it} \quad (1)$$

where  $y_{it}$  is the dependent variable,  $z_{jit}$  are the control variables,  $x_{kit}$  is the MPCs characteristics and  $w_i$  the individual Central Bank's fixed effects. We will use our MPC database, described above, which is an unbalanced panel<sup>21</sup> for 16 Central Banks from 1999-2018, which giving us 313 observations. For each dependent variable, five different models were estimated: the first with all MPC characteristics simultaneously, the second only the educational background block, the third only with the demographics group, the fourth with only the professional background block, and, finally, the fifth with only the size of the committee.

For the control variables we use the lagged output gap and the annual variation in commodity prices in local currency. The idea is that the output gap should control for demand shocks and the commodity prices for supply shock in the inflation rate. To construct the output gap, we used a Hodrick-Prescott<sup>22</sup> filter in the quarterly real GDP data<sup>23</sup>, for each country. In order to avoid possible border effects, the series with each country real GDP, from 1994 to 2018, were chained with IMF's forecasts from 2019 to 2023, so the filtered series go from 1994 to 2023. The output gap is the difference between the observed GDP and the smoothed series as the percentage of the latter. The series used for the commodity prices is de the Goldman Sachs Commodity Price Index. This series is an index based on commodities prices quoted in US dollars, so it was converted to the local currency of each country other than the US. All the data used is to calculate the local currency commodity prices is in annual average and was retrieved from Bloomberg (both the Goldman Sachs Commodity Price Index and the foreign exchange rates).

Since the models (1) that were estimated contain a lag of the dependent variable, the traditional estimation approach using OLS was not adequate as an

---

<sup>21</sup> Information for Norway is available from 2002 forward and for Mexico from 2003 forward.

<sup>22</sup> It was used a Lambda of 40000 for a smother result.

<sup>23</sup> Data from Haver Analytics.

independent variable is correlated with the error (BALTAGI, 2005, p. 135). In order to address this problem, we estimated the models following the approach proposed by Arellano & Bond (1991) and then extended in Arellano & Bover (1995) and in Blundell & Bond (1998). The method uses a system of equations both in levels and in difference to benefit from appropriate instruments from both equations and thus estimating more robust estimators, which is done by generalized method of moments (GMM). In addition, we will use the one-step version of the method, which yields better results in small to moderate samples (HANSEN, 2019).

#### *4.1. Results for Inflation Level*

Table 4 shows the coefficients of the models using the annual inflation level as the dependent variable. The variables related to higher educational levels have negative and significant coefficients for both the general model (1.1) and model that includes only the educational background (1.2). We verified a negative and significant coefficient for the variables Master and PhD in equation (1.1), and also for MBA in the restricted model (1.2) this implies that a higher proportion of members with a Masters or PhD degree in economics, or on MBA are associated, on average, to lower inflation. Those findings are not surprising, given that in the last twenty years we saw the consolidation of the inflation-targeting framework, being reasonable to assume that higher training in economics makes people more committed to its importance, hence avoiding the higher inflation from the 1980's and early 90's.

Our results show that the coefficients for the gender variable are negative and significant for both model (1.1) and model (1.3), meaning that a higher proportion of women the MPC is linked to lower inflation, i.e. a more hawkish stance of the Central Bank. These results are also in line with the findings of Diouf & Pépin (2017), that women central bankers put more emphasis on stabilizing inflation vis-à-vis output than men. As pointed by Masciandaro, Profeta & Romelli (2016), a higher proportion of women could be a sign of prudence in how the MPC implements monetary policy.

**Table 4 – Panel Results for Inflation Level<sup>24</sup>**

Variables	(1.1)	(1.2)	(1.3)	(1.4)	(1.5)
Lag	0.3719*** (0.0461)	0.44*** (0.0386)	0.3948*** (0.0456)	0.4747*** (0.0401)	0.4459*** (0.0398)
GDP Gap (-1)	0.2177*** (0.0352)	0.1929*** (0.0329)	0.2125*** (0.0329)	0.1765*** (0.0333)	0.1795*** (0.0322)
Commodity Price	0.0223*** (0.003)	0.0238*** (0.0029)	0.0231*** (0.0029)	0.0242*** (0.003)	0.0241*** (0.0029)
B. Economics	-0.8057 (1.1737)	-1.0673 (1.1569)			
B. Law	-0.7255 (1.1184)	-1.1833 (0.9322)			
Master	-2.9743** (1.359)	-4.1584*** (1.1827)			
MBA	-2.1913 (1.3847)	-2.5153** (1.2836)			
PhD	-2.092** (0.9146)	-2.6421*** (0.7115)			
Age	-0.0127 (0.4351)		-0.5112 (0.4096)		
Age^2	-0.0013 (0.0039)		0.0039 (0.0036)		
Experience	-0.0712 (0.2397)		-0.1133 (0.2249)		
Experience^2	0.0189 (0.0197)		0.0163 (0.018)		
Gender	-1.7746 (1.2133)		-2.9125*** (1.0478)		
Academia	-0.8842 (1.0258)			-1.8145** (0.8254)	
Private Sector	0.0793 (0.7618)			-0.4383 (0.638)	
Public Sector	0.1484 (0.7365)			0.0014 (0.5471)	
Multilateral Org.	2.2831** (1.0328)			0.1475 (0.5617)	
Central Bank Staff	0.4861 (0.79)			-0.0702 (0.7243)	
MPC Size	0.1164 (0.2084)				-0.0576 (0.1273)
MPC Size^2	-0.0089 (0.009)				-0.0062 (0.0066)
Constant	8.7439 (12.0607)	4.8821*** (1.0754)	18.207 (11.6092)	2.0583*** (0.5903)	2.408*** (0.5893)

Source: Author (2019).

<sup>24</sup>Numbers in parenthesis are standard errors. \*p-value<10%, \*\*p-value<5%, \*\*\*p-value<1%.

The last finding from Table 4 is tentative evidence that a higher proportion of MPC members with a background in academia is connected to a lower inflation rate on average and the contrary in the case for a background in multilateral organizations. The coefficient for academia background is significant at a 5% level in equation (1.4), but is not in the unrestricted model (1.1). This may be due to fact that the background in academia is correlated with members with PhD, so the justification is the same as the above. For the positive relationship between multilateral organizations and the inflation rate, a reason could be that appointments to those jobs are in many cases political, so that could imply an MPC member less independent from a political point of view.

The second model that was estimated used the level of core inflation as the dependent variable. Using core inflation as a dependent variable is an important exercise of robustness for the results using the level of headline inflation because core inflation is less volatile, and for that reason less subject to noise that was not captured by our control variables. The main results (Table 5) for core inflation are roughly similar to the ones extracted from the model that has headline inflation as the dependent variable. The coefficient of the variable PhD is still negative and significant, at a significance level of 10%, for the restricted model (2.2). The same is true for the gender variable: its coefficient is still significant in model (2.3), but no longer significant in the unrestricted model (2.1).

For the professional background block, the academia background variable is negative and significant in both the restricted (2.4) and unrestricted (2.1) models, and with a higher significance than in the models using headline inflation. Another result worth mentioning is the significance of both private sector background and central bank staff, the first in the restricted and unrestricted models and the second only in the latter. This outcome is in line with the ones in Farvaque, Hammadou & Stanek (2010), and for the case of central bank staff also consistent with the results of Gohlmann & Vaubel (2007), that a higher proportion of former staff employees in the MPC is associated with lower inflation.

#### *4.2. Results for Inflation volatility*

The studies in the literature we surveyed used only the level of inflation as the dependent variable (FARVAQUE, HAMMADOU & STANEK, 2010 and GOHLMANN &

VAUBEL, 2007). However, since we are looking at Inflation Targeting Central Banks, the more direct approach would be to compare with the deviation of the target. With this in mind, we use the absolute value of the difference between the core inflation and the inflation target as dependent variable<sup>25</sup>. Even though most central bank's target headline inflation rate, core filters much of the noise from temporary price shocks that an inflation targeting central bank usually ignores. It is also important to point out that we will also use the absolute value for the control variables.

The results in Table 6 show that, considering the educational background, the variable PhD is once again negative and significant in both the restricted model (3.2) and the unrestricted one (3.1), meaning that a higher proportion of members with a PhD background is connected to a lower absolute deviation from the inflation target on average. A background in Law shows a negative and significant relationship with the deviation of the inflation in the unrestricted (3.1) model, as the variable Master in the case for the restricted model (3.2).

The demographic block shows the average age of the MPC being significant, for both the linear and the quadratic term. In addition, the signal of the quadratic term is positive, meaning that there exists a level of the average age of the MPC associated with a minimum absolute deviation of inflation, that age being around 55 years. Coincidentally, the minimum deviation age is very close to the average MPC age along our entire sample. The variable Experience is significant (at a level of 10%), but the results are the contrary to which we expected, meaning a positive relationship in the case of the restricted model (3.3), and a concave quadratic relationship in the case of the unrestricted model (3.1), with maximum around 6.3 years. It is hard to interpret this last result, especially given that the relationship is only significant at a level of 10%, hence we are cautious about extracting conclusions from that evidence.

Other results from the professional background block are that both a higher proportion of MPC members with a background in the public sector and with a background in the central bank staff are positively related with the absolute deviation of inflation. We did not find strong evidence to support a meaningful effect of those variables in the inflation level. However, given that previous research (FARVAQUE, HAMMADOU & STANEK, 2010 and GOHLMANN & VAUBEL, 2007) found a positive

---

<sup>25</sup> Only the difference between the inflation rate and the target, but the results were very similar to the ones using only the inflation level as dependent variable.

relationship between the inflation level and the proportion of former public servants in the MPCs and a negative relationship between the former and the proportion of past central bank employees, the results we presented could have diverse meaning. When it comes to central bank staff, the absolute deviation relationship could be due to an undershooting of the inflation rate. For the public sector, meanwhile, such behavior could be due to an overshoot. Either way, our results support the view that a higher proportion of both former central bank staff or public employees is linked to larger misses from the inflation target.

Finally, model (3.5) has both the linear and quadratic terms for the size of the MPC as significant. Since the coefficient of the quadratic term of the MPC size is positive, the relationship between MPC size and inflation deviation is convex, meaning a minimum point. Model (3.5) suggests the MPC size consistent with the minimum average inflation deviation to be around 17 members, which is much larger than other similar studies such as Farvaque, Hammadou & Stanek (2010) and Berger & Nitsch (2011) that find this number being between five to ten members. Our results could be influenced by the two largest MPC boards, the ECB and the Fed with 25 and 19 members, respectively. However, running the model without both of them gives an inconclusive result.

In addition to the deviation from the target, we will also look at the five-year rolling standard deviation of the quarterly year-over-year core inflation as dependent variable. The results in Table 7 are broadly consistent with our previous findings. In the educational background block of variables, the share of PhDs in the MPC is significant and with a negative coefficient in both restricted (4.2) and unrestricted (4.1) models. This means that as the proportion of PhD members increases, the standard deviation of inflation decreases. Combined with our previous results indicates that an MPC with more PhDs is related not only to a lower inflation level, but also a smaller deviation from the target and lower inflation volatility.

Moving on to the demographics block, the variable gender also proved significant (at a 10% level) with a negative sign, providing tentative evidence that the higher the share of women in the MPC, the lower the inflation volatility, on average. The average age of the MPC had a significant quadratic relationship with the inflation standard deviation of inflation, and an optimal minimum point around 58 years.

**Table 5 – Panel Results for Core Inflation Level<sup>26</sup>**

Variables	(2.1)	(2.2)	(2.3)	(2.4)	(2.5)
Lag	0.2609*** (0.0487)	0.3088*** (0.0434)	0.314*** (0.0458)	0.3068*** (0.0427)	0.3251*** (0.0424)
GDP Gap (-1)	0.2021*** (0.0353)	0.2037*** (0.0328)	0.2014*** (0.0337)	0.2064*** (0.0328)	0.2051*** (0.0325)
Commodity Price	0.0158*** (0.0029)	0.0164*** (0.0028)	0.0169*** (0.0029)	0.0171*** (0.0028)	0.0166*** (0.0028)
B. Economics	-1.0712 (1.0584)	-1.0764 (1.0209)			
B. Law	-0.315 (1.1871)	0.4849 (0.9371)			
Master	0.1702 (1.3774)	-0.1946 (1.2563)			
MBA	-0.3647 (1.331)	-1.1065 (1.262)			
PhD	-0.1933 (0.8452)	-1.1652* (0.682)			
Age	0.2215 (0.4437)		0.5774 (0.4049)		
Age^2	-0.0021 (0.004)		-0.0051 (0.0036)		
Experience	-0.0119 (0.2274)		0.0561 (0.2148)		
Experience^2	-0.0045 (0.0186)		-0.0079 (0.0173)		
Gender	-1.7356 (1.1194)		-1.8000* (0.9734)		
Academia	-2.536*** (0.9302)			-2.8379*** (0.7786)	
Private Sector	-1.3363** (0.6806)			-1.1795** (0.56)	
Public Sector	-0.9862 (0.7075)			-0.6139 (0.4951)	
Multilateral Org.	-1.033 (0.9618)			-0.1005 (0.4648)	
Central Bank Staff	-0.6225 (0.6714)			-1.0903* (0.6269)	
MPC Size	-0.3088 (0.1944)				-0.0875 (0.119)
MPC Size^2	0.0103 (0.0082)				0.0004 (0.0062)
Constant	0.8904	3.3148***	-14.5595	3.4589***	2.2429***

Source: Author (2019).

<sup>26</sup> Numbers in parenthesis are standard errors. \*p-value<10%, \*\*p-value<5%, \*\*\*p-value<1%.

**Table 6 – Panel Results for Absolute Core Inflation Deviation from Target <sup>27</sup>**

Variables	(3.1)	(3.2)	(3.3)	(3.4)	(3.5)
Lag	0.157*** (0.0423)	0.2166*** (0.0392)	0.2251*** (0.041)	0.2173*** (0.0398)	0.2192*** (0.0397)
GDP Gap (-1)	0.1592*** (0.0431)	0.2017*** (0.0402)	0.206*** (0.0406)	0.2114*** (0.041)	0.2171*** (0.0389)
Commodity Price	0.0193*** (0.0031)	0.0184*** (0.003)	0.0184*** (0.0031)	0.0201*** (0.0031)	0.0188*** (0.003)
B. Economics	-1.2066 (0.777)	-0.8404 (0.7432)			
B. Law	-2.1193*** (0.8172)	-0.5439 (0.5757)			
Master	-1.0618 (0.9561)	-1.6258** (0.8149)			
MBA	-1.1535 (0.9776)	-1.2805 (0.8839)			
PhD	-2.0304*** (0.6913)	-2.2823*** (0.574)			
Age	-0.6917*** (0.2656)		-0.9513*** (0.2228)		
Age^2	0.006** (0.0024)		0.0086*** (0.002)		
Experience	0.2981* (0.1606)		0.2517* (0.1467)		
Experience^2	-0.0235* (0.0135)		-0.017 (0.0121)		
Gender	0.4603 (0.8207)		-0.4828 (0.7418)		
Academia	1.169* (0.7041)			-0.0579 (0.5954)	
Private Sector	0.3009 (0.4744)			0.1891 (0.3889)	
Public Sector	1.606*** (0.5367)			0.654* (0.3845)	
Multilateral Org.	-0.776 (0.7067)			0.6425* (0.3711)	
Central Bank Staff	1.2164** (0.5172)			1.303*** (0.4642)	
MPC Size	-0.221 (0.1357)				-0.2366*** (0.0809)
MPC Size^2	0.0058 (0.0054)				0.0071** (0.0036)
Constant	21.8301*** (7.192)	2.596*** (0.7275)	25.336*** (6.2195)	-0.68* (0.4031)	1.2884*** (0.4127)

Source: Author (2019).

<sup>27</sup> Numbers in parenthesis are standard errors. \*p-value<10%, \*\*p-value<5%, \*\*\*p-value<1%.



The professional background variables were only significant of a 10% level for both academia and multilateral organizations, which also presented a positive coefficient. Finally, the MPC size was significant for both the linear and quadratic terms. The coefficient of the quadratic term was positive, meaning a convex relationship with inflation volatility. Once again, the number of MPC members that is consistent with the minimum inflation standard deviation is 19, removing the two largest MPCs from our sample makes the coefficients non-significant, providing evidence that our results may be influenced by the two outlier MPCs in terms of size.

#### 4.3. Results for the Phillips Curve Rolling Beta Coefficients

To test if the MPC composition has any relationship with the slope of the Phillips Curve we designed this variable using the rolling coefficients of a Phillips Curve with the following specification:

$$\pi_t = \rho\pi_{t-1} + \beta g_{t-1} + c + \varepsilon_t \quad (2)$$

where  $\pi_t$  is the year-over-year core inflation rate,  $\pi_{t-1}$  is its lag and  $g_{t-1}$  is the lag of the output gap<sup>28</sup> and  $c$  a constant term. We used quarterly data since 1996 with a 20 quarters rolling sample, storing the estimated coefficient for the last quarter of each year. This procedure caused our panel sample losing two years going from 2001 to 2018. In addition, different countries have different lags between output gap and the inflation rate, so we ran four different models using one to four lags of the output gap and took the average of them.

The results in Table 8 show a negative and significant relationship between the slope of the Phillips curve and the proportion of MPC members with a PhD in economics, being true for both the restricted (5.2) and unrestricted (5.1) models. This negative relationship implies that the higher the share of PhD members inside an MPC, the higher the trade-off between output and inflation, on average.

For both, the Age (5.3) and MPC size (5.5) we found a significant and convex relationship with the slope of the Phillips curve, suggesting a minimum point exists. The mean age of an MPC associated with the lowest Phillips curve coefficient is around 58, very similar to the results for the smallest standard deviation of inflation. An MPC

---

<sup>28</sup> Same output gap as described above.

**Table 7 – Panel Results for Standard Deviation of Core Inflation<sup>29</sup>**

Variables	(4.1)	(4.2)	(4.3)	(4.4)	(4.5)
Lag	0.7323*** (0.0222)	0.7628*** (0.0188)	0.7284*** (0.0195)	0.7517*** (0.0184)	0.7436*** (0.0175)
GDP Gap (-1)	0.0105 (0.01)	0.0108 (0.009)	0.0155* (0.0087)	0.0187** (0.0091)	0.016* (0.0087)
Commodity Price	0.002** (0.0009)	0.0021** (0.0009)	0.0022** (0.0009)	0.0023*** (0.0009)	0.0021** (0.0008)
B. Economics	-0.5994* (0.3439)	-0.5089 (0.3213)			
B. Law	-0.5068 (0.3747)	-0.364 (0.2821)			
Master	-0.7178* (0.4297)	-0.547 (0.3672)			
MBA	-0.2059 (0.4024)	-0.2904 (0.3655)			
PhD	-0.5098* (0.2857)	-0.4937** (0.2235)			
Age	-0.2023 (0.1289)		-0.348*** (0.1072)		
Age^2	0.0016 (0.0012)		0.003*** (0.0009)		
Experience	0.026 (0.0696)		0.0346 (0.0643)		
Experience^2	-0.0036 (0.0058)		-0.0045 (0.0051)		
Gender	-0.1182 (0.359)		-0.492* (0.2927)		
Academia	0.4521* (0.2685)			0.067 (0.2132)	
Private Sector	0.0722 (0.2355)			0.155 (0.1894)	
Public Sector	0.1497 (0.1962)			0.0948 (0.1457)	
Multilateral Org.	-0.0602 (0.322)			0.3065* (0.1614)	
Central Bank Staff	0.3438 (0.2135)			0.2618 (0.1959)	
MPC Size	-0.1321** (0.0559)				-0.1196*** (0.0347)
MPC Size^2	0.0048** (0.0021)				0.0032** (0.0015)
Constant	7.7327** (3.5241)	1.0394*** (0.2744)	10.2164*** (3.0342)	-0.0283 (0.1628)	0.8566*** (0.1883)

Source: Author (2019).

<sup>29</sup> Numbers in parenthesis are standard errors. \*p-value<10%, \*\*p-value<5%, \*\*\*p-value<1%.

**Table 8 – Panel Results for Phillips Curve Slope<sup>30</sup>**

Variables	(5.1)	(5.2)	(5.3)	(5.4)	(5.5)
Lag	0.6925*** (0.0427)	0.7094*** (0.0394)	0.6957*** (0.0394)	0.7091*** (0.0389)	0.7141*** (0.0394)
GDP Gap (-1)	0.0023* (0.0014)	0.001 (0.0013)	0.0017 (0.0012)	0.0031** (0.0013)	0.0017 (0.0012)
Commodity Price	0.0003** (0.0001)	0.0002* (0.0001)	0.0003*** (0.0001)	0.0003*** (0.0001)	0.0003*** (0.0001)
B. Economics	-0.0198 (0.0474)	-0.0572 (0.0452)			
B. Law	0.0801 (0.0551)	0.0039 (0.0461)			
Master	-0.0932 (0.0577)	-0.0355 (0.0489)			
MBA	-0.0182 (0.052)	0.0631 (0.0469)			
PhD	-0.1314*** (0.0387)	-0.0634** (0.0293)			
Age	-0.0464*** (0.0158)		-0.0464*** (0.0141)		
Age^2	0.0004*** (0.0001)		0.0004*** (0.0001)		
Experience	-0.0153 (0.0111)		-0.0166 (0.0101)		
Experience^2	0.0013 (0.001)		0.001 (0.0009)		
Gender	-0.0379 (0.0454)		-0.0429 (0.0355)		
Academia	0.1465*** (0.0415)			0.0806** (0.0366)	
Private Sector	0.0978*** (0.0313)			0.1041*** (0.0269)	
Public Sector	-0.0038 (0.0316)			0.0114 (0.026)	
Multilateral Org.	0.0572 (0.0446)			0.0916*** (0.0254)	
Central Bank Staff	0.0635** (0.0291)			0.0532** (0.0267)	
MPC Size	-0.0037 (0.0087)				-0.0168*** (0.0057)
MPC Size^2	0.0001 (0.0003)				0.0006** (0.0002)
Constant	1.4185*** (0.4459)	0.1033** (0.043)	1.3393*** (0.3942)	-0.0704** (0.0287)	0.0988*** (0.0283)

Source: Author (2019).

<sup>30</sup> Numbers in parenthesis are standard errors. \*p-value<10%, \*\*p-value<5%, \*\*\*p-value<1%.

of around 14 members is the size for the lowest average Phillips curve slope. This size is still larger than most MPCs, except the ECB and the Fed<sup>31</sup>.

Regarding the professional background block of variables, only the background on the public sector does not have a significant coefficient. The share of MPC members with a background in the academia, private sector, multilateral organizations and central bank staff presented a positive relationship with the slope of the Phillips curve, suggesting the higher their share, the lower the output cost to control inflation. One puzzling point is that the coefficient of the background in academia has the opposite sign of the PhD one, which is curious, given that they are relatively well correlated and presented the same sign in other models where the two were significant.

#### 4.4. *Summary of Results*

A summary of our main findings is presented in Table 9, where it is possible to see which variables have significant coefficients across the different models. Regarding academic background, the most relevant result is that the coefficient associated with the proportion of PhDs in the MPC is significant in all the models. The results are consistent with a higher share of PhDs reducing the level, the deviation from the target and, finally, the standard deviation of the inflation rate, suggesting that a board populated with experts in economics tends to generate a better outcome for monetary policy. For the slope of the Phillips curve, our results points to PhDs being related to a higher tradeoff between output and inflation, or a flatter Phillips curve. Researchers are still trying to understand the reasons for the flattening of the Phillips Curve in recent years, and one possible reason could be due to a better anchoring of inflation expectations (BERNANKE, 2007). If this is true, given our previous finding that a higher percentage of PhD MPC members is associated with a smaller deviation of inflation from target, then one hypothesis for the negative relationship between the slope of the Phillips curve and the proportion of PhDs in MPCs is that more PhD are also correlated with better anchored inflation expectations. However, to test this hypothesis is beyond the scope of the current study.

For the demographics block of variables, the results are mixed. Both the average age of the MPC and the proportion of women are statistically relevant in three

---

<sup>31</sup> Once more our results for the MPC size are not robust to the exclusion of the ECB and the Fed.

out of five models. The results indicate that an MPC with an average age between 55 and 58 years has the lowest inflation volatility, with a lower absolute deviation from the inflation target and a lower standard deviation. A similar range was found for the committee's age associated with a steeper Phillips curve, or the MPC average age that has the minimum tradeoff between activity and inflation. In addition, we found that a higher proportion of women inside the MPCs are linked to a lower level and also to a lower standard deviation of inflation. Since the majority of MPCs are still dominated by men, these results indicate that a more diverse and inclusive committee are a positive development for the monetary policy debate.

In the professional background block, we highlight the results for three variables. First, a higher proportion of background in the Academia is linked to a lower level of inflation and a steeper Phillips Curve, but a higher volatility of inflation – with the coefficients that allow us to draw such conclusions being significant at a 10% level. Second, more former multilateral organizations inside the MPCs is associated with both a higher level and volatility of inflation. One possible explanation for this is that nominations to these kinds of jobs are usually highly political, which could imply less independent MPC members. However, we would caution that the results for that variable are not very robust in our specifications, and in many occasions only significant at a relatively high level. Finally, a higher fraction of past private sector employees is related with a lower level of inflation, as well as with a steeper Phillips curve. It is interesting to note that it is hard to define the best profile of central bankers based only on his/her past work experience, with results tentatively pointing towards a preference for former academia and private sector workers.

The last set of results is on the optimum size of the MPC. Our exercise show that the number of members of the MPC is not related with the inflation level, but points that a larger committee would be associated with a lower volatility of inflation and a flatter Phillips curve. Once again, it is important to highlight that those results seem to be influenced by the Fed and the ECB, the two largest MPCs in our sample. Once we remove them from our regression sample, the results are not conclusive for the influence of the MPC size.

**Table 9 – Main Results Summary.**

	Headline Inflation Level	Core Inflation Level	Absolute Target Deviation	Rolling Standard Deviation	Rolling Phillips Curve Beta
B. Economics				Significant in only one model	
B. Law			Significant in only one model		
Master	Significant in both restricted and unrestricted models		Significant in only one model		
MBA	Significant in only one model				
PhD	Significant in both restricted and unrestricted models	Significant in only one model	Significant in both restricted and unrestricted models	Significant in both restricted and unrestricted models	Significant in both restricted and unrestricted models
Age			Significant in both restricted and unrestricted models	Significant in only one model	Significant in both restricted and unrestricted models
Age <sup>2</sup>			Significant in both restricted and unrestricted models	Significant in only one model	Significant in both restricted and unrestricted models
Experience			Significant in both restricted and unrestricted models		
Experience <sup>2</sup>			Significant in only one model		
Gender	Significant in only one model			Significant in only one model	
Academia	Significant in only one model	Significant in both restricted and unrestricted models	Significant in only one model		Significant in both restricted and unrestricted models
Private Sector		Significant in both restricted and unrestricted models			Significant in both restricted and unrestricted models
Public Sector			Significant in both restricted and unrestricted models		
Multilateral Org.	Significant in only one model		Significant in only one model	Significant in only one model	
Central Bank Staff		Significant in only one model	Significant in both restricted and unrestricted models		Significant in both restricted and unrestricted models
MPC Size			Significant in only one model	Significant in both restricted and unrestricted models	Significant in only one model
MPC Size <sup>2</sup>			Significant in only one model	Significant in both restricted and unrestricted models	Significant in only one model

Significant in both restricted and unrestricted models  
 Significant in only one model

Source: Author (2019)

## 5. CONCLUSION

In this paper we expanded the literature that associates the personal profile of the individual members of the MPCs with the performance of monetary policy in two ways. First, we created a new database that aggregate the individual characteristics of MPC members for a larger number of central banks and also for a more recent period. Our database contains information for 439 individuals, who served as board members for 16 different central bank MPCs from 1999 to 2018. Second, we extended the results of the effects of the average MPC profile beyond only its relationship with the inflation

level, but also studying how it could be linked with the absolute deviation of the inflation target, inflation standard deviation and the slope of the Phillips curve.

Our results show that the individual characteristics of the members that forms an MPC are relevant for the performance of monetary policy. The main results that we found were: (i) higher proportion of members with PhD in economics is associated with a lower inflation level and volatility, but towards a flatter Phillips curve, (ii) more women as MPC members are related with both lower and less volatile inflation, (iii) the average MPC age inside a range between 55 and 60 years seems to be linked with less volatile inflation, and (iv) there is evidence associating a higher share of MPC member with former experience in the private sector and in academia with lower inflation, and also that both groups plus past multilateral organizations employees tend to be tied to a lower tradeoff between output and inflation, or a steeper Phillips curve.

Even as, our findings point in the direction of a link between the profile of the members of an MPC with the performance of the monetary policy, our results are merely associative and without providing a causal relationship between both. Beyond the individual characteristics of the policy makers, many other factors are in play in order to generate a better or worse outcome for monetary policy. Factors such as the central bank independence from the government, the institutional framework where it operates, the decision-making process within an MPC, the degree of transparency, among others, are likely also in play and could even influence the profile of the members that society chooses to be part of the MPC. Still, this work sheds some more light in which objective characteristics should we search while selecting our monetary policy makers.

## REFERENCES

- Arellano, M. and S. Bond, 1991, Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations, *Review of Economic Studies* 58, 277–297.
- Arellano, M. and O. Bover, 1995, Another look at the instrumental variables estimation of error-component models, *Journal of Econometrics* 68, 29–51.
- Baltagi, B.H. (2005) *Econometric Analysis of Panel Data*. 3rd Edition, John Wiley & Sons Inc., New York.
- Berger, Helge & Nitsch, Volker, 2008. "Too many cooks? Committees in monetary policy," Discussion Papers 2008/8, Free University Berlin, School of Business & Economics.
- Bernanke, B. (2007). Inflation Expectations and Inflation Forecasting. Speech at the Monetary Economics Workshop of the NBER Summer Institute, Cambridge, Massachusetts (July 10).
- Blinder, Alan S. (2004), *The Quiet Revolution: Central Banking Goes Modern*. New Haven, CT: Yale University Press.
- Blinder, A. S. and J. Morgan (2005), 'Are Two Heads Better Than One? Monetary Policy by Committee', *Journal of Money, Credit, and Banking* 37, 789–812.
- Blinder, A. S. and J. Morgan (2008), 'Leadership in Groups: A Monetary Policy Experiment', *International Journal of Central Banking* 4, 117–150.
- Blundell, R. and S. Bond, 1998, Initial conditions and moment restrictions in dynamic panel data models, *Journal of Econometrics* 87, 115–143.
- Chappell, H. W. Jr and R. R. McGregor (2000), 'A Long History of FOMC Voting Behavior', *Southern Economic Journal* 66, 906–922.
- Diouf, Ibrahima and Pépin, Dominique, (2017), Gender and central banking, *Economic Modelling*, 61, issue C, p. 193-206
- Eichler, S., & Lähler, T. (2013). Forecast dispersion, dissenting votes, and monetary policy preferences of FOMC members: the role of individual career characteristics and political aspects. *Public Choice*, 160(3-4), 429–453.
- Eijffinger, Sylvester, Mahieu, Ronald J and Raes, Louis, (2013), Estimating the preferences of central bankers: an analysis of four voting records, No 9602, CEPR Discussion Papers, C.E.P.R. Discussion Papers.



Eijffinger, Sylvester, Mahieu, Ronald and Raes, Louis, (2015), Hawks and Doves at the FOMC, No 10442, CEPR Discussion Papers, C.E.P.R. Discussion Papers.

Eijffinger, Sylvester & Mahieu, Ronald & Raes, Louis, 2018. "Inferring hawks and doves from voting records," *European Journal of Political Economy*, Elsevier, vol. 51(C), pages 107-120

Farvaque, Etienne, Hammadou, Hakim and Stanek, Piotr, (2010), *Selecting Your Inflation Targeters: Background and Performance of Monetary Policy Committee Members*, *German Economic Review*, 12, issue 2, p. 223-238

Federal Reserve (1996), *Transcripts of the July 1996 Meeting of the Federal Open Market Committee*. (Retrieved November 22, 2019, from <https://www.federalreserve.gov/monetarypolicy/files/FOMC19960703meeting.pdf>)

Federal Reserve (2012), *Federal Reserve issues FOMC statement of longer-run goals and policy strategy*. (Retrieved November 22, 2019, from <https://www.federalreserve.gov/newsevents/pressreleases/monetary20120125c.htm>)

Gohlmann, Silja and Vaubel, Roland, (2007), "The educational and occupational background of central bankers and its effect on inflation: An empirical analysis", *European Economic Review*, 51, issue 4, p. 925-941.

Hammond, Gill, (2012), *State of the art of inflation targeting*, 4 ed., Centre for Central Banking Studies, Bank of England.

Hansen, Bruce. **Econometrics**. University of Wisconsin. 2019. (Retrieved November 28, 2019, from: <https://www.ssc.wisc.edu/~bhansen/econometrics/Econometrics.pdf>)

Harris, M. N., Levine, P., & Spencer, C. (2011). A decade of dissent: explaining the dissent voting behavior of Bank of England MPC members. *Public Choice*, 146(3-4), 413–442.

Havrilesky, T., & Schweitzer, R. (1990). A theory of FOMC dissent voting with evidence from the time series. In T. Mayer (Ed.), *The Political Economy of American Monetary Policy* (pp. 195-208). Cambridge: Cambridge University Press

Reis, Ricardo. 2013. "Central Bank Design." *Journal of Economic Perspectives*, 27 (4): 17-44.

International Monetary Fund. 2019. *World Economic Outlook: Growth Slowdown, Precarious Recovery*. Washington, DC, April.

Masciandaro, Donato & Profeta, Paola & Romelli, Davide. 2016. "Gender and Monetary Policymaking: Trends and Drivers," *BAFFI CAREFIN Working Papers* 1512,

BAFFI CAREFIN, Centre for Applied Research on International Markets Banking Finance and Regulation, Universita' Bocconi, Milano, Italy.

Reis, Ricardo, (2013), Central Bank Design, *Journal of Economic Perspectives*, 27, issue 4, p. 17-44.

Romer, Christina and Romer, David, (2004), Choosing the Federal Reserve Chair: Lessons from History, *Journal of Economic Perspectives*, 18, issue 1, p. 129-162.

Sibert, A. 2006. "Central Banking by Committee." *International Finance* 9 (2): 145–68.

Smales, Lee A. & Apergis, Nick, 2016. "The influence of FOMC member characteristics on the monetary policy decision-making process," *Journal of Banking & Finance*, Elsevier, vol. 64(C), pages 216-231.

SCHELLER, Hanspeter K. *The European Central Bank: History, Role and Functions*. Frankfurt am Main: European Central Bank, 2004.

## APPENDIX

**Table 10 – MPCs Average Profile by Year**

	Demographics		Academic Background					
	Women	Age	Bachelors in Economics	Bachelors in Law	Other Bachelor Degree	Master Degree in Economics	MBA Degree	PhD in Economics
<b>1999</b>	0.10	53.3	0.81	0.12	0.27	0.10	0.04	0.62
<b>2000</b>	0.11	54.0	0.82	0.10	0.28	0.12	0.04	0.61
<b>2001</b>	0.11	54.6	0.81	0.07	0.31	0.13	0.05	0.59
<b>2002</b>	0.13	54.5	0.80	0.10	0.27	0.13	0.05	0.56
<b>2003</b>	0.13	55.1	0.78	0.13	0.27	0.13	0.06	0.60
<b>2004</b>	0.13	55.1	0.81	0.12	0.24	0.14	0.08	0.60
<b>2005</b>	0.13	55.5	0.82	0.10	0.20	0.14	0.09	0.59
<b>2006</b>	0.11	55.1	0.84	0.09	0.18	0.15	0.10	0.62
<b>2007</b>	0.11	55.3	0.84	0.09	0.20	0.16	0.09	0.60
<b>2008</b>	0.10	56.1	0.85	0.09	0.20	0.17	0.09	0.59
<b>2009</b>	0.09	55.7	0.85	0.09	0.19	0.15	0.07	0.64
<b>2010</b>	0.11	56.1	0.85	0.09	0.19	0.14	0.07	0.68
<b>2011</b>	0.13	56.3	0.86	0.10	0.16	0.11	0.09	0.71
<b>2012</b>	0.15	56.4	0.88	0.07	0.14	0.14	0.07	0.69
<b>2013</b>	0.16	56.9	0.86	0.04	0.16	0.18	0.08	0.64
<b>2014</b>	0.20	56.6	0.85	0.05	0.14	0.19	0.06	0.65
<b>2015</b>	0.19	57.3	0.85	0.05	0.13	0.19	0.07	0.63
<b>2016</b>	0.19	57.1	0.86	0.06	0.13	0.22	0.06	0.61
<b>2017</b>	0.19	57.3	0.83	0.07	0.15	0.19	0.08	0.57
<b>2018</b>	0.21	56.6	0.84	0.08	0.14	0.22	0.11	0.53

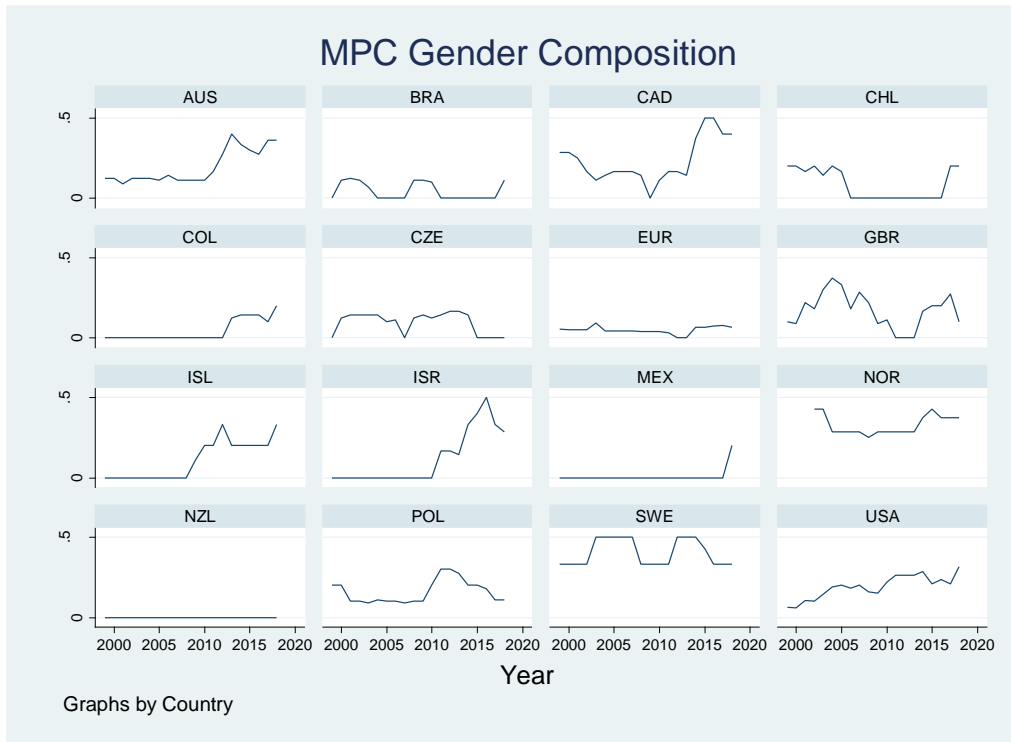
Source: Author

**Table 11 – MPCs Average Profile by Year (Cont.)**

	Professional Experience					Years of Experience in MPC
	Academia	Private Sector	Government	Multilateral Organizations	Central Bank Staff	
<b>1999</b>	0.40	0.22	0.24	0.13	0.28	5.2
<b>2000</b>	0.36	0.25	0.28	0.14	0.31	5.3
<b>2001</b>	0.30	0.31	0.34	0.15	0.33	5.4
<b>2002</b>	0.28	0.28	0.38	0.14	0.33	5.3
<b>2003</b>	0.28	0.27	0.39	0.12	0.33	5.2
<b>2004</b>	0.30	0.27	0.38	0.10	0.33	5.3
<b>2005</b>	0.32	0.26	0.37	0.10	0.29	5.4
<b>2006</b>	0.35	0.22	0.35	0.11	0.23	5.3
<b>2007</b>	0.37	0.19	0.35	0.10	0.26	5.5
<b>2008</b>	0.38	0.19	0.35	0.11	0.27	6.0
<b>2009</b>	0.41	0.20	0.32	0.13	0.25	5.8
<b>2010</b>	0.41	0.21	0.32	0.14	0.25	5.8
<b>2011</b>	0.40	0.19	0.34	0.11	0.28	5.2
<b>2012</b>	0.40	0.21	0.29	0.14	0.29	4.9
<b>2013</b>	0.38	0.23	0.26	0.17	0.32	4.9
<b>2014</b>	0.38	0.21	0.23	0.16	0.34	4.9
<b>2015</b>	0.37	0.24	0.24	0.17	0.31	5.4
<b>2016</b>	0.37	0.26	0.21	0.19	0.33	5.6
<b>2017</b>	0.41	0.23	0.21	0.18	0.33	5.7
<b>2018</b>	0.38	0.30	0.23	0.09	0.34	5.2

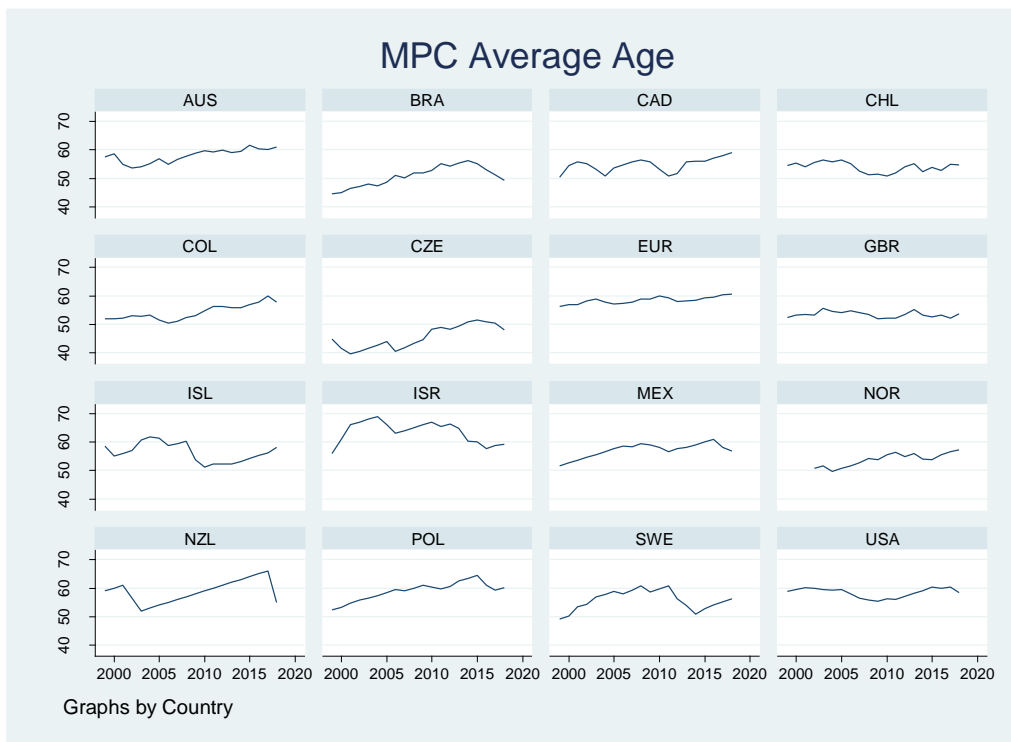
Source: Author

**Figure 1 – Gender Composition**



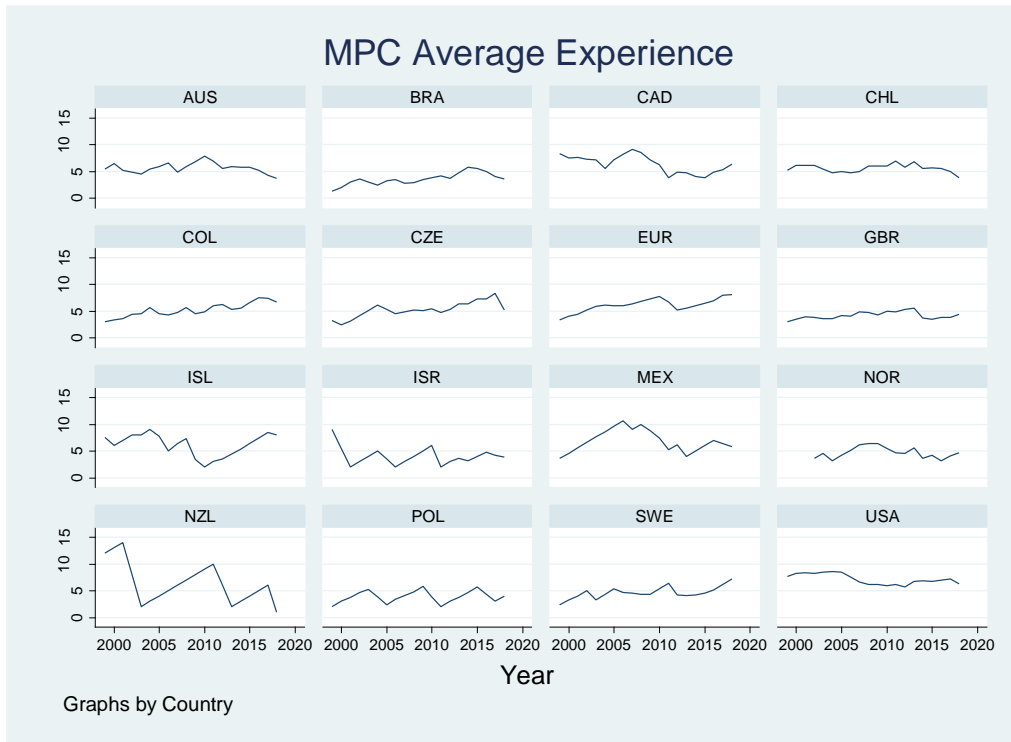
Source: Author

**Figure 2 – Average Age**



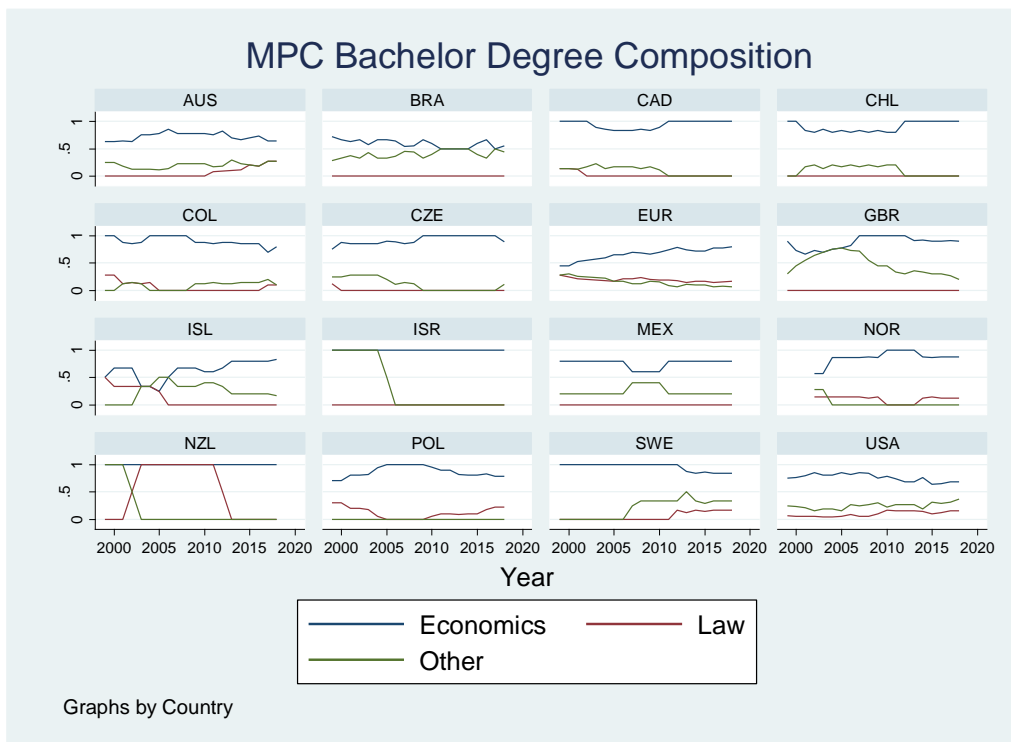
Source: Author

**Figure 3 – Average Experience**



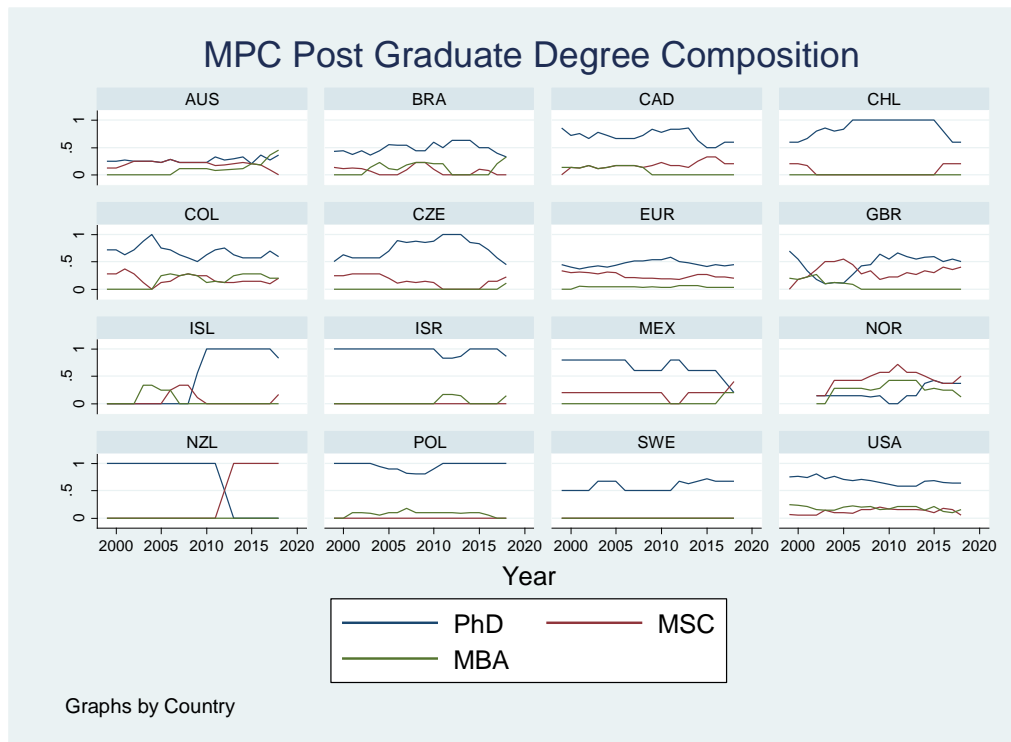
Source: Author

**Figure 4 – Bachelor Degree Composition**



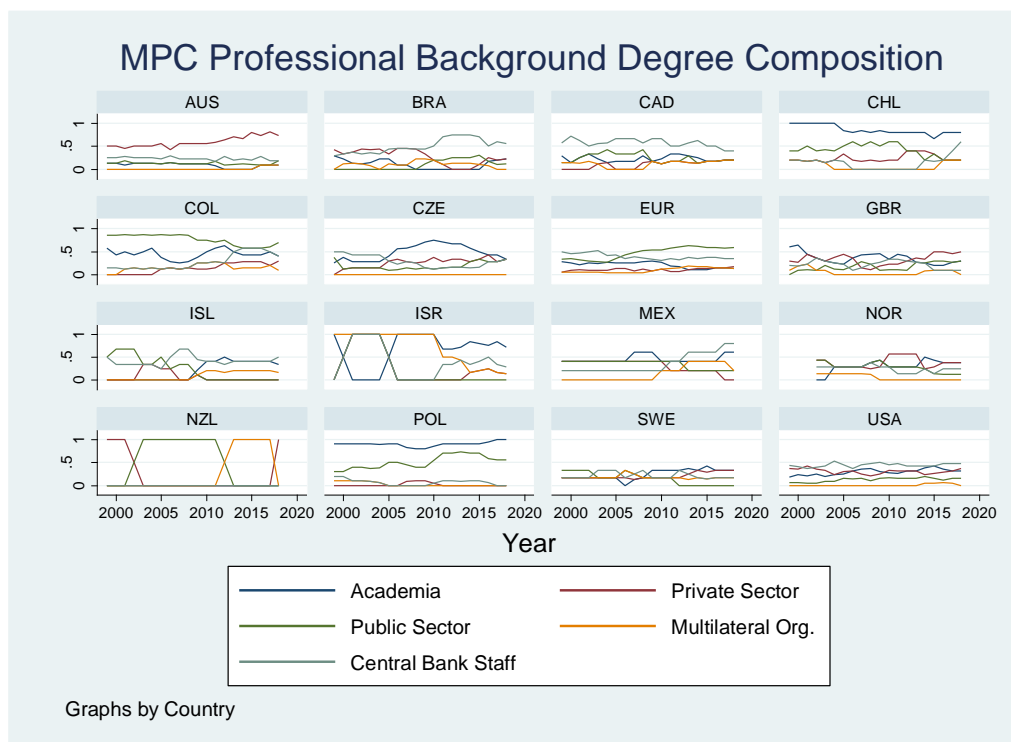
Source: Author

**Figure 5 – Post Graduate Degree Composition**



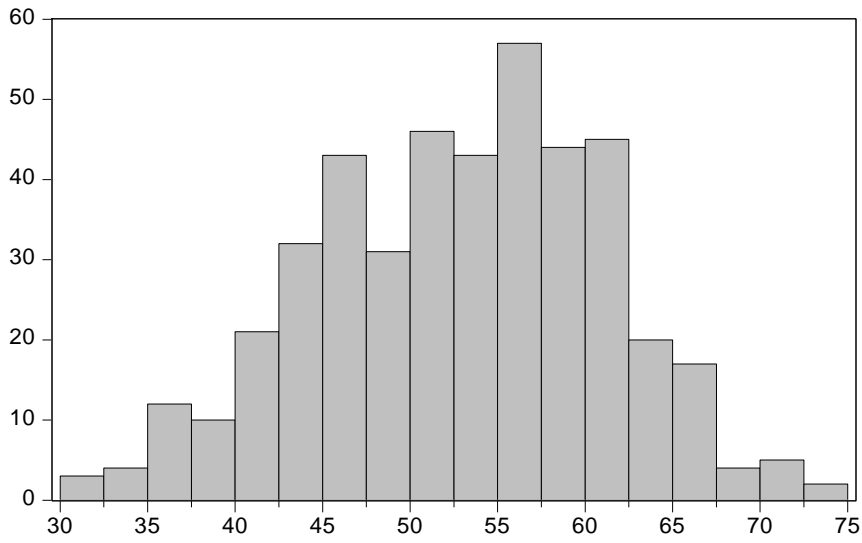
Source: Author

**Figure 6 – Professional Background Degree Composition**



Source: Author

**Figure 7 – MPC Members Entry Age (Descriptive Statistics)**



Series: AGE	
Sample 1 439	
Observations 439	
Mean	52.64465
Median	53.00000
Maximum	74.00000
Minimum	31.00000
Std. Dev.	8.330031
Skewness	-0.153763
Kurtosis	2.648417
Jarque-Bera	3.990929
Probability	0.135950

Source: Author

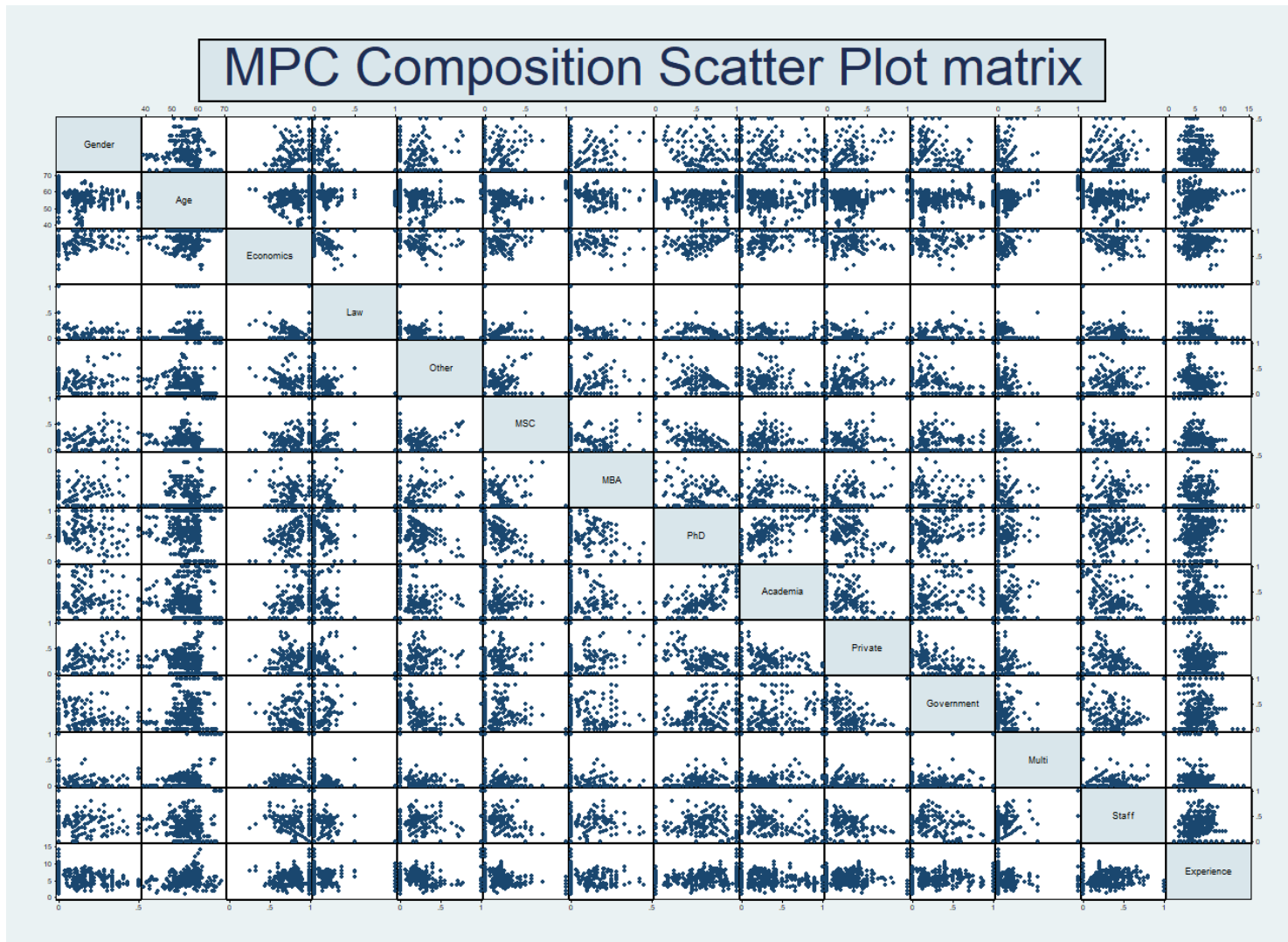


**Table 12 – Characteristics Correlation Matrix**

	gender	age	economics	law	other	msc	mba	phd	academia	private	government	multi	staff	experience
gender	1.000													
age	-0.017	1.000												
economics	0.156	0.028	1.000											
law	-0.127	0.089	-0.022	1.000										
other	-0.114	0.054	-0.301	-0.202	1.000									
msc	0.008	-0.015	0.044	-0.134	-0.093	1.000								
mba	0.173	0.060	-0.193	-0.035	-0.038	0.183	1.000							
phd	-0.136	0.007	0.398	0.094	-0.053	-0.645	-0.355	1.000						
academia	0.013	0.000	0.281	-0.258	-0.293	-0.280	-0.106	0.547	1.000					
private	0.063	0.060	-0.055	-0.232	0.479	0.098	0.174	-0.203	-0.300	1.000				
government	-0.361	0.123	0.118	0.506	-0.152	-0.143	-0.034	0.219	0.015	-0.181	1.000			
multi	-0.135	0.455	0.278	-0.169	0.151	0.133	-0.168	0.087	0.060	-0.052	-0.054	1.000		
staff	0.036	0.002	-0.312	-0.244	0.329	-0.044	0.141	-0.140	-0.336	0.049	-0.121	0.103	1.000	
experience	-0.195	0.220	-0.072	0.100	0.125	-0.106	0.026	0.048	-0.161	0.126	0.066	-0.208	0.046	1.000

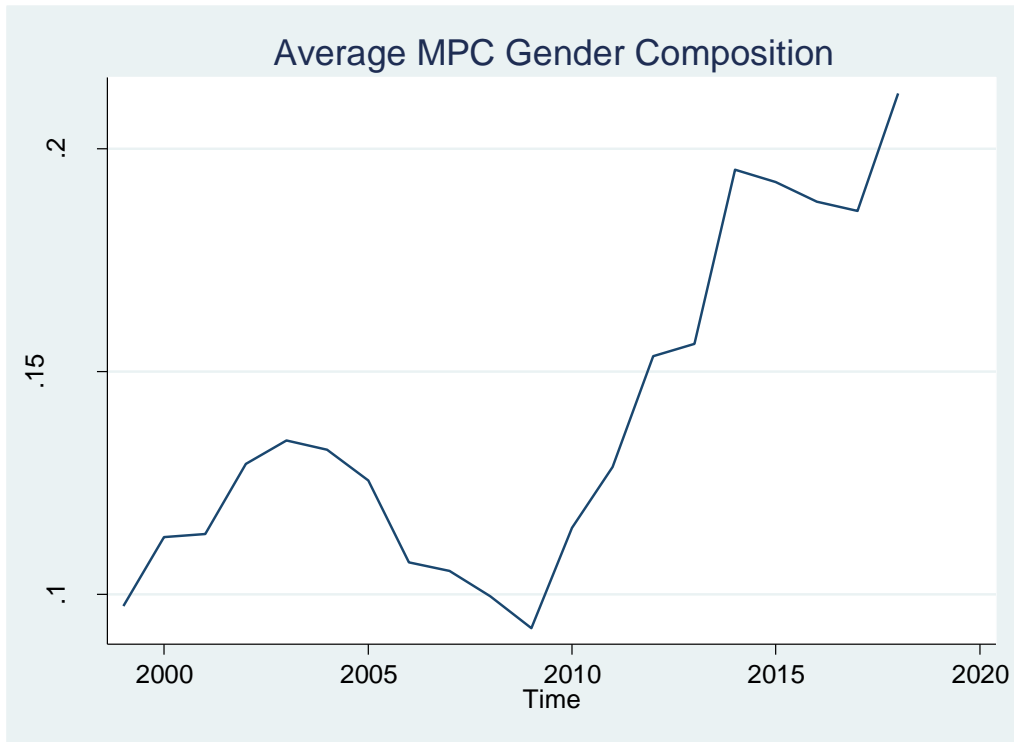
Source: Author

Figure 8 – Characteristics Scatter Plot Matrix



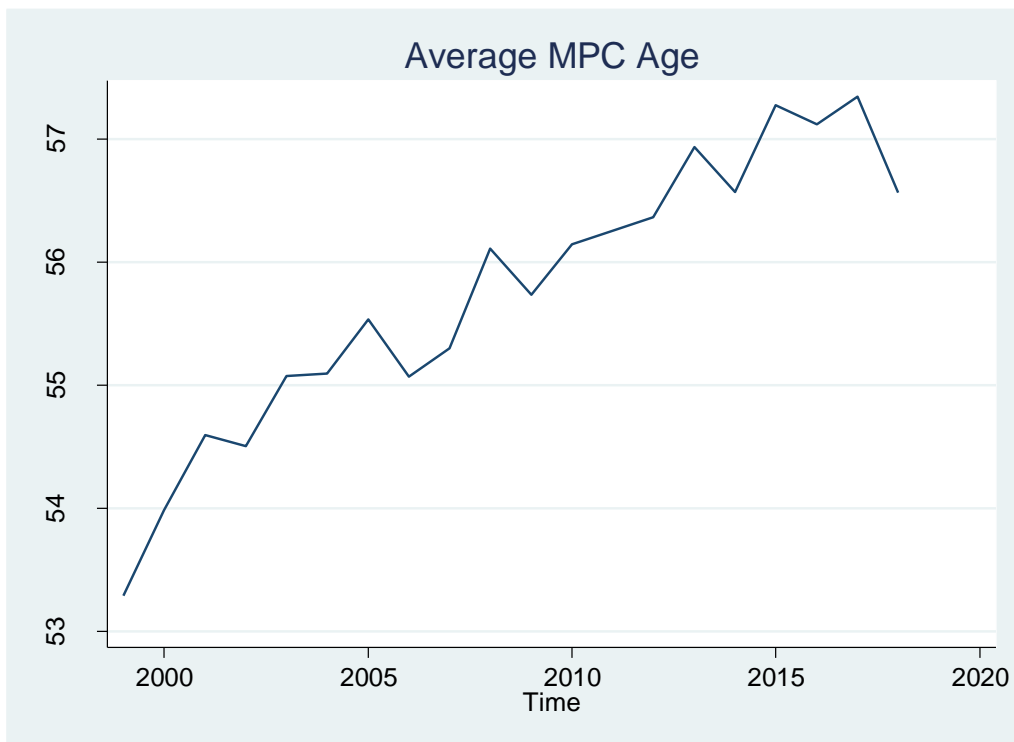
Source: Author

**Figure 9 – Average MPC Gender Composition**



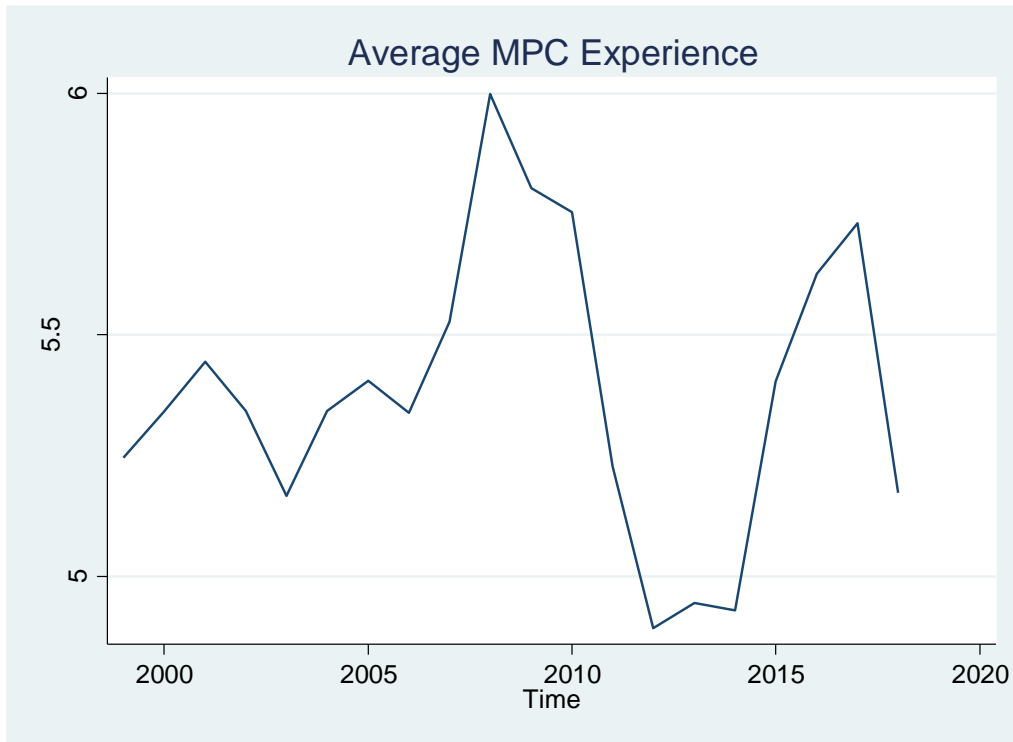
Source: Author

**Figure 10 – Average MPC Age**



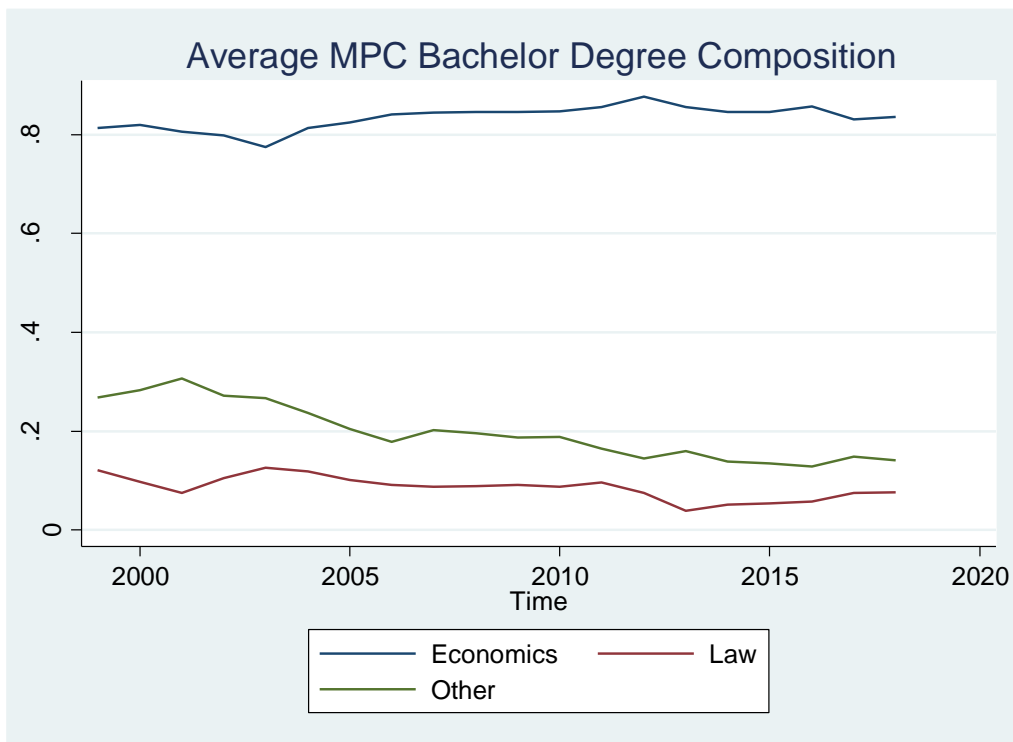
Source: Author

**Figure 11 – Average MPC Experience**



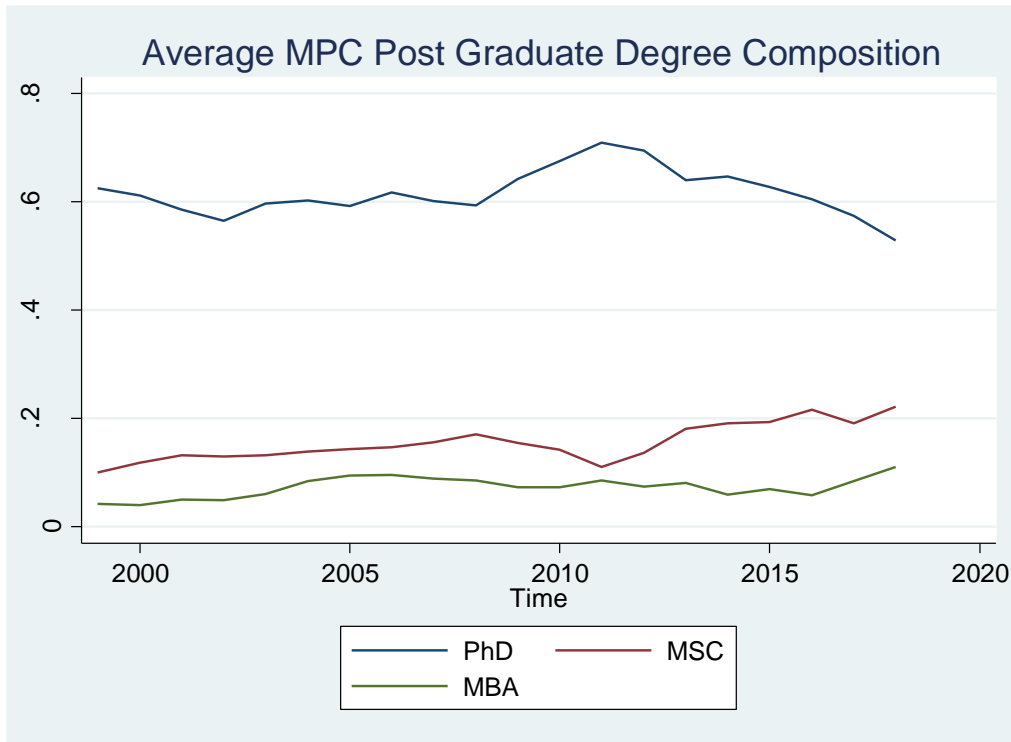
Source: Author

**Figure 12 – Average MPC Bachelor Degree Composition**



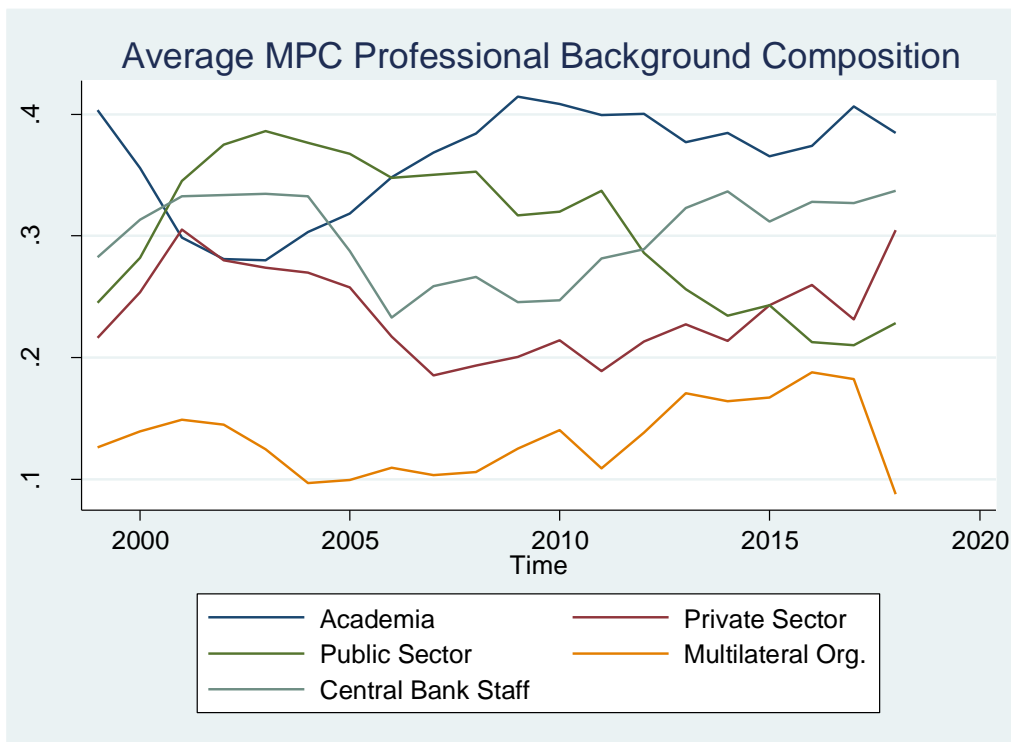
Source: Author

**Figure 13 – Average MPC Post Graduate Degree Composition**



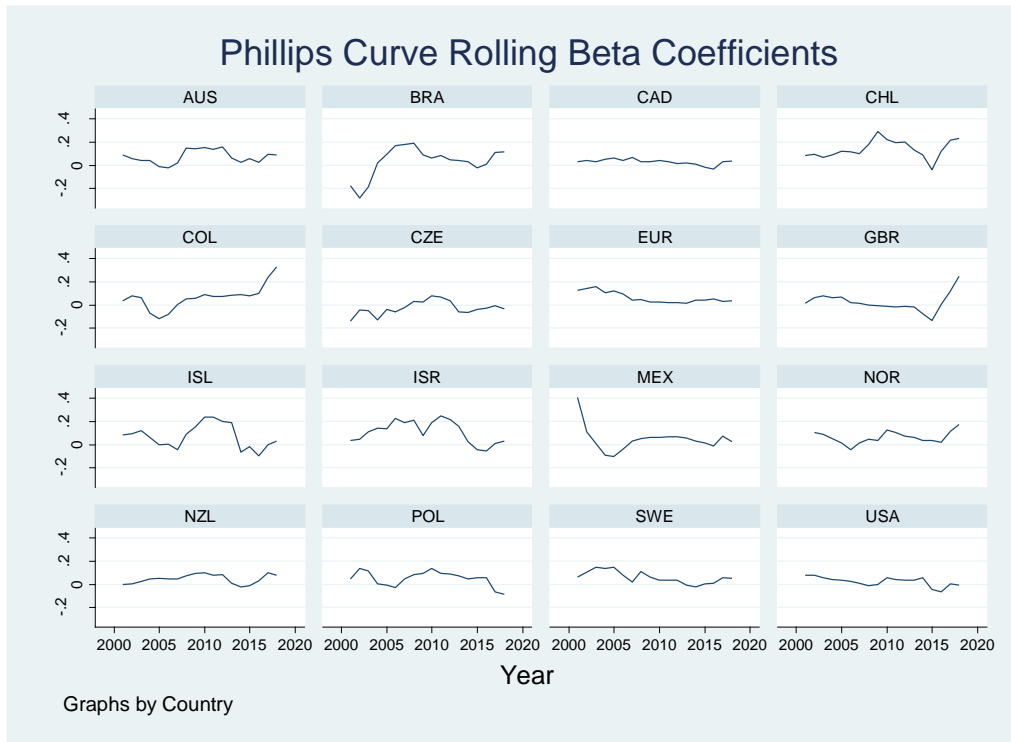
Source: Author

**Figure 14 – Average MPC Professional Background Composition**



Source: Author

**Figure 15 – Phillips Curve Rolling Beta Coefficients**



Source: Author