



# Encuesta Estructural Empresarial

..... ENESEM - 2023

Marzo · 2025

# Diseño Muestral de la Encuesta Estructural Empresarial (ENESEM)

Año de investigación 2023



%JSFDDJØO

%JSFDDJØO EF \*OGSBFTUSVDUWSB &TUBEÓTUJDB Z .VFTUSFP

6OJEBE

(FTUJØO EF %JTFxP .VFTUSBM

&MBCPSBEP QPS

"OHFM (BJCPS

3FWJTBEP QPS

+POBUIBO 3PTFSP

\$ISJTUJBO (BSDİT

"QSPCBEP QPS

%JBOB #BSDP



# 5 B C M B E F D P O U F O J E P

\* O U S P E V D D J Ø O

" O U F D F E F O U F T

1 M B O J m D B D J Ø O

0 C K F U J W P T Z E F M J N J U B D J Ø O E F M B P Q F S B D J Ø O F T U B E Ó T U J D B  
0 C K F U J W P T  
% F M J N J U B D J Ø O

% J T F x P Z D P O T U S V D D J Ø O

% J T F x B S F M N B S D P Z M B N V F T U S B  
5 J Q P Z F U B Q B T E F E J T F x P N V F T U S B M  
% P N J O J P T E F F T U V E J P  
. B S D P N V F T U S B M  
7 B S J B C M F T E F E J T F x P  
5 B N B x P N V F T U S B M  
4 F M F D D J Ø O E F M B N V F T U S B  
\$ P O U S P M E F D P C F S U V S B E F D B N Q P Z N V F T U S B M  
\$ P O T U S V D D J Ø O E F G B D U P S F T E F F Y Q B O T J Ø O  
' B D U P S E F F Y Q B O T J Ø O U F Ø S J D P  
' B D U P S Q P T U F T U S B U J m D B E P

& T U J N B D J P O F T Z F S S P S F T N V F T U S B M F T

& T U J N B D J Ø O E F D B S B D U F S Ó T U J D B T  
& S S P S E F N V F T U S F P

% F D M B S B D J Ø O E F M 1 M B O E F N V F T U S F P

3 F G F S F O D J B T



# \* O U S P E V D D J Ø O

&M \*OTUJUVUP /BDJPOBM EF &TUBEÓTUJDB Z \$FOTPT \*/&\$ PSHBOJTM  
EVDDJØO &TUBEÓTUJDB FO FM &DVBEPS SFBMJ[B BOVBMNFOUF FODVFT  
B FNQSFTBT B OJWFM OBDJPOBM

&O FTUF TFOUJEP TF SFBMJ[B BOVBMNFOUF MB i&ODVFTUB &TUSVDUVS  
FO DVFOUB MBT EJ TUJOUBT TFDDJPOFT FDPOØNJDBT DPOUFNQMBEFT  
USJBM \*OUFSOBDJPOBM 6OJGPSNF EF "DUJWJEBEFT &DPOØNJDBT \$\*\*6  
NFEJBOBT FO FTUB FODVFTUB FO QBSUJDVMBS TF VUJMJ[B FM \$\*\*6 B

&M QSPDFTP RVF TF SFBMJ[B QBSB MB HFOFSBDJØO EFM EJTFxP NVFTUS

&O MB QSJNFSB FUBQB TF UPNB FO DVFOUB

- %FUF SNJOB DJØO EFM NBS DP EF NVFTUSFP
- &M VOJWFSTP EF MB JOWFTUJHBDJØO
- -BT VOJE BEFT EF NVFTUSFP Z BOÈMJTJT
- \$PCFSUVSB HFP HSÈmDB
- \$PCFSUVSB UFNÈUJDB

&O MB TFHVOEB FUBQB

- .FUPEPMPHÓB QBSB FM EJTFxP NVFTUSBM
- %FUF SNJOB DJØO EF MPT EPNJOJPT EF FTUVEJP
- %FUF SNJOB DJØO EFM UBNBxP EF MB NVFTUSB
- 4FMFDDJØO EF MB NVFTUSB
- 7BMJE BDJØO EF MB DPCFSUVSB PCUFOJEB FO DBNQP

1PS ÞMUJNP TF SFBMJ[B

- &M DÈMDVMP EF MPT GBDUPSFT EF FYQBOTJØO
- 1PTUFTUSBUJmDBDJØO
- &TUJNBDJØO EF DBSBDUFSÓTUJDBT
- &SSPS EF NVFTUSFP
- %FDMBSBDJØO EFM QMBO EF NVFTUSFP

\$BCF NFODJPOBS RVF EFCJEP B MB EJOÈNJDB EF MBT FNQSFTBT TF VU  
DJEP DPNP QPTUFTUSBUJmDBDJØO DPO MB mOBMJEBE EF BKVTUBS MP  
VOJE BEFT EF PCTFSWBDJØO QPS BDUVBMJ[B DJØO EFM 3FHJTUSP &TUB



# " O U F D F E F O U F T

& O F M B x P E F Q P S E J T Q P T J D J Ø O E F M % F Q B S U B N F O U P E F \* O W F T U J H  
# B O D P \$ F O U S B M T F S F B M J [ Ø F M Q S J N F S \$ F O T P & D P O Ø N J D P E F M T F D U P  
Q B S U J S E F T F F N Q F [ Ø B S F B M J [ B S M B & O D V F T U B E F . B O V G B D U V S B Z  
E F i & O D V F T U B T \* O E V T U S J B M F T w M B D V B M T F F K F D V U Ø I B T U B & O  
T F H V O E P D F O T P E F . B O V G B D U V S B Z . J O F S Ó B Z F M Q S J N F S D F O T P E F \$ P N  
B E F M B O U F E F T E F I B T U B T F J O W F T U J H Ø G P S N B M N F O U F M B & O D V  
. J O F S Ó B & O D V F T U B E F \$ P N F S D J P Z & O D V F T U B E F ) P U F M F T 3 F T U B V S B O U  
Q P S Q S J N F S B W F [ M B \$ M B T J m D B D J Ø O \* O E V T U S J B M \* O U F S O B D J P O B M 6 O  
6 O J E B T

" Q B S U J S E F Z F O C B T F B M \$ F O T P & D P O Ø N J D P E F D P N F O [ Ø B F K  
D V F T U B F O E P T Q B S U F T 5 P N P \* Z 5 P N P \* \* \$ B C F N F O D J P O B S R V F F O C  
& O D V F T U B T \* O E V T U S J B M F T E F C J E P B M \$ F O T P & D P O Ø N J D P Q V F T U P R V F  
U P S F T F D P O Ø N J D P T & O F M N B S D P E F M B N F K P S B D P O U J O V B Z E F T B U J T  
M P T V T V B S J P T B Q B S U J S E F M T F D B N C J Ø F M N P E P E F S F D P M F D D J Ø C  
G Ó T J D P T B F M F D U S Ø O J D P T " T Ó U B N C J I Ø T F J O D S F N F O U B S P O F M J N J O  
W B S J B C M F T Z D B Q Ó U V M P T

& O F M F M \* / & \$ S F B M J [ Ø F M \$ F O T P / B D J P O B M & D P O Ø N J D P \$ & / & \$ F M  
D J Q B M Q B S B M B B D U V B M J [ B D J Ø O E F M N B S D P N V F T U S B M Z B R V F G V F S F  
Q S J N F S B D P O T J T U J Ø F O F M F N Q B E S P O B N J F O U P B m O E F V C J D B S H F P H  
C M F D J N J F O U P T E F M V O J W F S T P Z D P O U B S D P O V O E J S F D U P S J P B D U V B M J  
F M M F W B O U B N J F O U P E F M B & O D V F T U B & Y I B V T U J W B D P O B x P E F S F G F S  
F M D V B M O P T F S F B M J [ B S P O M B T & O D V F T U B T \* O E V T U S J B M F T & T B T Ó R V  
S F U P N Ø T V Q S P E V D D J Ø O Q F S P C B K P V O F T R V F N B E F N B S D P T N V F T U S B M  
E F G P S N V M B S J P T R V F O P M B I B D Ó B D P N Q B S B C M F O J D P O M B T F S J F E F M  
E F I B D J B B U S È T O J D P O M B & O D V F T U B & Y I B V T U J W B E F

' S F O U F B F T U B T J U V B D J Ø O Z D P O F M m O E F E B S D P O U J O V J E B E B M B T T F S  
C M F T N B D S P F D P O Ø N J D B T D B M D V M B E B T F O M B T & O D V F T U B T \* O E V T U S J E  
Q S P D F E J Ø B S F B M J [ B S F M F K F S D J D J P E F F N Q B M N F E F F O D V F T U B T J O E V  
& O D V F T U B & Y I B V T U J W B R V F D P O T J T U J Ø F O B O B M J [ B S M B D P N Q P T J  
O Ø N J D P T Q P S D B E B S B N B E F B D U J W J E B E D P O M B m O B M J E B E E F E B S D P O  
M P T Q S J O D J Q B M F T B H S F H B E P T F D P O Ø N J D P T Q B S B R V F T F B O D P N Q B S B C  
1 B S B M B D P O T U S V D D J Ø O E F M B T F S J F T F U P N Ø D P N P M Ó O F B C B T F M B J O  
\* O E V T U S J B M F T " T Ó T F Q B S U F E F M B O È M J T J T E F M B & O D V F T U B & Y  
M B T & O D V F T U B T \* O E V T U S J B M F T

" Q B S U J S E F M B x P T V S H F M B O F D F T J E B E E F J N Q M F N F O U B S N F K P S B T  
Q S F T B S J B M F T F T Q P S F T U B S B [ Ø O R V F T F S F B M J [ B V O B S F W J T J Ø O N F U  
& T U S V D U V S B M & N Q S F T B S J B M & T U B T J U V B D J Ø O E F S J W Ø F O M B J N Q M F  
N V F T U S B M I P N P M P H È O E P T F M B T & O D V F T U B T \* O E V T U S J B M F T . B O V G B D  
F O V O G P S N V M B S J P E F O P N J O B E P & O D V F T U B & T U S V D U V S B M & N Q S F T B S  
D B S H B E F S F T Q V F T U B E F M P T J O G P S N B O U F T D P N P V O B B Q S P Y J N B D J Ø C  
N J O J T U S B U J W P T B T Ó D P N P M B N F K P S B F O M P T N Ø E V M P T E F \* O G P S N B D  
5 F D O P M P H Ó B T E F M B \* O G P S N B D J Ø O Z M B \$ P N V O J D B D J Ø O 5 \* \$ M B D V B M  
U V B M J E B E



1 M B O J m D B D J Ø O

0 C K F U J W P T Z E F M J N J U B D J Ø O  
P Q F S B D J Ø O F T U B E Ó T U J D B

0 C K F U J W P T

0CKFUJWP (FOFSBM

&MBCPSBS FM %JTFxP .VFTUSBM EF MB i&ODVFTUB &TUSVDUVSBM &NQS  
OJDBT EF NVFTUSFP QSPCBCJMÓTUJDP RVF QFSNJUBO FNJUJS SFTVMU  
QBMFT WBSJBCMFT RVF TF JOWFTUJHBSÈ FO EJDIB FODVFTUB

0CKFUJWPT &TQFDÓmDPT

- (BSBOUJ[BS MB SFQSFTFOUBUJWJE BE EF MB FODVFTUB UBOUP B OJ  
MPT EPNJOJPT EF FTUVEJP
- \$BMDVMBS GBDUPSFT EF FYQBOTJØO Z FSSPSFT BTPDJBEPT BM NVF

% F M J N J U B D J Ø O

5JQP EF PQFSBDJØO FTUBEÓTUJDB

&TUB PQFSBDJØO FTUBEÓTUJDB DPSSFTQPOEF B VOB FODVFTUB EJSJH  
\$PCFSUVSB UFNÈUJDB

" OJWFM EF TFDDJPOFT FDPOØNJDBT EF MB \$\*\*6 MBT FNQSFTBT B JO  
MBT TJHVJFOUFT SBNBT

- # &YQMPUBDJØO EF NJOBT Z DBOUFSBT
- \$ \*OEVTSJBT NBOVGBDUVSFSBT
- % 4VNJOJTUSPE EF FMFDUSJDJE BE HBT WBQPS Z BJSF BDPOEJDJPOBE
- & %JTUSJCVDJØO EF BHVB BMDBOUBSJMMBEP HFTUJØO EF EFTFDIPT  
NJFOUP
- ' \$POTUSVDDJØO
- ( \$PNFSDJP BM QPS NBZPS Z BM QPS NFOPS SFQBSBDJØO EF WFIÓDVM  
UPDJDMFUBT
- ) 5SBOTQPSUF Z BMNBDFOB NJFOUP
- \* "DUJWJEBEFT EF BMPKBNJFOUP Z EF TFSWJDJP EF DPNJE BT
- + \*OGPSNBDJØO Z DPNVOJDBDJØO
- , "DUJWJEBEFT mOBODJFSBT Z EF TFHVSPT /P JODMVZF , Z ,
- "DUJWJEBEFT \*ONPCJMJBSJBT
- . "DUJWJEBEFT QSPGFTJPOBMFT DJFOUÓmDBT Z UÍDOJDBT
- / "DUJWJEBEFT EF TFSWJDJPT BENJOJTUSBUJWPT Z EF BQPZP
- 1 &OTFxBO[B
- 2 "DUJWJEBEFT EF BUFOVDJØO EF MB TBMVE IVNBOB Z EF BTJTUFODJB T
- 3 "SUFT FOUSFUFOJNJFOUP Z SFDSFBDJØO
- 4 0USBT BDUJWJEBEFT EF TFSWJDJPT /P JODMVZF TØMP MB EJWJTJØ

4F FYDMVZFO MBT TFDDJPOFT



" "HSJDVMUVSB HBOBEFSÓB TJMWJDVMUVSB Z QFTDB  
 0 "ENJOJTUSBDJØO QPcMJDB Z EFGFOTB QMBOFT EF TFHVSJE BE TP  
 UPSJB  
 5 "DUJWJEBEFT EF MPT IPHBSFT DPNP FNQMFBEPSFT BDUJWJEBEFT  
 MPT IPHBSFT DPNP QSPEVDUPSFT EF CJFOFT Z TFSWJDJPT QBSB VTF  
 6 "DUJWJEBEFT EF PSHBOJ[BDJPOFT Z ØSHBOPT FYUSBUFSSJUPSJBM  
 &O FM DBTP EF MB TFDDJØO " TF EFCF B RVF MB GPSNB EF JOWFTUJHBS  
 FO VOB FODVFTUB FTQFDÓmDB EF FTUBEÓTUJDBT BHSPQFDVBSJBT 1P  
 0 5 Z 6 OP IBDFO SFGFSFODJB B MB QPCMBDJØO PCKFUJWP RVF TPO MBT  
 \$PNP QBSUF EF MB DPCFSUVSB UFNÈUJDB TF UJFOF MPT UBNBxPT EF FN  
 ■ .FEJBOB FNQSFTB i"w  
 ■ .FEJBOB FNQSFTB i#w Z  
 ■ (SBOEF FNQSFTB

" MPT DVBMFT TF MPT IBO EFmOJEP FO CBTF B MB FTUSBUJmDBDJØO EF M  
 /BDJPOFT \$"/ FTUBCMFDJEB EF MB 5BCMB

5BCMB 5BNBxP EF FNQSFTB

| \$MBTJmDBDJØO E<br>FNQSFTB | 1FSTPOBM P[ | 7FOUBT BO<br>64% |
|----------------------------|-------------|------------------|
| 1FRVFxB FNQSFTB            | o           |                  |
| .FEJBOB FNQSFTB 5JQP "     | o           |                  |
| .FEJBOB FNQSFTB 5JQP #     | o           |                  |
| (SBOEF FNQSFTB             | Z NÈT       | Z NÈT            |

'VFOUS"/ %FDJTJØO "SUJDVMP

6OJWFSTP EF FTUVEJP  
 -BT FNQSFTBT EF UBNBxP HSBOEF NFEJBOB " Z NFEJBOB # RVF DVNQMFB  
 EF DMBTJmDBDJØO EF DPCFSUVSB UFNÈUJDB QBSB FM BxP  
 6OJE BE EF PCTFSWBDJØO Z VOJE BE EF BOÈMJTJT  
 &NQSFTBT  
 \$PCFSUVSB HFPHSÈmDB  
 -B DPCFSUVSB HFPHSÈmDB FTUÈ EFmOJEB QPS MBT FNQSFTBT RVF TF  
 EFOUSP EFM UFNÈUJDB FDVBUPSJBOP JODMVZFOEP MB SFHJØO \*OTV  
 1PCMBDJØO PCKFUJWP  
 1BSB MB &/&4&. MB QPCMBDJØO PCKFUJWP TPO MBT FNQSFTBT RVF C  
 HPSÓBT EFTDSJUBT FO MB DPCFSUVSB UFNÈUJDB  
 \$POUJOVJE BE  
 %FTEF FM BxP IBTUB MB BDUVBMJE BE  
 1FSJPEJDJE BE  
 "OVBM



% J T F x P Z D P O T U S V D D J Ø O

% J T F x B S F M N B S D P Z M B N V F T

5 J Q P Z F U B Q B T E F E J T F x P N V F T U S B

. V F T U S F P Q S P C B C J M Ó T U J D P E F F M F N F O U P T D P O T F M F D D J Ø O B M F B U P S

% P N J O J P T E F F T U V E J P

- P T E P N J O J P T E F F T U V E J P E F M B F O D V F T U B T P O M P T T F D U P S F T F D P O Ø N  
Q S F T B B O J W F M O B D J P O B M E F U B M M B E P T F O M B T F D D J Ø O E F \$ P C F S U V S  
E P N J O J P E F F T U V E J P T F D P O T J E F S B D P N P H S V Q P E F J O D M V T J Ø O G P S [  
U B N B x P i ( S B O E F F N Q S F T B w F T E F D J S F T U B T F N Q S F T B T F O U S B O D P O Q  
G P S N B S Q B S U F E F M B N V F T U S B \$ B C F S F D B M D B S R V F T F J O D M V J S È B M  
F S B O E F U B N B x P i ( S B O E F F N Q S F T B w Z F O F M T P O i . F E J B O B T # w D P O  
T F H V J N J F O U P E F F T U B T F N Q S F T B T F O T V T D B S B D U F S Ó T U J D B T

. B S D P N V F T U S B M

& M . B S D P E F . V F T U S F P Q B S B M B i & O D V F T U B & T U S V D U V S B M & N Q S F T B S J  
Q P S M B T F N Q S F T B T R V F D P O T U B O F O F M 3 F H J T U S P & T U B E Ó T U J D P E F &  
D P O T U S V J E P F O M B % J S F D D J Ø O E F & T U B E Ó T U J D B T & D P O Ø N J D B T R V F D  
S J B C M F T E F J E F O U J m D B D J Ø O W B S J B C M F T E F V C J D B D J Ø O W B S J B C M F T  
E F E J T F x P Z D P O U S P M E F M B T F N Q S F T B T J O E J T Q F O T B C M F T Q B S B F M E J

1 S F W J P B M V T P E F M 3 & & . T F S F B M J [ B V O Q S P D F T P E F W B M J E B D J Ø O B C  
E F M B T W B S J B C M F T R V F D B S B D U F S J [ B O B M B T F N Q S F T B T 7 F O U B T U P U  
E P T " D U J W J E B E & D P O Ø N J D B 5 B N B x P E F F N Q S F T B ' P S N B J O T U J U V D J P  
T F D P O U S B T U B M B J O G P S N B D J Ø O E F M 3 & & . F O D P N Q B S B D J Ø O B M B E

1 B S B M B D P O T U S V D D J Ø O E F M . B S D P . V F T U S B M T F U P N B F O D V F O U B M P  
M P T R V F T F F O G P D B M B F O D V F T U B R V F F T U É O E F U F S N J O B E P T Q P S M B D  
M P T T J H V J F O U F T

- . B O V G B D U V S B
- . J O F S Ó B
- \$ P O T U S V D D J Ø O
- \$ P N F S D J P
- 4 F S W J D J P T

- V F H P E F S F W J T B S M B C B T F E F E B U P T E F M 3 & & . D P O G P S N B E P Q P S  
1 B S B M B D P O T U S V D D J Ø O E F M . B S D P . V F T U S B M T F T F M F D D J P O Ø F N Q S F  
H V J F O U F T D B S B D U F S Ó T U J D B T S F T Q P O E J F O E P B M B T O F D F T J E B E F T E  
Q B S B M B F O D V F T U B

- & N Q S F T B T E F U B N B x P ( S B O E F & N Q S F T B . F E J B O B & N Q S F T B 5 J Q P # Z  
T B 5 J Q P "



- 4F FYDMVZF FNQSFTBT DVZB BDUJWJEBE &DPOØNJDB 1SJODJQBM E DJØO EF \$MBTJmDBDJØO \*OEV TUSJBM \*OUFSOBDJPOBM 6OJGPSNF I 3FWJTJØO \$\*\*6 DPSSFTQPOEF B "HSJDVMUVSB " "ENJOJTUSBD EBEFT EF IPHBSFT 5 Z "DUJWJEBEFT EF PSHBOJ[BDJPOFT 6
- 4F FYDMVZF EF MB TFMFDDJØO MBT TJHVJFOUFT EJWJTJPOFT EFM \$ t "DUJWJEBEFT EF TFSWJDJP mOBODJFSP FYDFQUP EF TFHVSPT , t "DUJWJEBEFT BVYJMJSFT EF TFSWJDJP mOBODJFSP , t "DUJWJEBEFT EF "TJTUFODJB 4PDJBM TJO BMPKBNJFOUP 2 t "DUJWJEBEFT EF "TPDJBDJPOFT 4
- 4F FYDMVZFO MBT FNQSFTBT DPO GPSNB JOTUJUVDJPOBM i\*OTUJUW
- 4F FYDMVZF FNQSFTBT SFQPSUBEBT DPNP OP VCJDBEBT EF BDVFS iFNQSFTBT OP VCJDBEBT w EFM 3&&.
- 4F FYDMVZF MBT FNQSFTBT (SBOEFT Z .FEJBOBT i#w DPO GPSNB JOT OBUVSBMFT OP PCMJHBEFT B MMFWBS DPOUBCJMJEBE w
- &O DPOKVOUP DPO MB (FTUJØO EF &TUBEÓTUJDBT &TUSVDUVSBMFT FNQSFTBT RVF IBO SFDIB[BEP FOUSFHBS JOGPSNBDJØO FO MBT USF WFTUJHBDJØO EF NBOFSB DPOTFDVUJWB &M OþNFSP EF FNQSFTBT I FT

## 7BSJBCMF T EF EJTF xP

&M UBNB xP EF MB NVFTUSB TF DBMDVMB FO GVODJØO B TV WBSJBCMF E w

## 5BNB xP NVFTUSB M

1BSB MB EFUFSNJOB DJØO EFM UBNB xP EF MB NVFTUSB TF SFRVJFSF FTU P DBSBDUFSÓTUJDBT B FTUJNBS FM OJWFM EF DPOMBO[B Z MB QSFDJT RVF MPT SFTVMUBEPT PCUFOJEPT OP TFBO EFNBTJBEP DPTUPTPT Z P J

&O FTUF TFOUJEP MB WBSJBCMF EF EJTF xP FO CBTF B MB DVBM TF DBM USB FT i7FOUBT UPUBMFT w -PT WBMPST QPCMBDJPOBMFT NBSDP TF UPNBO EF MB CBTF EF EBUPT EFM 3FHJTUSP &TUBEÓTUJDP EF &NQSF

-B GØSNVMB QBSB MB EFUFSNJOB DJØO EFM UBNB xP EF MB NVFTUSB DPS QSPCBCJMÓTUJDP QBSB FM FTUJNBEP S EFM UPUBM

$$n_i >= \frac{(N_i S_i)^2}{\frac{N_i - 1}{N_i} \cdot \frac{e_r X_i}{z}^2 + N_i S_i^2} \frac{1}{(1 - \text{tnr}_i)}$$

EØOEF

- $n_i$  = 5BNB xP EF MB NVFTUSB QPS EPNJOJP
- $N_i$  = 5BNB xP EFM EPNJOJP
- $X_i$  = &TUJNBDJØO EF MB WBSJBCMF EF iEJTF xP FO FM EPNJOJP
- $S_i$  = \$VBTJWBSJBO[B E iFM EPNJOJP
- $e_r$  = &SSPS SFMBUJWP NÉYJNP BENJTJCMF
- $z$  = \$PFmDJFOUF RVF SFQSFTFOUB FM OJWFM EF TFHVSJEBE P DPOMBO
- $\text{tnr}_i$  = 5BTB EF OP SFTQVFTUBi EFM EPNJOJP

-B DVBTJWBSJBO[B SFQSFTFOUB MB WBSJBCJMJEBE EFM EPNJOJP B QB WBSJBCMF EF EJTF xP



" QBSUJS EFM NBSDP EF NVFTUSFP DPOTUJUVJEP QPS FNQSFTBT  
NVFTUSB EF UBNBxP JHVBM B FNQSFTBT DPO FM EF FSSPS SFM  
DPOmBO[B EFM QBSB MB WBSJBCMF EF EJTFxP 7FOUBT UPUBMFT  
EF OP SFTQVFTUB QBSUJDVMB S QBSB DBEB EPNJOJP EF FTUVEJP RVF T  
PCUFOJIOEPTF VOB GSBDDJØO EF NVFTUSFP HMPCBM EF

-B NVFTUSB QPS UBNBxP TF EJTVSJCVDJØO DPNP TF NVFTUSB FO MB 5BCMB

5BCMB %JTUSJCVDJØO EF MB NVFTUSB TFHPO UBNBxP

|                               |
|-------------------------------|
| 5BNBxP EF FNQSF /PNFSP EF FNQ |
| .FEJBOB FNQSFTB 5JQP "        |
| .FEJBOB FNQSFTB 5JQP #        |
| (SBOEF FNQSFTB                |
| 5PUBM                         |

'VFOU&&.

## 4FMFDDJØO EF MB NVFTUSB

-B TFMFDDJØO EF MBT FNQSFTBT RVF GPSNBO QBSUF EF MB NVFTUSB E  
xP FTUBCMFDJEP TF SFBMJ[B JOEFQFOEJFOUFNFOUF FO DBEB VOP EF M  
VO NVFTUSFP BMFBUPSJP TJNQMF FT EFDJS DBEB FNQSFTB UJFOF ME  
TFMFDDJØO

## \$POUSPM EF DPCFSUVSB EF D NVFTUSBM

-B DPCFSUVSB IBDF SFGFSFODJBB MB JOGPSNBDJØO PCUFOJEB FO DBN  
MPT JOGPSNBOUFT EF MBT FNQSFTBT QVFEF FTUBS DPOTUJUVJEB EF E

5BCMB &TUSVDUVSB EF DPOEJDJØO EF MFWBOUBNJFOUP EF JC

|  |                                     |
|--|-------------------------------------|
| &GFDUJWJEBE EF I 3FTVMUBEP EF FOUSFWJTUE |                                     |
|  | \$BNCJP EF SBNB EF BDUJWJEBE        |
|  | \$BNCJP EF TFDUPS FDPOØNJDP         |
|  | \$BNCJP EF SB[ØO TPDJBM             |
|  | \$BNCJP EF 36\$                     |
| &GFDUJWB                                 | \$BNCJP EF 1SPWJODJB EF MB FNQSFTB  |
|  | &NQSFTBT RVF QSPEVDFO QBSB UFSDFSPT |
|  | 'VTJPOBEBT                          |
|  | "CTPSCJEBT                          |
|  | %FTJOUFHSBDJØO                      |
|  | &TDJTJØO                            |
| /P FGFDUJWB                              | /P VCJDBEBT                         |
|  | 3FDIB[PT                            |
|  | -JRVJEBEBT                          |



| &GFDUJWJEBE EF I 3FTVMUBEP EF FOUSFWJTUE |   |
|--|---|
|  | 4JO DBSBDUFSÓTUJDBT                     |
| /P FGFDUJWB                              | *OBDUJWBT                               |
|  | 4JO DPOUBCJMJEBE FO FM BxP EF SFGFSFODJ |

'VFOU&FODVFTUB &TUSVDUVSBM &NQSFTBSJBM &/&4&.

4F EFCF DPOTJEFSBS RVF MB DPCFSUVSB FTUÈ FO GVODJØO EF DBEB VO  
EFUFSNJOB B QBSUJS EFM OÞNFSP EF FNQSFTBT FGFDUJWBT Z FM UPUE  
FTUP B MP MBSHP EFM MFWBOUBNJFOUP TF SFBMJ[BO TFHVJNJFOUPT DF  
DPO FM mO EF HBSBOUJ[BS MB DBMJEBE EF MPT FTUJNBEPST

\$PNP TF QVFEF PCTFSWBS FEF MB UÞBMBE F MB NVFTUSB EF MB &ODVFTUB  
&NQSFTBSJBM FNQSFTBT TF PCUVWP VOB DPCFSUVSB EF  
FT EFDJS VOB FGFDUJWJEBE EFM

5BCMB 4FHVJNJFOUP EF DPCFSUVSB QPS EPNJOJP EF FTUVI

| %PNJC 6OJWF 5/3 .VFTU 6OJWF &GFDU \$PCFSU |
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| 5PUBM                                     |

'VFOU(FTUJØO EF %JTFxP .VFTUSBM %\*/&.  
 /PUB-B WBSJBCMF i%PNJOJPw FTUÈ DPOTUJUUVJEP QPS VO OÞNFSP Z VOB MFUSB FM  
 FM UBNBxP EF MB FNQSFTB FT EFDJS .FEJBOB UJQP i"w .FEJBOB UJQP i#w Z  
 1PS PUSP MBEP MB MFUSB BEKVOUB SFQSFTFOUB MB SBNB EF BDUJWJEBE B MB R  
 BODMBEB DPO FM \$\*\*6 FM DVBM FTUÈ FTQFDJmDBEP FO FM BQBSUBEP i\$PCFSUV

# \$POTUSVDDJØO EF GBDUPS F FYQBOTJØO

## 'BDUPS EF FYQBOTJØO UFØSJD P

&M PCKFUJWP EF VOB FODVFTUB QPS NVFTUSFP FT IBDFS JOGFSFODJB  
 B QBSUJS EF MB JOGPSNBDJØO DPOUFOJEB FO MB NVFTUSB &O FTUF T  
 EF FYQBOTJØO QBSB MMFWBS MB JOGPSNBDJØO EF MB NVFTUSB B OJWF  
 DPNP FM JOWFSTP EF MB QSPCBCJMJEBE EF FTDPHFS VOB FNQSFTB FO V  
 DPOTJEFSBOEP FM JOGPSNF EF DPCFSUVSB RVF SFHJTUSB MBT OPWFEI



&M GBDUPS EF FYQBOTJØO QBSB DBEB EPNJOJP EF FTUVEJP TF EFUFSM  
EF FNQSFTBT UBOUP EFM NBSDP EF NVFTUSFP DPNP EF MB NVFTUSB BT

$$a_{ki} = \frac{N_k}{n_k} \frac{n_{fk}}{n_{fk}}$$

EØOEF

$a_{ki}$  = 'BDUPS EF FYQBOTJØO EFM NBSDP EF NVFTUSFP DPNP EF MB NVFTUSB BT  
 $N_k$  = 5BNBxP EF MB QPCMBDJØO EFM EPNJOJP  
 $n_k$  = 5BNBxP EF MB NVFTUSB EFM EPNJOJP  
 $n_{fk}$  = 5BNBxP EF FNQSFTBT EF JODMVTJØO GPS[PTB FO FM EPNJOJP L

" QBSUJS EF BIPSB TFM NBSDP EF FYQBOTJØO EFM NBSDP EF NVFTUSFP DPNP EF MB NVFTUSB BT

## 'BDUPS QPTUFTUSBUJmDBEP

\$POTJEFSBOEP RVF MB NVFTUSB GVF TFMFDDJPOBEB B QBSUJS EFM 3&&  
JOGPSNBDJØO MFWBOUBEB FO MB FODVFTUB DPSSFTQPOEF BM BxP  
QPS FM EJOBNTNP FDPOØNJDP DBNCJBSPO EF UBNBxP Z P TFDUPS FD  
DVFODJB MPT EPNJOJPT EF FTUVEJP PSJHJOBMFT TVGSJFSPO DBNCJPT

&O MB 5BCMBWJEFODJB FM DBNCJPEFM UBNBxPEF MBT FNQSFTBT FO MB  
SFHJTUSBO WBSJBDJPOFT MP DVBM DPSSFTQPOEF BM EFM UPU

5BCMB \$BNCJPEF UBNBxPEF MBT FNQSFTBT EF MB NVFTUSB

| 3 & & .  |                     |
|--|---------------------|
| 5BNBxP .FEJBOB<br>FNQSF UJQP " UJQP # FNQSF UBNBxP DBNCJPT | 5PUBM EF<br>DBNCJPT |
| .FEJBOB<br>5JQP "  |                     |
| .FEJBOB<br>5JQP #  |                     |
| (SBOEF<br>FNQSFTB  |                     |
| 5PUBM<br>DBNCJPT   |                     |

'VFOUFTUJØO EF %JTFxP .VFTUSBM %\*/&.

"EJDJPOBM QBSBFM TFEBOEF CBKB FNQSFTBT EF MB QPCMBDJØO  
BTJHOBEP VO UBNBxPEF FNQSFTB

%F JHVBM GPSNB FYJTUFO DBNCJPT FO MBT TFDDJPOFT FDPOØNJDBT  
FNQSFTBT FTEFDJS FM EFM UPUBM EF FNQSFTBT FGFDUJWBT 1P  
EFTUBDBS RVF FNQSFTBT QBTBSPO B OP UFOFS OJOHVOB SBNB EF BDU



5BCMB \$BNCJP EF UBNBxP EF MBT FNQSFTBT EF MB NVFTUSB

| 3 && .         |            |   |    |   |   |   |     |   |   |         |         |        |
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| 4 FDDJ & DPOØN | 4 JO DØEJH | # | \$ | % | & | ' | ( ) | * | + | , - . / | 1 2 3 4 | 5 PUBM |
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| \$             |            |   |    |   |   |   |     |   |   |         |         |        |
| %              |            |   |    |   |   |   |     |   |   |         |         |        |
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| 1              |            |   |    |   |   |   |     |   |   |         |         |        |
| 2              |            |   |    |   |   |   |     |   |   |         |         |        |
| 3              |            |   |    |   |   |   |     |   |   |         |         |        |
| 4              |            |   |    |   |   |   |     |   |   |         |         |        |
| 5 PUBM         |            |   |    |   |   |   |     |   |   |         |         |        |

'VFOUFTUJØO EF %JTFxP .VFTUSBM %\*/&.

\$PNP DPOTFDVFODJB EF MPT DBNCJPT EF UBNBxP Z TFDDJØO FDPOØNJDB QSFTBT RVF GVFSPO FGFDUJWB DPOUBSÈO DPO GBDUPS EF FYQBOTJØO FNQSFTBT FTUÈO GVFSB EF MB QPCMBDJØO PCKFUJWP 1BSB MB &/&4& DVFOUBO DPO GBDUPS EF FYQBOTJØO TPO FTEFDJS VOB FGFDUJWB

"IPSB CJFO FTUPT DBNCJPT EF EPNJOJP PDVSSFO UBOUP FO MB NVFT NBSDP NVFTUSBM \$PO FM mO EF TPMWFOUBS FTUPT JODPOWFOJFOUFT NJOBEP QPTUFTUSBUJmDBDJØO FM DVBM QFSNJUF SFBMJ[BS VO BKVT NFEJBOUF MB JODPSQPSBDJØO EF JOGPSNBDJØO BVYJMJBS &O FTUF DVUJMJ[BEB QSPWJFOF EFM 3&&. EFTEF FM DVBM TF SFBMJ[B VO TFH EF MB QPCMBDJØO PCKFUJWP &TUB JOGPSNBDJØO TF DPOWJFSUF FO M [BDJPOFT BM VOJWFSTP EF JOWFTUJHBDJØO Z BTJHOBS FM EPNJOJP EF DBEB VOB EF MBT FNQSFTBT JOWFTUJHBEBT

% FFTUB NBOFSB VO QPTUFTUSBUP FTUÈ DPOGPSNBEP QPS MBT FNQSF UBNBxP EF FNQSFTB Z TFDDJØO FDPOØNJDB EF BDVFSEPDPO FM 3&&. MPT EPNJOJPT PSJHJOBMFT EF MB NVFTUSB

-B GØSNVMB EF DÈMDVMP EFM GBDUPS EF FYQBOTJØO QPS FNQSFTB FT

$$f_{exp_{k_p}} = a_k \frac{N_p}{N_p}$$

% ØOEF

$f_{exp_{k_p}} = 'BDUPS EF FYQBOTJØO EF QPCMBDJØO EF MB QPTUFTUSBUP$   
 $N_p = 5BNBxP FTUJNBEP EF MB QPCMBDJØO EF MB QPTUFTUSBUP$   
 $N_p = 5BNBxP EF MB QPCMBDJØO EF MB QPTUFTUSBUP$

&T OFDFTBSJP NFODJPOBS RVF MBT FNQSFTBT RVF UJFOFO GBDUPS D

- &NQSFTBT HSBOEFT EF BDVFSEPDPO FM EPNJOJP EF TFMFDDJØO E 3&&.
- &NQSFTBT HSBOEFT TFHPO 3&&. RVF TF DPOWJSUJFSPO FO NF 3&&. DPO FM mO EF SFBMJ[BS TFHVJNJFOUP EF EJDIBT FNQSFTB



# & T U J N B D J P O F T Z F S S P S F N V F T U S B M F T

## & T U J N B D J Ø O E F D B S B D U F S Ó T

% F C J E P B M B Q P T U F T U S B U J m D B D J Ø O R V F T F S F B M J [ B M B F T U J N B D J Ø O  
E F U F S N J O B E B D B S B D U F S Ó T U J D B P W B S J B C M F : T F P C U J F O F B Q B S U J S I

$$\hat{Y}_{POST} = \sum_{p=1}^P \sum_{s_p} X_{sp} f_{exp_{k_p}} y_k$$

% Ø O E F

$\hat{Y}_{POST}$  = & T U J N B E P S Q P T U F T U S B U J m D B E Y P E F M B D B S B D U F S Ó T U J D B  
f<sub>exp<sub>k<sub>p</sub></sub></sub> = ' B D U P S E F F Y Q B O T J Ø O E F M B S U N F O S Ó T U J D B O U F B M Q P T U F T U S B U P  
y<sub>k</sub> = \$ B S B D U F S Ó T U J D B Z E K F M B F N Q S F T B  
s<sub>p</sub> = & N Q S F T B T R V F Q F S U F O F O D F P O B M Q P T U F T U S B U P

## & S S P S E F N V F T U S F P

& M F S S P S E F N V F T U S F P D P N F U J E P Q B S B M B F T U J N B D J Ø O E F D B S B D U F S Ó  
B Q B S U J S E F M B F T U J N B D J Ø O E F M B W B S J B O [ B E F M F T U J N B E P S E F M U P U  
D V Z B G Ø S N V M B F T M B T J H V J F O U F

$$CV \hat{Y}_{POST} = \frac{\sqrt{\text{var } \hat{Y}_{POST}}}{\hat{Y}_{POST}}$$

D P O

$$\text{var } \hat{Y}_{POST} = \sum_s \frac{X_{sI}^2}{k_l} \frac{g_k e_k g_e}{k l}$$
$$k_l = k_l k l$$
$$k = \frac{1}{a_k}$$
$$e_k = y_k y_{s_p}$$
$$y_{s_p} = \frac{1}{N_p} \sum_{s_p} f_{exp_{k_p}} y_k$$
$$g_k = \frac{N_p}{N_p}$$

% Ø O E F

CV  $\hat{Y}_{POST}$  = \$ P F m D J F O U F E F W B S J B D J Ø O E F M F T U J N B E P S E F U P U B M Q P T  
var  $\hat{Y}_{POST}$  = & T U J N B E P S E F M B W B S J B O [ B E F M F T U J N B E P S E F U P U B M Q P T  
k<sub>l</sub> = 1 S P C B C J M J E B E E F J O D M V T J Ø O D P Q k Z V O U B E F M B T F N Q S F T B T  
y<sub>s<sub>p</sub></sub> = & T U J N B E P S E F M B N F E J B F Q F M Q P T U F T U S B U P



# % F D M B S B D J Ø O E F M 1 M B O N V F T U S F P

1BSB FM DÈMDVMP EF MPT FTUJNBEPST Z TVT FSSPSFT WBSJBO[BT DP  
WBMPT EF DPOmBO[B Z FGFDP EF EJTFxP DPOTJEFSBOEP FM EJTFxP NV  
FM TPGUXBSF FTUBEÓTUJDB 4144 FO FM RVF TF DPOTUSVZF VO QMBO E  
DPNQMFKBT "VORVF FM QBRVFUF OP UJFOF MBT GBDJMJEBEFT QBSB SF  
FTUSBUJmDBDJØO TF QVFEF FTUJNBS DPO VO EJTFxP BQSPYJNBEP Q  
QMBO EF NVFTUSFP FT MB TJHVJFOUF

```
CSPLAN ANALYSIS  
/PLAN FILE='C:\Users\Estructurales\plan_muestreo_final.csplan'  
/PLANVARS ANALYSISWEIGHT=f_exp  
/PRINT PLAN  
/DESIGN STRATA=Pst  
/ESTIMATOR TYPE=EQUAL_WOR  
/POPSIZE VARIABLE=N_fin.
```

EPOEF MBT WBSJBCMFT DPSSFTQPOEFO B

Pst = QPTUFTUSBUP  
f @xp = GBDUPS EF FYQBOTJØO  
N @n = UPUBM EF MB QPCMBDJØO QPS QPTUFTUSBUP

%F JHVBMNBOFSB UBNCJÏO TF QVFEFO DBMDVMBS VUJMJ[BOEP FM TPG  
EFDMBSDJØO

```
svyset [pweight=f_exp], strata(Pst) fpc(N_fin) vce(linearized)  
svyset, singleunit(certainty) noclear
```

1PS ÞMUJNP FO FM TPGUXBSF 3 TF VUJMJ[B MB TJHVJFOUF TJOUBYJT



```

plan_muestreo <- factores_fin_V1_1 %>%
  as_survey_design (ids = "id_empresa",
                    strata="Pst",
                    fpc= "N_fin",
                    weights = f_exp,
                    nest = T)
options(survey.lonely.psu = "certainty")

```

# 3 F G F S F O D J B T

<)JEJSPHMV FU)B MJSPHMV . 4ÊSOEBM \$ BOE #J@EUFSO %BOE &T  
 UJNBUIPO JO #VTJOFPTD 4VSWFZBDE 4POT

<,JTI ,JTI - .VFTUSFP EF FODS\$JTWB BT

<4ÊSOEBM FU 4ÊSOEBM \$ 4XFOTTPO # BOE 8SPBN@OTFJTUFE  
 4VSWFZ 4BN@MSDHFS 4FSJFT JO 4UBUJTUJDT 4QSJOHFS /FX :PSL

