**Method**

Initially, I viewed a number of graphs using a Pivot Table on Excel, always looking at how the other variables showed significant differences with respect to the total charges or another variable. After this, I flocked to GRETL and ran an ordinary least squares test. I then decided to focus my analysis on the identified significant variables, referring to my observations from the pivot table graphs.

**Results**

1. **From GRETL:**

coefficient std. error t-ratio p-value

-----------------------------------------------------------------

tenure 74.3840 1.63496 45.50 4.07e-177 \*\*\*

PhoneService 358.184 129.776 2.760 0.0060 \*\*\*

InternetService 1367.40 98.4041 13.90 3.42e-037 \*\*\*

StreamingTV 196.387 88.4481 2.220 0.0269 \*\*

1. **From the pivot table:**

* Customers with month-to-month contracts have the highest monthly and total charges, as opposed to one year and two-year contract holders
* Females have higher charges than males
* Non-senior citizens have much higher charges than senior citizens
* Fiber optic users had the highest charges among all customers
* Those with no internet services streamed movies the most, with those with Fiber optics second
* Those with no tenure had the highest charges
* Electronic check had the most, while automatic bank transfers had the least
* Those with phone services had significantly higher charges than those without
* Those who streamed TV only had a slightly higher charge than those who don’t. Most of them have no internet services. Those who stream the least are those with DSL internet services.

**Analysis**

The hint that users with no tenure were those with the highest charges gave me an inkling that their services are targeted towards smaller businesses and households. Their telco services are probably more appropriate for personal use. When I saw that those with Fiber Optics paid the most, I attributed it to two factors: Higher charges in general and greater customer satisfaction. This is backed up by how more users who stream TV Shows and Movies have Fiber Optics. I chose to mainly look at the total charges as the regressand since this is reflective of their use of the Telco services.

**Conclusion:**

Retain those who have no internet services because they are less likely to be dissatisfied with services. Among those with Fiber Optics, retain those who with more than ten years of tenure. They are also the highest payers. Among those with DSL, retain those who stream TV and who have total charges higher than 700 pesos. All else are likely to churn. In the end, there are more willing to stay than expected to churn.

|  |  |
| --- | --- |
| **Churned** | **Stayed** |
| 2775-SEFEE | 2452-MRMZF |
| 8468-FZTOE | 3118-UHVVQ |
| 6253-GNHWH | 4707-MAXGU |
| 7471-MQPOS | 2509-TFPJU |
| 0270-THENM | 8441-SHIPE |
| 5996-EBTKM | 6976-BWGLQ |
| 0531-XBKMM | 5115-SQAAU |
| 2451-YMUXS | 1705-GUHPV |
| 5820-PTRYM | 5893-KCLGT |
| 2314-TNDJQ | 4534-WGCIR |
| 7619-PLRLP | 2569-WGERO |
| 4114-QMKVN | 7558-IMLMT |
| 1122-YJBCS | 3454-JFUBC |
| 8050-XGRVL | 0052-YNYOT |
| 7470-DYNOE | 4597-ELFTS |
| 3605-JISKB | 5146-YYFRZ |
| 7672-VFMXZ | 4086-WITJG |
| 0617-AQNWT | 1074-WVEVG |
| 8591-NXRCV | 6848-HJTXY |
| 2405-LBMUW | 4779-ZGICK |
| 0657-DOGUM | 6813-GZQCG |
| 3908-MKIMJ | 9173-IVZVP |
| 2408-PSJVE | 4990-ALDGW |
| 8738-JOKAR | 0508-SQWPL |
| 4174-LPGTI | 6340-DACFT |
| 5306-BVTKJ | 3662-FXJFO |
| 4186-ZBUEW | 1241-FPMOF |
| 5126-RCXYW | 9588-YRFHY |
| 7931-PXHFC | 4807-IZYOZ |
| 5906-CVLHP | 8249-THVEC |
| 4940-KHCWD | 0804-YGEQV |
| 9259-PACGQ | 6762-NSODU |
| 1094-BKOSX | 9916-AYHTC |
| 7605-SNLQG | 2068-WWXQZ |
| 9013-AQORL | 0048-PIHNL |
| 5245-VDBUR | 1047-RNXZV |
| 9388-ZEYVT | 9710-NJERN |
| 2188-SXWVT | 2511-ALLCS |
| 2038-YSEZE | 7242-EDTYC |
| 6810-VCAEX | 4955-VCWBI |
| 8292-FRFZQ | 2061-VVFST |
| 5012-YSPJJ | 4933-BSAIP |
| 1904-WAJAA | 1488-SYSFC |
| 6967-PEJLL | 0827-ITJPH |
| 4926-UMJZD | 7815-PDTHL |
| 2144-ESWKO | 3389-KTRXV |
| 4011-ARPHK | 5474-LAMUQ |
| 2108-GLPQB | 2346-CZYIL |
| 9828-QHFBK | 2595-KIWPV |
| 2978-XXSOG | 9347-AERRL |
| 0076-LVEPS | 0357-NVCRI |
| 3733-ZEECP | 0164-XAIRP |
| 1395-OFUWC | 3978-YNKDD |
| 2843-CQMEG | 9546-KDTRB |
| 4576-CSAJH | 9801-NOSHQ |
| 3648-GZPHF | 7956-XQWGU |
| 7078-NVFAM | 1760-CAZHT |
| 4501-VCPFK | 9617-UDPEU |
| 7746-AWNQW | 8969-PRHFK |
| 9940-HPQPG | 2164-SOQXL |
| 6969-MVBAI | 9945-PSVIP |
| 2215-ZAFGX | 1272-ILHFG |
| 8799-OXZMD | 4488-PSYCG |
| 6447-GORXK | 9364-YKUVW |
| 7234-FECYN | 9845-QOMAD |
| 3585-ISXZP | 8317-BVKSO |
| 3914-FDRHP | 6508-NJYRO |
| 2810-FTLEM | 5546-QUERU |
| 0872-NXJYS | 3078-ZKNTS |
| 6339-YPSAH | 9837-FWLCH |
| 3898-BSJYF | 2791-SFVEW |
| 0786-VSSUD | 2740-JFBOK |
| 3468-DRVQJ | 0064-SUDOG |
| 4526-RMTLL | 2005-DWQZJ |
| 9979-RGMZT | 6258-NGCNG |
| 9451-LPGOO | 2229-DPMBI |
| 3635-JBPSG | 4020-KIUDI |
| 8182-PNAGI | 5647-URDKA |
| 1925-TIBLE | 8148-WOCMK |
| 3319-DWOEP | 5850-BDWCY |
| 2990-HWIML | 2030-BTZRO |
| 8792-AOROI | 0661-KQHNK |
| 3640-JQGJG | 2159-TURXX |
| 5568-DMXZS | 7976-CICYS |
| 9928-BZVLZ | 9770-LXDBK |
| 1596-OQSPS | 9039-ZVJDC |
| 0749-IRGQE | 2342-CKIAO |
| 5392-AKEMH | 8006-PYCSW |
| 5868-YWPDW | 0871-OPBXW |
| 0463-ZSDNT | 9700-ZCLOT |
| 9820-RMCQV | 4745-LSPLO |
| 4566-NECEV | 3590-TCXTB |
| 6229-LSCKB | 7839-QRKXN |
| 8344-WFMFH | 1000-AJSLD |
| 9210-IAHGH | 7878-RTCZG |
| 1750-CSKKM | 2369-FEVNO |
| 7758-XKCBS | 0970-QXPXW |
| 8212-DJRCH | 1724-IQWNM |
| 8775-CEBBJ | 9739-JLPQJ |
| 0305-SQECB | 2380-DAMQP |
| 9696-RMYBA | 3795-CAWEX |
| 7693-LCKZL | 3508-CFVZL |
| 1273-MTETI | 4909-JOUPP |
| 5876-HZVZM | 0530-IJVDB |
| 1442-BQPVU | 1320-GVNHT |
| 4801-JZAZL | 4670-TABXH |
| 1400-MMYXY | 8071-SBTRN |
| 4710-NKCAW | 8107-RZLNV |
| 9274-CNFMO | 7203-OYKCT |
| 8361-LTMKD | 8213-TAZPM |
| 3855-ONCAR | 7632-MNYOY |
| 1389-CXMLU | 8561-NMTBD |
| 5482-NUPNA | 6257-DTAYD |
| 8217-QYOHV | 2234-XADUH |
| 8083-YTZES | 9558-IHEZX |
| 2235-DWLJU | 4616-ULAOA |
| 1980-KXVPM | 4323-OHFOW |
| 7952-OBOYL | 8065-QBYTO |
| 3191-CSNMG | 5481-NTDOH |
| 3411-WLRSQ | 0218-QNVAS |
| 6994-KERXL | 6500-JVEGC |
| 7009-LGECI | 0639-TSIQW |
| 8976-OQHGT | 3090-HAWSU |
| 2075-RMJIK | 6797-LNAQX |
| 9850-OWRHQ | 3186-AJIEK |
| 9398-MMQTO | 9488-FYQAU |
| 4919-MOAVT | 1304-SEGFY |
| 5570-PTWEH | 9586-JGQKH |
| 2710-WYVXG | 2898-MRKPI |
| 8676-TRMJS | 6341-AEVKX |
| 5295-PCJOO | 7426-GSWPO |
| 5561-NWEVX | 4989-LIXVT |
| 9317-WZPGV | 1035-IPQPU |
| 0685-MLYYM | 9589-ABEPT |
| 5916-QEWPT | 6664-FPDAC |
| 5832-XKAES | 1548-FEHVL |
| 6304-IJFSQ | 9912-OMZDS |
| 7853-OETYL | 6728-VOIFY |
| 4662-EKDPQ | 2904-GGUAZ |
| 8450-JOVAH | 5090-EMGTC |
| 9626-WEQRM | 9079-YEXQJ |
| 2108-XWMPY | 7789-CRUVC |
| 7384-GHBPI | 7964-ZRKKG |
| 0295-PPHDO | 3768-NLUBH |
| 9572-WUKSB | 2371-KFUOG |
| 4592-IWTJI | 0898-XCGTF |
| 7729-JTEEC | 1427-VERSM |
| 2737-WFVYW | 3005-NFMTA |
| 3798-EPWRR | 5515-AKOAJ |
| 6230-BSUXY | 2267-WTPYD |
| 6457-USBER | 6300-BWMJX |
| 6618-RYATB | 1930-WNXSB |
| 5480-HPRRX | 4816-OKWNX |
| 9248-OJYKK | 5297-MDOIR |
| 6894-LFHLY | 8444-WRIDW |
| 4415-IJZTP | 6394-MFYNG |
| 0723-DRCLG | 7103-IPXPJ |
| 1031-IIDEO | 4070-OKWVH |
| 1122-JWTJW | 1545-ACTAS |
| 2446-PLQVO | 0422-UXFAP |
| 1062-LHZOD | 7921-LMDFQ |
| 4501-EQDRN | 3545-CNWRG |
| 6502-MJQAE | 9972-VAFJJ |
| 6457-GIRWB | 5136-GFPMB |
| 7660-HDPJV | 1591-MQJTP |
| 1447-GIQMR | 2750-BJLSB |
| 2856-HYAPG | 9412-ARGBX |
| 5909-ECHUI | 3541-ZNUHK |
| 0674-EYYZV | 9600-NAXZN |
| 9108-EJFJP | 7142-HVGBG |
| 8992-JQYUN | 6583-QGCSI |
| 1471-GIQKQ | 6661-HBGWL |
| 6127-IYJOZ | 5243-SAOTC |
| 3926-CUQZX | 1450-SKCVI |
| 3085-QUOZK | 0093-XWZFY |
| 0032-PGELS | 6518-LGAOV |
| 7242-QZLXF | 5681-LLOEI |
| 5351-QESIO | 2832-KJCRD |
|  | 4690-PKDQG |
|  | 4657-FWVFY |
|  | 5274-XHAKY |
|  | 4480-MBMLB |
|  | 1116-DXXDF |
|  | 3174-RKMOW |
|  | 6563-VNPMN |
|  | 1685-BQULA |
|  | 5981-ZVXOT |
|  | 3452-SRFEG |
|  | 6075-SLNIL |
|  | 2133-TSRRM |
|  | 9053-EJUNL |
|  | 7398-LXGYX |
|  | 8465-SBRXP |
|  | 3588-WSTTJ |
|  | 0402-CQAJN |
|  | 6906-MPARY |
|  | 3990-QYKBE |
|  | 5161-XEUVX |
|  | 0376-OIWME |
|  | 8267-ZNYVZ |
|  | 1024-KPRBB |
|  | 8709-KRDVL |
|  | 9003-CPATH |
|  | 2758-RNWXS |
|  | 7957-RYHQD |
|  | 0666-UXTJO |
|  | 1041-RXHRA |
|  | 3976-BWUCK |
|  | 0516-OOHAR |
|  | 0886-QGENL |
|  | 9767-FFLEM |
|  | 6897-UUBNU |
|  | 5060-TQUQN |
|  | 5389-FFVKB |
|  | 2685-SREOM |
|  | 1785-BPHTP |
|  | 5022-KVDQT |
|  | 5666-CYCYZ |
|  | 1309-BXVOQ |
|  | 8404-FYDIB |
|  | 8739-WWKDU |
|  | 0818-OCPZO |
|  | 2523-EWWZL |
|  | 1956-YIFGE |
|  | 6633-SYEUS |
|  | 1754-GKYPY |
|  | 7703-ZEKEF |
|  | 5626-MGTUK |
|  | 7240-FQLHE |
|  | 0682-USIXD |
|  | 9129-UXERG |
|  | 8725-JEDFD |
|  | 8784-CGILN |
|  | 8155-IBNHG |
|  | 8685-WHQPW |
|  | 6668-CNMFP |
|  | 2823-LKABH |
|  | 2027-CWDNU |
|  | 6215-NQCPY |
|  | 8456-QDAVC |
|  | 3621-CEOVK |
|  | 1113-IUJYX |
|  | 7315-WYOAW |
|  | 2025-JKFWI |
|  | 6692-UDPJC |
|  | 1226-IENZN |
|  | 0023-XUOPT |
|  | 1195-OIYEJ |
|  | 4078-SAYYN |
|  | 1564-NTYXF |
|  | 6906-ANDWJ |
|  | 2272-QAGFO |
|  | 3398-FSHON |
|  | 1465-VINDH |
|  | 2180-DXNEG |
|  | 0928-XUTSN |
|  | 1173-XZPYF |
|  | 9547-ITEFG |
|  | 7562-UXTPG |
|  | 7603-USHJS |
|  | 4075-WKNIU |
|  | 3967-KXAPS |
|  | 6365-HITVU |
|  | 6258-PVZWJ |
|  | 6369-MCAKO |
|  | 6437-UDQJM |
|  | 3938-YFPXD |
|  | 9530-GRMJG |
|  | 5702-KVQRD |
|  | 6439-PKTRR |
|  | 8722-PRFDV |
|  | 0083-PIVIK |
|  | 8469-SNFFH |
|  | 6953-PBDIN |
|  | 6691-CCIHA |
|  | 7164-BPTUT |
|  | 2363-BJLSL |
|  | 2256-YLYLP |
|  | 6120-RJKLU |
|  | 2274-XUATA |
|  | 1036-GUDCL |
|  | 7359-SSBJK |
|  | 3259-KNMRR |
|  | 9281-CEDRU |
|  | 5130-YPIRV |
|  | 6169-PGNCD |
|  | 1960-UOTYM |
|  | 6898-RBTLU |
|  | 8822-KNBHV |
|  | 2453-SAFNS |
|  | 9888-ZCUMM |
|  | 7696-AMHOD |
|  | 3704-IEAXF |
|  | 4891-NLUBA |
|  | 4342-HFXWS |
|  | 5294-CDGWY |
|  | 4701-AHWMW |
|  | 1264-FUHCX |
|  | 6211-WHMYA |
|  | 9609-BENEA |
|  | 8080-POTJR |
|  | 0822-QGCXA |
|  | 6598-KELSS |
|  | 2925-MXLSX |
|  | 9863-JZAIC |
|  | 6840-RESVB |
|  | 8690-UPCZI |
|  | 4747-LCAQL |
|  | 1684-FLBGS |
|  | 1389-WNUIB |
|  | 3205-MXZRA |
|  | 3315-IKYZQ |
|  | 4459-BBGHE |
|  | 7895-VONWT |
|  | 9867-XOBQA |
|  | 8930-XOTDP |
|  | 2257-BOVXD |
|  | 0550-DCXLH |
|  | 7750-EYXWZ |
|  | 5204-QZXPU |
|  | 1699-HPSBG |
|  | 1518-VOWAV |