Matching Between CEOs and Firms: Proposal of Useful CEO and Firm Characteristics

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1 CEO Characteristics

The CEO characteristics I proposed are talent, generality, human capital, managerial abilities, optimism, and insider status.

The importance of CEO talent in CEO-firm matching has been emphasized theoretically (Gabaix and Landier, 2008; Tervi, 2008) and empirically (Bandiera et al., 2020; Falato et al., 2015). Bandiera et al. (2020) used survey data from Italy to quantify CEO talent, which is inapplicable for us. Alternatively, Falato et al. (2015) constructed an overall talent factor for CEOs within the 1992-2005 Execumcomp universe. This factor is a weighted sum of reputational, career, and schooling credentials with the weights calculated using factor analysis. Although their measures of reputational, career, and schooling credentials were collected from multiple restricted sources that are unavailable to us, I was able to get the overall talent factor from the authors. Therefore, I included this talent factor in our dataset. The number of CEOs available each year is showed in Table 1a.

Table 1

(a) Frequency Table: Total Talent Factor

Year	# of CEOs
1992	321
1993	805
1994	1059
1995	1116
1996	1165
1997	1193
1998	1227
1999	1285
2000	1315
2001	1270
2002	1291
2003	1315
2004	1311
2005	1028
Total Unique	2996

(b) Frequency Table: General Ability Index

Year	# of CEOs	Year	# of CEOs
1992	284	2005	1598
1993	730	2006	1694
1994	965	2007	1938
1995	1023	2008	1892
1996	1116	2009	1845
1997	1186	2010	1788
1998	1293	2011	1731
1999	1403	2012	1666
2000	1469	2013	1616
2001	1429	2014	1556
2002	1463	2015	1430
2003	1549	2016	961
2004	1581	Total Unique	5469

Bertrand (2009) pointed out the increasing importance of general managerial skills among CEOs over the past 30-40 years after reviewing extensive literature. Kaplan et al. (2012); Kaplan and Sorensen (2021) provided additional support to this claim with a factor analysis on 30 CEO characteristics assessed by a consulting firm named ghSMART. For empirical application, Custódio et al. (2013) developed a general ability index (GAI) for CEOs within the 1992-2016 Execumcomp universe. This index captures the following aspects of a CEO's professional career: past number of (1) positions, (2) firms, and (3) industries in which a CEO worked; (4) whether the CEO held a CEO position at a different company; and (5) whether

the CEO worked for a conglomerate. GAI is the first factor of the principal components analysis of the above five proxies. Prof. Custódio provided her data with this link GAI. They are working on further update, so data on more recent years might be available later this summer. The number of CEOs available each year is showed in Table 1b.

Human capital factor as the combination of the total talent factor and GAI was also applied in Falato et al. (2015)'s analysis. They suggested that the average of the two can be used as an aggregate human capital measure, so I also included it in our dataset.

Demerjian et al. (2012) proposed another measure of managerial ability, which directly assesses managers' efficiceny in generating revenues to their current firm. Their approch started with a DEA-based total firm effciency measure. Managerial ability is then obtained as the residual of total firm efficiency after removing majors firm-specific characteristics. [1] The authors made the data available from 1980 to 2020 with this link MA. After merging with CEO information using Execucomp, the sample period becomes 1992-2020. For this measure, the number of CEOs available each year is showed in Table 1b.

Table 2: Frequency Table: Managerial Ability

Year	**# of CEOs**	**Year**	**# of CEOs**
1992	306	2007	1661
1993	877	2008	1643
1994	1181	2009	1618
1995	1233	2010	1583
1996	1273	2011	1555
1997	1318	2012	1533
1998	1360	2013	1522
1999	1441	2014	1514
2000	1419	2015	1435
2001	1320	2016	1405
2002	1313	2017	1357
2003	1357	2018	1312
2004	1368	2019	1268
2005	1355	2020	1092
2006	1411	Total Unique	6785

The next characteristic I included is related to CEO optimism. It was shown in the literature as a feature that attracts innovative firms (Hirshleifer et al., 2012), increases CEO forced turnover risk (Campbell et al., 2011), lowers CEO compensation (Otto, 2014), and improves firm performance (Hilary et al., 2016). Stock option-based optimism is the most popular measure among all. This proxy was developed originally by Malmendier and Tate (2005), which requires detailed and proprietary data. Campbell et al. (2011) proposed a coarser version of the measure using just data from 1992-2005 ExecuComp and Compustat. The basic idea is that highly optimistic CEOs are more likely to hold deep-in-the-money

[1] The six firm characteristics included were firm size, firm market share, cash availability, life cycle, operational complexity, and foreign operations.

stock options. On the contrary, CEOs with low optimism are more likely to sell deep out-of-the-money stock options. Following Campbell et al. (2011), I constructed two dummy variables *high-optimism* and *low-optimism* to characterize CEO optimism using 1992-2021 ExecuComp and Compustat data. However, there are cases where a CEO fell within both categories even when I tightened the classification rules [2]. I double-checked my codes and couldn't find any mistakes. If I followed the instruction correctly, the problem might be we having a much longer time series. If you think the two variables are useful, we can discuss it further to figure things out. The current catgory table is showed below in Table 3a:

Table 3

(a) Category Table: Optimism

High Optimism \ Low Optimism	0	1	.	Total
0	1461	3524	20277	25262
1	126	150	2191	2467
.	0	1872	24104	25976
Total	1587	5546	46572	53705

(b) Category Table: Insider Status

Insider	Freq.
0	7072
1	13001
.	33632
Total	53705

The last characteristic I considered is CEOs' insider status. Cziraki and Jenter (2021a) claimed that firms prefer someone they already know due to firm-specific human capital, asymmetric information, and other frictions. They used ExecuComp and several other supplementary datasets to identify if a CEO is an insider (current employees of the firm), external insider (former employees and current or former board members), or outsider (all others). Due to data and time restrictions, I can't fully categorize every CEO as detailed as they did. Using only 1992-2021 Execucomp data and following Falato et al. (2015), I defined a CEO as an insider if she joined the company at least 365 days before the date she became its CEO. As shown in Table 3b, a large majority of CEOs' insider status is missing because the information provided by Execucomp is incomplete.

2 Firm Characteristics

The firm characteristics I proposed are size, governance strength, firm prestige, level of diversification, innovation, growth rate.

Firm size has been emphasized in this literature to be complementary with CEO talent (Gabaix and Landier, 2008; Tervi, 2008; Bandiera et al., 2020; Falato et al., 2015). I used logged total assets at each period as the proxy of firm size as it appear frequently in the literature (Falato et al., 2011; Pan, 2017; Chen et al., 2021; Cziraki and Jenter, 2021b) and it's directly available from MinkiResult2.dta. [3] The sample covers period from 1992 to 2020. , and the number of firms available each year is shown in Table 4.

[2] They assigned high (low) optimism to a CEO if he/she held (sold) deep-in(out-of)-the-money options at least twice during the sample period. I tightened the rule by setting the threshold number to be 5

[3] This is originally results2.dta from the Jonathan's shared Dropbox folder Minki\ NewData\ OutputData.

Table 4: Frequency Table

Year	# of Firms	Year	# of Firms
1992	1167	2007	2025
1993	1442	2008	1984
1994	1495	2009	1957
1995	1570	2010	1954
1996	1663	2011	1905
1997	1724	2012	1881
1998	1759	2013	1883
1999	1709	2014	1895
2000	1636	2015	1866
2001	1686	2016	1805
2002	1703	2017	1748
2003	1735	2018	1716
2004	1714	2019	1597
2005	1614	2020	1475
2006	1751	Total Unique	3688

I also added firms' diversification and innovation. Pan (2017) found that large diversified and innovative firms pay their executives more as they are matched with talented managers who have more diversified experience and are more prone to innovation. Additionally, Hirshleifer et al. (2012) found the complementary between firm innovation and CEO optimism. I followed the approach from Pan (2017) to measure the degree of diversification as number of segment or the entropy based on segment sales, and innovation as R&D expenditure scaled by sales. The 2 diversification measures were collected from Compustat segment data from 1992 to 2020, and the innovation measure is directly available from MinkiResult2.dta. The number of firms having each of these 3 variables each year is shown in Table 5a, 5b, and 6, respectively.

Table 5

Year	# of Firms	Year	# of Firms
1992	310	2007	1533
1993	889	2008	1490
1994	1199	2009	1457
1995	1260	2010	1420
1996	1306	2011	1395
1997	1344	2012	1373
1998	1391	2013	1366
1999	1357	2014	1334
2000	1321	2015	1282
2001	1226	2016	1233
2002	1203	2017	1188
2003	1233	2018	1154
2004	1236	2019	1108
2005	1230	2020	1082
2006	1262	Total Unique	2923

(a) Frequency Table: Number of Segments

Year	# of Firms	Year	# of Firms
1992	302	2007	966
1993	878	2008	953
1994	1185	2009	927
1995	1251	2010	902
1996	1294	2011	882
1997	1335	2012	845
1998	1350	2013	842
1999	951	2014	810
2000	861	2015	771
2001	770	2016	732
2002	750	2017	704
2003	776	2018	683
2004	782	2019	655
2005	756	2020	648
2006	765	Total Unique	2726

(b) Frequency Table:entropy

Table 6: Frequency Table: R & D Expenditure

Year	# of Firms	Year	# of Firms
1992	1167	2007	2024
1993	1441	2008	1983
1994	1494	2009	1957
1995	1569	2010	1953
1996	1664	2011	1904
1997	1723	2012	1882
1998	1758	2013	1883
1999	1708	2014	1894
2000	1635	2015	1865
2001	1687	2016	1804
2002	1702	2017	1747
2003	1736	2018	1715
2004	1714	2019	1595
2005	1614	2020	1473
2006	1751	Total Unique	3688

The next attribute I included is the firms' governance strength. Governance strength could directly affect firm performance (Gompers et al., 2003). Additionally, it is a factor influencing the connection between CEO optimism and forced turnover risk (Campbell et al.,

2011), and the connection between CEO superstar status and compensation increase (Malmendier and Tate, 2008). The measure I adopted is the entrenchment index developed by Bebchuk et al. (2009) as it is publicly available from 1993 to 2008. The number of firms available each year is shown in Table 7.

Table 7: Frequency Table: Entrenchment Index

Year	# of Firms
1993	848
1995	1023
1998	1298
2000	1180
2002	1290
2004	1334
2006	1297
2007	81
2008	72
Total Unique	2273

Focke et al. (2017) found that CEOs of prestige firms receive lower pay. It defined firm prestige based on Fortune's America's Most Admired Companies (MAC) ranking. I used the 1990-2011 ranking data that the authors provided to construct a dummy variable for firm prestige. Table 8a and 8b provide some basic information about the availability and distribution of this variable.

Table 8

(a) Frequency Table: Firm Prestige

Year	# of Firms	Year	# of Firms
1992	388	2003	948
1993	854	2004	964
1994	938	2005	994
1995	925	2006	978
1996	932	2007	997
1997	944	2008	997
1998	939	2009	998
1999	961	2010	997
2000	983	2011	996
2001	955	Total Unique	1924
2002	947		

(b) Category Table: Firm Prestige

Firm Prestige	Freq.
0	16297
1	2339
Total	18636

Lastly, Graham et al. (2013) suggested that younger CEOs are more likely to run growth companies. However, they used survey results directly from managers to gauge the firm historic and expected growth, which is unavailable to us. Instead, I used the sales growth

(Falato et al., 2015) as our feasible measure and it is directly available from MinkiResult2.dta. The number of firms available each year having each measure is shown in Table .

Table 9: Frequency Table: Sales Growth

Year	**# of Firms**	**Year**	**# of Firms**
1992	1103	2007	1972
1993	1393	2008	1958
1994	1467	2009	1930
1995	1539	2010	1919
1996	1603	2011	1875
1997	1667	2012	1849
1998	1712	2013	1837
1999	1657	2014	1839
2000	1613	2015	1825
2001	1662	2016	1780
2002	1691	2017	1728
2003	1728	2018	1697
2004	1703	2019	1586
2005	1611	2020	1469
2006	1734	Total Unique	3663

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